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A mixed methods investigation of paramedic independent prescribing in emergency and urgent Care

by

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Thesis for the degree of Doctor of Philosophy

June 2025

Abstract

Introduction

This research investigated paramedic independent prescribing (PIP) in emergency and urgent care (EUC), examining any benefits, limitations, facilitators or barriers. Previous PIP research was limited, and it was unclear if and how PIP benefits patients and EUC services. Potential issues were also identified in previous research, including low uptake of PIP across the ambulance sector, restrictions on the prescribing of Controlled Drugs (CDs), and that paramedics are not following national recommendations by completing master's level education before adopting PIP.

Methods

A sample of key stakeholders with strategic insights on the research topic were interviewed (n=15), using a Framework approach for data analysis. Mixed methods case study research was then undertaken in an emergency department (ED) and an out-of-hours urgent care service. A detailed and comprehensive insight into PIP in each setting was obtained through observation of practice, semi-structured interviews, and analysing site documents and prescribing data. Quantitative data were analysed using descriptive statistics, with qualitative data being coded and categorised to facilitate thematic analysis.

Findings

PIP enabled a wide range of drugs to be prescribed, enhancing paramedic practice and improving patient access to medicines. These benefits were valued given the high levels of demand being faced by EUC services. PIPs managed a broad range of presentations, including high acuity conditions in the ED. In urgent care, the scope of PIP was influenced by wider pressures in primary care, and a range of acute problems, longer-term medical issues, and repeat prescription requests were managed by PIPs. Key facilitators of PIP included access to detailed patient information and to medical support. Despite national policy stipulating master's education is required for PIP, most participants did not perceive this to be necessary. Restrictive organisational governance and the utility of existing methods of medicines supply appear to be limiting the uptake of PIP in the ambulance sector. However, increasing the use of remote prescribing may result in benefits to patient care and service delivery. The experience paramedics develop in ambulance services also equips them with a unique and transferable skill set as PIPs in other EUC settings. Since 2024, PIPs can now prescribe the most frequently required CDs in EUC. However, a wider range of CDs are required in practice, resulting in barriers to patient care, and frustration for PIPs, emphasising the need for further legislative changes.

Conclusions

This research provides the first, detailed insight into PIP in EUC, highlighting the resulting benefits for patients and services from an enhanced scope of practice and use of medicines. Further legislative changes to expand CD prescribing and addressing implementation challenges in the ambulance sector could enhance the potential of PIP in EUC.

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Acknowledgements

I would like to offer my sincere gratitude and thanks to Professor Sue Latter and Dr Joanne Turnbull for all their guidance and support throughout my doctoral journey. I would also like to thank Dr Sarah Black for supporting me throughout my NIHR Fellowship.

I also owe a debt of gratitude to my wife Becky and our son Joshua. Whether I was away from home collecting data, or focused on writing, their support and understanding to enable me to complete this journey has been unwavering and truly appreciated.

Finally, I would like to thank all the research participants, case site staff and my team of patient and public engagement and involvement representatives for their contributions to the research.

This research was funded by a National Institute of Health Research (NIHR) Clinical Doctoral Research Fellowship (NIHR 302127). The views expressed are those of the author and not necessarily those of the NIHR or the Department of Health and Social Care.

Definitions and Abbreviations

ACMD.....Advisory Council on the Misuse of Drugs

ACP..... Advanced Clinical Practitioner

ACP-EM.....Advanced Clinical Practitioner in Emergency Medicine

CAS.....Clinical Assessment Service

CD(s).....Controlled Drug(s)

CHM.....Commission on Human Medicines

ED .....Emergency Department

EUC.....Emergency and Urgent Care

FP10.....Handwritten Prescription

GP .....General Practitioner

HRA.....Health Research Authority

IP .....Independent Prescribing

JBI .....Joanna Briggs Institute

JRCALC .....Joint Royal Colleges Ambulance Liaison Committee

PA(s) .....Physician Assistant(s)

PGD(s).....Patient Group Directions

PIP .....Paramedic Independent Prescribing

PPEI .....Patient and Public Engagement and Involvement

Chapter 1 Introduction

1.1 Chapter introduction

In this chapter, an overview of the research topic of paramedic independent prescribing (PIP) in emergency and urgent care (EUC) is presented. The chapter concludes with the research questions, aims and objectives of the study. These are framed around the need to understand if and how PIP benefits practice, patient care and service delivery. Also if there are limitations and if any facilitators or barriers exist.

Leading up to the introduction of PIP, a number of important benefits were anticipated. These included improving patient access to medicines, delivering more autonomous, advanced patient care and enhancing the overall contribution of paramedics within multidisciplinary teams (Department of Health, 2010; NHS England, 2015a). Prior to conducting this research, only a very limited evidence base existed on the topic of PIP. With an even smaller body of research regarding its use within EUC settings such as emergency departments (EDs), urgent care services and the ambulance sector. Addressing this knowledge gap was an important research priority, particularly given at the start of the research project, EUC services were facing their most testing time in NHS history in the wake of the COVID-19 pandemic. A perfect storm of pressures had impacted the whole health and care system following the pandemic. However, they caused the most visible problems across EUC as the 'front door' of the NHS (NHS England, 2023b). Existing workforce shortages and a lack of capacity from years of underfunding exacerbated by the pandemic contributed to this situation (Royal College of Emergency Medicine, 2021). The House of Lords summarised this in a 2023 report as representing a national emergency (House of Lords, 2023). It had therefore never been more important to understand if and how PIP improves patient care and service delivery in EUC and if any challenges exist which might reduce its full potential and contribution from being realised.

1.2 Overview of emergency and urgent care

EUC is defined as a range of healthcare services available to people who need medical advice, diagnosis and treatment quickly and unexpectedly (NHS England, 2023a).

Emergency care involves life-threatening illnesses such as sepsis, cardiac emergencies or major trauma, requiring immediate treatment from an ambulance service or an ED (NHS England, 2023a). Urgent care involves the treatment of acute, less severe illness or injury requiring urgent attention. These include minor infections or acutely painful conditions such as back pain or dental pain (NHS England, 2023a). Urgent care often also involves providing urgent treatment for end-of-life symptoms such as pain, agitation and vomiting during out-of-hours periods (overnight and during weekends) (Webb and Gibson, 2011a; Campling *et al.*, 2022).

EUC services can be accessed directly by patients, for example by self-presenting to an ED or by calling 999. The NHS 111 24-hour service also provides a route to EUC in England, Scotland, Wales and Northern Ireland, designed to triage patients and signpost them to an appropriate service where needed. Patients can contact NHS 111 by telephone or can seek initial advice and direction from a web-based decision tool (NHS 111 Online) (NHS England, 2025a). Patients calling NHS 111 are initially assessed by a non-clinical call advisor. Based on the answers given by the patient, the call advisor uses a computer triage system to direct patients to a care disposition (NHS England, 2025a). Patient cases are passed to a regional ambulance service if a potential emergency is identified. Most patients are reviewed by an NHS 111 nurse or paramedic who may advise attending an ED, an urgent treatment centre or referral to their own or primary care provider for further assessment. During out-of-hours periods, patients who require urgent assessment and treatment are passed to a regional Clinical Assessment Service (CAS). These are staffed by doctors and urgent care practitioners who undertake further clinical assessment and if required provide treatment (NHS England, 2024a; Practice Plus Group, 2025). The dispositions and their frequency of use during 2023-2024 are outlined in Figure 1.

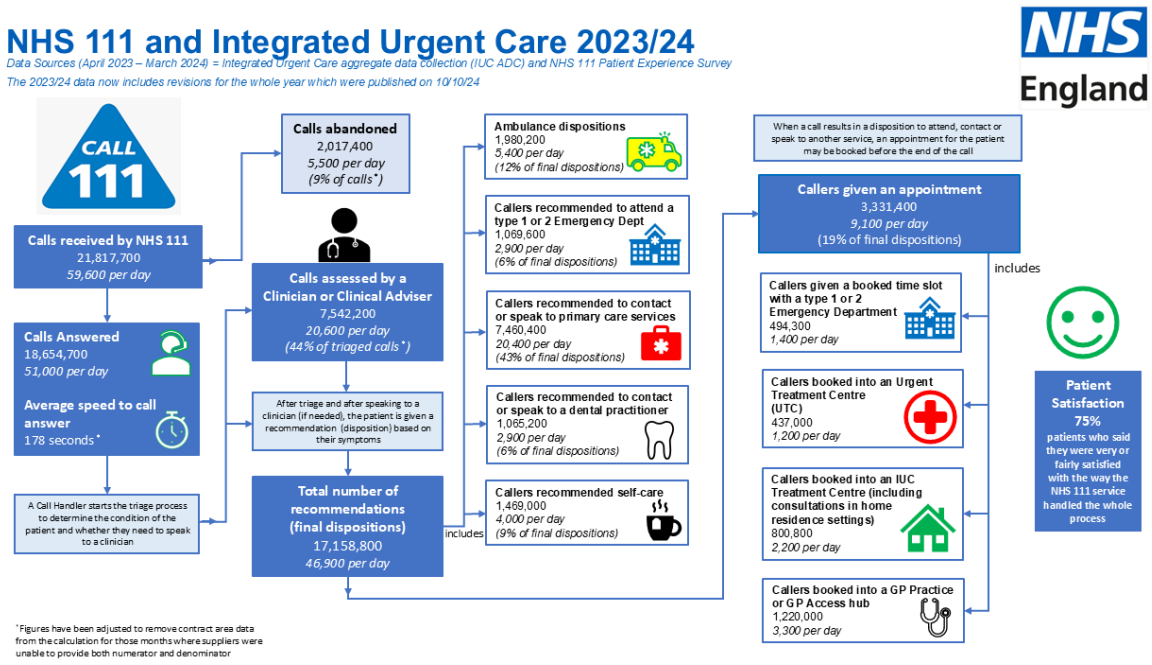


Figure 1: Overview of NHS 111 Outcomes (NHS England, 2024b)

1.3 Demand for emergency and urgent care services

Over the past two decades, EUC services have experienced escalating levels of patient demand. This has been influenced by factors such as population growth and patients living longer with increasing co-morbidities (NHS England, 2023b). However, the COVID-19 pandemic which started in 2021 significantly exacerbated these existing challenges (Royal College of Emergency Medicine, 2021; NHS England, 2023b). In the complex, post pandemic landscape, patients are experiencing difficulties in accessing primary and community care. Hospitals are also struggling to discharge patients from EDs, due to low capacity in secondary and community care. As a result, EUC services have experienced substantial increases in patient numbers, which have risen even further as the NHS continues to recover in the wake of the pandemic (House of Lords, 2023). Demand for ED care has risen gradually but consistently since 2003. In 2019 there were 25.6 million ED attendances (2.1 million a month), which was 20% more than compared to 2011 (NHS England, 2023b). Emergency admissions also grew by 28% over the same period to 6.5 million (NHS England, 2023b). The number of 999 calls has also steadily increased by 6% between 2018-2023 (House of Lords, 2023). Similarly, NHS 111 experienced the largest numbers of annual calls ever received in 2021, alongside an

annual growth of 6% a year in the number of calls received in the five years before the COVID-19 pandemic (NHS England, 2023b). In October 2022, one in five patients, over six million people, faced a wait of over two weeks between booking their primary care appointment and attending it, whilst almost 2 million people waited over 28 days (NHS Digital, 2022; House of Lords, 2023). The GP Patient Survey in 2022 also found that more than 1 in 10 people who could not get an appointment at their GP surgery went to an ED (GP Survey, 2022; House of Lords, 2023).

Previous research also highlights that patients do not always comply with NHS 111 advice, with 5.4-11% of patients attending an ED when they were advised by NHS 111 to follow self-care advice or contact primary care (Egan *et al.*, 2020; Lewis *et al.*, 2021). A further study found that less than half of 111 callers triaged to a primary care disposition contacted their primary care service, and if they did, only 58% received a prompt assessment within the specified time frame of three days. This then increased the likelihood of patients then calling 999 or attending an ED (Pilbery *et al.*, 2024). The findings of these studies therefore suggest that patients with more routine, lower acuity issues often present to EUC services rather than primary care. This may in turn increase the breadth of conditions encountered in EUC, which could have implications for PIP in these settings.

In 2023-2024, 12% of patient cases were passed to an ambulance service by NHS 111 (Figure 1). Previous research exploring paramedic experiences of these referrals suggested many cases were not perceived by paramedics to be an emergency requiring an ambulance response. Paramedics suggested this was a result of non-clinical call advisors following the instructions given by the NHS 111 triage system, because a potential emergency had been falsely identified (Phillips, 2020).

A complex EUC landscape has therefore unfolded, with a system under increasing strain and patients with unmet needs in primary care turning to EUC (Royal College of Emergency Medicine, 2021; House of Lords, 2023; Pilbery *et al.*, 2024). This results in unnecessary delays and suboptimal treatment for patients, as they often wait for long periods of time to receive treatment in EUC for conditions which could have been managed in primary care if there had been capacity for them to do so (Egan *et al.*, 2020; Lewis *et al.*, 2021; House of Lords, 2023; NHS England, 2023b).

1.4 The introduction of paramedics into a multi-disciplinary workforce

The paramedic profession has undergone significant transformation over the past two decades. Paramedic training has evolved from being delivered internally by ambulance services, focused solely on emergency care and rapid transportation to being delivered through undergraduate degree programmes (Eaton, 2023). Paramedics are now trained to a much higher level to assess and manage a wide range of problems including emergencies such as cardiac arrest and major trauma, minor illness and injuries and flare ups of long-term conditions (NHS England, 2020). Paramedics are as a result, considered as highly skilled, versatile practitioners (NHS England, 2023b), capable of working across a wide range of different clinical settings (NHS England, 2023c).

Alongside changes to paramedic pre-registration training, extended, post-registration paramedic roles have also emerged. These began with introduction of the Emergency Care Practitioner, where paramedics were provided with additional training and permitted to use a wider range of medicines to facilitate community treatments (Mason *et al.*, 2012). Over time, specialist and advanced practice roles have emerged, underpinned by postgraduate training in patient assessment and diagnostic decision-making (NHS England, 2016; Bedson and Latter, 2018). Whilst specialist practice is typically underpinned by a level of postgraduate education, advanced practice is associated with higher levels of diagnostic decision-making and an ability to manage more complex conditions. This includes managing patients with multiple morbidities and those at the extremes of age (NHS England, 2015a). National professional guidance also outlines how advanced paramedic practice should also be underpinned by master's level education (NHS England, 2016; College of Paramedics, 2020).

Engagement and scoping work with different EUC service leaders and PIPs prior to, and during the research, provided a contemporary overview of specialist and advanced paramedic practice in EUC, which is summarised below.

1.4.1 Extended paramedic roles in ambulance services

In all ten UK ambulance Trusts, specialist and/or advanced paramedics attend a wide spectrum of 999 calls, usually as a solo responder and increasingly undertaking remote consultations with patients over the phone. They also provide remote clinical advice to

other ambulance staff. A distinction is made in most ambulance services, between specialist or advanced paramedics roles in urgent care, which focus on managing patients in the community and the different role of specialist/advanced paramedics in critical care, who focus on the pre-hospital management of serious illness and trauma.

1.4.2 Extended paramedic roles in emergency departments

In EDs, advanced level paramedics are most often employed as Advanced Clinical Practitioners (ACPs) in Emergency Medicine (ACP-EM). Working as part of a multi-disciplinary team, ACP-EMs treat minor illness and injury and higher acuity cases. These include major trauma, serious illness such as sepsis and cardiac arrests. ACP-EMs complete a master's programme in advanced clinical practice and undergo a supervised credentialling programme with the Royal College of Emergency Medicine. The ACP-EM role is associated with a high degree of clinical leadership, often as a senior clinician in the department, practicing at a comparable level to a middle grade ED doctor (Crouch and Brown, 2018; Royal College of Emergency Medicine (RCEM), 2022b).

1.4.3 Extended paramedic roles in urgent care

Specialist and advanced paramedics working in urgent care services do so either within urgent care centres or an out-of-hours CAS. Urgent care centres are often co-located with EDs and staffed by a multi-disciplinary team of doctors, paramedics and nurses, to provide urgent care for minor illness and injury. Urgent care centres are open during the day, at evenings and at weekends, but are not open overnight. (Armstrong, 2015; NHS England, 2023a).

During weekday evenings and overnight periods and from Friday evenings to Monday mornings, urgent care is provided by a CAS. Patient cases range from acute infections and minor illness to end-of-life patients requiring urgent symptom management. Within a CAS, urgent care is provided either through face-to-face consultations at out-of-hours treatment centre locations, by remote telephone or video assessment, or by visiting patients in their homes.

1.5 The use of medicines by paramedics

Since 1992, paramedics have been permitted to administer a range of emergency medicines under specific exemptions in legislation (NHS England, 2020). These enable paramedics to administer the drugs required in cardiac arrests, to treat pain using Morphine and to manage seizures with benzodiazepines such as Diazepam or Midazolam. The use of these medicines is guided by evidence-based clinical guidelines set by the national Joint Royal College Ambulance Liaison Committee (JRCALC) (Brown, 2019).

However, as the nature of paramedic practice evolved, a wider range of drugs were required in practice, particularly by those in specialist and advanced roles. Ambulance services and other NHS organisations responded by introducing patient group directions (PGDs) (NHS England, 2016; Bedson and Latter, 2018). These are written instructions for medicines to be supplied and/or administered by health professionals for pre-determined, specific conditions. They contain specific criteria about which professionals can supply or administer the medicine and the situations in which the PGD can be used (NHS England, 2020). The use of PGDs was authorised for paramedics in 2000. PGDs provide a way for paramedics working in extended roles to carry and supply a wider, pre-determined formulary of medication to patients (NHS England, 2015a). This includes antibiotics to treat minor infections and analgesics to manage painful conditions (Bedson and Latter, 2018).

However, in the context of the enhanced scope of practice of these roles and the proliferation of paramedics into a wider range of clinical settings, existing legislation was felt to limit the potential for them to provide optimal patient care (NHS England, 2016). Specialist paramedics using PGDs in ambulance settings reported being unable to always provide the most appropriate antibiotic to patients, based on local antimicrobial resistance patterns. Additionally, being able to only supply a weak opioid analgesia to patients meant that patients' pain could not always be adequately managed (Bedson and Latter, 2018). If paramedics were unable to supply or administer a required medication to patients under a PGD, they needed to seek assistance from an independent prescriber (IP) or a doctor (Bedson and Latter, 2018). These limitations from existing legislative mechanisms and the evolving nature of paramedic practice therefore led to an increased interest in the adoption of IP rights for the profession. IPs

are defined as practitioners responsible and accountable for the assessment of patients with previously undiagnosed or diagnosed conditions and for decisions about the clinical management required, which include the prescribing of medicines (Joint Formulary Committee, 2025).

1.6 The journey to paramedic independent prescribing

The introduction of PIP was first proposed in 2005 in a report "Taking Healthcare to the Patient" (Department of Health, 2005). This was followed five years later by a formal stakeholder engagement exercise (Department of Health, 2010) and another five years later by an NHS public consultation (NHS England, 2015a). Stakeholder and public consultation documents outlined that PIP would be adopted only by advanced level paramedics who had completed master's level education (NHS England, 2015b;2016).

Despite the high levels of support received from a wide range of NHS Trusts and other professional bodies during the stakeholder engagement work and support from the public consultation, the Commission on Human Medicines (CHM) initially rejected the proposal to introduce PIP in 2015. Whilst only very limited information was publicised regarding this decision, it was reportedly due to concerns about the lack of clarity regarding advanced paramedic practice and whether paramedics would have sufficient training to prescribe for the wide range of conditions they might encounter (Commission on Human Medicines, 2015). However, Commissioners subsequently approved the proposal during 2018 (Collen, 2018; UK Government, 2018), although it was unclear how the concerns of Commissioners had been addressed.

1.7 Controlled Drug prescribing

Although PIP was approved in 2018, paramedics were unable to prescribe any Controlled Drugs (CDs) until the 31st December 2023. CDs are more likely to be associated with dependency, misuse and increased harm. As such, they are subject to stricter regulatory controls and governed by the Misuse of Drugs Act (Joint Formulary Committee, 2025). This delay of almost six years occurred because once PIP had been approved, separate authorisation to prescribe CDs had to be obtained from the Home Office. A limited list of five CDs was agreed by the Advisory Council on the Misuse of Drugs in 2019 (Advisory Council on the Misuse of Drugs, 2019) and approved by the

Home Office in 2022. However, legislation was not updated until 31/12/2023 to allow paramedics to prescribe Morphine, Codeine, Midazolam, Diazepam and Lorazepam (College of Paramedics, 2023; UK Government, 2023).

Whilst these legislative processes relate to the prescribing of CDs, all paramedics can administer a limited range of CDs such as Morphine and Diazepam under paramedic exemptions in legislation. A wider formulary of CDs can also be permitted by individual NHS Trusts under PGDs to enable paramedics to administer and supply CDs to patients (NHS England, 2015b). However, some important limitations are associated with these legislative mechanisms. These include that drug administration must be undertaken by the paramedics themselves and cannot be delegated to other healthcare staff. Due to the increased risks for potential misuse and harm, certain CDs such as Oxycodone, Tramadol and Diamorphine cannot be used under PGD (UK Government, 2012).

1.8 Independent prescribing by other professions

The approval of PIP enabled paramedics to join a growing number of IP professions. The first of these were optometrists, nurses and pharmacists between 2006-2008, followed by physiotherapists and podiatrists in 2012 and therapeutic radiographers in 2016 (Graham-Clarke et al., 2019). Whilst optometrists can prescribe only for eye complaints, all other professions can prescribe medicines for any condition (Joint Formulary Committee, 2025). With regards to CD prescribing, considerable inter-professional variation exists. Whilst optometrists are not permitted to prescribe CDs, nurses and pharmacists are afforded the widest prescriptive scope and can prescribe almost any CD since legislation was amended to permit this in 2012 (Graham-Clarke et al., 2019) . Physiotherapists, podiatrists, therapeutic radiographers and paramedics can all prescribe a limited range of CDs and the specific drugs permitted vary between each profession (Joint Formulary Committee, 2025).

A further point of interprofessional variation is the level of academic attainment required by different professional bodies to adopt IP. For example, only paramedics and pharmacists are required to complete IP training at postgraduate level. All other professions are permitted by both their professional bodies and by universities to complete the module at undergraduate level (Allied Health Professions Federation, 2018; The University of the West of England, 2025).

1.9 Research questions, aims and objectives

1.9.1 Research aims

Prior to conducting this research, only a very limited empirical evidence base existed on the topic of PIP, with an even smaller body of research available regarding its use within EUC settings. The existing evidence base (synthesised in Chapter 2) provided little detail to understand how PIP was being used in EUC, or to confirm if the anticipated benefits described in the stakeholder and public consultation documents (Department of Health, 2010; NHS England, 2015a) had been realised. Previous research also highlighted that despite the case of need presented in the consultation documents, very few paramedics had adopted PIP in ambulance services, although the reasons for this were not clear. Other potential issues included the restrictions on the prescribing of CDs and the potential disparity between recommendations in national policy that master's education is required for PIP and the reported educational backgrounds of PIPs. Consequently, it was unclear if and how the introduction of PIP was benefiting patients and EUC services, how these potential issues were influencing PIP in EUC or if other limitations or challenges existed. Addressing this knowledge gap was therefore deemed to be an important research priority given anticipations that PIP could enable paramedics to contribute more effectively to meeting the challenges being faced by EUC services from rising demands and difficulties in providing timely patient care (NHS England, 2016). The study therefore aimed to enhance the evidence base on PIP to inform future policy and guidance. This included providing evidence to support any continued investment in PIP or increasing PIP numbers. Also, the findings were anticipated to be useful in informing future discussions with legislators regarding CD prescribing restrictions, and to inform national guidance on the need for master's education.

1.9.2 Research questions

1. What benefits, limitations and challenges are associated with PIP in EUC and how does it contribute to patient care and healthcare service delivery?

2. What facilitators and barriers exist which influence the implementation and delivery of PIP within EUC?

1.9.3 Research objectives

1) To evaluate the scope and scale of PIP in EUC, including the range and frequency of prescriptions and conditions treated.

2) To understand if and how PIP benefits paramedic practice, patient care and NHS EUC service delivery, and if there are limitations or challenges.

3) To ascertain any facilitators and barriers which influence the implementation and use of PIP within EUC.

4) To determine if and how PIP has changed practice, confidence and autonomy.

1.10 Thesis structure

Following on from this introductory chapter, previous research evidence on the topic of PIP is synthesised through a literature review in Chapter 2. Given the limitations of this existing evidence base, a literature review synthesising previous research findings on the broader topic of IP by all professions in EUC internationally was also completed and is presented in Chapter 3. Chapter 4 provides a detailed overview of the research methods of the study, also considering important theoretical perspectives on research paradigms, the generation of knowledge in qualitative research, and considerations around rigour in the research. The findings from key stakeholder interviews (Chapter 5), the ED case study (Chapter 6) and the urgent care case study (Chapter 7) are then presented. Chapter 8 draws cross case comparisons between these case studies. The research findings are then discussed in Chapter 9 in the context of wider literature and theory, with the conclusions drawn from this outlined in Chapter 10.

Chapter 2 Literature review of paramedic independent prescribing

2.1 Chapter introduction

The overview of contemporary paramedic practice outlined in Chapter 1 illustrates how paramedics work in a broad range of settings. These include EUC services and primary care, although paramedics also practice in specialty hospital settings such as cardiology and intensive care (NHS England, 2015a; Best and Taylor, 2021; Stenner, Van Even and Collen, 2021; Eaton *et al.*, 2022). The PIP stakeholder and public consultation documents outlined how PIP was anticipated to benefit patient care across these settings (NHS England, 2015a). This literature review therefore aimed to identify and synthesise previous research relating to PIP in any setting. This was undertaken to provide context to the research findings relating to PIP in EUC and identify any gaps in the wider evidence base. Following an initial systematic search in 2021, the search strategy was repeated in 2024. This highlighted how the research evidence base had grown over time, although important gaps still existed regarding the use of PIP in EUC settings. Given the limitations of the evidence base surrounding PIP, a literature review synthesising previous research on the broader topic of IP by all professions in EUC internationally was also completed and is presented in Chapter 3.

2.2 Methodological rationale for literature reviews

The aim of the literature reviews reported in Chapters 2 and 3 was to systematically identify and synthesise empirical research evidence on PIP and IP in EUC. Booth *et al.* (2021) describe the wide typology of literature review approaches that are available to researchers, emphasising the importance of adopting a method that is proportionate to the purpose, scope and resources of the project. At the outset of this study, several review methodologies were considered including scoping, narrative and rapid reviews. Each were associated with strengths and limitations. A scoping review would have provided a broad mapping of existing evidence, which is particularly useful where a body of literature is heterogeneous or conceptually diffuse, as was anticipated.

However, scoping reviews typically prioritise breadth over depth and do not usually include formal critical appraisal or synthesis of empirical findings (Arksey and O'malley, 2005; Levac, Colquhoun and O'brien, 2010; Peters *et al.*, 2020). Similarly, a rapid review which applies systematic methods within condensed timeframes offers utility for time-sensitive decision-making, however streamlining of key stages such as search comprehensiveness or dual screening may limit depth and critical engagement with the evidence (Tricco *et al.*, 2015).

A narrative review was also considered, as this allows flexible synthesis and conceptual integration across diverse sources (Greenhalgh, Thorne and Malterud, 2018). A narrative review does however typically lack systematic procedures such as transparent search strategies, defined inclusion criteria and formal quality appraisal, often relying instead on author interpretation and selective evidence use (Baumeister and Leary, 1997; Green, Johnson and Adams, 2006; Ferrari, 2015). However, a structured narrative synthesis retains the accessibility of a narrative account whilst allowing for the rigour and transparency of systematic review methods to still be followed. This includes a predefined research question, transparent search and screening processes, structured data extraction and explicit quality assessment (Popay *et al.*, 2006; Grant and Booth, 2009). This approach therefore integrates findings through an auditable, stepwise synthesis that explores relationships between studies, whilst assessing the robustness of evidence (Popay *et al.*, 2006). A structured narrative synthesis therefore enhances credibility and reproducibility by reducing bias while maintaining the interpretive depth and contextual richness of traditional narrative reviews (Green, Johnson and Adams, 2006; Ferrari, 2015).

After evaluating this range of review methodologies, a structured literature review which followed systematic review methods, and restricted to empirical research, was therefore selected, to provide a balance between rigour and feasibility. This involved systematic searching, transparent selection and a structured, narrative synthesis of empirical findings, aligning with what Grant and Booth (2009) conceptualise as a systemised review. By focusing on empirical evidence, the review ensured that conclusions were grounded in clinical practice and outcomes, rather than conceptual or policy discourse. This aligned directly with the project's broader aims to examine the benefits, limitations, barriers and facilitators of PIP, within real-world EUC contexts.

The review process was undertaken primarily as a single researcher and without support from a larger team, which is more common in systematic review methodology (Peters *et al.*, 2020). To balance the need for methodological rigour with the time and resources available, the review methodology was informed by the Joanna Briggs Institute (JBI) Manual for Evidence Synthesis (Aromataris, 2020). The JBI manual provided a structured, evidence-based framework for planning and conducting systematic reviews, ensuring methodological transparency and reproducibility. Given the overall purpose of the review was to identify gaps in the literature, rather than be a piece of research in its own right, a formal protocol was not registered or published. Instead, the review followed the core transparency principles of PRISMA 2020 (Page *et al.*, 2021), with all search strategies, selection processes and study flow reported to ensure clarity and reproducibility.

Given the more substantial size of the literature review on IP in EUC (Chapter 3) and the more specific exclusion criteria, two academic supervisors peer-reviewed 20% of all screening decisions at each stage. While dual independent screening is considered the ideal in systematic reviews (Higgins and Green, 2008), methodological guidance acknowledges that single-reviewer screening with verification of a sample is an acceptable and pragmatic approach for doctoral or resource-limited reviews (Khangura *et al.*, 2012; Tricco *et al.*, 2015).

Data from included studies were extracted using a customised data extraction table rather than a pre-existing or published extraction tool. This decision was made to ensure sufficient flexibility to accommodate the heterogeneity of study designs, contexts and outcomes. As such, rigid, pre-specified extraction frameworks such as the Cochrane Data Extraction Form or the JBI standardised extraction template were not ideally suited to capturing the range and nuance of findings relevant to the research focus (Higgins and Green, 2008; Aromataris, 2020).

Booth *et al.* (2021) highlight that literature reviews, particularly those dealing with complex or interdisciplinary topics, often require bespoke extraction approaches that are fit for purpose rather than strictly standardised. Similarly, the JBI Manual for Evidence Synthesis (Aromataris, 2020) and the Cochrane Handbook (Higgins and Green, 2008) both recognise that flexibility is essential when reviews encompass

multiple study types or heterogeneous evidence bases, recommending adaptation of data extraction tools to the review's aims and context. This approach also aligns with established methodological literature emphasising that rigour lies in transparency and coherence, rather than the use of a specific tool (Whittemore and Knafl, 2005; Booth *et al.*, 2021).

2.2.1 Literature review question

What are the findings of research that has been undertaken on the topic of PIP and what gaps exist in the evidence base regarding PIP in EUC?

2.2.2 Review objectives

1) To determine the demographic profile of PIPs, including numbers of paramedics qualified in PIP, experiential and educational backgrounds, practice settings and clinical roles.

2) To identify the range and frequency of prescribed medication and conditions treated in the different practice settings where PIP is being used.

3) To examine any associated patient, service or professional level benefits from PIP.

4) To identify if any barriers, challenges or facilitators exist which influence PIP implementation and delivery.

5) To identify the key gaps in the research evidence base in relation to PIP use in EUC.

2.3 Review methods

Systematic searches were undertaken during 2021 with a date range of 2014-2021 and updated in June 2024 with a date range of 2021-2024 using PubMed, CINAHL, AMED, EMBASE, Scopus, Web of Science, TRIP, EthOS, CENTRAL (The Cochrane Central Register of Controlled Trials), ASSIA and Delphis (2021 only) databases. Google Scholar was also searched, and the first 200 relevant articles were screened. This was informed by the approach outlined by Bramer *et al.* (2017) which balances relevance to the search with the vast number of results retrieved by Google Scholar. Boolean operators were used to combine the search terms paramedic AND prescrib*, alongside using key MeSH terms, further details on which are provided in Appendix A. A final, more focused update search was also run during April 2025 using only Google Scholar. This captured

12/14 of the previously included studies and screening the first 200 results did not identify any new PIP studies.

2.3.1 Review inclusion criteria

The inclusion criteria for the review were designed to identify empirical research on the topic of PIP. Given PIP had only been implemented into UK paramedic practice, the scope of the search was UK based research only. However, restrictions were not placed on the clinical settings included in studies, seeking to capture any empirical research findings on the topic of PIP.

- Empirical research studies.
- Published after 2014 – To capture relevant pre-implementation research.
- Reporting data on any aspect of PIP including pre-implementation views/experiences, range/frequency of medication prescribed, benefits, limitations, facilitators or barriers to PIP.
- UK-based paramedic practice.

2.3.2 Review exclusion criteria

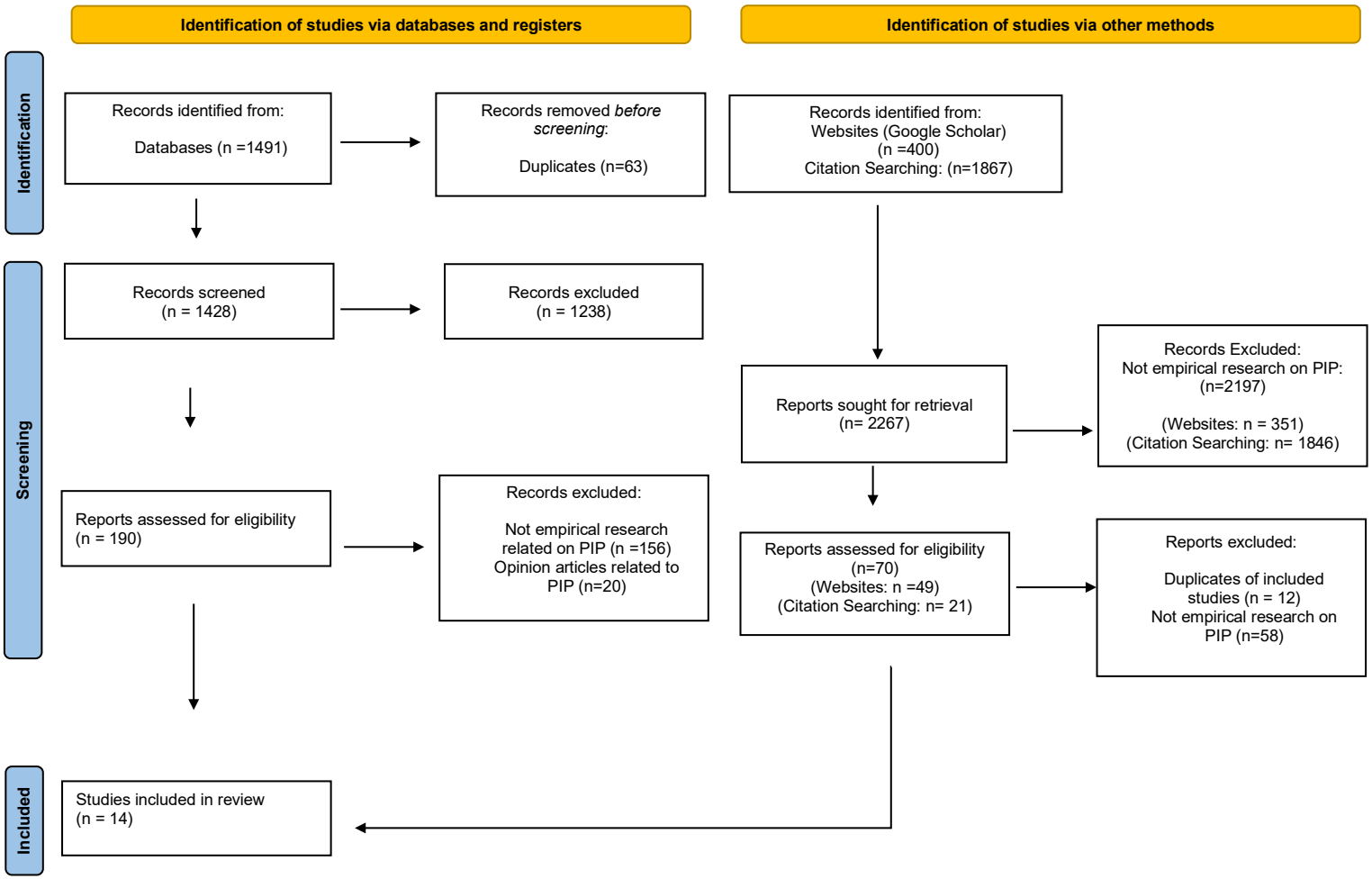
- Non empirical research articles (e.g. opinion articles).
- Non-UK based research.

2.3.3 Study screening, critical appraisal and data extraction

Results were imported into EndNote reference management software (Clarivate, 2022) and duplicate results removed using automated tools and manual checks. Articles were screened firstly by title and abstract, with potentially relevant papers then undergoing a full text review by a single reviewer (AB) (Figure 2). Those meeting the inclusion criteria underwent critical appraisal and data extraction. During this process, the citations of included studies were screened, although no new studies were identified. Figure 2 illustrates how a total of 14 studies were included in the review. These included 6 studies from the initial search in 2021 and a further 8 studies from the search in 2024.

Given the variety of methodological approaches used in the included study, the Mixed Methods Appraisal Tool was selected to guide critical appraisal as it can be applied to quantitative, qualitative, multi-method and mixed methods studies (Hong *et al.*, 2019). Relevant data including details of the clinical settings, participants and key findings were extracted into a data collection table (Appendix A) within Microsoft Word and synthesised through a narrative summary.

Figure 2: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Diagram (Page et al. 2021): PIP Review



2.4 Literature review findings

2.4.1 Overview of included studies

The initial literature Search in 2021 identified two empirical research studies following the introduction of PIP in 2018 (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021). Four additional included studies were conducted prior to the introduction of PIP which contained relevant data from exploring participant views on PIP (Duffy and Jones, 2017; Bedson and Latter, 2018; Clarke, 2019; Turner and Williams, 2019). In June 2024, a total of eight new studies were identified which met the inclusion criteria. Of these, only two were specifically focused on PIP (Edwards, 2023; Pryor, Hand and Dunn, 2023). Two focused more widely on paramedic practice and included limited data on PIP (Ellis, 2022; Eaton, 2023). Five studies reported data on IP by all professions which included limited extractable data specifically on PIP (Brett and Palmer, 2022; Drennan *et al.*, 2023; Pryor, Hand and Dunn, 2023; Deveau, Plowright and Dawson, 2024; Rae, 2024). In total therefore, 14 studies were included in the review. Whilst the additional search demonstrated how the body of evidence surrounding PIP had grown over time, any detailed insight regarding PIP in EUC settings was still missing in this evidence base. In total 5/14 studies presented some limited findings regarding PIP in EUC following its introduction (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021; Drennan *et al.*, 2023; Pryor, Hand and Dunn, 2023; Rae, 2024). Table 1 provides an overview of the included studies.

The included studies used a range of qualitative and quantitative methods including online surveys (Bedson and Latter, 2018; Best and Taylor, 2021; Rae, 2024), analysis of prescribing records (Brett and Palmer, 2022), case study research (Edwards, 2023), qualitative interviews (Stenner, Van Even and Collen, 2021; Edwards, 2023; Pryor, Hand and Dunn, 2023; Rae, 2024) and focus groups (Duffy and Jones, 2017; Pryor, Hand and Dunn, 2023). Two studies used multiple research methods (Drennan *et al.*, 2023; Deveau, Plowright and Dawson, 2024) and two were mixed methods studies (Edwards, 2023; Rae, 2024).

2.4.2 Critical appraisal

The results of the critical appraisal process are summarised through a visual summary using a traffic light system (Figure 3), which highlights the different answers to the critical appraisal questions (Figure 4). This illustrates how overall the included studies were of mixed quality and only 2/14 had zero answers of ‘no’ or ‘don’t know’. The two mixed methods studies (Edwards, 2023; Rae, 2024) were strengthened by clear integration of the mixed methods data using detailed narrative summaries. Limited survey response rates were noted in two studies (Best and Taylor, 2021; Rae, 2024). A significant lack of detail regarding the paramedic participants included in the research by Ellis (2022) was also highlighted during the appraisal process. Further relevant points from the critical appraisal process are included within the narrative summary in the following sections of this chapter.

Table 1: Overview of Included Studies

Author, year	Aims	Participants, Settings and Details	Methods
(Bedson and Latter, 2018)	To explore current practice using PGDs and views of PIP ahead of its introduction.	Specialist paramedics (non-PIPs) in two ambulance services (n=72).	Online survey.
(Best and Taylor, 2021)	To explore PIP implementation.	PIPs in multiple settings including EUC (n=60).	Online survey.
(Brett and Palmer, 2022)	To explore antimicrobial prescribing patterns in primary care.	Primary care. All prescribing professions including PIPs.	Retrospective analysis of prescribing data.
(Clarke, 2019)	To explore the lived experiences of paramedics working in ED.	Paramedics (n=8) working in ED. Pre-implementation study.	Semi structured interviews.
(Deveau, Plowright and Dawson, 2024)	To explore the breadth and diversity of IP practice in UK critical care.	Critical care (hospital), all prescribing professions. PIPs in sample (n=4/105 IPs, 3.8%). Further 2/57 (3.5%) PGD users	Online survey.

		were paramedics, and the remainder were nurses.	
(Drennan *et al.*, 2023)	To investigate current and future employment of non-medical practitioners in EUC.	Purposive sample of NHS EUC key stakeholders (n=18) identified through policy review.	Semi structured interviews and analysis of policy documents.
(Duffy and Jones, 2017)	To explore views of paramedics ahead of PIP introduction.	Paramedics and managers in single ambulance service (n=6). Pre-implementation study.	Focus group.
(Eaton *et al.*, 2022)	To ascertain the current scope of clinical role of paramedics in primary care.	Paramedics in primary care (n=341), 125/341 (36.7%) qualified in PIP, 57/341 (16.7%) completing PIP training.	Online survey.
(Edwards, 2023)	To explore how paramedic IP is being adopted, implemented and used to support services in general practice in England.	Cross-sectional, pre-implementation survey of advanced paramedics (n= 234), case study research on PIP post implementation in primary care using patient satisfaction	Online survey and mixed methods case study research.

		questionnaires (n=61), self-reported prescribing data from PIPs (n=5) and qualitative interviews (various practice staff n=16, and PIPs n=5).	
(Ellis, 2022)	To critically explore the lived experiences of Advanced Paramedic Practitioners.	Paramedics (n=14) in urgent care and primary care.	Interviews and focus group.
(Pryor, Hand and Dunn, 2023)	To explore the opinions of student and newly qualified paramedic prescribers regarding the impact and effectiveness of paramedic independent prescribing on their clinical practice.	Trainee (n=7) and qualified (n=2) PIPs. One PIP in ambulance and the other in primary care. Focus group participants from ambulance, ED, urgent care and primary care.	Focus group and interviews.
(Rae, 2024)	To understand the current practice and experience of IPs in the UK.	IP survey respondents (n=14/408 3.4% of sample were PIPs). Specific PIP practice settings unclear, one PIP interview	Mixed methods, online survey and interviews.

		participant identified as working in an ED.	
(Stenner, Van Even and Collen, 2021)	To explore the views and experiences of early adopters of PIP.	PIPs (n=18) working across EUC and primary care.	Semi-structured interviews.
(Turner and Williams, 2019)	To evaluate a rotational working pilot programme which included participant views on PIP.	Specialist paramedics (n=7), ambulance nurse (n=1), specialist paramedic managers (n=4), project leads (n=2), ambulance service senior managers (n=4), GPs (n=2), MDT staff (n=8), practice manager (n=1), commissioner (n=1).	Semi-structured interviews. Quantitative analysis of routine ambulance data and call activity summaries from pilot sites.

Quantitative Studies	SQ1	SQ2	Q1	Q2	Q3	Q4	Q5
Brett and Palmer (2021)	Yes	Yes	Yes	Can't Tell	Yes	Can't Tell	Yes
Deveau et al. (2024)	Yes	Yes	Yes	Can't Tell	Yes	Yes	Yes
Qualitative Studies	SQ 1	SQ2	Q1	Q2	Q3	Q4	Q5
Clarke (2019)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Drennan et al. (2023)	Yes	Yes	Yes	Can't Tell	Can't Tell	Yes	Yes
Duffy and Jones (2017)	Yes	Yes	Yes	Can't Tell	Can't Tell	No	Can't Tell
Ellis (2022)	Yes	Yes	No	No	Yes	Yes	No
Pryor (2024)	Yes	Yes	No	No	Yes	Yes	Yes
Stenner et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Multi Methods Studies	SQ1	SQ2	Q1	Q2	Q3	Q4	Q5
Bedson and Latter (2018) Qualitative Questions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bedson and Latter (2018) Quantitative Questions			Yes	Can't Tell	Yes	No	Yes
Best and Taylor (2021) Qualitative Questions	Yes	Yes	Yes	No	Can't Tell	Can't Tell	No
Best and Taylor (2021) Quantitative Questions			Yes	No	Can't Tell	Can't Tell	No
Eaton et al. (2022) Qualitative Questions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eaton et al. (2022) Quantitative Questions			Yes	Can't Tell	Yes	Can't Tell	Yes
Turner and Williams (2018) Qualitative Questions	Yes	Yes	Yes	Yes	Can't Tell	Yes	Can't Tell
Turner and Williams (2018) Qualitative Questions			Yes	Yes	Yes	Yes	Yes
Mixed Methods Studies	SQ1	SQ2	Q1	Q2	Q3	Q4	Q5
Edwards (2023) Qualitative Questions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edwards (2023) Quantitative Questions			Yes	Can't Tell	Yes	Can't Tell	Yes
Edwards (2023) Mixed Methods Questions			Yes	Yes	Yes	Yes	Yes
Rae (2022) Qualitative Questions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rae (2022) Quantitative Questions			Yes	No	Yes	No	Yes
Rae (2022) Mixed Methods Questions			Yes	Yes	Yes	Yes	Yes

Figure 3: Critical appraisal using Mixed Methods Appraisal Tool (Hong et al. 2018)

Category of study designs	Methodological quality criteria	Responses			
		Yes	No	Can't tell	Comments
Screening questions (for all types)	S1. Are there clear research questions?				
	S2. Do the collected data allow to address the research questions?				
	Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.				
1. Qualitative	1.1. Is the qualitative approach appropriate to answer the research question?				
	1.2. Are the qualitative data collection methods adequate to address the research question?				
	1.3. Are the findings adequately derived from the data?				
	1.4. Is the interpretation of results sufficiently substantiated by data?				
	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?				
2. Quantitative randomized controlled trials	2.1. Is randomization appropriately performed?				
	2.2. Are the groups comparable at baseline?				
	2.3. Are there complete outcome data?				
	2.4. Are outcome assessors blinded to the intervention provided?				
	2.5 Did the participants adhere to the assigned intervention?				
3. Quantitative non-randomized	3.1. Are the participants representative of the target population?				
	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?				
	3.3. Are there complete outcome data?				
	3.4. Are the confounders accounted for in the design and analysis?				
	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?				
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the research question?				
	4.2. Is the sample representative of the target population?				
	4.3. Are the measurements appropriate?				
	4.4. Is the risk of nonresponse bias low?				
	4.5. Is the statistical analysis appropriate to answer the research question?				
5. Mixed methods	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?				
	5.2. Are the different components of the study effectively integrated to answer the research question?				
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?				
	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?				
	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?				

Figure 4: Mixed Methods Appraisal Tool questions (Hong et a. 2018)

2.4.3 Practice settings and prescribing activity

The included studies illustrated how PIP has been adopted across a wide range of clinical settings. These include primary care, critical and intensive care, EDs, urgent care and ambulance services (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021; Brett and Palmer, 2022; Eaton *et al.*, 2022; Ellis, 2022; Edwards, 2023; Pryor, Hand and Dunn, 2023; Deveau, Plowright and Dawson, 2024; Rae, 2024). PIPs prescribing in the ambulance sector appeared to represent only a minority (n=2/66, 3%) of participants in comparison to PIPs prescribing in other settings such as primary care (n=38/66, 57.5%) or ED (n=15/66, 22.7%) (Best and Taylor, 2021). Edwards (2023) reported that of 160 advanced paramedic survey respondents enrolled on IP modules, the vast majority (95%, n=152) worked in non-ambulance settings. Of these, 57% (n=91/152) worked in primary care and 38% (n=38%) in secondary and tertiary care settings (n =61, 38%).

Five studies provided limited insights into the drugs prescribed by PIPs or the conditions they treated (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021; Brett and Palmer, 2022; Edwards, 2023). Of these, two described PIP activity in EUC, based on self-reported prescribing estimates from PIPs during interviews (Stenner, Van Even and Collen, 2021) or through survey responses (Best and Taylor, 2021). Data were however reported as combined summaries for all clinical settings, which did not allow for prescribing activity specific to EUC to be differentiated. In one of these studies, conditions reported to be treated in EDs included trauma, cardiovascular disease, seizures, COPD, asthma and stomach problems (Stenner, Van Even and Collen, 2021). Across all secondary care settings which included EDs, intensive care, critical care and coronary care, PIPs reported prescribing analgesia, anti-seizure medications, cardiovascular drugs, steroids, resuscitation drugs and intravenous fluids. They also prescribed pain relief, antimicrobials and allergy medications (Stenner, Van Even and Collen, 2021). However, just over half of the sample interviewed had not started to prescribe in practice at the point of participating in interviews. In addition to the potential for recall and social desirability bias influencing this data (Althubaiti, 2016), some participants had not gained any experience of prescribing in practice on which to base these estimates.

In primary care, participants were primarily involved with treating patients with acute presentations of infection or exacerbations of long-term conditions, such as asthma. Typical medication groups included antimicrobials, anti-inflammatories, analgesia, inhalers, creams and steroids and anti-depressants (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021; Edwards, 2023).

Overall, the limited existing research provides very little insight or clarity regarding PIP activity in EUC. For example, whilst it is suggested that PIPs in ED settings may be prescribing for high acuity cases in EDs, these findings lacked detail or specificity (Stenner, Van Even and Collen, 2021). Equally, the scope of PIP practice in urgent care was not clearly detailed in any of this previous research.

2.4.4 Benefits of paramedic independent prescribing

Studies stated a range of reported patient, service and professional benefits from PIP. These included improving patient care and healthcare service delivery through an enhanced level of practice and improving patient access to medicines across a range of settings.

Prior to the introduction of PIP, paramedics anticipated it would increase their scope of practice and autonomy and in turn improve patient access to medicines (Duffy and Jones, 2017; Bedson and Latter, 2018; Edwards, 2023). Being unable to prescribe was reported as a significant issue by ED based paramedics, who had very limited access to medicines without PIP (Clarke, 2019). This impacted on their practice and patient care, as seeking support from other prescribers caused delays in providing treatment. Participants estimated this occurred 2-3 times per day, with an average delay of 10-15 minutes in providing important treatments such as analgesia and sedation when patients were in pain (Clarke, 2019).

Early adopters of PIP described during interviews that PIP had contributed to relieving workforce shortages and improved team knowledge and expertise, although it was not clear in which settings these views related to (Stenner, Van Even and Collen (2021). However, they did report that PIP increased capacity and facilitated doctorless services in out-of-hours urgent care. Across all settings, PIP was perceived to improve speed and efficiency when treating patients. It also reduced the burden placed on other prescribers from third party prescription requests. Early adopters of PIP (n=18) also

perceived it has increased their career opportunities, putting them on a more equal footing with other professionals such as nurses or pharmacists. Participants also reported that PIP improved job satisfaction, increasing knowledge and confidence around pharmacology (Stenner, Van Even and Collen (2021). A further study using interviews and focus groups found that PIPs (n=8) perceived advanced paramedic roles could not be fulfilled without prescribing. One participant stated: *"I think… in primary care, you can't not be a prescriber. You can't function" (*Pryor, Hand and Dunn (2023).

Survey respondents in Best and Taylor (2021) (n=60) reported that most PIPs strongly agreed or agreed that PIP improves quality of care (n= 69/60, 99%), leads to a better use of skills (n= 57/60, 95%), increases capacity to see more patients (n= 48/60, 80%) and enables treating a wider range of presentations (n=42/60, 70%). Additionally, in an interview study, Edwards (2023) found that PIPs working in primary care (n=5) cited benefits including hastening medicines access, streamlining care and enhancing service efficiency. Prior to adopting PIP, paramedics in this study reported extremely limited access to medicines in primary care and were reliant on doctors to issue prescriptions on their behalf. This was often associated with long waits outside of the GP's door for them to be free for such requests. PIP was therefore viewed as having fundamentally changed the way in which medicines were accessed and significantly enhanced the autonomy, clinical responsibility and overall job satisfaction of paramedics (Edwards, 2023). Survey responses capturing pre-prescribing views in this study also indicated that paramedics felt frustrated by being unable to prescribe during remote consultations in primary care. These became increasingly used during the COVID-19 pandemic, with 75% (n=184) of all PIP consultations being conducted by telephone (Edwards, 2023). This suggests that the ability to issue electronic prescriptions during remote consultations is an additional benefit of PIP. This was not anticipated in the stakeholder and public consultation documents (Department of Health, 2010; NHS England, 2016). Whilst participant views about remote prescribing were not explored by Edwards (2023), Pryor, Hand and Dunn (2023) described concerns from PIPs about the increased risks associated with remote prescribing. However, any further detailed insights or data regarding this were not provided. None of the included studies reported any data on remote prescribing in EUC. This pointed to a need to explore this in more detail, particularly given remote prescribing appears to now be

more frequently used in primary care since the pandemic and that some paramedics had concerns about using PIP in this way.

Whilst the range of organisational and professional benefits identified by these studies implies PIP resulted in improvements to patient care and experience, they lacked specificity to EUC. The data were also limited to the self-reported views and experiences of paramedics themselves. Perspectives from individuals in more strategic, leadership positions and the views of other staff working with PIPs in EUC were not explored.

Only one study explored patient views and experiences of PIP and focused only on primary care settings (Edwards, 2023). In a telephone survey of 61 patients treated by PIPs, 93.5% (n=57) agreed/strongly agreed that paramedics should be able to prescribe, 83.6% (n=51) indicated no preference for whether a doctor or paramedic prescribed their medicines, and 13.1% (n=8) expressed a preference for a medical prescriber. An additional 6.6% (n=4) reported they preferred a PIP. Using a Consultation Satisfaction Questionnaire, patients were highly satisfied with PIP consultations (median total CSQ 77.8, range 25.0-98.6), with scores highest for the domains professional care (89.3, 28.5-100.0), general satisfaction (75.0, 16.7-100.0), and length of consultation (75.0, 25.0-100.0). These findings suggest good levels of patient acceptance and satisfaction, but they are limited to a small sample of patients in primary care.

2.4.5 An unclear case of need in ambulance settings

PIP research suggested that potential challenges may exist in the ambulance sector, alongside uncertainty if PIP is required in this setting. Prior to its introduction, the majority (64/78, 82%) of specialist paramedics from two ambulance Trusts reported being very interested in adopting PIP. However, only 36% (n=28/78) felt PGDs were too restrictive on their ability to supply medication. The remainder were unsure (29%, n=23) or reported PGDs were not too restrictive (35%, n=27). The majority (67/72, 93%) of participants also perceived that PIP would enable them to work in roles outside of the ambulance service (Bedson and Latter, 2018). It was therefore unclear if and how PIP would change practice and the extent to which it was required in the ambulance sector. An evaluation of a rotational paramedic pilot programme Turner and Williams (2019) reported mixed views amongst 30 stakeholders regarding the need for PIP in ambulance

settings. Some thought PIP would further enhance paramedic scope of practice and increase efficiency by reducing the number of cases they had to refer to other clinicians who were prescribers. However, others thought it would not make a huge difference given the existing utility of PGDs in practice.

Following the introduction of PIP, advanced paramedic participants reported concerns about lack of access to patient records to support PIP in ambulance settings (Best and Taylor, 2021; Edwards, 2023). Additionally, participants expressed concerns about a lack of organisational governance and questioned whether PGDs were a more suitable option for treating patients in ambulance service practice (Best and Taylor, 2021). Edwards (2023) reported that only 11/234 (4.7%) of advanced paramedic survey respondents worked in an ambulance service and all had decided not to adopt PIP. Their decisions were also based on perceptions of organisational barriers, and a lack of need for PIP over a continued reliance on PGDs.

The findings of the review therefore suggest a lack of uptake of PIP in the ambulance sector and a range of concerns surrounding its implementation. The conclusions however are limited to studies reporting paramedic pre-implementation views and experiences, or from small samples of early adopters of PIP, with very few working or prescribing in ambulance settings. Therefore, further research is required to understand why PIP might not have been so readily adopted in the ambulance sector and if a case of need does exist over a continued reliance on alternative legislative options such as PGDs. These gaps in the evidence base also point to a need to explore PIP implementation from a more strategic viewpoint, including individuals in senior leadership positions and those involved in national, strategic work regarding PIP.

2.4.6 Controlled Drug prescribing restrictions

None of the included studies reported on practice after the change in legislation which enabled PIPs to prescribe a limited list of five CDs (UK Government, 2023). Some data were presented to highlight the challenges from being unable to prescribe any CDs. PIPs expressed frustration with the restrictions, given the need for CD prescribing in practice (Eaton *et al.*, 2022; Ellis, 2022; Rae, 2024). PIPs also perceived that CDs were integral to advanced roles in EDs and in providing end-of-life care in the community (Stenner, Van Even and Collen, 2021; Pryor, Hand and Dunn, 2023; Rae, 2024). CD restrictions were

also reported to cause confusion about PIPs scope of practice, given that their colleagues from other IP professions could prescribe them (Stenner, Van Even and Collen, 2021; Pryor, Hand and Dunn, 2023). Concerns were also expressed that employers may favour other IP professions rather than employ PIPs due to their inability to prescribe CDs (Stenner, Van Even and Collen, 2021; Drennan *et al.*, 2023). However, despite the implied restrictions from the above studies, none explored in detail how often CDs were needed in practice. It was also unclear how being unable to prescribe CDs impacted on patient care and service delivery in EUC, if the introduction of a limited CD formulary had changed practice or if this restricted approach to CD prescribing was sufficient.

2.4.7 Variation in educational preparation for prescribing

Despite published recommendations that master's level education is required to adopt PIP (NHS England, 2016; College of Paramedics, 2021), the included studies found that health providers do not adhere to this (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021; Eaton *et al.*, 2022; Edwards, 2023). Given the CHM rejected the initial proposal to introduce PIP for the profession over concerns about the level of training and education PIPs would hold, this is a potential cause for concern (Commission on Human Medicines, 2015).

Four of the included studies provided data on the educational backgrounds of PIPs, all showing that less than half of PIP participants held master's level qualifications. Whilst many PIPs were reportedly in the process of completing master's training, a minority (1/18 in one study and 3/60 in another) held only degree level education or potentially no higher education at all (3/60) (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021; Edwards, 2023).

Whilst no study explored why so many PIPs were not educated to master's level, Eaton *et al.* (2022) reported that paramedic survey respondents working in primary care (36.7% n=125/341 of which were PIPs) felt overwhelmed by the volume of academic work alongside their clinical workload. Lack of protected time to study and an absence of funding from primary care employers were highlighted as a hinderance to development in primary care. Edwards (2023) also reported how interviews with PIPs (n=5), GPs (n=3) and primary care managers (n=2) highlighted that a lack of managerial

input left decision-making regarding eligibility to adopt PIP to the individual paramedics, potentially explaining why so many paramedics are accessing PIP training without meeting the recommended eligibility criteria. These findings also suggest paramedics feel able and ready to adopt PIP despite not having completed master's level qualifications.

The rationale for recommending the requirement of a full master's award was not clear from the literature, pointing to a need for further research to understand this. The current evidence base also does not confirm that a master's is in fact an important facilitator of PIP. However, Edwards (2023) did report that PIPs holding a full master's (n=3) prescribed in 46.9% (n=61) of consultations, equating to prescribing once every 2.13 consultations, whilst paramedics with undergraduate degrees (n=2) prescribed for 32.8% (n=38, p=0.024) and once in every 3.05 consultations. Those with a master's also recommended over-the-counter medicines (n=31, 12.6%, versus, n=8, 3.3%, p<0.001), altered/stopped existing medicines (n=15, 6.1% versus n=4, 1.6%, p=0.018) and undertook medication reviews more frequently than those without a master's (n=16, 6.5% versus n=1, 0.4%, p<0.001), potentially indicating a wider scope of practice and a higher level of confidence. However, the small sample size of PIPs in this study (n=5) limit the strength of such conclusions, given other factors such as clinical experience, personal attributes, levels of confidence or differences between case site organisations may all have also influence prescribing activity.

2.4.8 Medical support and paramedic prescribing

Five included studies provided findings regarding the role of medical support as a facilitator of PIP (Bedson and Latter, 2018; Stenner, Van Even and Collen, 2021; Edwards, 2023; Pryor, Hand and Dunn, 2023; Rae, 2024). Paramedics in primary care had access to high levels of medical support both as trainee and qualified prescribers (Pryor, Hand and Dunn (2023). Early adopter PIP participants working in both primary, secondary and EUC settings also described how a supportive working environment helped mitigate isolation, safety concerns and anxiety as newly qualified prescribers (Stenner, Van Even and Collen, 2021).

Edwards (2023) also outlined how during case study interviews with GPs and primary care-based PIPs, participants reported actively fostering team interactions to develop a

culture of shared learning. This created reliable channels of communication for prescribing and clinical decision-making. All PIPs (n=5) described easy access to informal support and advice and that they had high levels of mentorship and support both during PIP training and in practice. When reflecting on the importance of medical support, PIPs expressed concern about PIP occurring in the ambulance service, where this level of support would not be available (Stenner, Van Even and Collen, 2021). However, only 4/18 participants worked in ambulance services and only 11/18 were prescribing in practice at the time of interview. As a result, it was unclear if findings reflected any direct experience of PIP in ambulance settings. Specialist paramedics from two ambulance Trusts responding to a survey prior to the introduction of PIP did anticipate being able to obtain remote support from a GP (74/78, 95.8%) should they require support with prescribing decision-making (Bedson and Latter, 2018). Overall, it was not sufficiently clear from this limited insight if PIPs in ambulance services can access medical support or how this might impact on prescribing decision-making.

Rae (2024) reported that medical support was valued by one PIP interviewee working in an ED. The participant also described the impact of the COVID-19 pandemic, which resulted in ED doctors being too busy to provide support and advice regarding prescribing decision-making making. Whilst the pandemic arguably placed unprecedented strain on EUC services, this finding suggests that providing medical support may be challenging in the face of service pressures and patient demand. Given as discussed in Chapter 1, these are increasing rather than abating in the post pandemic era, further research is required to understand if and how medical support can be negotiated by PIPs in EUC.

2.5 Conclusions

This review has synthesised the findings of the small but growing body of research about PIP. The evidence base was limited to predominantly reporting pre-PIP implementation views, experiences of early adopters of PIP, and has not examined practice following the change in CD legislation on 31/12/2023. The findings do suggest that a range of benefits have been realised from the introduction of PIP. These include an enhanced scope of practice and improved patient care and access to medicines. However, the available data provide only a very limited understanding of PIP in EUC. This includes a lack of specificity and detail regarding the scope of prescribing in EUC or how PIP is benefiting

patients and services in these settings. The findings also suggest potential concerns and challenges from CD prescribing restrictions, particularly in EUC settings. However, the extent to which of these drugs are required in practice is not clear, neither is how the introduction of a limited list of CDs has changed practice. Whilst medical support appears to be a facilitator of PIP, the findings suggest it may not be available in all EUC settings, whilst also potentially influenced by service pressures and demand, pointing to a need to understand this further.

Fewer PIPs appear to be working within an ambulance service compared to other settings such as EDs, urgent care and primary care. The reasons for this were not reported, although this suggests that the case of need for PIP in the ambulance sector is unclear. There were also concerns around sufficient access to patient records in ambulance services to support PIP. These findings contrast with PIP stakeholder and public consultation documents, which largely framed the need for PIP around ambulance service practice (Department of Health, 2010; NHS England, 2015a).

In conclusion, the existing evidence base is limited to a small number of studies, with only a limited focus on PIP in EUC, largely relying on self-reported estimates of prescribing practice and reporting only views and experiences of PIPs and non-prescribing paramedics through. The methods used in these studies such as interviewing or surveys may be subject to recall and social desirability bias (Althubaiti, 2016). This lends support to the use of other methods such as observation of PIP practice and analysis of prescribing frequency data. Whilst one included study (Drennan *et al.*, 2023) reported the views of a sample of key stakeholders on advanced clinical roles in EUC, this contained only very limited data on PIP. As such, any strategic level views and insights regarding PIP in EUC were missing from the research evidence. The identified issues associated with CD legislative restrictions, master's education and the limited implementation of PIP in the ambulance sector all point to a need to obtain a more strategic level insight to understand these issues further. This therefore informed the focus of the research methods (Chapter 4), which included seeking the views and insights of a sample of PIP key stakeholders (Chapter 5).

Chapter 3 Literature review of independent prescribing in emergency and urgent care

3.1 Introduction

Presented in this chapter are the findings of a literature review which explored the broader use of IP by all professions working in EUC. This included UK and international research, as a range of professions are permitted to prescribe in the USA, Australia, New Zealand, Canada and across Europe (Cope, Abuzour and Tully, 2016; Abuzour, Lewis and Tully, 2018b). Previously published evidence syntheses on the topic of IP in the form of umbrella reviews have demonstrated equivalent patient outcomes in comparison to medical prescribing in the management of chronic conditions such as diabetes and asthma (Stewart *et al.*, 2017; Carey *et al.*, 2021). Additionally, a range of contextual factors were reported to influence the success of IP. These challenges included restrictions from narrow organisational prescribing formularies, having access to patient's medical records, and being able to access medical support when needed (Stewart *et al.*, 2017; Carey *et al.*, 2021). However, IP in EUC was not specifically discussed in any previously published evidence reviews. Whilst the primary purpose of this review was to inform this research on PIP in EUC (Chapters 5, 6 and 7), it is also the first evidence synthesis to focus specifically on IP in EUC.

3.1.1 Review question

What are the benefits and limitations of independent prescribing within EUC settings and what are the facilitators and barriers?

3.1.2 Review aims

To identify and synthesise the available empirical research findings on IP by healthcare professionals within EUC to:

1. Understand the current contribution towards patient care and healthcare service delivery.
2. Investigate the benefits and limitations associated with IP in EUC.
3. Explore any facilitators or barriers to IP in EUC settings.

3.2 Review methods

3.2.1 Inclusion and exclusion criteria

Inclusion and exclusion criteria were set to identify contemporary, empirical research on the use of IP in EUC settings internationally. A date restriction of studies published after 2006 was set, based on those used in previous umbrella reviews on IP (Stewart *et al.*, 2017; Carey *et al.*, 2021). This date also represents the year in which the first IPs in the UK (nurses and pharmacists) gained full independent prescribing rights (Stewart *et al.*, 2017). Research on IP in EUC by all eligible prescribing professions was sought and these included nurses, pharmacists, midwives, physiotherapists, opticians, therapeutic radiographers, podiatrists, chiropodists, paramedics and (in the USA) physician assistants (PAs). EUC settings included EDs, urgent care centres, minor injury units, out-of-hours urgent care (including out-of-hours end-of-life care) and the provision of urgent care in community pharmacy settings. Within the USA, urgent care is also provided by IPs in retail health clinics, staffed by nurse or PA IPs who provide treatment of urgent conditions such as minor infections (Mehrotra *et al.*, 2015; Harvard Medical School, 2016) and so were also included in the review. Studies focused on the more specific practice of prescribing only emergency contraception (predominantly in community pharmacy settings) were excluded from the review. This very specific use of IP was deemed to be different to the broader application of IP to provide EUC, for example to manage a range of acute healthcare issues, rather than to prevent unplanned pregnancy.

3.2.1.1 Inclusion criteria

1. Empirical international research on the use of IP in EUC settings.
2. Studies published from 2006.

3. English language, full text articles.

3.2.1.2 Exclusion criteria

1. Literature reviews and evidence syntheses.
2. Studies on IP in non-EUC settings such as primary care and secondary care.
3. Studies where data on IP in EUC cannot be extracted from other settings, or from data regarding medical prescribers.
4. Conference abstracts.
5. Opinion articles and other forms of non-empirical research.
6. Studies focused specifically on the prescribing of emergency contraception by community pharmacists.

3.2.2 Search strategy

The search strategy for the review including key search terms and databases selected was informed by those used in previous umbrella reviews on IP (Stewart *et al.*, 2017; Carey *et al.*, 2021) and through scoping searches using Medline, CINAHL and EMBASE. A list of search terms were generated and combined using Boolean operators to retrieve articles published between 2006-2022 in English, adjusting search strings accordingly depending on the specific database being searched. An overview of key search terms is presented in Figure 5 with further details provided in Appendix B.

“Independent prescrib*”; “Non-medical prescrib*”; "pharmac* prescrib*"; “nurs* prescrib*" "midwi* prescrib*"; "podiatrist* prescrib*"; "chiropodist* prescrib*"; "opt* prescrib*"; "optician* prescrib*"; "physiotherap* prescrib*"; "paramedic* prescrib*"; "radiograph* prescrib*"; “allied health prof* prescrib*”; physician assistant prescrib*; physician associate prescrib*; advanced clinical practitioner prescrib*; ACP prescrib*; APP prescrib*; emergency nurse prescrib*; “emergency practitioner prescribe”; emerg*; accident; urgent; "out of hour*"; unscheduled; “minor injury”; “walk in”; “crisis”; “retail clinic”.

Figure 5: Key search terms for review on IP in EUC.

The following databases were searched: Medline, CINAHL, EMBASE, Science Direct, International Pharmaceutical Abstracts, AMED, Scopus, Web of Science, TRIP, EthOS and ASSI. Google Scholar was also used, although due the much larger numbers of results provided by this website, the first 200 results which were sorted in order of relevance by the website were screened, as recommended by Bramer *et al.* (2017). Scoping searches supported this approach, with results becoming irrelevant to the search focus beyond this point.

Results were imported into EndNote reference management software (Clarivate, 2022) to facilitate automated and manual screening of duplicates. Following removal of duplicates, results were then imported into Joanna Briggs Institute SUMARI software (JBI, 2022) to facilitate initial title and abstract screening, followed by full text screening.

To enhance the rigour of the review, the author’s two academic supervisors checked random samples of 20% of articles screened at title and abstract level, 20% screened at full text level and 20% of studies included in the review. During this process any disagreements regarding the inclusion or exclusion of articles were resolved through discussion. Citation searching of the reference lists of all included studies, alongside

the reference lists of any literature reviews identified in the search process were screened for additional articles.

3.2.3 Data extraction and critical appraisal

Critical appraisal of included studies was undertaken using the Mixed Methods Appraisal Tool (Hong, Gonzalez-Reyes and Pluye, 2018). This was selected given its applicability to appraising a range of study designs including quantitative, qualitative, multi-method and mixed methods. For economic evaluation studies, the Critical Skills Appraisal Programme Economic Evaluation Checklist was used (Critical Appraisal Skills Programme, 2022). The findings from the critical appraisal process are visually summarised in Figures 7-11, based on the traffic light system used in Chapter 2. The appraisal tool questions are provided in Figure 4 (Chapter 2).

The visual indications (Figures 7-11) highlight only 13/43 studies had zero answers of no or don't know, although studies were not excluded based on quality. Of relevance to informing the methods chosen for this research, two studies adopted a full mixed methods research design demonstrating clear integration of mixed methods data (Schindel *et al.*, 2017; Campling *et al.*, 2022)). Four studies used a multi-method approach but did not clearly integrate qualitative and quantitative data (Drennan *et al.*, 2009; Webb and Gibson, 2011a; Pharmacy Association of Nova Scotia (PANS), 2013; Armstrong, 2015). This arguably reduced the strengths of the findings, and the conclusions drawn, given mixed methods data integration can provide a more complete understanding of the research topic (Creswell, 2017).

Relevant data were extracted from studies using a data extraction table (Appendix B) to record key information including the research aims, the EUC setting, participant demographics and research findings on IP in EUC. This was used to compare and contrast the findings of included studies, synthesising the results through a narrative summary.

3.3 Literature review findings

The results of the search are displayed in Figure 6 in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidance (Page *et al.*, 2021). A total of 42 studies were included and summarised in Table 2. A more detailed article summary table is provided in Appendix B. Two of the PIP studies included in the focused literature review in Chapter 2 were identified in the search and did meet the inclusion criteria of this review, presenting limited data on PIP in EUC (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021). These studies have however not been included, given they are reported in detail in the more focused PIP review presented in Chapter 2.

Nine studies were identified from citation searching which were not identified through searches, potentially due to key search terms not being present in their titles. Whilst the search strategy was carefully developed and followed, this illustrates that a small number of relevant studies may not have been identified through the search strategy being too narrow. It also highlights the importance and value of citation searching as part of the review process (Aromataris, 2020).

Ten systematic reviews and four non-systematic reviews were identified during systematic searching. A total of 347 citations from systematic reviews and 181 citations from non-systematic reviews were screened to check for potentially eligible studies. Across all review types, 12 duplicate studies already identified from searching were included in these other reviews, although none made any specific reference to IP in EUC in their narrative summaries. One additional study meeting the inclusion criteria was identified from this screening and subsequently included (Taylor, 2017).

Figure 6: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Diagram (Page et al., 2021)

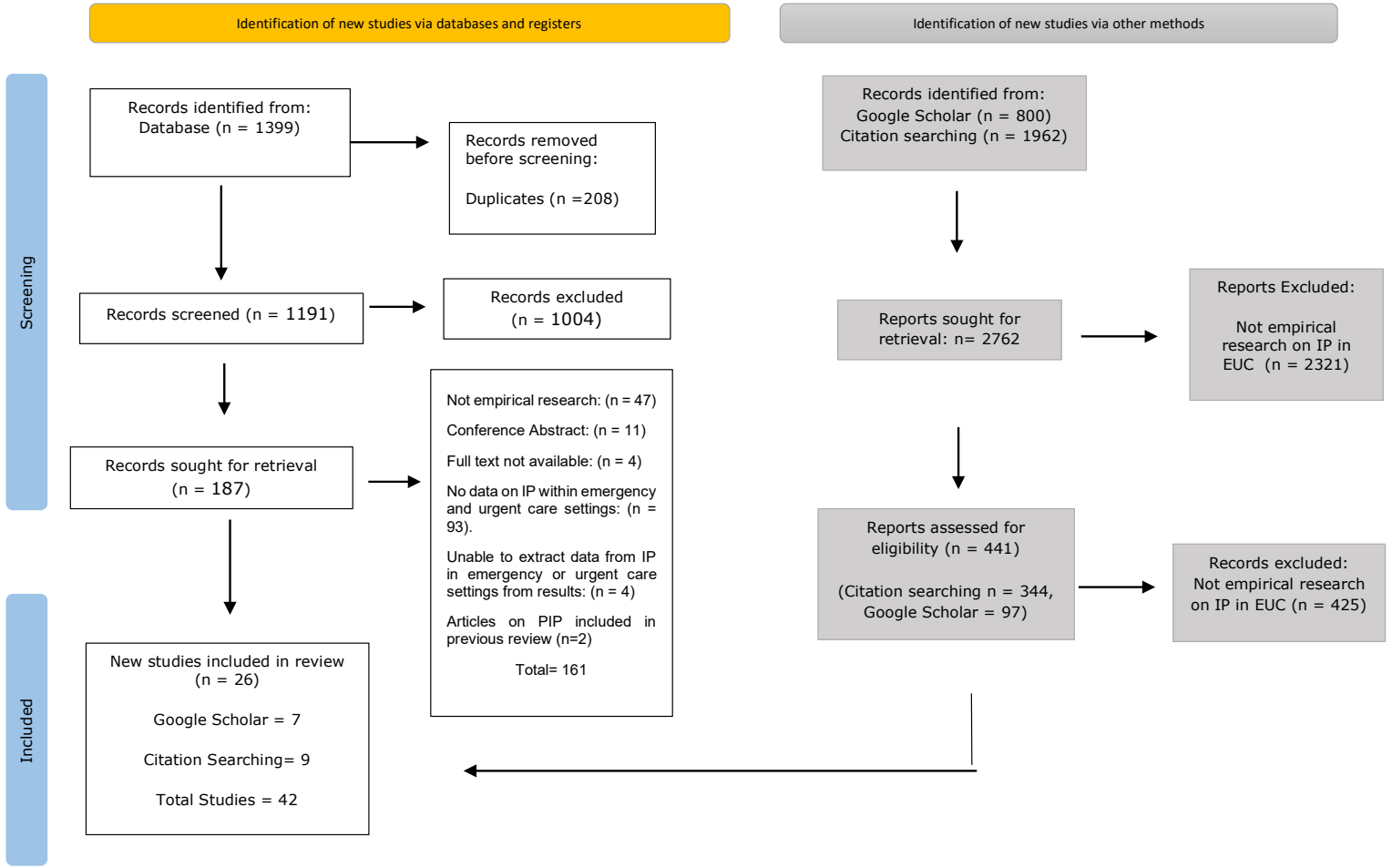


Table 2: Article Summary Table

	Study	Participants/focus	Country/ setting	Methods
	Emergency Department Studies			
1.	(Agiro *et al.*, 2018)	Nurse and PA IPs, antimicrobial prescribing appropriateness.	EDs, urgent care centres and retail clinics USA.	Retrospective analysis of records.
2.	(Alsabbagh and Houle, 2019)	Pharmacist IP for lower acuity cases.	ED, Canada.	Retrospective analysis of records.
3.	(Black and Dawood, 2014)	Comparison of Nurse IP and PGDs.	ED, UK.	Retrospective record analysis.
4.	(Buckley *et al.*, 2013)	Evaluation of Nurse IP range/frequency.	ED. Australia.	Survey.
5.	(Connor and McHugh, 2019)	Evaluation of Nurse IP.	ED. UK.	Interviews.
6.	(Desai, Sadlowski and Mistry, 2020)	Nurse and PA IP, antimicrobial prescribing appropriateness.	ED, USA.	Retrospective analysis of records.
7.	(Drennan *et al.*, 2009)	Evaluation of Nurse IP.	ED, UK.	Retrospective record analysis, interviews.

8.	(Ganem et al., 2015)	PA IPs, opioid prescribing.	ED, USA.	Retrospective analysis of records.
9.	(Gridley et al., 2019)	Physiotherapist IPs, prescribing appropriateness.	ED, Australia.	Retrospective analysis of records.
10.	(Hughes et al., 2017)	Pharmacist IP for lower acuity cases.	ED, UK.	Cross sectional observational study.
11.	(Klein et al., 2017)	PA IP, focus on antimicrobial prescribing.	ED, USA.	Mixed methods.
12.	(Lineberry *et al.*, 2021)	Pharmacist IP for medication reviews.	ED, USA.	Retrospective analysis of records.
13.	(McConnell, Slevin and McIlfatrick, 2013))	Evaluation of Nurse IP.	ED, urgent care, UK.	Survey.
14.	(Ogilvie et al., 2022)	Pharmacist IPs, medication review.	ED, Australia.	Randomised trial.
15.	(Wright et al., 2018)	Evaluation of pharmacist IPs.	ED, UK.	Interviews, focus groups.
16.	(Yang *et al.*, 2019)	Nurse and PA IP, opioid prescribing.	ED, USA.	Retrospective analysis of records.
	Fixed Site Urgent Care Studies			
1.	(Armstrong, 2015), UK	Evaluation of nurse IP.	Urgent care centre, UK.	Interviews, survey, documentary analysis.

2.	(Brett Bowen, 2019)	Nurse IP, management of unexpected high acuity cases.	Minor injury unit, UK.	Interviews.
3.	(Carey, Stenner and Courtenay, 2014)	Nurse IP for respiratory conditions. in urgent care.	Urgent care centres, UK.	Interviews.
4.	(Garbutt *et al.*, 2013a)	Nurse/PA IP, patient experience.	Retail clinics, USA.	Survey.
5.	(Garbutt *et al.*, 2013b)	Nurse/PA IP, experiences of primary care professionals.	Retail clinics, USA.	Survey.
6.	(Jacoby *et al.*, 2011)	Nurse and PA IP, focus on antimicrobial prescribing.	Retail clinics, USA.	Retrospective analysis of records.
7.	(Mehrotra *et al.*, 2009)	Nurse/PA IP, economic analysis.	Retail clinics, USA.	Retrospective analysis of records.
8.	(Mehrotra et al., 2015)	Nurse/PA IP, antimicrobial prescribing frequency.	Retail clinics, USA.	Retrospective analysis of records.
9.	(Shrank *et al.*, 2014)	Nurse/PA IP, antimicrobial prescribing appropriateness.	Retail clinics, USA.	Retrospective analysis of records.
10.	(Woodburn, Smith and Nelson, 2007)	Nurse/PA IP, antimicrobial prescribing appropriateness.	Retail clinics, USA.	Retrospective analysis of records.

	Community Pharmacy Studies			
1.	(Beahm, Smyth and Tsuyuki, 2019)	Urgent care by pharmacist IPs.	Community pharmacy, Canada.	Prospective registry trial.
2.	(Bhatia, Simpson and Bungard, 2017)	Urgent care by pharmacist IPs.	Community pharmacy. Canada.	Survey.
3.	(Isenor et al., 2018)	Urgent care by pharmacist IPs.	Community pharmacy, Canada.	Survey.
4.	(Kim *et al.*, 2021)	Urgent care by pharmacist IPs, economic evaluation.	Community pharmacy, Canada.	Economic analysis.
5.	(Mansell *et al.*, 2015)	Urgent care by pharmacist IPs, patient experience.	Community pharmacy, Canada.	Survey.
6.	(Pharmacy Association of Nova Scotia (PANS), 2013)	Urgent care by pharmacist IPs.	Community pharmacy, Canada.	Multi-method.
7.	(Rafferty et al., 2017)	Urgent care by pharmacist IPs, economic analysis.	Community pharmacy, Canada.	Economic analysis.
8.	(Schindel *et al.*, 2017)	Urgent care by pharmacist IPs.	Community pharmacy, Canada.	Multi-method.
9.	(Shearer et al., 2018)	Urgent care by pharmacist IPs.	Community pharmacy, Canada.	Survey.

10.	(Taylor, 2016)	Urgent care by pharmacist IPs.	Community pharmacy, Canada.	Survey.
11.	(Taylor, 2017)	Urgent care by pharmacist IPs.	Community pharmacy, Canada.	Survey.
	Out-of-hours urgent and palliative care studies			
1.	(Campling *et al.*, 2022)	Nurse IP, palliative care.	Out-of-hours urgent care, UK	Mixed methods.
2.	(Latham and Nyatanga, 2018a;b)	Nurse IP, palliative care.	Out-of-hours urgent care, UK.	Interviews.
3.	(Latter et al., 2020)	Nurse IP, palliative care.	Out-of-hours urgent care, UK.	Survey.
4.	(Webb and Gibson, 2011a)	Nurse IP, palliative care.	Out-of-hours urgent care, UK.	Survey, retrospective analysis of clinical records.
5.	(Williams *et al.*, 2018)	Nurse IPs, antimicrobial prescribing.	Out-of-hours urgent care, UK.	Interviews.

Figure 7: Quantitative Studies Critical Appraisal Visual Summary

Quantative Studies	SQ1	SQ2	Q1	Q2	Q3	Q4	Q5
Agiro et al. (2018)	Yes	Yes	Yes	Yes	Yes	Can’t Tell	Yes
Alsabbagh et al. (2019)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beahm et al. (2018)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bhatia et al. (2017)	Yes	Yes	Yes	No	No	No	Yes
Buckley et al. (2013)	Yes	Yes	Can't Tell	No	Yes	No	Yes
Black and Dawood (2014)	Yes	Yes	Yes	Yes	Yes	No	Yes
Desai et al. (2020)	Yes	Yes	Yes	Yes	Yes	Can’t Tell	Yes
Ganem et al. (2015)	Yes	Yes	Yes	Yes	Yes	No	Yes
Garbutt et al. (2013)	Yes	Yes	Yes	Can't Tell	Yes	Yes	Yes
Garbutt et al. (2013b)	Yes	Yes	Yes	No	Can't Tell	No	Yes
Gridley et al. (2019)	Yes	Yes	No	Yes	Yes	No	Yes
Hughes et al. (2017)	Yes	Yes	Yes	Can't Tell	Can't Tell	Yes	Yes
Jacoby et al. (2011)	Yes	Yes	Can't Tell	Yes	Yes	No	Yes
Lineberry et al. (2021)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Latter et al. (2020)	Yes	Yes	Yes	Can't Tell	Yes	Yes	Yes
Mansell et al. (2015)	Yes	Yes	Yes	Yes	Yes	Can’t Tell	Yes
Mehotra et al. (2009)	Yes	Yes	Yes	No	Yes	Can’t Tell	Yes
Mehotra et al. (2015)	Yes	Yes	Yes	Can't Tell	Yes	Can’t Tell	Yes
Ogilvie et al. (2022)	Yes	Yes	Yes	Yes	Yes	No	Yes
Shearer et al. (2018)	Yes	Yes	Yes	No	Yes	Yes	Yes
Shrank et al. (2014)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Woodburn et al. (2007)	Yes	No	Yes	Yes	Yes	Yes	Yes
Yang et al. (2019)	Yes	Yes	Yes	Yes	Yes	Can’t Tell	Yes
Taylor and Mansell (2017)	Yes	Yes	Yes	No	Yes	No	Yes

Figure 8: Qualitative Studies Critical Appraisal Visual Summary

Qualitative Studies	SQ 1	SQ2	Q1	Q2	Q3	Q4	Q5
Brett Bowen (2019)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Carey et al. (2014)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Connor and McHugh (2019)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lantham et al. (2018a; 2018b)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wright et al. (2018)	Yes	Yes	Yes	No	Yes	Yes	Yes
Williams et al. (2017)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Figure 9: Multi-Method Studies Critical Appraisal Visual Summary

Multi Methods Studies	SQ1	SQ2	Q1	Q2	Q3	Q4	Q5
Armstrong (2015) Qualiative Questions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Armstrong (2015) Quantatitive Questions			No	Yes	Yes	Yes	Yes
Drennan et al. (2009) Qualitative Questions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Drennan et al. (2009) Quantitative Questions			Yes	Yes	Yes	Yes	Yes
Isenor et al. (2018) Qualitative Questions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Isenor et al. (2018) Quanitative Questions			No	Can't Tell	Yes	No	No
Klein et al. (2017) Qualitative Questions	Yes	Yes	No	No	Can't Tell	Yes	Can't Tell
Klein et al. (2017) Quantitative Questions			Yes	No	Can't Tell	No	Yes
McConnell et al. (2013) Qualitative Questions	Yes	Yes	Can't Tell	Can't Tell	No	Can't Tell	Can't Tell
McConnell et al. (2013) Quantitative Questions			Yes	Yes	Yes	Yes	Yes
Webb and Gibson (2011) Qualitative Questions	Yes	Yes	No	No	Yes	Yes	Yes
Webb and Gibson (2011) Quantitative Questions			Yes	Can't Tell	No	Can't Tell	Yes
Pharmacy Association of Nova Scotia (PANS) (2013) Qualitative Questions	Yes	Yes	Yes	Can't Tell	Can't Tell	Can't Tell	Can't Tell
Pharmacy Association of Nova Scotia (PANS) (2013) Quantitative Questions			Can't Tell	Can't Tell	Can't Tell	Can't Tell	Can't Tell
Taylor (2016) Qualitative Questions	Yes	Yes	Yes	No	Yes	Yes	Yes
Taylor (2016) Quantitative Questions			Yes	Can't Tell	No	Yes	Yes

Figure 10: Mixed Methods Studies Critical Appraisal Visual Summary

Mixed Methods Studies	SQ1	SQ2	Q1	Q2	Q3	Q4	Q5
Schindel et al. (2017) Qualitative Questions	Yes	Yes	Yes	Yes	Yes	Yes	No
Schindel et al. (2017) Quantiative Questions			Yes	No	Yes	No	Can't Tell
Schindel et al. (2017) Mixed Methods Questions			No	No	No	No	Yes
Campling et al. (2022) Mixed Methods Questions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Campling et al. (2022) Quantatitive Questions			Yes	Yes	Yes	Yes	Yes
Campling et al. (2022) Mixed Methods Questions			Yes	Yes	Yes	Yes	Yes

Figure 11: Economic Evaluation Studies Critical Appraisal Visual Summary

Economic Evaluations	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Kim et al. (2021)	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes
Rafferty et al. (2017)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Can't Tell	Yes

3.4 Narrative synthesis

3.4.1 Overview of included studies and participants

Table 2 illustrates how of the 42 included studies, data were available on the use of IP in EDs in 16 studies, on the provision of urgent care in community pharmacies in 11 studies, on IP in fixed site urgent care settings (retail health clinics and urgent care centres) in 10 studies, and on IP in out-of-hours urgent care (including palliative end-of-life) care in 5 studies.

The professions represented in this review included nurses, PAs, pharmacists and physiotherapists. A total of 14 studies reported on IP in the United Kingdom, 13 in the United States of America (USA), 12 in Canada, and 3 in Australia. No study reported findings from New Zealand or any other European countries in which IP is permitted. Any notable differences between international healthcare services are highlighted in the narrative synthesis. These include differences such as publicly funded NHS care in the UK, and privatised healthcare in the USA, Canada and Australia.

Only three studies reported the educational backgrounds of IPs. These ranged from vocational qualifications, degree level training, postgraduate education and master's level training (Drennan *et al.*, 2009; Buckley *et al.*, 2013; McConnell, Slevin and McIlfatrick, 2013). None of these explored if or how different levels of education influence prescribing practice.

3.4.2 Utilisation of independent prescribers in emergency and urgent care settings

Presented in this section is an overview of how IPs are utilised in the different settings to contribute to patient care and healthcare service delivery.

3.4.2.1 Independent prescribing in emergency departments

Of 16 studies which focused on IP in ED settings (Table 2), 11 presented quantitative data on IP from clinical record analysis and 1 from survey data. Only 2 studies reported data on all the drugs prescribed by IPs (Buckley *et al.*, 2013; Black and Dawood, 2014), with the remainder focused on more specific aspects such as opioid or antimicrobial prescribing rates. Overall, the findings showed that nurse, PA, physiotherapist and

pharmacist IPs prescribed to manage lower acuity presentations in the UK, Australia and USA, suggesting similarities in the use of IPs between these countries. This included prescribing antimicrobials for minor infections and prescribing a range of CD and non-CD analgesia for conditions such as back pain and dental pain (Buckley *et al.*, 2013; Black and Dawood, 2014; Ganem *et al.*, 2015; Hughes *et al.*, 2017; Klein *et al.*, 2017; Wright *et al.*, 2018; Alsabbagh and Houle, 2019; Gridley *et al.*, 2019; Yang *et al.*, 2019; Desai, Sadlowski and Mistry, 2020; Jauregui, Nutt and Margolis, 2020).

In one Australian study, nurse IPs based in ED settings (n=69/209) estimated in survey responses prescribing a broader range of drugs than those in other speciality hospital roles (n=140/209) and in primary care settings (Buckley *et al.*, 2013). However, in the UK, a 12-month review of 382 clinical records from a small sample of nurse IPs (n=4) in a single ED, reported that a total of 274 drugs from a relatively limited formulary of 29 different medications were prescribed. Overall frequency of prescribing was therefore quite low in this study, equating to less than one prescription (0.7) per day on average, or 68.5 prescriptions per nurse per year. This study again highlighted the low acuity focus of IP, reporting that the most frequently prescribed for conditions included minor infections (n=68 35.9%) soft tissue conditions (n= 110, 27.3%), lacerations (10.4%, n =42) and bone fractures (9.9%, n = 40) (Black and Dawood, 2014).

Within EDs in the USA, a more specific analysis of opioid prescribing from a larger sample of clinical records between 2005-2015 illustrated that when compared to doctors, both nurse and PA IPs prescribed opioid medications more at discharge from the ED than during admission (NP = 51.6%; PA = 52.6%; doctor = 39.6%). This appeared to reflect their practice in treating and discharging lower acuity cases such as dental pain and injury-related pain. Conversely, doctors more frequently administered opioids to treat higher acuity cases including chest pain (NP = 1.1%, PA = 1.6% vs doctor = 4.4%), abdominal pain (NP = 6.5%, PA = 6.7% vs doctor = 12.9%), and other more complex conditions such as cancer-related pain, and kidney or gall bladder infections (NP = 2.1%, PA = 2.5%, doctor = 6.3%) (Yang *et al.*, 2019).

Six studies reported that some IPs contributed to patient care and delivery in EDs in a more targeted way, based on the requisite skills of their profession (Hughes *et al.*, 2017; Wright *et al.*, 2018; Alsabbagh and Houle, 2019; Gridley *et al.*, 2019; Lineberry *et al.*, 2021; Ogilvie *et al.*, 2022). For example, Gridley et al. (2019) outline the specific

utilisation of physiotherapist IPs to manage musculoskeletal conditions. Two studies also reported how the specific skills and knowledge of pharmacist IPs were used by tasking them to undertake medication reviews and adjust previously prescribed drugs (Lineberry *et al.*, 2021; Ogilvie *et al.*, 2022). Wright et al. (2018) also report on a programme to introduce pharmacist IPs into an ED setting as ACPs. Pharmacist IPs (n=9) and other ED staff such as nurses and doctors (n=24) described during interviews and focus groups that an additional benefit from utilising pharmacists in the ED was that they were also able to provide pharmacological advice to other clinicians. Pharmacist IPs also autonomously assessed and prescribed treatments for patients. However, doctors and nurses felt that pharmacists lacked important skills and knowledge in patient examination and consultation skills in comparison to nurse IPs. Their skills and scope of practice were also perceived by other staff to be more suited to lower acuity case management in the ED.

Overall, despite the limitations in the data available, the included studies suggest that IPs in ED settings contribute by managing a range of lower acuity cases. Whilst some professions such as nurses and PAs predominantly prescribed for a range of conditions, other professions such as physiotherapists and pharmacists were typically used in more specific and targeted ways, reflective of the requisite skills of their profession. The overall weight of international (n=12) versus UK based studies (n=6) may however not provide a complete picture of contemporary UK ED practice. Only one study reported on the entire range of conditions prescribed by UK based IPs and was published over a decade ago (Black and Dawood, 2014). Since this time, the scope of IP in UK EDs is likely to have increased given the introduction of the ACP-EM role (outlined in Chapter 1).

3.4.2.2 Independent prescribing in fixed site urgent care settings

Of the 12 studies relating to fixed site urgent care settings such as retail health clinics, urgent care centres and minor injury units, 11 provided data to show that IP was also focused on treating minor illness and injury, particularly the use of antimicrobials for acute infections (Woodburn, Smith and Nelson, 2007; Mehrotra *et al.*, 2009; Jacoby *et al.*, 2011; Garbutt *et al.*, 2013a; Garbutt *et al.*, 2013b; McConnell, Slevin and McIlfatrick, 2013; Carey, Stenner and Courtenay, 2014; Shrank *et al.*, 2014; Armstrong, 2015; Mehrotra *et al.*, 2015; Agiro *et al.*, 2018). Overall, very few studies reported data on the

range and frequencies of drugs prescribed. Of those which did, the specific focus on antimicrobial prescribing for respiratory tract infections provided only a limited insight. Agiro *et al.* (2018) for example, highlight the prescribing frequency of IPs in both retail clinics and in urgent care centres in 14 different regions of the USA. The data was specific to the treatment of children 2 to 17 years of age, treated between January 2012-July 2014. In retail clinics, IPs prescribed antibiotics in a total of 7144 cases in order to treat acute pharyngitis (n=3241/7144, 45.3%), acute ear infections (n=2643/7144, 36.9%) and sinusitis (n=1260/7144, 17.6%). In urgent care centres, IPs prescribed antimicrobials in 8202 cases for pharyngitis (n=4386/8202, 53.4%), acute ear infections (n=2614, 31.8%) and sinusitis (n=1202, 14.6%). The appropriateness of antimicrobial prescribing by IPs in EUC is considered later in the review.

Eleven studies focused on urgent care within community pharmacy settings, and all were undertaken in Canada. As a result of national policy to increase the provision of urgent care in community pharmacy settings in Canada, IPs prescribed for a range of lower acuity acute conditions. Similarly to retail clinics and urgent care centres, these included infections such as upper respiratory tract and also urinary tract infections (Pharmacy Association of Nova Scotia (PANS), 2013; Mansell *et al.*, 2015; Taylor, 2016; Bhatia, Simpson and Bungard, 2017; Rafferty *et al.*, 2017; Schindel *et al.*, 2017; Taylor, 2017; Beahm, Smyth and Tsuyuki, 2018; Isenor *et al.*, 2018; Shearer *et al.*, 2018; Kim *et al.*, 2021).

Although the review findings demonstrated an overall focus on the management of lower acuity complaints, one study described the experiences of a small sample (n=6) of nurse IPs in a minor injury unit in the UK, in prescribing for unexpected high acuity presentations (Brett Bowen, 2019). IPs described how this work was a challenging, but inevitable part of their role, given patients present to minor injury units with higher acuity, emergency conditions. These cases required IPs to prescribe and administer antibiotics for suspected meningitis and to treat acute cardiac emergencies. The study findings did not allow for analysis of the appropriateness or safety of this prescribing, particularly given it was undertaken outside of the IPs' regular scope of practice. It did however report that IPs found this work highly stressful, and they considered it to be outside of their usual role requirements.

3.4.2.3 Independent prescribing in the community

The findings from four studies reported on the use of IP to treat patients requiring urgent, end-of-life care during out-of-hours periods by specialist palliative care nurse IPs (Latham and Nyatanga, 2018b; Latter *et al.*, 2020; Campling *et al.*, 2022).

Open response question survey data from a range of stakeholders (n=1327), including GPs and IPs, highlighted how clinical nurse specialists' ability to prescribe medicines was critical to their perceived effectiveness in delivering palliative care, including during out-of-hours (Latter *et al.* (2020). Additionally, semi-structured interviews with specialist palliative care nurses (n=6), felt they were more appropriately placed to manage palliative care patients during out-of-hours than doctors working for urgent care services, given their specialist knowledge in this area (Latham and Nyatanga, 2018b).

Only one included study reported data on IP in out-of-hours urgent care services (Williams *et al.*, 2018) and specifically focused on antimicrobial prescribing. Nurse IPs interviewed in this study (n=15) reported prescribing antimicrobials for a range of acute infections. Their views also highlighted the focus of IP on more straightforward cases, with all the nurse IPs (n=15) and urgent care doctors (n=15) interviewed perceiving more complex cases should be managed by doctors. Doctors had also observed that IPs were more likely to work to protocols, and IPs also tended to agree with this definition and saw this in a positive light, given it meant their decisions were made based on local and national guidelines. GPs reported they would often prescribe differently from the guidelines and base their prescribing decisions on 'gut feeling'.

3.5 Benefits from independent prescribing in emergency and urgent care

This section presents the findings regarding a range of benefits from IP in EUC. These included being able to offer treatment more frequently in comparison to non-prescribing clinicians (Black and Dawood, 2014), and more quickly due to no longer needing to find a doctor to prescribe treatments such as analgesia (Drennan *et al.*, 2009; Armstrong, 2015). IP facilitated alternative options for patients to access urgent healthcare within settings such as community pharmacies (Pharmacy Association of Nova Scotia (PANS), 2013; Mansell *et al.*, 2015; Taylor, 2016; Bhatia, Simpson and Bungard, 2017; Taylor,

2017; Schindel *et al.*, 2019) and retail health clinics (Jacoby *et al.*, 2011). IP was also integral to managing acute end-of-life cases during out-of-hours periods (Webb and Gibson, 2011a; Latham and Nyatanga, 2018b; Campling *et al.*, 2022).

3.5.1 Access to treatment

The use of IP in EUC was associated with improved patient care and access to medicines (in a total of 12 studies), in EDs (Drennan *et al.*, 2009; Black and Dawood, 2014; Connor and McHugh, 2019), urgent care centres (Carey, Stenner and Courtenay, 2014; Armstrong, 2015), out-of-hours palliative care (Webb and Gibson, 2011b; Latham and Nyatanga, 2018b; Latter *et al.*, 2020; Campling *et al.*, 2022) and community pharmacies (Pharmacy Association of Nova Scotia (PANS), 2013; Schindel *et al.*, 2017; Taylor, 2017). For example, one ED study reported that a review of 617 clinical records in a single ED over a 12-month period found patients were 2.23 times more likely to receive medication from a nurse IP than a non-prescribing practitioner using PGDs Black and Dawood (2014).

A small interview study with three nurse IPs from a single urgent care centre co-located with an ED, also reported that IP facilitated improved speed of care and access to medicines for patients (Armstrong, 2015). In both ED and urgent care centre settings, IPs described improved access to medicines from being able to prescribe or initiate treatment as soon as they encountered a patient, rather than having to wait for a doctor (Armstrong, 2015; Connor and McHugh, 2019). In a further interview study, nurse IPs reported that, within urgent care centres and out-of-hours services, IP expands the type of care they provide to patients, enabling medicines provision beyond the scope of PGDs. IPs in this study also perceived they were more accessible and available compared to doctors. This ensured timely commencement of treatment, which was perceived to reduce the likelihood of worsening symptoms or complications (Carey, Stenner and Courtenay, 2014).

Interviews with six specialist palliative care nurse IPs suggested that IP enabled them to provide more seamless, holistic care with faster access to medicines. This was of particular benefit during the end-of-life phase at weekends, resulting in faster resolution of symptoms for patients (Latham and Nyatanga, 2018b). Webb and Gibson (2011a) also report on the views of a small sample of GPs (n-9) who felt IP by community

palliative care nurses was an effective way to provide timely and appropriate symptom control for patients during the out-of-hours period. The views and opinions of patients or the IPs themselves were however not sought. Despite the small sample size of locally based GPs, the researchers used an unpiloted postal questionnaire to seek their views, rather than qualitative interviewing, which would have allowed for a more in-depth exploration of their views (Ritchie, 2013).

Three studies also reported improved patient access to treatment because of IP in community pharmacy settings (Pharmacy Association of Nova Scotia (PANS), 2013; Schindel *et al.*, 2017; Taylor, 2017), with the largest of these studies reporting that 96% (n=556/582) of patients were able to access care sooner as a result of pharmacist IP for urgent lower acuity issues (Pharmacy Association of Nova Scotia (PANS), 2013).

3.5.2 Positive patient outcomes

Three community pharmacy studies included data on patient outcomes, all showing the majority of patients reported symptom improvement or resolution following treatment (Mansell *et al.*, 2015; Taylor, 2017; Beahm, Smyth and Tsuyuki, 2019) . For example, of 750 patients in a study by Beahm, Smyth and Tsuyuki (2019) who were treated by a community pharmacist IP for urinary tract infection symptoms, 686 (91.5%) completed a two-week follow-up. Of these, 88.9% (n=609) reported symptom resolution. Additionally, of the patients who had received a prescription for their urinary infection from a doctor, pharmacist IPs modified 40.4% of these initial prescriptions rather than dispensing the antibiotic prescribed by the doctor. Whilst further details were not provided, this suggests pharmacist IPs may offer additional benefits from being able to optimise treatment and improve prescribing appropriateness, even if they were not the initial prescriber. The data does however not allow for any clear conclusions to be drawn from this, or if the decisions made by the pharmacists to change a prescription issued by a doctor were correct or justified.

3.5.3 Benefits associated with providing urgent care in the community

Six of the community pharmacy studies also suggested providing urgent treatment in community pharmacies improved patient access to treatment and potentially reduced the burden on other healthcare services (Pharmacy Association of Nova Scotia (PANS), 2013; Mansell *et al.*, 2015; Taylor, 2016; Bhatia, Simpson and Bungard, 2017; Schindel

et al., 2017; Taylor, 2017). A small sample of patient survey respondents (n= 48) suggested that had they not received treatment from a community pharmacist IP, 10/48 (20.8%) would have gone to their primary care provider, and one would have gone to an ED (Taylor, 2017). In another study, of 125 patients receiving treatment for an urgent condition from a community pharmacist, 88 respondents answered a question on what they would have done had a pharmacist not been available. Of these, 31/88 (35.2%) would have seen a doctor in primary care and a minority (3/88, 3.4%) would have attended an ED (Mansell *et al.*, 2015). Patients in the study by (Taylor, 2017) cited reasons for seeking care from a pharmacist IP included a lack of availability of a timely medical appointment (12/48, 25%), not wanting to wait to be seen in primary care (23/48, 47%), the problem was not serious enough for a GP appointment (13/48, 27%), they trusted the pharmacist to provide their care (28/48, 53%), or they did not have a GP (4/48 8.3%).

Despite the more positive reports in previous studies, another study suggested that providing urgent care in community pharmacies using IP could potentially increase patient risk (Taylor, 2016). This study reported findings from a survey completed by 287 Canadian GPs. Participants estimated between 10% and 30% of patient cases which appeared to a minor illness actually ended up being a more serious medical problem. In their open answer responses, doctors therefore expressed concerns about these more serious issues being missed if mistakenly treated as a minor ailment by community pharmacist IPs.

3.5.3.1 Patient satisfaction

Patient satisfaction regarding IP in EUC was reported to be high across 7 included studies, 4/7 from community pharmacy settings (Pharmacy Association of Nova Scotia (PANS), 2013; Mansell *et al.*, 2015; Taylor, 2017; Beahm, Smyth and Tsuyuki, 2019), and single studies reporting on ED (Drennan *et al.*, 2009), urgent care centre (Armstrong, 2015), and retail clinic (Garbutt *et al.*, 2013a) IP patient satisfaction.

In one of the largest of the studies evaluating community pharmacist IP in Canada, 96% of patients (n=556/582) completing a satisfaction survey indicated that they were able to access health care sooner because of care from a community pharmacist IP. Furthermore, the 96% indicated that visiting the community pharmacist IP had been beneficial or very beneficial and 99% (n=578/584) reported that they would use the

service again. Patients appreciated that the service was fast and convenient and the pharmacist's knowledge and skills. 89% (n=772 of 871) indicated that their condition was satisfactorily resolved following their treatment (Pharmacy Association of Nova Scotia (PANS), 2013). Patient satisfaction with community pharmacist IP in two other studies was also high with only 5.6% (n=6) of patients in one study reporting views that a doctor would have been more thorough (Mansell *et al.*, 2015).

Within retail health clinics, high patient satisfaction was also reported. In one study, most parents responding to a survey (n=1484) were satisfied (61.7%, n=915) or very satisfied (32.8%, n=486) with the care their child received from nurse IPs at a retail clinic, although only 53.4% (n=792) indicated they would use retail health clinics in the future for paediatric care (Garbutt *et al.*, 2013a). The use of a closed-response survey prevented further exploration of patient views or experiences, thus is it is unknown why nearly half of patients would not use a retail clinic again. Additionally, participants were recruited at primary care centres and not at retail clinics. The reasons for this are not made clear. It was also not specified if they were attending primary care for further treatment or a second opinion for the condition treated at the retail clinic, which may have led to the mixed satisfaction reported in this study.

In contrast to the high levels of patient satisfaction reported in other studies and settings, only one study reported on patient satisfaction in out-of-hours urgent care (Williams *et al.*, 2018). This study, which was focused specifically on antimicrobial prescribing, reported that nurse IPs experienced low levels of patient satisfaction in cases where they had declined to prescribe antimicrobials. This was based on their judgement that antimicrobials were not indicated for the patient's condition. They also reported patients perceived a doctor would have prescribed the treatment had the patient been seen by them instead of a nurse IP. However, this finding is specific to patient perceptions around antimicrobials and may not reflect broader satisfaction levels with IP in this setting. The finding also suggests IPs in EUC experience pressure to prescribe, and patient satisfaction is reduced when IPs resist this pressure. Antimicrobial prescribing in EUC is considered further later in the review.

3.5.3.2 Potential cost savings

There was a limited body of international evidence from two studies to suggest potential financial benefits from IP within community pharmacy settings (Rafferty *et al.*, 2017;

Kim *et al.*, 2021) and a further single study to illustrate potential cost savings from IP in retail health clinics (Mehrotra *et al.*, 2009). Treatment by IPs in these settings were predicted in all three studies to be less costly in comparison to settings such as EDs. For example, Mehrotra *et al.* (2009) report that costs of care for 1200 episodes of care for throat infections (n=700) , ear infections (n=700) and urinary tract infections (n=700) initiated at retail clinics were substantially lower than those of matched episodes initiated in primary care, urgent care centres, and emergency departments ($110 vs. $166, $156, and $570, respectively; $P < 0.001$ for each comparison). It is unclear how these international findings might relate to IP in UK EUC settings given differences in healthcare funding, and that retail clinics only exist in the USA.

Overall, despite the limited focus of most studies, the findings do suggest patient benefits are associated with IP within EUC settings. Patients encountered in EUC include those with painful conditions and acute infections that require prompt treatment. Being able to prescribe for these conditions led IPs to treat patients more often in comparison to non-prescribing clinicians in EDs, and they also reported being able to initiate treatment more quickly in urgent care centres. Equally, by providing treatment in settings such as retail health clinics and in community pharmacies, IPs were able to provide patients with an alternative to attending an ED or visiting primary care. IPs also provided important symptom management in end-of-life cases during out-of-hours periods. High levels of satisfaction and acceptance of IP by patients in EUC were also reported by both IPs and patients themselves. The overall weight of evidence specific to UK EUC practice was limited and may not reflect contemporary practice in ED settings. Very little research was identified regarding IP in out-of-hours urgent care services, beyond the specific provision of urgent palliative care.

3.6 Antimicrobial prescribing

Ten studies presented data about appropriate use of antimicrobials for suspected or confirmed bacterial infections rather than for symptoms more likely to be associated with viral infections (Woodburn, Smith and Nelson, 2007; Jacoby *et al.*, 2011; Garbutt *et al.*, 2013a; Garbutt *et al.*, 2013b; Shrank *et al.*, 2014; Mehrotra *et al.*, 2015; Klein *et al.*, 2017; Agiro *et al.*, 2018; Williams *et al.*, 2018; Desai, Sadlowski and Mistry, 2020). Of these, four studies assessed prescribing appropriateness specifically in retail clinics. Whilst two of these studies based their assessments on the results of rapid testing

results for bacterial throat infections taken by IPs (Woodburn, Smith and Nelson, 2007; Jacoby *et al.*, 2011), two provided arguably less robust data in order to make judgment on prescribing appropriateness. These data were obtained from either surveying children's parents about the prescribing encounter (Garbutt *et al.*, 2013a) or interviewing primary care staff regarding their views on antimicrobial prescribing in retail clinics (Garbutt *et al.*, 2013b). A further study also examined antimicrobial prescribing appropriateness in a USA ED setting, by surveying IPs and doctors about their views on antimicrobial prescribing decision-making (Klein *et al.*, 2017).

Three studies explored antimicrobial prescribing practises by drawing comparisons between different settings which included retail clinics, EDs, urgent care and primary care. Of these, two (Shrank *et al.*, 2014; Mehrotra *et al.*, 2015) compared retail clinic IP prescribing with prescribing in EDs and primary care. However, neither study specified if the comparison data also included IPs or only medical prescribers. However, the other of these studies by Agiro et al. (2018) compared the prescribing practices of doctors and IPs working in EDs, urgent care centres, retail clinics and in primary care. This study focused on children (2-17 years) with a diagnosis which would not usually warrant antimicrobials in paediatric patients. These included acute ear infections, sinusitis, pharyngitis, bronchitis or upper respiratory infections. In total, 16% (19,763/124,907) of children were judged to have inappropriately received antibiotics across all settings. The lowest proportion of potentially inappropriate antibiotic prescriptions was by paediatric doctors in urgent care centres, (8%, P = 0.02) and by IPs in retail clinics (8%, P = 0.37), followed by ED clinicians (14%, P = 0.001). These findings contrasted with higher rates of potentially inappropriate prescribing by primary care doctors (28%, P = 0.001), and IPs in urgent care centres (29%, P = 0.001), alongside urgent care non-paediatric doctors (30%, P = 0.001) and primary care IPs (30%, P = 0.001). The findings suggest that overall, potentially inappropriate prescribing rates were low across all settings and prescribers. Arguably, assessing prescribing appropriateness based only on the recorded diagnosis may not reflect all of the complexities involved in clinical decision-making. Prescribers may therefore base decision-making on other factors such as how unwell a patient appears, or if they have other risk factors which might alter the risk-benefit decisions made by prescribers.

In contrast to the generally positive findings previously considered, a further study reported significant concerns about the prescribing practises of IPs working in retail

clinics (Garbutt *et al.*, 2013b). Of 226 paediatricians and paediatric nurse practitioners surveyed, the majority reported that they had experienced incorrect diagnoses (n= 183, 81%), overuse (n=174, 77%) and misuse (n=153, 68%) of antibiotics, alongside failure to conduct diagnostic tests (n=153, 68%) or ignoring the test results when making the treatment decision (n=155, 69%). Furthermore, Jacoby *et al.* (2011) reported that, whilst IPs in retail health clinics correctly managed cases of suspected viral illness by not prescribing antibiotics in 88.35% (5369/6077) of cases, in 13% (n=708), antimicrobials were judged to have been prescribed for a suspected viral illness. Furthermore, in just over half (55%, 389/708) of these cases, the clinical record detailed that the antibiotic was prescribed because the child's parent had requested it, suggesting poor antimicrobial stewardship practice.

Whilst concerns have been raised by primary care providers and there are some examples of potentially poor practice in retail clinics, the findings suggests that overall, IPs in EUC prescribe antimicrobials appropriately (Woodburn, Smith and Nelson, 2007; Jacoby *et al.*, 2011; Garbutt *et al.*, 2013a; Garbutt *et al.*, 2013b; Shrank *et al.*, 2014; Mehrotra *et al.*, 2015; Klein *et al.*, 2017; Agiro *et al.*, 2018; Williams *et al.*, 2018; Desai, Sadlowski and Mistry, 2020).

Williams *et al.* (2018) also reported how nurse IPs (n=15) working in a UK out-of-hours urgent care service reported adhering to anti-microbial prescribing guidance more closely than urgent care doctors. Interestingly, both doctors and IPs described how the additional effort made by patients in engaging with out-of-hours services often meant they had increased expectations of needing antimicrobials, resulting in pressure to prescribe. This was compounded by an inability to arrange any follow up appointments, as unlike in primary care, patients were usually seen as a one-off encounter. Some IPs and doctors felt the anxiety displayed by patients which led to prescriber anxiety, influencing their prescribing decisions, especially for children and the elderly. However, as this study was conducted before more recent policies on antimicrobial stewardship and public education campaigns, patients' views may have changed over time (World Health Organisation, 2021).

3.7 Controlled Drug prescribing

The data presented in five studies, showed that IPs in ED settings prescribed a range of CDs. This included prescribing opioid analgesia to treat acute and chronic painful conditions such as back pain, minor injuries, dental pain and headaches (Buckley *et al.*, 2013; Black and Dawood, 2014; Ganem *et al.*, 2015; Gridley *et al.*, 2019; Yang *et al.*, 2019).

From their review of the prescribing activity of nurse IPs (n=4) in UK EDs, (Black and Dawood, 2014) highlighted that although overall prescribing frequency was quite low, nurse IPs prescribed a range of CDs including Codeine (n=74/278, 26.6%) and Diazepam (n=7/274, 7%). In another USA study focused on opioid prescribing in EDs (Yang *et al.*, 2019), out of a total of 77,213 patient visits, nurse and PA IPs prescribed opioids for only a minority (n= 4322, 5.59%) of these cases. The remainder were prescribed by a doctor (n=64709 83.8%) with 8182 (10.59%) being seen by both a doctor and an IP. It was not clear who prescribed the treatment in this final subset. Total numbers of IPs and doctors in the dataset were also not reported, limiting comparisons between prescribing frequencies. The use of opioid analgesia by IPs working in EDs did however gradually increase between 2005-2015 (116.7% nurse IPs, PAs 15.5%). The authors report this reflects increasing numbers of IPs during this time, and because of legislative changes in several states which expanded IPs CD prescribing rights.

A three-year review (2009-2012) of patient records for cases of chronic pain in the USA by Ganem *et al.* (2015) found that of 1322 patients presenting to the ED with chronic pain, 443 (34%) were prescribed an opioid. PA IPs (n=20) prescribed opioids more frequently than ED doctors (n=81) with 55% of all opioids being prescribed by PAs. The authors point out this is reflective of the role of PAs who would be most likely to manage lower acuity conditions associated with chronic pain such as back pain and headaches. PAs prescribed a range of CDs including Oxycodone, Hydrocodone, Tramadol and Codeine. Ganem *et al.* (2015) acknowledge a limitation of their study, which relied on a specific diagnosis code to identify eligible records. This approach may have missed potentially large numbers of eligible patients in comparison to manually screening patient records.

CDs were also prescribed in end-of-life care. In an analysis of prescribing records, Webb and Gibson (2011a) reported that of 136 drugs prescribed by nurse IPs during out-

of-hours periods over six months, 36 (26.4%) were opiates and 31 (22.7%) were benzodiazepines, demonstrating that nearly half (49.2%, n=67) of all drugs prescribed were CDs. The findings of the included studies therefore suggest that CDs form a substantial component of patient care in EUC settings, especially in EDs and out-of-hours end-of-life care. This is unsurprising given the range of painful conditions encountered in ED settings and the need to manage both pain and agitation during end-of-life care.

3.8 Facilitators and barriers to independent prescribing in emergency and urgent care

This section of the review considers the findings regarding potential facilitators and barriers to IP in EUC. Facilitators included access medical support, whereas barriers included insufficient access to patient records, organisational issues, barriers relating to a lack of time, service pressures and demand.

3.8.1 Medical support

Limited data from three studies discussed accessing medical advice and support in IP practice, suggesting it was a facilitator of prescribing decision-making, although also had the potential to challenge IP autonomy. (Black and Dawood, 2014; Williams *et al.*, 2018; Connor and McHugh, 2019).

In urgent care, nurse IPs in a UK out-of-hours service cited peer discussion and education from doctors as playing an important role in supporting their prescribing decisions, providing the opportunity to discuss alternative options, and validating their own prescribing decisions (Williams *et al.*, 2018). Nurse IPs (n=15) and doctors (n=15) in this study also all agreed that more complex cases where prescribing decisions needed to be made outside of clinical guidance should be seen by doctors and not IPs. In a UK ED, IPs autonomously discharged most cases they encountered and prescribed for (82.5% (n = 315). The most common reason for not independently discharging was to obtain advice from a doctor before doing so (Black and Dawood, 2014). However, ED-based IPs in another study perceived prescribing advice from doctors at times felt more controlling and dictatorial than supportive (Connor and McHugh, 2019).

3.8.2 Organisational factors

Potential barriers to IP due to a lack of organisational support for IP included issues with specific organisational policies, a lack of organisational and managerial support, issues with accessing patient records, or being able to issue electronic prescriptions (McConnell, Slevin and McIlfatrick, 2013; Isenor *et al.*, 2018; Connor and McHugh, 2019; Latter *et al.*, 2020; Campling *et al.*, 2022).

Connor and McHugh (2019) report from interviews with nurse IPs in a single Irish ED that all six participants reported restrictions in their prescriptive authority from pre-determined clinical practice algorithms set by their employing organisation, which they were required to follow. Participants reported how fellow nursing colleagues approached them to prescribe medication, but they were unable to do so because of these restrictions. It was unclear if the participants felt confident to do so, had the clinical practice algorithms were not in place. A more dated study on nurse IP in Ireland reported that of a sample of ED nurse practitioners (n=42) who responded to a survey, 33.4% (n=14) were qualified in IP. However, just over half (n=8/14, 57.1%), were actually prescribing in practice due to organisational barriers preventing the use of IP in practice, with the majority (78.6%, n=33) of all survey respondents instead using PGDs in practice (McConnell, Slevin and McIlfatrick, 2013).

Within out-of-hours urgent palliative care services, IPs reported being unable to issue electronic prescriptions to patients and were reliant on using handwritten FP10 prescription pads. Where electronic prescriptions were required, presumably to prescribe for patients following telephone consultations, these cases were referred to regional out-of-hours urgent care services who did have this capability (Latter *et al.*, 2020; Campling *et al.*, 2022).

3.8.3 Access to records

Access to patient records was integral in supporting IP, although the findings regarding this aspect of IP were limited to community EUC settings. It was unclear if IPs in EDs, urgent care centres, retail clinics or community pharmacies were able to access patient records, or how this impacted on IP in these settings. However, three studies reporting on IP in the provision of out-of-hours urgent palliative care all reported how access to medical records was essential for recording and checking relevant clinical history

(Latham and Nyatanga, 2018b; Latter *et al.*, 2020; Campling *et al.*, 2022). However, Latter *et al.* (2020) reported that of clinical nurse specialist survey respondents (n=389), 44% (n=173) reported having no access to primary care records, and 66% (n=256) were unable to access reports generated from other out-of-hours services. In another study, a lack of access to patient records resulted in decisions not to prescribe during out-of-hours periods (Latham and Nyatanga, 2018b). Williams *et al.* (2018) also reported that for IPs in out-of-hours urgent care, access to primary care records was variable, and dependent on whether primary care practices had agreed to provide this access. Participants reported lack of access resulted in uncertainty and additional pressure to make the correct prescribing decisions.

3.8.4 Time pressures and demand

IP was sometimes seen to result in additional work and responsibilities for IPs. A small qualitative study by Latham and Nyatanga (2018b) reported the experiences of six nurse IPs prescribing for palliative care patients in the community during out-of-hours periods. Participants reported additional pressures from district nurses to prescribe for patients not directly in their care, which they felt was a challenge to managing their own workload and tasks. Additional distractions and challenges were also reported by participants when trying to prescribe where there were high levels of background noise in patients' homes, alongside the distraction of family members trying to converse with them whilst issuing prescriptions.

Another small qualitative study exploring the experiences of nurse IPs (n=3) working in an urgent care centre also described how adopting IP had resulted in frequent requests from other staff to prescribe for patients not directly in their care, distracting IPs from their current task (Armstrong, 2015). In a further study involving 40 nurse IPs who completed a survey on IP, some reported that additional pressures were faced from patients using immediate access services such as walk in clinics or out-of-hours to request repeat prescriptions from IPs. Nurse IP participants in this study perceived these patients should not have accessed urgent care services, reporting views that repeat prescriptions should only be obtained from primary care (Carey, Stenner and Courtenay, 2014).

3.8.5 Conclusions

This review has synthesised the available research evidence on use of IP in different EUC settings internationally. From a relatively limited body of evidence, the findings suggest IP can improve patient access to medication, reducing delays in treatment and also provide alternative care options in the community. Within EDs, similarly to other EUC settings, IPs manage only lower acuity issues and do not appear to prescribe for higher acuity emergency cases in either the UK, Australia or the USA. However, this may not represent contemporary practice, particularly in the UK given the introduction of the ACP-EM role, which involves practice across the entire spectrum of cases seen in emergency medicine (Crouch and Brown, 2018; Royal College of Emergency Medicine (RCEM), 2022a). The review highlighted a very limited amount of research on UK urgent care practice. Only one study reported data from an out-of-hours urgent care service, focused only on antimicrobial prescribing in this context. Whilst a further four studies presented data on out-of-hours palliative care, these were based on care from specialist palliative care services rather than by out-of-hours urgent care service clinicians. Whilst potential facilitators and barriers were identified in the review findings, such as access to records, medical support and organisational factors, these findings were again based on limited data from a small number of studies.

Further research is therefore required to explore the entire scope of contemporary IP practice in both EDs and out-of-hours urgent care in the UK to obtain a more complete understanding of IP practice in these settings beyond the limited insights provided in previous research.

The review also identified that CDs are prescribed by IPs in EUC, particularly to manage acute and chronic pain in ED settings, and in the provision of end-of-life care. However, the frequency with which these drugs are required in practice was unclear, and the findings were again limited to their use by specialist palliative care nurses in community settings. In the context of PIP, further research is needed to understand the extent of any impact from restrictions on prescribing CDs in EUC.

Set against growing concerns regarding global antimicrobial resistance (Murray et al., 2022), the findings of the included studies suggest predominantly appropriate antimicrobial prescribing by IPs in EUC, despite the limitations in how this was determined in some studies. However, in the context of out-of-hours urgent care in the

UK, one study suggested IPs do experience pressure to prescribe antimicrobials, although none of the included studies evaluated antimicrobial prescribing practices in the UK. Given this gap in the research evidence, and more recent policy drives to both promote both antimicrobial stewardship and increase public awareness of the appropriate use of antimicrobials, further research is required to explore this aspect of IP in EUC further.

Despite the limitations of the review findings, they do provide a useful lens in which to frame both data collection and analysis of the research in this study on PIP in EUC. This includes exploring if PIPs in EUC can access detailed patient records and medical support, and if they experience pressure to prescribe in EUC either from patients or their colleagues. The review also pointed to some potential differences between PIP and IP by other professions to be explored further. This included the restrictions on CD prescribing, and the potentially much wider scope of practice of PIPs in EUC suggested by the PIP review in Chapter 2, which included higher acuity case management.

Chapter 4 Methodology and methods

4.1 Introduction

This chapter sets out the philosophical assumptions underpinning the research and presents a detailed overview of the research methods. These included semi-structured interviews with a sample of key stakeholders and mixed methods case study research in EUC settings. The chapter also considers important aspects related to data collection, including the generation of knowledge in qualitative research and researcher positionality. The potential challenges and additional considerations associated with interviewing participants in positions of seniority, power or influence, often referred as 'elite' participants are also discussed (Littig, 2009).

4.1.1 Paradigms and worldviews underpinning the research

Creswell and Clark (2017) describe the prevailing philosophical assumptions which can inform research studies, combining these to represent what they define as worldviews or paradigms. These define a set of generalisations relating to the shared beliefs and values of researchers. Considering these different paradigms, or worldviews, enabled me to develop my research methodology accordingly. These include the paradigms of positivism, post positivism, constructionism and pragmatism.

Positivism assumes that reality exists independently of humans. It is not mediated by our senses and is governed by immutable laws. The ontological position of positivists is that of realism. Positivists strive to understand the social world like the natural world. In nature, there is a cause-effect relationship between phenomena, and once established, they can be predicted with certainty in the future (Creswell and Clark, 2017). For positivists, the same applies to the social world. As reality is context free, different researchers working in different times and places will converge to the same conclusions about a given phenomenon (Rehman and Alharthi, 2016). Many scholars have criticised the positivist approach given that while objective and scientific methods

are appropriate for studying natural objects, they are not as successful when they are applied to social phenomena (Rehman and Alharthi, 2016).

Such criticism led to the emergence of post-positivism, which straddles both the positivist and interpretivist paradigms. Post-positivism is a worldview or paradigm often associated with quantitative approaches. Researchers make claims for knowledge based on determinism or cause-and-effect thinking, and through reductionism, by narrowing and focusing on select variables to interrelate. This also involves conducting detailed observations and measures of variables, and testing theories that are continually refined. Whilst post positivism strives to measure, explain and understand phenomena, it does not claim to represent the absolute truth assumed by positivism. It instead acknowledges that reality is subjective and constructed by individuals based on their perception and experiences, therefore assuming the position of interpretivism, and as such, truth cannot be fully known (Slife and Williams, 1995; Creswell and Clark, 2017; Panhwar, Ansari and Shah, 2017).

Conversely, constructivism is a paradigm commonly associated with qualitative approaches and works from a different set of assumptions. The understanding or meaning of phenomena formed through participants and their subjective views make up this worldview. When participants provide their understandings, they speak from meanings shaped by social interaction with others and from their own personal histories. In this form of inquiry, research is shaped from the bottom up, from individual perspectives to broad patterns, and ultimately, broad understandings (Denzin, 2012; Creswell and Clark, 2017).

Creswell and Clark (2017) go on to discuss that, whilst some individuals still seek to participate in paradigm debates, many mixed methods writers have moved on to identify what they believe is the worldview that best provides a foundation for mixed methods research, which is that of pragmatism. This emphasises employing what works, using diverse approaches, and valuing both objective and subjective knowledge. Creswell and Clark (2017) describe how in pragmatist approaches to mixed methods research both quantitative and qualitative research methods may be used in a single study. This recognises that all research methods have their limitations and so

combining methods can allow for research to understand and explore a phenomenon more fully.

This worldview aligned with my overall research questions and aims to understand objectively using quantitative data, the range of conditions treated using PIP in EUC, alongside undertaking a more subjective, qualitatively focused exploration of any benefits, limitations, facilitators and barriers. This therefore required the use of a mixed methods research design and a pragmatic stance which valued the importance of both subjective and objective data to explore the research topic (Creswell and Clark, 2017; Tashakkori and Teddlie, 2021). Related to research paradigms or worldviews are the philosophical considerations around otology and epistemology, which are discussed in the following sections of the chapter.

4.1.2 Ontological considerations

Ontology is defined as the nature of reality and what there is to know about the world. Key ontological questions concern whether a social reality exists independently of human conceptions and interpretations (Ritchie, 2013). Closely related to this is whether there is a shared social reality, or rather multiple, context-specific ones (Ritchie, 2013). Social science has been shaped by two overarching ontological positions in relation to these concepts, which are realism and idealism. Realism is based on the idea that there is an external reality which exists independently of people's beliefs or understanding of it. Conversely, idealism asserts that reality is fundamentally mind-dependent, and it is only knowable through the human mind and through socially constructed meanings. Idealism assumes therefore, that no reality exists independently of these (Ritchie, 2013; Creswell and Clark, 2017). One version of idealism is referred to as post-modernism and assumes there are multiple social worlds. These are socially and contextually created by individuals' constructions of culture and identity (Pope and Mays, 2020). In practice, ontological perspectives are often more nuanced, and most health research operates in intermediate positions along this continuum. Qualitative researchers therefore typically accept that there is a social reality existing beyond themselves, whilst also aware that understanding this

reality is dependent on the construction of a plausible account, using a variety of tools and judgements which are ultimately subjective (Pope and Mays, 2020).

Reflecting on these polarised ontological viewpoints and the potential continuum between them, my own positionality partly assumes that an external reality exists, which is how PIP has been implemented into EUC. However, the participants in my research have their own thoughts, views, insights and experiences which shape their perception of this reality, which is also the predominant lens through which the research topic was explored. This positionality aligns with that of critical realism (Ritchie, 2013; Zachariadis, Scott and Barrett, 2013; Creswell and Clark, 2017).

Critical realism emerged in the 1970s and 1980s initially through the work of Bhaskar (Bhaskar, 2013) and further discussed and elaborated by several other critical realists (Sayer, 1992; Collier, 1994; Archer, 1995; Lawson, 1997; Fletcher, 2017). Critical realism represents an alternative to the polarised stances of both positivism and constructivism (Denzin and Lincoln, 2005), although draws elements from both in its account of ontology and epistemology (Fletcher, 2017). Critical realism therefore distinguishes between the real world and the observable world. The real cannot be observed and exists independent from human perceptions, theories, and constructions. The world as we know and understand it is constructed from our perspectives and experiences, through what is 'observable'. Thus, according to critical realists, unobservable structures cause observable events (Fletcher, 2017). The social world can therefore only be understood if people understand the structures that generate events (Bhaskar, 2013). Critical realism recognises the importance of participant's own interpretations of the issues researched, believing that their varying vantage points will yield different types of understanding. Critical realism also assumes that external reality is itself diverse and multifaceted, and so the aim of the research is to capture that reality in all its complexity and depth (Bhaskar, 2013; Ritchie, 2013; Fletcher, 2017).

4.1.3 Epistemological considerations

Epistemology is concerned with ways of knowing and learning about the world, focusing on how we can learn about reality and what forms the basis of our knowledge (Ritchie, 2013). One epistemological view is that knowledge is based on induction, a bottom-up process through which patterns are derived from observations of the world. In contrast, those who argue that knowledge is acquired through deduction, view knowledge acquisition as a 'top-down' process whereby logically derived propositions or hypotheses are tested against observations (Ritchie, 2013). The knowledge generated in this research is from a predominantly inductive approach, based on participant views and experiences, alongside my own observations during case studies. However, data collection and analysis were also sequentially informed by the findings from the literature reviews, findings from key stakeholder interviews, and my own experiences and positionality in the research landscape. This is therefore aligned with deduction, applying prior knowledge and research evidence to inform both data collection and analysis. Blaikie (2007) lends support to this approach, arguing that there is no such thing as pure induction, or pure deduction, given that when inductive researchers generate and interpret their data, they cannot approach this with a blank mind. Similarly, deductive researchers setting out to test a hypothesis will have drawn on a body of theory which in turn has been inductively derived from prior observations.

The epistemological position for the research also reflects that of an interpretivist stance. This emphasises the importance of understanding people's perspectives in the context of the conditions and circumstances of their lives, which has implications for the balance between inductive and deductive approaches to data collection and analysis (Ritchie, 2013). At the start of a research project, this typically involves the use of existing theory and research to help plan and design the study, develop a sampling approach and create fieldwork tools (Ritchie, 2013). In this study, this work involved drawing on the findings from the literature reviews and then also the findings of the key stakeholder interviews. However, with an interpretive stance in the field and in early analysis, the focus then shifts to understanding and exploring participants' views and experiences from their points of view, to obtain as much detailed information as possible about participants' experiences and perspectives (Ritchie, 2013). This

represents the approach taken with both the key stakeholder interviews and case study research data collection.

4.2 Rationale for a mixed methods research design

The literature review presented in Chapter 2 identified key gaps in the PIP research evidence base, due in part to the limited focus on PIP in EUC, and because of the methods used in these studies. Early studies for example lacked specificity regarding the range and frequency of drugs prescribed in EUC, pooling EUC data with other settings, and relying on self-reported prescribing estimates (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021). Given such approaches to data collection can be prone to recall bias (altered due to being reliant on the memory of participants) and social desirability bias (altered due to preconceptions about the research aims or views of the researcher) (Althubaiti, 2016), a more objective approach to measuring prescribing activity in EUC settings was required. Previous studies also did not explore in any detail how PIP impacts autonomy and confidence in EUC or how key facilitators and barriers such as medical support, patient records access, and CD restrictions affect PIP in EUC. Additionally, reliance on singular research methods such as interviews, surveys or focus groups, limited the depth and corroboration of findings. Previous research also explored the use of PIP mostly from the limited, one-dimensional perspective of paramedics themselves, without considering insights from doctors, colleagues or managers in EUC (Bedson and Latter, 2018; Clarke, 2019; Best and Taylor, 2021; Stenner, Van Even and Collen, 2021).

Key gaps in the evidence base also included a lack of clarity regarding the rationale for requiring master's level education, low PIP uptake in the ambulance sector, and whether further CD legislative changes are necessary. Whilst the wider literature review in Chapter 3 provided some broader insights into the use of IP in EUC such as confirming that CDs were often prescribed in EUC, this also highlighted a lack of insight into contemporary practice in EDs and urgent care. It also did not offer any further insight into the role of education as a facilitator of PIP.

The complex, multi-faceted nature of the identified issues surrounding PIP, and the lack of existing research evidence pointed to a need to explore the research topic from a range of perspectives. These included not only PIPs and other staff in EUC settings, but also strategic-level stakeholders whose views had remained unexplored in previous research. These gaps in the existing evidence base and limitations of previous research informed the mixed-methods research design chosen for this study.

The wider literature on mixed methods research considers its strengths in providing a more complete and detailed understanding of a research topic in comparison to a reliance on singular methods (O'Cathain, Murphy and Nicholl, 2010; Creswell, 2017; O'Cathain, 2020). Creswell and Clark (2017) for example, outline how one data source or one type of evidence may not tell the complete story. They also argue that the results from either a quantitative or qualitative exploration of a topic may in fact be contradictory, which might not be discovered by collecting only one type of data.

Reflective of the pragmatic paradigm adopted for the study, a mixed methods research design was selected to harness the strengths and offset the limitations of both singular quantitative and qualitative research methods. For example, collecting only quantitative prescribing data would not allow for the context of PIP in EUC settings to be understood, or the voices of participants heard (Creswell and Clark, 2017). On the other hand, qualitative research findings can be influenced by the subjective nature of the data (Creswell and Clark, 2017) such as previous estimates of PIP activity potentially being influenced by recall and social desirability bias (Althubaiti, 2016). More broadly data collection and analysis in purely qualitative designs can also be influenced by the views and positionality of the researcher (Ritchie, 2013; Creswell and Clark, 2017; Pope and Mays, 2020). Mixed methods research can therefore enhance the rigour of research studies by offsetting the inherent weaknesses associated with quantitative and qualitative methods. Equally, through the unique insights mixed methods data integration can provide, researchers can gain new knowledge that is more than just the sum of the two parts and answer questions that cannot be sufficiently answered by quantitative or qualitative approaches alone (O'Cathain, Murphy and Nicholl, 2010; Creswell and Clark, 2017; Poth, Creswell and Plano Clark, 2023).

4.2.1 The convergent mixed methods design

A convergent mixed methods design (Creswell and Clark, 2017; Poth, Creswell and Plano Clark, 2023) was selected to enable the simultaneous collection and analysis of separate quantitative and qualitative data, integrating the results of each analysis to obtain different but complementary insights on PIP in EUC (Creswell and Clark, 2017; Poth, Creswell and Plano Clark, 2023). In some convergent mixed methods studies, equal weight is given to both quantitative and qualitative data. However, in others, such as this study, a more substantive amount of qualitative data are collected. This included the key stakeholder interview data, case study field notes and interviews, and case site documentary analysis. Quantitative data collected included PIP prescribing frequency data and other site clinician CD prescribing data. In wider mixed methods literature, this balance of data is often referred to as a quan-QUAL mixed methods study (Creswell and Clark, 2017).

Integration of data is a central feature of mixed methods research, whereby the quantitative and qualitative datasets are combined to answer the research questions and aims of the study (Creswell and Clark, 2017; Poth, Creswell and Plano Clark, 2023). Integration occurred in several distinct places in the research. Methodological integration (Fetters, Curry and Creswell, 2013) occurred by using the quantitative prescribing data to inform the focus of reflective conversations with PIPs. This included for example, asking PIPs for their views on self-administering Morphine, given the frequency with which Morphine had been administered under paramedic exemption in the 2023 PIP dataset. During field work, PIP views on this were explored and I was also able to observe Morphine administration in practice before the change in CD legislation occurred. This highlighted how needing to personally prepare, check and administer Morphine directly to patients distracted PIPs from other tasks. Further methodological integration then occurred between these findings and analysis of site documents, with medicines management policies outlining the expected governance procedures of separating prescribing and administration to enhance medicines safety.

Integration was then undertaken at the interpretation and reporting level (Fetters, Curry and Creswell, 2013) in Chapter 9. This draws together the quantitative and qualitative

case study data, integrating these with key stakeholder interview findings. By also situating this integrated analysis within previous research on PIP (Chapter 2) and on IP in EUC (Chapter 3), wider literature, and relevant theory, analytical concepts were developed to answer the research questions of the study. These higher-level concepts which arise from mixed methods data integration are defined in mixed methods research literature as meta inferences (Poth, Creswell and Plano Clark, 2023). Figure 12 illustrates the overall mixed methods study design and the points at which data integration occurred.

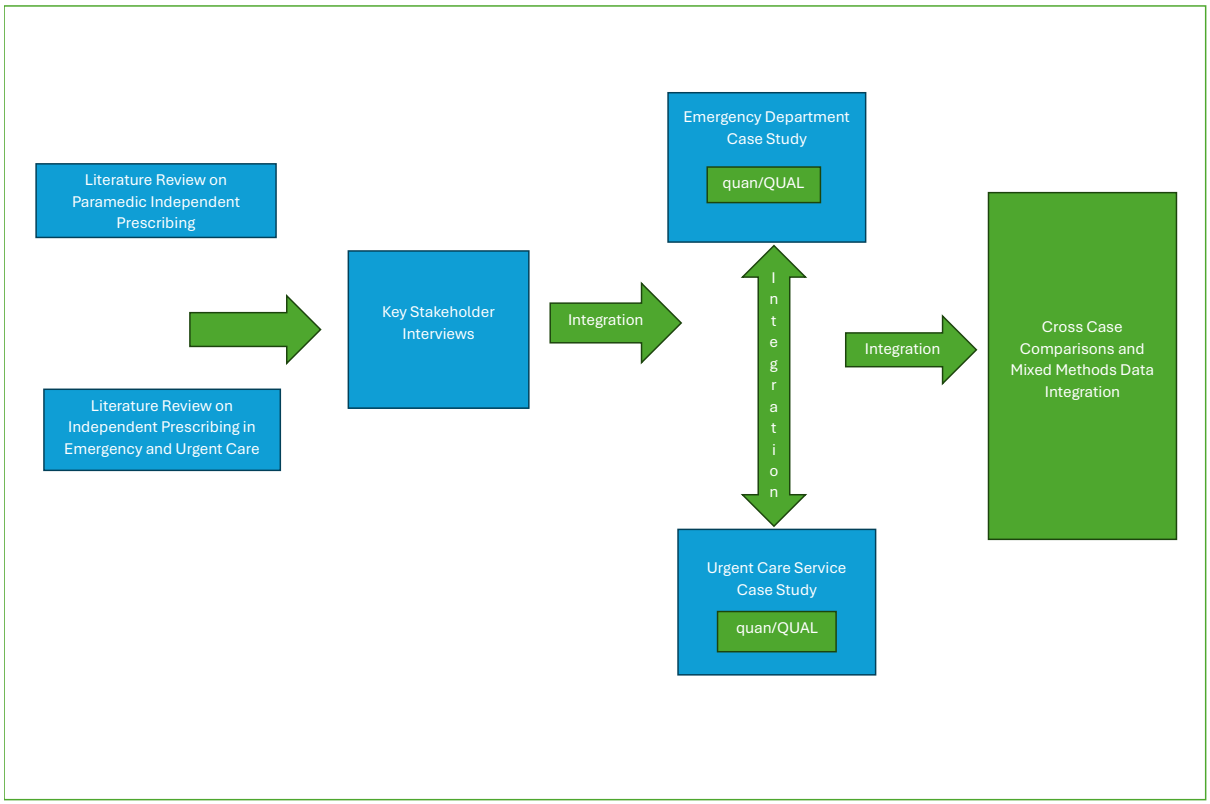


Figure 12: Mixed Methods Study Diagram

4.2.2 Patient and public engagement and involvement

Throughout the research project, members of an ambulance service patient and public engagement and involvement (PPEI) group provided ongoing advice and input to the design and delivery of the research. A specific PPEI group were also recruited for the study, members of which had direct experience of receiving care from PIPs.

This group of five members met with me and the members from the ambulance service PPEI group every 3-6 months to provide ongoing advice and guidance in conducting the proposed research. This work included reviewing the topics to explore with key stakeholders and case study participants, including exploring participant experiences of patient acceptance and understanding of PIP in EUC. I also discussed with PPEI representatives how patients might perceive my presence during their care episodes, devising strategies with them to ensure patients felt comfortable and able to decline for me to be present. We also developed the study information leaflet together and discussed how I should present myself during data collection. This led to a shared decision for me to wear smart casual office attire and designing a bespoke identify badge to wear during field work identifying myself as a paramedic researcher. The PPEI members also reviewed the research findings, identifying key aspects to report in publicly available dissemination outputs.

PPEI members also highlighted how their own experiences as patients mirrored what I had observed in my research regarding the long waits for care in EUC, overcrowding in EDs and long delays for receiving consultations in both urgent and primary care. These framed interesting discussions on the wider challenges for patients in accessing healthcare in the post pandemic era. Equally, PPEI members discussed how patients may have concerns around the increasing range, diversity and scope of healthcare professional roles in EUC, as exemplified by the research findings on PIP in EUC. We agreed together that exploring patients' views, satisfaction and acceptance of PIP therefore remains an important future research priority.

4.2.3 Absence of patient participants' perspectives from the research design

Whilst engagement work with PPEI members highlighted the relevance of patients' views and experiences of PIP in EUC, a key methodological decision was made to focus on EUC healthcare staff as research participants during this study. This decision aligns with wider methodological literature which advocates for clarity of focus and coherence between research aims, design and scope (Maxwell, 2013; Mason, 2018). Attempting to combine both professional and patient perspectives within a single doctoral study risked broadening the project beyond feasible analytical depth,

potentially compromising the interpretive richness of either strand (Hammersley & Atkinson, 2019).

The primary focus of this study was to explore how PIP has been introduced into professional practice in EUC and how it is understood, enacted and negotiated within professional and organisational contexts. Concentrating on healthcare staff therefore enabled a deeper exploration of the professional, social and systemic factors shaping prescribing practice. However, patients' accounts offer a unique lens on the relational and experiential dimensions of care, which are increasingly recognised as crucial in understanding the real-world impact of healthcare innovations (Greenhalgh, Howick and Maskrey, 2014; Locock *et al.*, 2020). Patients' experience often illuminate aspects of healthcare practice that remain invisible to professionals or researchers observing from within the system (Ziebland *et al.*, 2013; O'Hara *et al.*, 2018). The absence of patient participants was therefore not intended to diminish the value of these perspectives, but to ensure that they could later be studied with sufficient focus and depth at a later stage.

4.3 Key stakeholder interview methods

The literature review on PIP (Chapter 2) highlighted how previous research had predominantly evaluated PIP only through the views and insights of paramedics and PIPs. As a result, any higher level, more strategic views and experiences were missing from the research evidence. Whilst Drennan *et al.* (2023) interviewed a purposive sample of key stakeholders to explore their strategic insights into advanced healthcare roles in EDs, this contained only very limited data on PIP. The limited research findings from other PIP studies also pointed to a range of key issues which specifically required strategic insight to understand. These included the legislative restrictions regarding CDs, and the disparity between national policy and previously reported PIP educational backgrounds. Previous research also suggested a very limited uptake of PIP in ambulance services despite the case of need presented in the stakeholder and public consultations (Department of Health, 2010; NHS England, 2015b). To evaluate if and how PIP was benefiting patients and EUC services, whilst exploring any facilitators or

barriers, including those identified in previous research, the insights of a purposive sample of key stakeholders were therefore sought.

Key stakeholder participants were deliberately sampled for their experience and knowledge as subject experts, also underpinned by strategic work from positions of seniority within NHS and other key organisations. These included participants involved in the work to introduce PIP for the profession (stakeholder and public consultations, and meetings with the CHM), those working in key roles with the College of Paramedics and NHS England, individuals involved in the organisational and delivery of PIP education, and those in senior leadership positions within different EUC organisations. Given most participants were also healthcare professionals they also had significant clinical experience in EUC settings, underpinning their more strategic level views.

Key stakeholders therefore represented what has been described in previous literature as elite participants. These are participants who exercise a major share of authority or influence within a larger group or organisation (Scally *et al.*, 2021). Littig (2009) describes a differentiation between elite participants who have 'interpretive power' based on their knowledge and skill (the experts) and those who have 'formative power' because of their position in organisations, and their direct involvement in, or proximity to decision-making (the elite). However, in the context of this study, participants were anticipated to hold both interpretive power and formative power, given they were known to be both subject experts and in positions of organisational authority.

4.3.1 Key stakeholder interview objectives

The research objectives for this work package were:

1) To explore key stakeholder views on the benefits and limitations of PIP in EUC.

2) To ascertain views regarding if/how PIP contributes to patient care and service delivery.

3) To understand views on any facilitators or barriers influencing PIP implementation and delivery.

4.3.2 Key stakeholder sampling and recruitment

Between October 2022 and March 2023, a purposive sample of key stakeholders were contacted by email. Purposive sampling was used given the need to recruit participants able to contribute appropriate data, both in terms of relevance and depth. The advantage of purposive sampling is that the researcher can identify participants who are likely to provide data that are detailed and relevant to the research question (Oliver, 2025). However, purposive sampling rests on the subjectivity of the researcher's decision-making, which may represent a source of potential bias (Oliver, 2025). Whilst this approach to sampling enabled participants to be recruited who held high levels of experience and knowledge of the research topic, it is acknowledged that other potentially eligible participants may have not been identified in this process. However, a snowball sampling approach was also used (Ritchie, 2013) whereby recruited key stakeholders were asked to identify any additional potential participants who also had strategic experience regarding the PIP public consultation, meetings with the CHM, or with strategic leadership roles associated with PIP in EUC.

A total of 37 potential participants were approached, 6 of which were identified through snowball sampling. An invitation email (Appendix C) was sent to potential participants' organisational email address. This contained a consent form (Appendix I) and a participation information sheet (Appendix D). Two reminder emails were sent fortnightly to any participants who had not responded. All participants were offered a £25 online shopping voucher in recognition of their time and contribution. Of 37 participants approached, 15 participants agreed to participate and were interviewed, 2/15 were those recruited through snowball sampling. All participants signed and returned a consent form prior to being interviewed. Participant anonymity was carefully maintained when reporting the findings of the research and participants were advised of this prior to being interviewed.

4.3.3 Semi-structured interviews

Semi-structured interviews were chosen to explore both key stakeholder participant, and later, case study participants' views on the research topic. Unlike fully structured

interviews, which aim to collect standardised responses, or fully unstructured interviews, which can risk straying off-topic or failing to cover all the aspects of the research questions, semi-structured interviews provide both structure and flexibility. The use of an interview topic guide helps to ensure key themes are covered, while allowing natural discussion to flow (Ritchie, 2013; Seale, 2017; Roulston, 2021). Using a topic guide also enabled me to provide a level of consistency and structure to interviews. It also allowed for participants to speak freely about related and interesting topics, whilst providing a useful point of reference to return the conversation back to the key topics to be covered.

Topic guides were informed by both literature reviews (Chapters 2 and 3) including questions on identified key aspects such as access to records, medical support, and CD restrictions. The structure of the topic guides broadly followed the four-stage topic guide template outlined by Ritchie (2013). This includes the sections of introduction, surface-level questions, in-depth discussion, and conclusion. The key stakeholder interview guide served as the foundation for the case study guide, with modifications made for site-specific relevance. Both my academic supervisors and PPEI representatives reviewed and refined the guides prior to use. Key stakeholder interviews were scheduled for an hour and lasted between 40–60 minutes. The topic guide used for key stakeholder interviews is provided in Appendix E.

4.3.4 Theoretical considerations on interviewing

Relevant theorical positions on qualitative interviewing were considered prior to conducting the research and how these might inform and guide data collection. Roulston (2021) considers several distinct theoretical positions which each describe specific differences in the role of the interviewer, interviewee, and how these influence the construction of data.

Roulston (2021) outlines how romantic interviewing involves intimate encounters which allow the interviewer to explore the inner world and personal feelings of the interviewee, establishing rapport and empathic connection in which the interviewer plays an active role to develop in-depth interpretations of participants' life worlds. The data are

therefore co-constructed by the interviewer and interviewee, and the interviewer may contribute their own views to the conversation to heighten rapport. A constructionist theorisation of interviewing also recognizes that the interviewer and interviewee co-construct data, and the researcher produces an analysis of how the interviewer and interviewee made sense of the research topic and constructed narratives. As the data are co-constructed by the interviewer and interviewee, any of the interviewer's contributions are subject to the same analytic focus as that of the interviewee (Roulston, 2021).

The overall aim during both key stakeholder and case study interviews was to obtain participants' professional views and experiences on the topic of PIP in EUC, rather than to explore any deeply personal feelings, or to necessarily co-construct data with them. It was clear therefore, that neither a romantic nor purely constructionist approach to interviewing would be suitable. Therefore, an alternative conceptualisation of neo-positivism was considered.

Roulston (2021) describes how the neo-positivist conception of interviewing draws on similar assumptions as those used by researchers employing standardised surveys. For example, the data generated provides valid and credible knowledge concerning the beliefs, perceptions and experiences of the 'authentic self' of an interviewee. The interviewer generally refrains from participating in the data generation, other than asking questions and following up with neutral questions. Data are commonly coded and categorised, and the researcher has a clearly defined topic which participants have information on. This approach was therefore felt to represent the most suitable theoretical approach. Roulston (2021) goes on to outline how neo-positivist assumptions are evident in mixed methods designs such as this project. Neo-positivist researchers are also likely to represent findings in the form of themes supported by extracts from interview transcripts, sometimes complemented with descriptive statistics.

Ritchie (2013) discusses how considerable debate exists regarding the extent to which knowledge is constructed during interviews or is a pre-existing phenomenon and how this relates to the interviewer's role in generating data. Reflective of the theoretical

propositions of Roulston (2021), Ritchie (2013) outlines how one view is that the interview is an interaction which accesses and acquires the participant's pre-existing knowledge or views, broadly reflecting the neo-positivist stance. Conversely, knowledge can also be considered as something which does not already exist, but which is created and negotiated in the interview, with both interviewee and researcher actively participating and interpreting. This is therefore aligned with the constructionist theorisation proposed by Roulston (2021).

The former of these two approaches were predominantly utilised during both key stakeholder and case study interviews, which focused on acquiring the participants' knowledge and views. However, at times my approach did in fact shift to the latter position of co-construction, by drawing on the views of previous participants or my findings, or from my knowledge of the research literature. This approach enabled me to frame some questions in such a way as to encourage participants to reflect on either the views of other participants or what had been reported in the wider literature, to explore if they held similar or contrasting views.

Ritchie (2013) goes on to outline that if knowledge is something which is created within the unique situation of the interview, this calls into question the stability, reliability and validity of interview data. This is particularly noted by those advocating postmodern theory, who refute the notion of there being an individual 'self' that can be interviewed, but instead that there are many different 'selves'. Consequently, this line of thinking infers that the interview is only a performance of one or a number of these, through which data is created that is merely a representation of that single interaction. This assumption questions the extent to which such constructed or generated data truly represents reality. This therefore lends support to the use of multiple sources of data to answer the research question, rather than a reliance on only participant interviews. The use of triangulation in this way is an important strategy to enhance the validity or credibility of research findings (Mills, Durepos and Wiebe, 2012; Ritchie, 2013) and is considered further later in the chapter.

4.3.5 Consideration of professional identity, relative seniority and power dynamics

Key stakeholder participants were deliberately sampled for their significant experience and knowledge as subject experts, often also underpinned by their strategic work from positions of seniority within NHS and other key organisations. As previously outlined, key stakeholders therefore represented what has been described in previous literature as elite participants (Scally *et al.*, 2021).

Previous literature suggests elite interview participants are often used to being in charge, are used to being asked about their opinion, and can converse easily (Mikecz, 2012). This was noted during the interviews and participants needed very little prompting to articulately convey their views and experiences. However, elites are also often trained and experienced in how to represent their organisation to the outside world. It is not uncommon for researchers to hear the public relations version of events instead of their personal accounts, and obtaining these can be challenging (Mikecz, 2012). Whilst this had potential to influence data collection, participants did appear to provide candid and balanced views of the research topic. For example, those at senior levels in ambulance Trusts which had adopted PIP described both the benefits and the challenges that currently exist. These included an honest account from one participant that whilst they perceived PIP was beneficial for patients and their organisation, other executives were less convinced.

Another consideration when interviewing elite interview participants are how the power and authority available to 'elites' in their professional life will translate onto the interviewer–interviewee relationship (Mikecz, 2012). However, any influence on power imbalance was not apparent during the interview process. There was not for example, any instances where participants dominated or controlled the interview or demonstrated any significant assertiveness. Welch *et al.* (2002) consider the position of a researcher who is an informed outsider, which describes that of a neutral outsider with an inside view. This can be an effective position from which to interview elites, who may perceive the interview as an opportunity to have an informed discussion. This represented my own positionality, given I am knowledgeable of the research topic but am both an outsider of their organisation and their work. Participants therefore

demonstrated high levels of interest and engagement in participating in interviews, appearing enthusiastic to share their views, highlight the positive benefits from PIP, whilst also openly discussing the limitations and challenges that exist.

4.3.6 Key stakeholder interview data collection methods

Interviews were conducted online using Microsoft Teams. The audio from these video calls was recorded and then transcribed by a professional transcriber. Each interview transcript was carefully checked against the original recording, with adjustments made to improve accuracy. This included for example, making corrections to acronyms or technical language which were not interpreted correctly by the transcriber. During these checks, I also ensured participant anonymity had been maintained, and that names of any individuals or organisations were redacted. Data were then transferred to the qualitative data analysis software NVivo for data management, storage, retrieval and analysis. Interview audio and transcripts were reviewed repeatedly to immerse myself in the data both during transcription checks and prior to commencing analysis.

4.3.7 Key stakeholder interview data analysis methods

The Framework Method was used to analyse the key stakeholder interview data (Gale *et al.*, 2013; Ritchie, 2013). This sits broadly within thematic analysis or qualitative content analysis methods. These approaches identify commonalities and differences in qualitative data, before focusing on relationships between different parts of the data, seeking to draw descriptive and explanatory conclusions clustered around themes (Gale *et al.*, 2013). The defining feature of the Framework Method is the matrix output of rows (cases), columns (codes or categories) and 'cells' of summarised data. This provides a structure which the researcher can use to systematically reduce the data to analyse it by case and by code (Gale *et al.*, 2013; Ritchie, 2013). It was anticipated that given the heterogeneity and diversity of the sample, participants would hold differing and potentially contrasting views on the research topic. The Framework Method was therefore used as it is particularly suited to exploring comparisons and contrasting views between participants (Ritchie, 2013). While in-depth analyses of key themes can take place across the whole data set, the views of each research participant remain

connected to other aspects of their account within the matrix, so that the context of the individual's views is not lost (Gale *et al.*, 2013; Ritchie, 2013).

During data familiarisation, open coding was undertaken inductively on four different interview transcripts, selected to provide a range of views and perspectives from which a working analytical framework could be developed (Ritchie, 2013). Participants selected included an ambulance service leader, a senior College of Paramedics member, an urgent care leader, and an educational leader. The working analytical framework was further refined following discussions with my supervisory team and then applied to the remaining transcripts. Where additional codes emerged in the remaining transcripts, previously coded transcripts were also carefully checked to ascertain if they contained any data to which these new codes might apply. Through a more deductive approach the codes were grouped together into categories, which were informed by findings from the literature reviews and reflected the research questions and aims of the study.

Using the framework matrix tool within NVivo, the original transcript data were then charted into a summary framework matrix. This contained a summary in each matrix cell which was linked in NVivo to the original transcript data. This provided the ability to continually cross-reference the participant matrix summaries with the original transcript data. This process then enabled the generation of key themes. A copy of the summary framework is provided in Appendix E and shows the final working analytical framework and an example of cell summaries for individual participants.

4.4 Case study research methods

Following the analysis of the key stakeholder interviews, mixed methods case study research was then completed. The case study approach is particularly useful when there is a need to obtain an in-depth appreciation of an issue, event or phenomenon of interest within the context of the setting in which it is being implemented or used (Crowe *et al.*, 2011). Case studies have been described as a preferred strategy when, as with this study on PIP, "how" or "why" questions are being posed to understand a contemporary phenomenon in its real-life context (Crowe *et al.*, 2011; Yin, 2018). Stake

(1995) describes that case study research often draws on naturalistic, ethnographic, phenomenological and biographic research methods, although acknowledges it is not necessarily a purely qualitative enquiry. Yin (2014) also points out the strengths of case study research include an ability to explore many variables of interest using multiple sources of evidence. Case study research therefore lends itself particularly well to mixed methods approaches to data collection, given the myriad of approaches to research design, analysis, and interpretation that are possible. It also allows for the rich empirical data yielded from case studies to be analysed using a combination of quantitative and qualitative methods (Mills, Durepos and Wiebe, 2012; Creswell and Clark, 2017).

4.4.1 Selection and overview of case study sites

To inform the identification of potential case sites, scoping work and online engagement meetings with clinical leaders from potential EUC sites were undertaken. Case site identification was also informed by ongoing collaborative work with special interest groups from the College of Paramedics, drawing on their experiences and insights to understand the range of different EUC settings in which PIP had been implemented.

Crowe *et al.* (2011) outline how the type of case study being conducted influences the site selection process. Stake (1995) characterises case studies as being either intrinsic, instrumental or collective. An intrinsic case study is typically undertaken to learn about a unique phenomenon in a specific case. Alternatively, an instrumental case study seeks to gain a broader appreciation of an issue or phenomenon. Collective case studies involve multiple cases to generate a broader appreciation of a particular issue. Whereas intrinsic case studies seek to select a specific site for its importance in demonstrating the uniqueness of what is being studied, instrumental case studies consider other factors such as site accessibility, location, and the willingness of the organisation to engage in the research. Instrumental cases also seek to select a site which is considered to be a typical case (Stake, 1995; Crowe *et al.*, 2011). Given the overall aim of the study was to understand how PIP has been implemented in different EUC settings, selecting case sites which were typical

was therefore an appropriate strategy to site recruitment. Given the nature of the study as a doctoral research project involving only a single researcher, collective case studies involving multiple cases of the same type were not deemed to be feasible.

Initially, three case site types were considered, which were an ED, an urgent care out-of-hours service, and a regional ambulance service. However, a final sample of an ED and an urgent care out-of-hours service were chosen. This was in part based on feedback received during my progression review during 2023, which recommended reducing the amount of case study sites to ensure the research could be completed within the project timeframe. Furthermore, only a small number of PIPs were employed in the ambulance service, describing using PIP very infrequently in their role during engagement conversations. Consequently, it would have been challenging to capture sufficient data at this site. It was also not feasible to recruit a different ambulance case site, as alternative services were either too far away geographically, had not adopted PIP at all, or declined to participate in the study.

Engagement with different potential sites during this work and the key stakeholder interviews emphasised how in ED and urgent care settings, PIP had in contrast been more widely implemented. Site collaborators also described high prescribing frequencies by PIPs in these settings. This therefore informed the final decision to focus on an ED and out-of-hours urgent care service for the case study research. Engagement work illustrated that both case sites were instrumental cases. For example, PIPs at the selected site were employed as ACP-EMs, a role governed by national specifications to ensure workforce consistency (Crouch and Brown, 2018; Royal College of Emergency Medicine (RCEM), 2022b). The ED site was also a Type 1 ED, providing consultant led, 24-hour emergency care. This is reflective of the national model of ED service provision (NHS England, 2019). In the urgent care site, PIPs worked in a similar role to those in other services that were engaged with. This included undertaking autonomous patient assessment and decision-making using PIP during both telephone and face-to-face consultations. Both case study sites covered a mix of urban and rural settings and had population characteristics similar to the national averages provided by the office of national statistics (Office for National Statistics, 2021).

Final decisions around case site selection were also influenced by their geographical location to me as the researcher. The ED site could be reached by car in under an hour, and the urgent care site within two hours. Selecting case sites geographically located in the same region therefore avoided the need for additional costs from overnight accommodation. Equally, researcher safety and wellbeing were also considered given the need to drive home after field work which often occurred during evenings and night shifts.

4.4.2 Case study participant sampling and recruitment

Given the need to specifically recruit participants who were qualified PIPs in each case study, a purposive sampling approach was used (Oliver, 2025). All PIPs at each site were identified by local site collaborators who emailed PIPs via their organisational email account. At the ED site, this was a consultant nurse and at the urgent care case site, a non-clinical manager. Site collaborators sent initial invitation emails and two fortnightly reminder emails (Appendix I) to eligible PIPs. These included a participant information sheet and a consent form (Appendix I). Throughout the recruitment process, local collaborators also informally discussed participation with PIPs to encourage participation should they wish to do so.

It was estimated that up to 10-15 case study interviews would be conducted per site. Potential participant types were identified through engagement work with site staff, PIP participants, and PPEI members. Expert advisors from the College of Paramedics who had experience and knowledge of PIP in EUC were also consulted and assisted in identifying the range of staff who might hold relevant and different perspectives. Potential participant types identified in these discussions therefore included ED doctors, IP leads within the organisation, and other healthcare professionals working in the ED. These included nurses and any non-prescribing paramedics.

Once a minimum of two PIP participants had been recruited, data collection was then commenced at the site. Participating PIPs and local collaborators were both asked to then identify case site staff who met these criteria and who could be approached by site collaborators to be invited to participate in a case study interview. Once a list of

potential staff has been agreed, purposive sampling was again used by asking local site collaborators to send potential participants an invitation email (Appendix H) using their organisational email address. This contained a participant information sheet (Appendix H) and consent form (Appendix I). Two fortnightly reminder emails were then sent to all participants (Appendix H). Recruited participants and case site collaborators were also asked to informally discuss participation with potential participants where opportunities arose to enhance recruitment. The study was also advertised in monthly site staff newsletters at both sites and local site collaborators again informally discussed the study with potential participants to encourage participation should they wish to do so.

4.4.3 Case study participant consent

All PIP and case study interview participants were asked to read and sign a consent form (Appendix I). Throughout field work, I regularly confirmed that PIP participants remained willing to participate. This included confirming if at any time they wished to pause data collection for any reason. A pragmatic approach to gaining consent during field work was applied in situations where staff meetings were observed, or where other site staff engaged in informal conversations with me which were subsequently recorded in my field notes. In these situations, verbal consent was obtained from site staff and meeting attendees to include any relevant data in my field notes. All staff involved provided this verbal consent. All PIP and interview participants were advised they could withdraw their data from the study up to the point when data analysis commenced.

4.4.4 Patient Consent

Whilst patients were not recruited as research participants, the nature of the data collection during field work required verbal consent to be obtained for me to observe their care episode. Planning for this aspect of the research was informed by detailed discussions with PPEI representatives. PIP participants were asked to gain verbal consent from patients or an appropriate family member at the earliest opportunity, such as when calling them from the waiting area, when starting a telephone call, or on

arrival at their home at the urgent care case site. A patient information leaflet was also developed with PPEI representatives prior to data collection (Appendix H). This was kept available during data collection should patients request more information about the study.

In a minority of cases where a patient lacked mental capacity to provide verbal consent such as those who were unconscious or had a history of existing cognitive impairment, permission to observe their care was sought a family member or carer if present. Where this was not possible, a discussion was held with the PIP participant to confirm they agreed it was appropriate for me to continue to observe the care episode. This was deemed to be an appropriate strategy given there was no direct risk to the patient from my presence to observe the PIP. This approach was first discussed with PPEI representatives, site collaborators and my supervisory team prior to then also being approved by both ethics committees and the HRA.

4.4.5 Eligibility criteria for case study PIP participants

Case site PIPs were deemed to be eligible to participate if they:

1) Had completed an approved PIP module at university.

2) Were a registered paramedic with the Health Care Professions Council (HCPC) and annotated on the HCPC register as a PIP.

3) Were registered as an IP with employing Trust and using PIP in EUC practice within the case site.

4.4.6 Exclusion criteria for case study pip participants

Paramedics would be ineligible to participate if they were:

1) Not qualified in PIP or not annotated with the HCPC.

2) Qualified in PIP but not actually independently prescribing in practice.

3) Working in roles that are not associated with EUC, such as in areas of secondary care outside of the ED.

4.4.7 Eligibility criteria for case study interview participants

To be eligible to participate in a case study interview, participants:

1) Must have been an employee of the case study organisation.

2) Perceive they have relevant experience of PIP within the case study site.

4.4.8 Exclusion criteria for case study interview participants

No exclusion criteria were set, however during recruitment potential participants were provided with written information about the study to ensure they felt in a position to provide relevant data. Participant information sheets and study advertisements also detailed that staff could contact the researcher to informally discuss any aspect of the study, which included to discuss potential eligibility to participate in a case study interview.

4.4.9 Observation within a case study design

Observation was selected as a key data collection method during case studies to develop an in-depth, contextual understanding of how PIP was used in each site. McCann (2022) discusses the significant benefits of detailed observation as an approach to understanding the complex work of paramedics, reflecting on their detailed research in ambulance services. Equally, Tope *et al.* (2005) also describe 'the benefits of being there', which can provide greater informational yield than purely interview-based studies such as those previously conducted to explore PIP (Clarke, 2019; Stenner, Van Even and Collen, 2021; Pryor, Hand and Dunn, 2023). Similarly, Gubrium and Holstein (1997) and Hammersley and Atkinson (2019) have defended the long-standing principles of observational sociology, noting that examination of work in its natural setting can provide insights that are not readily available to researchers using less immersive methods.

While sharing methods in common with classic ethnography, case studies which include observation often focus on a particular phenomena or issue, rather than a broader focus on a societal group and its culture, which are often studied over longer

periods of time in ethnographic research (Simons, 2009). However, including observation as part of a case study design can provide a more comprehensive picture of the site. It also provides a sense of the setting which cannot be obtained solely by interviewing participants, therefore providing rich description and a basis for further analysis and interpretation (Simons, 2009).

Given the dynamic and varied nature of EUC practice, the nature of how I conducted observations varied depending on the context and situation. Most patient consultations were pre-planned and conducted in fixed locations in the ED and the CAS treatment centre rooms. In these settings, I stood slightly apart from the PIP within the cubicle. For telephone calls, I sat beside the PIPs who all offered to conduct the phone call on loudspeaker, and for me to observe their notetaking and screen activity. During home visits, my position was adapted based on the PIP's actions, for example sitting next to them on a patient's sofa.

Observation in sociological research can range from very structured approaches which are useful for testing specific hypotheses, to unstructured, naturalistic approaches that capture events as they occur (Simons, 2009; Ritchie, 2013). Structured observations address very specific research objectives and seek to produce more objective, consistent and repeatable data, such as counting occurrences as they are observed (Simons, 2009; Ritchie, 2013). In contrast, unstructured methods emphasise describing and interpreting incidents within their real-life context (Simons, 2009; Ritchie, 2013). Although during observations, the range and frequencies of drugs prescribed were noted, overall, a more unstructured observational approach was used to capture data regarding how PIP was used in practice and exploring the views of PIPs on the cases they managed through reflective conversations.

Field observations can also vary from collecting data from a position of complete participant involvement to a fully non-participant, detached observation (Simons, 2009; Pope and Mays, 2020). The widely cited typology of Gold (2017) provides a concise overview of the possible observer positions in observational research. This describes a continuum between the researcher as a complete participant (fully immersed as part of the group being studied and often covert), the participant as an observer (observing

from a natural, existing position as part of the group), and the complete observer (fully detached from the group and often observing remotely). Given my external position to the organisation and setting, that remote observation would not be possible, and the need for reflective dialogue with participants about observed practices, I adopted an alternative position described by Gold (2017), which was the observer as a participant. In this role, the researcher is present but has only minimal involvement in the social setting being studied and are not normally part of the setting. This position enabled me to observe and collect a wide range of detailed, observational data. It also had the potential to influence participant behaviour as a result of being observed, the so-called Hawthorne effect (Holden and Bower, 1998; Pope and Mays, 2020). Whilst the potential for my presence to alter participant behaviour could not be fully avoided, the focus of my observation was on clinical and prescribing practice rather than observing participants in a more natural, social setting. This may have reduced any significant changes in behaviour from occurring as a result of being observed. For example, clinical care is often observed by colleagues outside of any involvement in observational research. PIPs in both case sites also described how they were regularly observed in practice when training and mentoring junior staff, or those new to the organisation. Equally, given the need to uphold professional standards and provide consistent, evidence-based patient care, participants would have been unable to alter their clinical practice significantly as a result of being observed for the purposes of research. However, my presence and positionality as the researcher may have influenced participant behaviour and the views they expressed during reflective conversations and during interviews, which is considered further in the following section.

4.5 Researcher positionality and reflexivity

Due to the selected case sites being located in my own geographical region of clinical practice, some of the participants were known to me, although many were not. Although the degree of previous encounters with participants varied, none were considered as close acquaintances. Some for example, had been colleagues whilst employed in the same regional ambulance service as me several years previously.

Additionally, most key stakeholders had been encountered during collaboration and engagement work leading up to data collection, although again, none were close acquaintances. My experience and background and subsequent positionality as the researcher therefore required careful consideration, given the potential for this to influence participant behaviour.

I have been a qualified and practising paramedic since 2005 and have undertaken a significant amount of clinical and academic development in pursuit of both an advanced level of clinical practice and a clinical academic career path. I have been a qualified and practising PIP since 2021, working across ambulance, primary care and urgent care settings. I am also a member of the College of Paramedics Medicines and Prescribing Special Interest Group and Primary and Urgent Care Special Interest Group. These two groups meet every 2-6 months to discuss ongoing issues, project streams and other strategic work associated with both PIP and advanced paramedic practice in emergency, urgent and primary care. Alongside this work, I have maintained a keen research interest in the topic of PIP and medicines usage by paramedics. This has included focusing my master's dissertation on this topic and publishing several articles about PIP.

This brief overview of my previous clinical and academic experience demonstrates a complex positionality as the researcher in this project. Whilst this strategic work, clinical experience and previous research activity were useful throughout the research study, they may also have influenced data collection and analysis.

Some of the benefits to this positionality included having an in-depth understanding of the research topic and previous research. These could be drawn upon to both understand what participants were saying and to guide my questioning. However, my positionality clearly had the potential to also influence how participants responded in interviews and what they chose to say. For example, participants may have given answers based on what they felt I as the researcher might want them to say. They may have felt required to report positive views of PIP given their awareness of my own interest and positive views of the research topic. However, during case study observations, my experience and knowledge enabled me to understand some of the

more complex and technical aspects of clinical and prescribing activity, although this in turn had the potential to influence how I perceive and therefore captured these observations in my field notes.

My positionality as the researcher in this project exemplifies a key epistemological issue within social research, which is the relationship between the researcher and the researched. Ritchie (2013) outlines how in the social world, people are affected by the process of being studied and that the relationship between the researcher and social phenomena is interactive. The researcher cannot therefore be neutral or produce a completely objective account. Ritchie (2013) discusses how a position of empathic neutrality recognises that research cannot be value free, and that researchers should try to be explicit in making their assumptions, biases and values transparent, while striving as far as possible to be neutral and non-judgemental in their approach. In this context, reflexivity in qualitative research is considered particularly important.

To ensure a reflexive approach to data collection and analysis, a reflexive diary was kept. This was achieved through a combination of short, handwritten reflexive notes within my field note jottings and self-recordings whilst driving home from observation shifts. This enabled me to be mindful of and reflect on how my own experiences and insights as both a PIP and a researcher might influence my objectivity when collecting and analysing the data. This included my own experiences and views on the role of master's education, the impact of CD restrictions and the need for medical support. Being cognisant of my own thoughts and feelings helped to ensure that when analysing and interpreting the data, the findings of the analysis more closely represented participant views and not my own.

My positionality in the research landscape therefore represented both a unique lens to enhance data collection and analysis, and a potential to influence how I analysed the data. Researcher positionality has been described as representing researchers who are an insider (emic) or outsider (etic) (Huberman and Miles, 2002). Insiders are considered part of the community within which they are conducting research, while outsiders are outside of the group they are studying. Wilson, Janes and Williams (2022) discuss how the insider position of paramedics conducting research within their specific clinical

setting has considerable benefits to participant access, understanding of data and dissemination, whist also highlighting the difficulties of role duality and power dynamics. However, this binary distinction may not reflect the reality of conducting research, given insider and outsider perspectives are two ends of a positionality continuum along which researchers can move back and forth in a dynamic, continuous way. Wilson, Janes and Williams (2022) go on to outline how an alternative concept is one of an 'inbetweener' researcher, who identifies as neither entirely inside nor outside. This more accurately represents my own positionality in the research being undertaken, as I was partly familiar to some participants and all participants were aware of my professional background. Equally, I was completely external to their organisations and present in a non-clinical capacity. Whilst I have considerable knowledge of the topic of PIP and practice experience in ambulance, primary care and in an urgent treatment centre, I had little direct personal experience of practice in an ED or in out-of-hours urgent care, further reinforcing an 'outsider' position.

The role duality experienced by clinicians and researchers who are acting as 'double agents' also raises questions around power dynamics, as participants may be concerned about giving the right answers (Wilson, Janes and Williams, 2022). This is particularly relevant to my research given participants were aware of my interest in PIP and work with the College of Paramedics Special Interest Groups. Consequently, any perceptions regarding my own views and positionality held by participants may have influenced their answers and willingness to express negative views. However, any potential influence from this was mitigated against using neutral, non-leading questions. As well as specifically asking participants to provide their honest views on both the benefits and limitations of PIP and any barriers to implementation and delivery.

These existing encounters and professional relationships with participants and my role as a paramedic researcher were carefully considered to reduce any influence on participant behaviour and to ensure participants felt at ease with my presence. My own clinical and prescribing background enabled participants to reflect on their practice using technical, professional language without the need to explain these in detail. However, it is acknowledged this also had the potential for increasing participant self-

consciousness about their practice or for them to alter their responses and behaviour. However, I regularly reassured participants that my aim was to understand their use of PIP and explore their views and insights on the research topic, rather than evaluate their performance. I also considered how I framed questions during reflective conversations, to ensure they did not sound challenging or that I was questioning the decisions participants had made.

To also distance myself from being perceived to be in a clinical role and emphasise my positionality as an impartial observer, I wore smart, casual attire rather than a clinical uniform. I also held an informal briefing with each participant at the start of data collection, emphasising I was not allowed to participate in any clinical activity or provide any kind of involvement in clinical decision-making. I also emphasised my desire to remain as impartial as possible and asked them not to ask for my clinical opinion on patient care episodes, all participants were able and willing to comply with these requests. I did however confirm with all participants that if an unexpected, life-threatening situation were to suddenly occur, I would if required, assist in providing basic life support until further help arrived. Although this situation did not occur.

4.5.1 Data collection from observations

The classic method for recording observational data is through the creation of fieldnotes, with the researcher acting as the research instrument, and documenting the world they observe (Pope and Mays, 2020). This requires good observational skills and memory. Clear, detailed, systematic recording is also required, using jotted notes during observation where possible to aid recall (Pope and Mays, 2020). Observational data were captured during field work through handwritten field note jottings, which were later used to write detailed fieldnotes in Microsoft Word. Examples of field notes are provided in Appendix F. During patient care episodes, I did not make any field note jottings. This strategy was discussed with PPEI representatives and was felt to be more appropriate than overtly taking notes during patient care, which may have increased patient and participant discomfort. This may have also led to patients incorrectly perceiving that I was collecting data about them directly as participants. However, immediately after the care episode, I completed short, field note jottings (Hammersley

and Atkinson, 2019; Pope and Mays, 2020) using an iPad Pro and electronic stylus in Microsoft OneNote software. I made these jottings often whilst PIPs were writing their own clinical notes, or during natural pauses in the conversation, and during reflective conversations with PIPs in their work outside of direct patient contact.

The use of an iPad to capture field note jottings provided a flexible and responsive approach to data collection in the often fast-paced environment of the field work. For example, PIPs frequently and quickly shifted between tasks, conversations and different patient cases. For this reason, a structured field note template was not used, to ensure note taking could remain dynamic and responsive. The iPad's functionality also enabled me to quickly and intuitively capture jotted notes, photograph relevant guidelines and prescribing proformas being used, or quickly add a new section to the note folder if a new case, subject or conversation started. This enabled me to keep a clear structure, often writing notes about a specific case in one section or folder of the notes. The functionality of the iPad and the ease of use in this process enabled me to maintain my focus on data collection rather than the need to address any technical issues with my note taking.

At convenient points during each observation shift, informal, reflective conversations were held with participants to discuss and probe emerging issues around the prescribing activity observed in a naturalistic manner (Reeves, Kuper and Hodges, 2008). Where briefer conversations occurred in between cases, these were captured using field note jottings as described. On several occasions, there were opportunities for longer conversations, such as during meal breaks. With participant consent, these were audio recorded and transcribed. The interview transcript data was than included in the written field note document for the participant.

Whilst conducting field work, I also spoke with site staff who were encountered as I observed the PIPs in their practice. In the ED case site, these included the ED doctors, nurses and healthcare assistants, as well as frailty ACPs, physiotherapists, emergency nurse practitioners, speciality doctors and ambulance paramedics. In the urgent care site, PIPs worked in a more isolated role. However, doctors, non-prescribing paramedics, nurse IPs and non-clinical operational staff were encountered. Whilst

interactions with these staff were often general conversations, some generated data relevant to the research topic. When relevant conversations or observed events occurred, I asked the staff members for their verbal consent to summarise the key points of in my field notes and all gave consent for me to do so. This included for example, a demonstration by one of the ED nurses on the governance and safety checks they undertaken before administering the drugs prescribed by PIPs. A PIP participant and a non-prescribing paramedic also debated the role of master's education as a requirement for PIP during an observation shift in the urgent care case study.

During the field work at the ED case site, regular staff handover meetings were held between the ED doctors and ACP-EMs, alongside twice weekly all staff meetings. At each meeting, the chair introduced me and confirmed attendees verbally consented to my presence and for me to record any relevant observations regarding PIP in my field notes.

4.5.2 Online data collection: case study interviews and online meeting observations

During the case studies, data were collected both in-person, as outlined in previous sections, also virtually. Online data collection included case study interviews and medicines management meetings via Microsoft Teams. The medicines management meetings were pre-scheduled, and I joined as an invited participant. Data collection mirrored in-person methods, with field note jottings taken on an iPad. With participant consent the audio from each online medicines governance meeting were recorded, and meeting chairs provided an automatically generated meeting transcript from Microsoft Teams. This was checked for accuracy against the meeting recording, fully anonymised and used as the basis for my field notes. These contained both the transcript and my field notes in one document. At the start of each online meeting, I introduced the study, and the meeting chair confirmed all participants consented to my presence. The chair also confirmed participants' consent for me to audio record the meeting to assist with later writing field notes. I also offered the option to exclude sensitive discussions, though no such requests were made.

Microsoft Teams proved an effective platform for data collection for both case study interviews, the key stakeholder interviews and for meeting observations in each case study. Audio and video quality were high and collecting data online did not appear to be associated with any clear difference in comparison to face-to-face methods. Online methods of data collection have become increasingly mainstream in social science research. Particularly following the COVID-19 pandemic, virtual meetings and conversations are also now more common (Deakin and Wakefield, 2014; Fielding, 2017; T' Hart, 2023; Wakelin, McAra-Couper and Fleming, 2024). Some authors have argued the importance of being physically in the same space as participants, for an emotional connection to be fostered, and the physicality of body cues' not to be missed (T' Hart, 2023; Wakelin, McAra-Couper and Fleming, 2024). However, reflective of my own experience, other studies have identified no differences between the two. Participants may also be more likely to share information when interviewed online rather than in-person, due to the space and distance with which the interview is taking place (Jenner and Myers, 2019; Self, 2021; Wakelin, McAra-Couper and Fleming, 2024). In the context of this study involving healthcare professionals, online interviews also provided flexibility and convenience for participants given the busy nature of their work. Equally, wider concerns raised regarding online data collection methods such as access to, and confidence in using technology (Fielding, 2017) were not likely to apply to the sample given their existing use of and experience in communicating through Microsoft Teams. However, all case study participants were offered a choice between face-to-face or online interview. Only one interview occurred face-to-face. This participant was an urgent care doctor, who identified I was observing a PIP where they were working. Having already received the invitation email, the participant approached me and asked for the interview to be conducted in their consultation room during the shift.

Case study interviews were anticipated to take between 15–30 minutes and varied from 16–60 minutes. Longer interviews occurred with participants with more diverse roles, such as those holding both clinical and organisational leadership positions. This resulted in longer interview durations, as participants spoke for longer based on their wider experiences of research topic. In contrast, some participants such as the ED

registrars provided rich, detailed insights into more specific aspects of the research aims, such as the role of medical support as a facilitator of PIP, although spoke for less time on other aspects of the topic guide, resulting in shorter interview durations.

Interviews were audio recorded and initially transcribed using automatic transcription software within Microsoft Word. Whilst this provided a largely accurate transcript, these were carefully and thoroughly reviewed against the interview recording, editing the transcript to ensure accuracy. Where PIP participant reflective conversations were audio recorded, this process was also followed to transcribe these recordings.

4.5.3 Case study documents

At each site, a range of documentation was collected. These included IP and medicines governance policies, prescribing checklists and proformas, PIP job descriptions and a range of clinical and prescribing guidance resources. These were either collected during field work by photographing paper documents, or those being viewed on a computer screen, or as electronic documents provided by site collaborators (such as organisational policies). All documents were stored within NVivo software either as document files or photographs.

4.5.4 Case Study Quantitative Prescribing Data

Local collaborators at each clinical site facilitated requests for electronically held anonymised PIP prescribing frequency data for a period of twelve months (01/01/2023-31/12/2023) for analysis. In August 2024, site collaborators were then asked to provide an updated dataset from 31/12/2023 to capture any CD prescribing by PIPs following the change in legislation (Home Office, 2023). At the ED case site, a complete revised dataset containing all PIP prescribing activity was provided from this request. This allowed for comparisons to be made between this dataset and the previous one from 2023. The updated dataset also included the CD prescribing that has occurred since 31/12/2023. However, at the urgent care case site, due to an issue with the prescribing software, PIPs had not been able to electronically prescribe CDs, or record on the electronic system where they had issued handwritten CD prescriptions or directly

supplied CDs from the stocks held by the organisation. Therefore, quantitative CD prescribing data were not available from the case site.

The emerging findings during the case study research highlighted that obtaining additional CD prescribing frequency data from other prescribing clinicians at each case site would provide some additional context into the data on PIP. A minor study amendment (Appendix I) was therefore submitted and approved by the HRA and both Research Ethics Committees ((ERGO Reference 69751.A2, IRAS project ID: 310457). Each case site then provided twelve months (01/01/2023-31/12/2023) of CD prescribing data for other site clinicians. At the ED case site, this included nurse ACP-EMs (n=2) and ED Doctors (n=38). At the urgent care case site, this included GPs (n=189), nurse practitioners (n=52) and pharmacists (n=2) also working within the out-of-hours CAS.

4.5.5 Case study data analysis

Anonymised prescribing frequency data were imported and analysed in Microsoft Excel using descriptive statistics such as frequencies and percentages. All other data sources which included interview transcripts, field notes and site documents were imported into NVivo software for storage, retrieval and analysis. All participants were assigned a unique identifier, and any site details were redacted from documents if included in the findings.

All qualitative case study data were analysed using a thematic analysis approach, coding and categorising data to then generate key themes or typologies (Simons, 2009; Mills, Durepos and Wiebe, 2012; Hammersley and Atkinson, 2019). Broadly, thematic analysis is an analytical and sensemaking approach used to manage large volumes of data without losing its context (Mills, Durepos and Wiebe, 2012). It also allows for the researcher to become immersed in the data, whilst organising, summarising and focusing their interpretation (Simons, 2009; Crowe *et al.*, 2011; Mills, Durepos and Wiebe, 2012). A wide range of data sources can be included in thematic analysis, such as the field notes, interview transcripts and documents collected at each site (Mills, Durepos and Wiebe, 2012).

The computer software NVivo was used to store and manage all the data collected during each case study, forming a case study database (Yin, 2014). The use of NVivo is recommended for storing, managing and analysing case study data, given the software has become more diverse and functional over the past decade, providing a valuable research tool in which all forms of case study data can be entered, searched and analysed (Mills, Durepos and Wiebe, 2012; Yin, 2014).

Interpretation of case study data is a highly cognitive and intuitive process, involving total immersion in the data, re-reading transcripts, field notes, observations and other forms of data (Simons, 2009). Significant time was spent immersing myself in the collected data, reviewing my field notes, the interview transcripts and the site documents. Having developed an in-depth understanding of the collected data, I then began a process of inductively coding across all data sources. As this process continued, more defined categories became apparent, and codes were grouped together into these categories. Coding and categorising data in this way are described in several case study (Simons, 2009; Mills, Durepos and Wiebe, 2012; Yin, 2014) and ethnographic research methods texts (Hammersley and Atkinson, 2019). This process provides a systematic, comprehensive and cumulative approach to gradually build understanding or explanations from the data.

Coding can be approached in different ways, using either subsequent coding, driven by the data, or precoding, where the codes used are informed by issues and findings identified by the researcher or from previous research (Simons, 2009). Reflective of the inductive/deductive continuum discussed earlier in the chapter (Blaikie, 2007), a degree of both induction and deduction were applied during this process. For example, whilst initial codes were developed inductively from the data, categories were also informed by the findings from the literature reviews (Chapters 2 and 3), grouping codes together that identified key facilitators such as access to records or CD restrictions.

The data within different codes and categories were then carefully and systematically reviewed, noting similarities and differences between them and considering how this might inform the overall analysis and the conclusions drawn. This process is broadly reflective of the constant comparison method proposed by Glaser (1965) and

facilitated the generation of higher-level themes or typologies (Simons, 2009; Hammersley and Atkinson, 2019). These are a set of sub-types of more general categories derived from the data (Hammersley and Atkinson, 2019). The findings from this analysis were presented as a narrative summary (Chapters 6 and 7). These represented a key point of mixed methods data integration, and the quantitative prescribing frequency data were integrated with the qualitative findings from each case.

4.5.5.1 Cross case analysis

Once each within-case analysis was complete, a process of cross case analysis was then undertaken (Chapter 8). This explored how the findings from each case compared or contrasted, examining them for emergent patterns which might more fully address the research questions and aims of the study (O'Cathain, Murphy and Nicholl, 2010; Mills, Durepos and Wiebe, 2012; Yin, 2014). This included comparing and contrasting the key benefits of PIP in each setting and the facilitators and barriers which had been identified in each. This process involved firstly reviewing the findings and data from each within-case analysis, summarising these and charting them into a summary matrix (Miles, 1994; Mills, Durepos and Wiebe, 2012; Yin, 2014). Doing so allowed for the identification of similarities and differences across the cases and the identification of common themes (Miles, 1994; Mills, Durepos and Wiebe, 2012) which were then summarised through a narrative synthesis.

4.6 Considerations regarding data saturation, informational redundancy and informational power

Throughout data collection, an ongoing assessment and analysis was undertaken to confirm if sufficient participant numbers and sufficient data had been collected at each stage. This was informed by my sense of what I was hearing and seeing as the researcher and supported by regular discussions with my supervisors, participants and other key collaborators. Preliminary data analysis also informed this decision-making including early familiarisation of interview transcripts and field notes. The quantitative prescribing data were used to assess if and when a point of informational redundancy

or data saturation had been achieved (Sandelowski, 2008). Informational redundancy is considered to have occurred when researchers sense they have seen or heard something so repeatedly that they can anticipate it and therefore collecting more data is deemed to have no further interpretive value (Sandelowski, 2008; Saunders *et al.*, 2018).

The concept of informational redundancy was useful in broadly determining that the research aims had been sufficiently explored with all participants and rich data captured from observations. It was also acknowledged that given the diverse and unpredictable nature of EUC, it was likely that there would always be new and interesting cases and situations to observe. Additional participants were also likely to offer further unique insights into the research topic. However, the decision that enough observational data had been collected was based on whether the views and experiences of participants had been sufficiently explored, and enough participants had been recruited to cover the range of anticipated viewpoints on the research topic. This equally guided decisions regarding when sufficient contextual information had been gained from observations to understand how PIP was used by participants at each case site. Also that the key benefits, facilitators, barriers and challenges had been sufficiently observed, explored and understood.

Wider literature on the topic of data saturation illustrates how significant debate exists surrounding its role in qualitative research. For example, Saunders *et al.* (2018) suggests that whilst data saturation is a convincing concept, it has a number of practical weaknesses, especially as in some cases the number of emergent themes are potentially limitless. This is because each life is unique and, in this sense, data are never truly saturated as there will always be new things to discover. O'Reilly (2013) also argues that if saturation is not reached, this simply means that the phenomenon has not yet been fully explored, rather than the findings are not valid.

Considerations around assessments of sufficient participant recruitment and data collection in qualitative research have also been discussed in the context of informational power. This considers how the depth and range of information that a sample can provide can inform the overall number of participants needed (Malterud,

Siersma and Guassora, 2016). Furthermore, studies with a very specific focus can require fewer participants than those with a broader aims and objectives. Information power is therefore related to the specificity of experiences, knowledge, or properties among the participants (Malterud, Siersma and Guassora, 2016). This was reflective of the aims of this study, which sought to explore the very specific topic of the use of PIP at each case site. Interview participants all held significant experience of the research topic, such as the doctors working with PIPs and the organisational leaders involved in PIP governance at the site. Interview participants in both case studies also often held clinical and leadership roles and so were able to draw on both aspects of their work during interviews, which further increased the informational power achieved from the sample. Equally, key stakeholder participants were all considered to hold high levels of informational power, given the breadth and extent of their experience and knowledge in relation to the research topic. Considerations around informational power therefore provide a useful lens to consider how the depth, richness and specificity of participants provided sufficient informational power to answer the research questions.

Whilst the views and insights of case study participants formed an important component of data collection in each case study, observations of PIP practice and reflective conversations with PIPs were anticipated to complement the interview data and provide high levels of informational power. Equally, PIP participant recruitment at both sites was high, enabling data to be collected from the majority of the sample. At the ED case site, all PIPs (n=4/4) were recruited and at the urgent care site the majority (6/8) of PIPs were recruited.

4.7 Rigour in the research process: considerations of validity, reliability, credibility and transferability

In qualitative research, observational data exist on a continuum between naturally occurring and researcher-generated evidence. While observations take place in real-world settings, as discussed, the researcher inevitably influences data collection and interpretation to some extent (Ritchie, 2013; Pope and Mays, 2020). Some scholars critique observation as a research method due to its reliance on the researcher's

memory, discipline, and diligence in documenting data. Additionally, the subjective nature of participant observation means that the researcher's own positionality, experiences and biases can shape both data collection and interpretation (Mack, 2005). Case study research has similarly been criticised for lacking scientific rigor and providing limited generalisability, making it difficult to transfer findings to other settings (Crowe *et al.*, 2011; Yin, 2014). To address these concerns and enhance the rigor of case study research and the ability to transfer findings beyond the case itself, transparency in the research methods and ensuring the validity or credibility of the findings are essential (Moran-Ellis *et al.*, 2006; Crowe *et al.*, 2011; Denzin, 2012; Ritchie, 2013; Pope and Mays, 2020). Providing a clear rationale for case selection, data collection methods and the researcher's level of involvement strengthens the study's credibility (Crowe *et al.*, 2011). These aspects were therefore carefully considered and have been discussed in earlier sections of this chapter.

In qualitative research, validity and reliability are terms used to refer to the robustness and credibility of findings. However, these concepts originate from quantitative research paradigms and their relevance in qualitative research remains debated (Ritchie, 2013; Seale, 2017). Alternative terms such as credibility, dependability, plausibility, and transferability have been proposed to better fit qualitative paradigms (Glaser, 1965; Lincoln, 1985; Ritchie, 2013; Creswell, 2017; Pope and Mays, 2020). Validity in qualitative research generally therefore refers to the accuracy and precision of findings. Internal validity relates to the extent to which causal statements are supported by data, while external validity, better understood as credibility in qualitative research, concerns whether findings can be applied beyond the study context (Ritchie, 2013; Seale, 2017). Ritchie (2013) argues that for qualitative research to have influence, particularly in policy contexts, it must demonstrate both credibility and broader applicability.

4.7.1 Triangulation and validity

A key method for validating qualitative research is through a process of triangulation. This involves using multiple data sources or approaches to data collection to enhance the accuracy and credibility of findings (Stake, 1995; Moran-Ellis *et al.*, 2006; Ritchie,

2013; Yin, 2014). By integrating different types of evidence, triangulation strengthens research conclusions by confirming or disconfirming the findings through multiple lenses (Denzin, 2012). Various forms of triangulation exist, including methods triangulation (comparing data from different methods), source triangulation (analysing data from different sources), analyst triangulation (involving multiple researchers in data analysis), and theoretical triangulation (interpreting findings through different theoretical perspectives) (Denzin, 2012; Ritchie, 2013; Yin, 2014; Creswell, 2017).

In this study, methods triangulation was achieved by integrating quantitative prescribing data with qualitative insights on PIP. For instance, prescribing data on controlled drugs (CDs) were compared with qualitative findings from interviews and observations. Source triangulation was also used, for example by drawing on quantitative prescribing data, observations of practice, interview findings and site documents, such as sedation checklists, to understand the role of PIP in the context of anaesthesia and sedation in the ED. Additionally, analyst triangulation was used to enhance the validity and credibility of the findings, through my academic supervisors reviewing coding frameworks, data categorisation and interpretation. This process, referred to as peer review or peer examination (Merriam and Grenier, 2019) ensured that interpretations were critically assessed and substantiated. Theoretical triangulation was also demonstrated by later interpreting findings within broader sociological theories of professionalisation, medical dominance and jurisdictional claims over prescribing authority (Chapter 9) (Newton, Hunt and Williams, 2020; Nancarrow and Borthwick, 2021; Weiss, 2021; McCann, 2022).

4.7.2 Respondent validation and validity

Another approach to validating qualitative findings is member or respondent validation, where researchers share findings with participants to confirm accuracy (Ritchie, 2013; Hammersley and Atkinson, 2019). Some authors argue that this process minimises the risk of misinterpreting participants' perspectives, and ensures findings align with their intended meaning (Maxwell *et al.*, 2013). However, member validation has also been widely critiqued. Some researchers warn that participants may challenge findings not due to inaccuracies, but because they are uncomfortable with certain interpretations,

or wish to suppress information (Robson, 2011). Others highlight the lack of empirical evidence demonstrating improvements in credibility through member checking (Thomas, 2017; Lloyd, Hyett and Kenny, 2024). Practical challenges also include low response rates, shifting participant perspectives over time and potential participant discomfort with reading their spoken words in transcripts (Goldblatt, Karnieli-Miller and Neumann, 2011; Mero-Jaffe, 2011; Birt *et al.*, 2016). Some participants may also feel pressure to agree with the researcher rather than challenge interpretations, which further questions the validity of this approach (Hagens, Dobrow and Chafe, 2009; Birt *et al.*, 2016). Additionally, if participants find the experience negative, they may withdraw from the study altogether (Mero-Jaffe, 2011; Thomas, 2017). Given these concerns, some researchers argue that member checking is not a necessary component of rigorous qualitative research and that its absence does not compromise study validity (Motulsky, 2021).

In this study, careful consideration was given to whether member validation should be used, and a decision was reached not to engage in a formal member checking process. This decision was informed by the limitations of member validation outlined in the literature. The potential constraints that might be faced by participants in engaging in this process were also considered, given they worked in busy, high-pressure healthcare roles with limited availability. Instead, credibility and validity of the research findings were increased through a focus on data triangulation. Furthermore, during fieldwork, participants were often asked and encouraged to review and discuss my field note jottings and their content formed part of the reflective conversations held. This interactive approach to field note writing served as a real-time form of participant validation, ensuring that observations and interpretations were accurate, whilst also facilitating reflective conversations.

4.8 Ethics

Prior to interviewing key stakeholder participants, ethical approval was obtained from the University of Southampton Faculty of Environmental and Life Sciences Ethics Committee (ERGO Reference 76847.A1) (Appendix I). Advice was also sought from the Health Research Authority (HRA) regarding the need for any additional approvals for this

aspect of study. The HRA confirmed that key stakeholder interviews did not require HRA or NHS Research Ethics Committee approval.

Prior to conducting the case study research, HRA approval was obtained (HRA Reference 23/HRA/3145) (Appendix I) alongside Ethical approval from the University of Southampton Faculty of Environmental and Life Sciences Ethics Committee (ERGO Reference 69751.A2) (Appendix I) and the Camden & Kings Cross NHS Research Ethics Committee (IRAS project ID: 310457) (Appendix I). A minor study amendment was also approved by the University of Southampton and HRA during July 2024 to obtain an additional quantitative dataset of CD prescriptions by other prescribing clinicians at each site.

Chapter 5 Findings: Key stakeholder interviews

5.1 Chapter introduction

This chapter reports the findings from key stakeholder interviews, where the views, insights and experiences of a purposive sample of participants, based on their expert knowledge and/or strategic work regarding PIP were sought. These views were anticipated to provide a different lens on the research topic in comparison to the case study research. This included the more strategic level experiences of key stakeholders regarding PIP implementation in different EUC services and aspects likely to be influenced by national policy and guidance, such as CD restrictions and master's education.

5.2 Overview of participants

Fifteen participants were interviewed online between October 2022 and February 2023 (Table 3). Participants included senior leaders from different EUC organisations, the College of Paramedics and NHS England. Participants held senior clinical and organisational leadership roles, with some also leading the work to introduce PIP for the profession. Participants were also engaged in ongoing national or regional strategic level work in areas such as IP education delivery, PIP policy and guidance development and continued engagement with the Home Office and UK Government regarding CD prescribing. Most participants were qualified in IP and were practising clinicians in EUC. This enabled them to draw on their strategic work and experience as leaders and experts in their field, alongside their own clinical practice experience in EUC. Care has been taken to maintain participant anonymity; specific details of participant's roles and experience have been omitted where they would identify an individual.

Participant	Role
1	Senior healthcare leader. PIP.
2	Senior healthcare leader. PIP.
3	Consultant ACP. PIP.
4	Senior healthcare leader. Paramedic.
5	Senior healthcare leader. PIP.
6	Senior healthcare leader. Paramedic.
7	Senior healthcare leader. Nurse.
8	Senior healthcare and education leader. Doctor.
9	Senior healthcare leader. PIP.
10	Senior healthcare leader. PIP.
11	Senior healthcare leader. PIP.
12	Senior healthcare leader. PIP.
13	Senior healthcare leader. PIP.
14	Senior healthcare and education leader. Doctor.
15	Senior education leader. Nurse IP.

Table 3: Key Stakeholder Participant Summary

5.3 Overview of themes in the data

The Framework Approach to data analysis (Gale *et al.*, 2013; Ritchie, 2013) described in Chapter 3 facilitated the development of three main themes and ten sub-themes (Table 4). These include the range of benefits from PIP in EUC identified by participants in Theme 1, including the enhancements to paramedic practice and resulting

improvements to patient care and service provision. Theme 2 presents findings regarding potential for pressure to prescribe in EUC, also considering how and why PIP uptake has been limited in the ambulance sector. Participant insights into a range of facilitators and barriers to PIP in EUC are then synthesised in Theme 3. This includes insights on how CD restrictions, organisational factors, access to medical support and patient records can impact on PIP implementation and delivery. This theme also considers the role of master's education in the context of PIP adoption.

Themes	Sub Themes
Theme 1- Benefits for patients, services and paramedics	
	1.1 Improved timeliness of patient care and access to medicines.
	1.2 Service improvements through more efficient practice.
	1.3 Professional benefits.
Theme 2-Challenges and limitations	
	2.1 Pressure to prescribe.
	2.2 Implementation challenges in the ambulance sector.
Theme 3- Facilitators and barriers	
	3.1 Spearfishing without a spear- the impact of CD restrictions.
	3.2 Organisational readiness and governance.
	3.2 Access to important information.
	3.4 Medical support.
	3.5 The role of master's education.

Table 4: Overview of Key Stakeholder Interview Themes and Sub-Themes

5.4 Theme 1: Benefits for patients, services and paramedics

Participants identified a range of important benefits were realised for patients and EUC services from introducing PIP. These included improved timeliness of patient care and access to medicines, delivering more enhanced care and enabling PIPs to contribute more effectively within EUC services.

5.4.1 Improved timeliness of patient care and access to medicines

Participants reported that the introduction of PIP within EUC services was seen to have improved patient care and access to medicines:

All the arguments that we put forward [to the Commission on Human Medicines] to improve patient care, timely access to medicines, prompt care, alleviating suffering, and all these things are brilliant. KS Participant 1, ACP-EM, PIP, ongoing strategic involvement with national PIP implementation.

Leaders of ambulance services which had implemented PIP described that prior to adopting PIP, being passed between multiple EUC services to be prescribed treatment was a source of great frustration for patients. PIP was reported to have significantly improved patients' experience and overall journey through the EUC system. Notably, it enabled advanced paramedics in the ambulance service to undertake a remote consultation and issue an electronic prescription to patients. This enabled patient cases to be managed over the phone, without a resource needing to attend. PIPs could also prescribe remotely where an on-scene ambulance crew requested treatment to enable the patient to be discharged on scene:

The most important benefit to me is the treatment, getting the right care at the right moment. So they're getting early access to care. KS Participant 7, senior ambulance service leader, nurse, experience in range of senior EUC roles including commissioning.

The patient voice is quite loud in that as well... duplication and being re-triaged and having to be asked the same questions, sometimes by 111, [ambulance service triage clinicians] remotely, then a clinician at scene. ... you can have a very frustrated patient at the end of that. ... if you provide the right clinician who can help them with their

medication ... first time, you're going to have a much more proactive, engaged patient that's going to work with the system rather than be frustrated and against it. KS Participant 5, senior leader in ambulance service, PIP, senior College of Paramedics role.

5.4.2 Service improvements through more efficient practice

PIP was reported to have been widely implemented into both ED and urgent care settings across the UK. PIP permitted a broad scope of practice, enabling paramedics to manage whole episodes of care. Being able to prescribe reportedly enabled paramedic ACP-EMs to see more patients per shift, as less time was spent seeking third party support for prescriptions and access to medicines. This also improved the flow of patients through the department, freeing up clinicians and resources for other patients waiting to be seen:

[PIP] has an operational benefit in terms of speeding up access to care, and the more that people can get access to the treatment that they require, the quicker people will move through the system and free it up for others to come in. KS Participant 10, Consultant ACP-EM, PIP, strategic work regarding advanced practice roles and PIP implementation.

I've now got a member of staff that can see the majority of patients in the majority of areas, that don't need that touch point from another clinician to be signing this, essentially signing a prescription that they haven't seen the patient for, and that's fraught with danger in itself, as well. KS Participant 3, Consultant ACP, PIP, regional strategic work on advanced practice roles.

Within out-of-hours urgent care, PIP was associated with more efficient and effective care by enabling greater contribution of paramedics in comparison to them being reliant on PGDs.

I would say, our PGDs probably cover 60-70% of all out-of-hours presentations... But there's a big area that isn't covered... [if], they're not a prescriber, there's not a PGD, they then have to seek a review with a doctor, which takes time and the patient's

journey is interrupted. Often urgent care is very quick, chest infections, sore throats, earaches, conjunctivitis, and those ones really slow it down. So when it could be a twenty-minute consultation, it suddenly turns into a forty-minute consultation, and it's inefficient. Participant 14, strategic academic/educational role in IP education delivery, Medical Director in EUC.

The introduction of PIP within urgent care therefore enabled more efficient practice and in turn reduced the burden on other prescribers in the organisation. A previous reliance on PGDs not only restricted practice but also meant paramedics could only supply medicines during face-to-face encounters. However, the ability to now issue remote electronic prescriptions reportedly enabled PIPs to deal with some cases through telephone consultations.

Participants with experience of ambulance service PIP implementation described that it contributed to meeting the challenges experienced due to wider capacity issues in primary and secondary care. These were felt to increase the range of patients being encountered in the ambulance sector who required treatment to be prescribed. PIP had enabled such cases to be managed more efficiently and internally as an organisation, without duplicating work by referring patients back to stretched primary care or other urgent care services:

So the reality is… if we don't fundamentally change the way we work, then we are going to drown under the sheer volume of patients that are coming through the system … because general practice doesn't have capacity … secondary care is already snowed under … There is no feasible alternative that can be responsive within the community at the moment. Well, that to me is where the ambulance service fits in…. And prescribing fits very firmly with it. KS Participant 4, senior leader in ambulance service, senior College of Paramedics role.

Participant 14 (Academic lead/ urgent care service Medical Director) also articulated how an inability to manage such cases due to an absence of PIP placed an additional burden on urgent care services, struggling to meet their own caseloads:

I've literally done an audit this week looking at all the calls for a week from the local ambulance service into the out-of-hours, and we had a hundred and ten calls in a week from the ambulance service. And at least forty-two of them resulted in a prescription. And it's things like UTIs, chest infections, simple things, cellulitis. KS Participant 14, Strategic academic/educational role in IP education delivery. Medical Director in EUC.

5.4.3 Professional benefits

Professional benefits for paramedics adopting PIP into their practice included providing parity with other professions within EUC settings, increasing job satisfaction through improved professional practice:

There's a lot of job satisfaction from just being able to go, see the patient, do your assessment, make a decision, come up with a plan, do the prescription and then that's that, job closed; nobody else needs to be involved in it… it forces you to become better. You realise you can't just ring someone up going, I've got these vague symptoms, what shall we do with it, what are you going to prescribe? Because you've got to make that decision, not somebody else. So it makes you a better clinician. KS Participant 11, senior leader for ambulance service, PIP, senior College of Paramedics role.

In ED settings, PIPs were reported to predominantly work as advanced clinical practitioners in emergency medicine (ACP-EMs). This involved a wide scope of clinical and prescribing practice to autonomously manage the entire spectrum of cases encountered in emergency medicine. Whilst the ACP-EM is a multi-professional role, participants felt paramedics were particularly well suited to this work, given their unique experience in managing a broad range of cases in the ambulance service, and autonomously using medicines to treat these:

Paramedics are used to seeing the entire age range [and] acuity spectrum and… [have] confidence in managing high acuity patients… [whilst also being] used to giving a range of medicines… having use of Schedule 17 and PGD medicines. So perhaps there's something there around confidence to prescribe, particularly in the sickest patients. KS Participant 10, Consultant ACP-EM, PIP, strategic work regarding advanced practice roles and PIP implementation.

5.5 Theme 2: Challenges and limitations of PIP

This theme identifies the challenges and potential limitations to PIP in EUC.

5.5.1 Pressure to prescribe

PIPs in EUC services can experience pressure to prescribe from patients and colleagues. This can result in additional pressure to that already experienced in busy EUC environments:

Sometimes people will come and ask me to prescribe on behalf of somebody else at work, for a patient that I've not seen. … which, again, adds to some time pressures within ED. Particularly if you're busy with your patient, and sometimes you've got three or four patients on the go at the time, and you're trying to juggle the pressures of all that. KS Participant 1, ACP-EM, PIP, ongoing strategic involvement with national PIP implementation.

One ambulance service leader described PIPs sometimes had to manage pressure to prescribe from colleagues, who may not have correctly diagnosed a patient's condition, and so were requesting they prescribe treatments that were not indicated. Another participant felt PIPs in ambulance settings may be at more risk of pressure to prescribe and manipulation to prescribe because they work in isolation without medical support:

Those in ambulance [services]…they're probably at risk of maybe manipulation or problems with patients who might be trying it on. And they're not in an environment where they can say, I'm just going to get a senior partner or I'm just going to get a consultant's second look. I don't think that they'd have that robust support around them. KS Participant 12, senior College of Paramedics role, PIP.

5.5.2 Implementation challenges in the ambulance sector

Despite the implementation of PIP into some ambulance Trusts and the benefits described uptake in the ambulance sector appears far slower and limited in comparison to other EUC settings. Participants reported how potential concerns and

challenges began during the proposal project, these were framed around misconceptions of contemporary paramedic practice by the CHM panel of doctors:

The first visit to CHM was a bit of a train wreck, and that really underpinned the fact that no-one knew what we do… So we really challenged ourselves on well, how do we get over this perception that we're these sort of jolly, chubby, smiley men, middle-aged white men in green suits, and who want to start writing out FP10s and giving out medicines like sweets? KS Participant 9: Senior leader in ambulance service, senior College of Paramedics role.

As the work to introduce PIP for the profession continued, the focus shifted to the use of PIP in a much wider range of settings than just the ambulance service. This was in part due to the concerns of the CHM, although also reflective of how many advanced paramedics were leaving the ambulance service to work in these other settings:

[The proposal project] did a huge disservice to the ambulance sector in some ways, because there were no drivers. The original case of need was 750 advanced paramedics in England, trained to become prescribers within five years; we achieved 750 in three and a half years, with a handful in the ambulance sector. We're now on twelve hundred. And again, a handful, still, in the ambulance sector. So because other settings pulled us in… If there hadn't been that interest …there would have been more political drive and will to modernise the ambulance sector. KS Participant 9, senior leader for in ambulance service, PIP, senior College of Paramedics role.

Participants reported how the uptake of PIP had been limited across the ambulance sector. Consequently, the very small numbers of PIPs made it challenging to demonstrate clear organisational benefits which were felt to be needed to support any further adoption:

I don't necessarily think [PIP] will benefit ambulance services specifically. It will benefit … the wider NHS… But I don't think ambulance services will be able to point at a quantifiable thing and say, because of prescribers we can now do this, …to my knowledge I only know of maybe one or two other ambulance services that are actively creating paramedic prescribers. … to do any kind of quantitative analysis to say, …these

are the differences that we have with our prescribers is challenging, because the numbers are tiny, in comparison to the whole patient load… The limitation for me is evidencing. KS Participant 4, senior leader in ambulance service, senior College of Paramedics role.

5.5.2.1 The utility of patient group directions in the ambulance sector

Despite the potential benefits of remote prescribing within ambulance settings reported by participants, which were outlined in Theme 1, PGDs continued to enable treatment in most face-to-face patient encounters. Consequently, ambulance service leaders reported that advanced paramedics who had adopted PIP still predominantly worked within existing PGD criteria. Some participants also questioned if PGDs were a more appropriate legislative option than PIP given the frequent need for immediate supply and administration of medicines in prehospital care:

I think in terms of an ambulance setting, it's probably less clear where the benefit lies here, because are you looking at prescribing, administering medicines that you already hold with you? Or are looking at providing a prescription for somebody to fill later? … if you're carrying medicines, they're easier to PGD because you have a limited formulary available to you. KS Participant 10, Consultant ACP-EM, PIP, strategic work regarding advanced practice roles and PIP implementation.

Participants described how some ambulance services had allowed advanced paramedics to adopt PIP more to support their professional development and to support staff retention by doing so. However, key stakeholders felt strongly that PIP should only be adopted if it clearly benefits patient care:

So it's not about sort of getting the ten metres swimming badge to sew on your trunks. We've always said this is not CPD. This is not a badge of honour. Prescribing is something that fills a gap in your practice and that addresses the needs of your patients. KS Participant 9, senior leader for in ambulance service, PIP, senior College of Paramedics role.

Ambulance service paramedics themselves sometimes struggled to articulate why PIP was needed in their practice when applying to enrol on university IP modules (KS

Participant 15 (IP Academic Lead, Nurse). A senior ambulance leader whose Trust had adopted PIP also cautioned against overemphasising the contribution of PIP given many of the perceived benefits are also attributable to advanced practice, and not just the legislative mechanism which is used to enable treatment:

Policy wise, prescribing is often seen as this panacea, you know, that once you've got it, once an organisation's got non-medical prescribers, it will relieve the workload on doctors, it'll mean fewer patients have to go to hospital, all those sorts of things. And actually, probably it's the knowledge and experience of the individual that does that, more than simply possessing a non-medical prescribing qualification, I think. So, I think prescribing has kind of been held up as a holy grail, and it really isn't that, in my view. KS Participant 2, senior ambulance service leader, PIP.

The strategic views of key stakeholders have shown how a degree of uncertainty exists about the role of PIP within ambulance settings. The existing utility of PGDs in facilitating immediate medicine supply and the difficulties in evidencing quantifiable benefits potentially explain the low numbers of PIPs across the ambulance sector. However, PIP implementation may increase over time, especially given the more tangible benefits to patient care and service delivery described in Theme 1.

5.6 Theme 3: Facilitators and barriers of PIP

Facilitators and barriers of PIP in EUC are presented in the following sections and include CD restrictions, organisational factors, access to patient records and medical support, and the role of master's level education.

5.6.1 Spearfishing without a spear: the impact of Controlled Drug restrictions

At the time of conducting the interviews, PIPs were unable to prescribe any CDs. Whilst a limited list of five drugs had been agreed with the Home Office, legislation had not been updated to permit PIPs to prescribe these drugs in practice. Participants outlined the strategic work involved in securing CD prescribing rights for the profession. They also described how a complete absence of CD prescribing was impacting on practice, patient care and service delivery in EUC.

Participants involved in the meetings with the CHM described that CD prescribing was a contentious issue with Commissioners and other stakeholders they engaged with. This resulted in a decision to pursue only a limited list of CDs, a decision also informed by their anticipations of which CDs would be needed by PIPs. Participants acknowledged in hindsight, a much wider formulary of drugs are however required in contemporary practice:

I mean, heart and head versions of the answer here, really … at the time… we were advised not to pursue any Controlled Drugs, at the risk of the whole project being canned…. Because it was seen as so contentious. Again, paramedics flying around with FP10s and being able to write prescriptions for Controlled Drugs and the risk of misdirection, misuse, y'know, it really scared people in higher authority. And understandably so. I completely get it. If we knew then what we know now, of course we'd have open book. And there's no regret, because it was what it was at the time. But it's still fundamentally going to hold us back. KS Participant 9: senior leader for in ambulance service, PIP, senior College of Paramedics role.

Because historically when the list was proposed, paramedics weren't working in all these roles. I think the profession has got to remember how fast we've accelerated … I think if we had the crystal ball back then, I think we would have rightfully gone for full Controlled Drug prescribing … But unfortunately, at the time, we weren't. …So, we've got to live with that and…at the moment [I'm] working with the relevant government departments to try and see how we push that forward. KS Participant 13, senior College of Paramedics role, PIP.

They shared a sense of frustration with the lengthy process in securing even a limited list of CDs for PIP. This had taken far longer than anticipated, informing views that securing any further legislative changes around CDs would equally take a long time to achieve:

It's winding me up the wall is the frank answer. It should've been put into place a long time ago. I think we do need equality. What do we need to do as a profession to prove that we will be safe if we are given the full spectrum of Controlled Drugs? We need it. KS Participant 13, senior College of Paramedics role, PIP.

Inability to prescribe any CDs had resulted in delays to providing important treatment and increased reliance on other prescribers to issue third party CD prescriptions. This was perceived as potentially unsafe given the third party was often not directly involved in the patient's care and had limited oversight of the case. The restrictions were reported to also encourage suboptimal prescribing by PIPs choosing alternative, less suitable, or less efficacious drugs as 'workarounds' to the restrictions. Although PIPs could administer Morphine under existing legislative exemptions, they could not delegate administration to the ED nurses as they would for other drugs used in practice. This resulted in inefficiency by having to personally administer CDs. Consequently, restrictions were felt to prevent the range of benefits anticipated from PIP being realised:

The timely access for medicines and all the arguments that we put forward [to the CHM] to improve patient care … it's almost like [being asked] to go spear fishing but not giving them a spear. And saying we want you …make this big impact on patient care, …but we're not going to give you the tools to do it… I feel it's a half-hearted approach. I understand that there's a lot of governance in and around it; … But let us do the job. Let us prove ourselves. KS Participant 1, ACP-EM, PIP, ongoing strategic involvement with national PIP implementation.

Within ambulance and urgent care settings, CD restrictions had a particular impact on the provision of end-of-life care, since most of the drugs required are CDs:

So quite often in out-of-hours we have where people, their pain's increased, they've increased their Morphine driver, and they're running out of Morphine, and they need some more. Well, actually that's quite an easy fix, really. Would I be happy to prescribe that? Yeah. Do I know about the drug? I know loads about that drug, I've used it for years. Do I know how to do it appropriately? Yeah. Can I do it? No… So, they are the patients who are probably suffering because of that legislation not being changed… paramedics need to have all CD prescribing so that they can manage patients appropriately. KS Participant 11, Senior leader for ambulance service, PIP, senior College of Paramedics role.

Service leaders in urgent care described how this impacted on patient care and service delivery, often requiring out-of-hours doctors to drive considerable distances to attend end-of-life cases because PIPs were limited by their inability to prescribe CDs.

CD restrictions were also perceived to impact on the credibility of PIPs, and participants described their own personal frustrations at being in senior clinical positions, such as consultant ACP-EMs, although were required to request third party CD prescriptions from junior colleagues in the ED. They felt this undermined their authority and impacted on the trust staff placed in them as senior leaders. Lack of parity with other professions resulted in some settings choosing to employ other professions over paramedics. However, despite expressing frustration, they reported that for PIPs working multidisciplinary teams in EUC, the availability of other prescribers did help to offset any impact from CD restrictions on patient care. Participants also conveyed optimism that paramedics will be permitted full CD prescribing rights in the future:

Controlled Drugs is a barrier. It will be a barrier for the foreseeable future … We're going to have to live with this limitation… it's still fundamentally going to hold us back. I can't see this changing for the next three to five years. So we need to get the current update in the Misuse of Drugs Regulations published. Get it out there and then we've got to go back to the system and say right, look, we need people to support this. KS Participant 9, senior leader for in ambulance service, PIP, senior College of Paramedics role.

5.6.2 Organisational readiness and governance

Governance and organisational readiness for PIP existed in EDs and urgent care, because IP by other professions was already well established in these services. This included permitting PIPs to prescribe for a broad range of conditions. In contrast, participants felt ambulance services struggled to situate PIP in the more protocolised nature of usual practice in this setting. This may reduce the full potential of PIP from being realised:

I have to say, for paramedics who have come on the course with us, especially ones from … ambulance trusts… they're not quite sure what to do with [PIP] when they go

out, because the protocol-drivenness doesn't really fit for the independent prescribing. KS Participant 15: Strategic role in IP education delivery. Nurse IP, previous EUC clinical experience.

Differences were noted in PIP governance between ambulance Trusts. Whilst some ambulance leaders described supporting PIPs to prescribe in an unrestricted capacity, others described restriction to a limited formulary of drugs and not allowing a PIP to prescribe outside the Trust when engaged in rotational working contracts. Participants involved in the work to introduce PIP for the profession (stakeholder and public consultations and meetings with the CHM) described that in contrast to this more restrictive practice, they had proposed the need for PIPs to use an unrestricted formulary.

In contrast to restricted practice of PIPs in some ambulance services, in EDs, the innovative ACP-EM role was described as having a broad prescriptive scope, ranging from lower acuity urgent care cases to high acuity emergencies. Within ambulance settings, PIP was viewed as unsuitable for higher acuity work and currently, advanced paramedics in critical care were not supported to adopt PIP, continued to use PGDs. This decision was driven by pre-hospital critical care requiring immediate use of drugs, many of which are CDs. Therefore, PGDs were perceived as more suitable.

5.6.3 Access to important information

Sufficient access to important information, for example, detailed patient records and diagnostic test results, were seen as key facilitators of PIP, supporting prescribing decision-making and reducing risk. These included accessing previous and current drug prescriptions and medical treatments, and notes from primary and secondary care consultations. Being able to view previous diagnostic test results, such as blood tests was also important, particularly in key areas such as renal function, which can have considerable impact on prescribing decision-making. The level of information available in ED and urgent care settings was more detailed and comprehensive than in ambulance services.

Participants also reported that the CHM panel expressed significant concerns that PIPs in ambulance settings would be unable to access this information, and whether PIP could be used safely without it:

I know that was a big concern when paramedic prescribing was approved, in terms of how much access paramedics would have to the previous medical history … if you're going to give certain drugs, for example you might want to know things like [kidney function test result]… they don't necessarily have that level of access; a lot of that is contained on the GP records. Or if they've been to the ED recently, they won't be able to see the blood records that are held there. KS Participant 2, senior ambulance service leader, PIP.

Since the CHM meetings took place, advances in digital technology have now enabled PIPs in one Trust to conduct a limited range of point-of-care diagnostic blood tests to inform prescribing decision-making. Ambulance service PIPs can now also access summary of care records in the field. These provide basic but essential patient information to support prescribing, such as allergies and previously prescribed treatments. However, it was unclear if this information was sufficient for PIP compared to the significantly more detailed information available in EDs and urgent care. There was also a sense that access to records is likely to improve over time, with one service already reporting some increase in the detail available:

Another great development that we've had…[is] access to the GP interface… we'll have that kind of overview of medication, past medical history, active complaints and investigations, test results, as well. So we won't see specific consultations, but we will have access to all the information behind it. It's specifically a trial for our advanced practice workforce at the moment. Participant 5: Senior leader in ambulance service, PIP, senior College of Paramedics role.

5.6.4 Medical support

The availability of medical support differs between EUC settings. For PIPs in EDs working as part of a wider team, a high level of support was available and frequently

relied upon by PIPs. This enabled them to draw on the experience and expertise of more senior staff, reducing risk of prescribing outside of their competence and confidence:

I think the more mature you become in this everlasting search to become like an autonomous decision-maker, that's fantastic. But you soon learn that, actually, your decision bounced around a room for ten seconds is probably a safer decision than one person making this decision. KS Participant 3, Consultant ACP, PIP, regional strategic work on advanced practice roles.

The availability of support was particularly valued in EDs when prescribing for more complex and higher acuity cases. Additionally, speciality doctors could be consulted when needed since the ED is situated within a wider secondary care system:

So in the emergency department there's almost always somebody more senior than you, clinically, and so there's somebody to ask… also the specialty doctors. So if you're prescribing things like antiarrhythmics and stuff, rather than just guessing what would be the most useful one, being able to talk to a cardiologist. KS Participant 10, Consultant ACP-EM, PIP, strategic work regarding advanced practice roles and PIP implementation.

For some participants, this medical support was vital, contrasting it with what was available to paramedics in ambulance services:

If you were to [use PIP] in an ambulance setting… you might have access to a GP to advise you, if you were to ring them, if you were lucky enough to get through; whereas … within an ED, you can very much go to a consultant within seconds, …And you pretty much get an instant response. You don't have that luxury at pre-hospital, do you? And I think that level of support sometimes is key in managing the patient, particularly the complex ones. KS Participant 1, ACP-EM, PIP, ongoing strategic involvement with national PIP implementation.

Ambulance service leaders agreed with this perspective, acknowledging that medical support is not readily available for PIPs in ambulance settings. However, they did not perceive this as a barrier, given PIP was associated with higher degrees of clinical autonomy:

When they're on rotational models and they're working within primary care or out-of-hours, they've got [access to medical support] in spades. When they return back to the ambulance service, we are patchy at best … I suppose that, if anything, that's probably a reason why I'd want more of them to be prescribers … Because they can work that bit more autonomously… …so their reliance on other people is less. KS Participant 4, Senior leader in ambulance service, senior College of Paramedics role.

Being autonomous without the ability to access support was also seen as preferable in some situations, suggesting that seeking help can sometimes result in a degree of medical dominance:

Obviously, my experience is predominantly in the ambulance service, … in out-of-hours as well… there's nothing worse than having a discussion [with the patient] about a care plan, to then have a conversation with a GP who then does something completely different. And sometimes … you want to manage to from end to end. KS Participant 11, Senior leader for ambulance service, PIP, senior College of Paramedics role.

Similar challenges in accessing medical support within busy out-of-hours services were also reported if doctors were unavailable to provide support due to service pressures:

It depends on the environment and if you're in a pressurised practice or clinical environment where they're under-staffed, like [urgent care service] … they're phoning and they're not getting a call back from the lead clinician; I think they would probably get pressure from everyone just to do a prescription. KS Participant 8, Academic/educational leader. Experienced urgent care doctor.

5.6.4.1 Medical acceptance of PIP

Some members of the medical profession held negative views about the potential introduction of PIP, which were expressed during the public consultation and by members of the CHM panel, who were all doctors:

So, we'd obviously done all the consultation, … we start analysing the results. … It was amazing to see what people wrote in these… paramedics should never be allowed to

prescribe; they're dangerous and they'll kill people. Doctor whatever from somewhere. And you're going, OK, right, so there's some work to be done there. KS Participant 6, NHS England role. Paramedic.

I think a comment that was said in one of the [CHM] meetings … was how many other professions do we want to prescribe? But said in a very derogatory sort of way. … there is lots of role protection, I think. KS Participant 1, ACP-EM, PIP, ongoing strategic involvement with national PIP implementation.

However, as PIP was implemented into EUC practice, it was predominantly accepted and supported by doctors working in these settings. This was partly due to other IP professions having been well established prior to the introduction of PIP. It was also felt that doctors appreciated the benefits of a multi-disciplinary team to provide more holistic care, and in reducing the pressures experienced across the health system. These views resulted from good experiences of working with PIPs and developing, supportive, collaborative relationships, alongside developing trust in their knowledge and abilities through working together.

My impression is it's generally quite good, and the doctors are generally very supportive of the paramedic prescribing role. Certainly historically, when nurse and pharmacist prescribing first came up, there was a lot of tension… I think the fact that we've had… years now of non-medical prescribing from the other professions, … think that's very much paved the way. KS Participant 13, Senior College of Paramedics role, PIP.

5.6.5 The role of master's level education

Participants involved in the meetings with the CHM described how the assurances they gave to Commissioners that only experienced, master's level educated, advanced paramedics would adopt PIP, were integral to successfully securing approval for PIP:

One of the reasons why prescribing was granted in the first place is because it was going to be those more advanced paramedics who were going to be doing it. KS Participant 12, senior College of Paramedics role, PIP.

They acknowledged however that the guidance issued by the College of Paramedics cannot be mandated and so paramedics do not always have this recommended level of education. Some also felt individual universities should not allow paramedics to study independent prescribing modules if they do not fulfil the College of Paramedic's criteria:

I think that the [universities] it's more of a … let's get the funding through, because obviously they're businesses and they need to make the money. I think they should be tighter on their eligibility criteria. KS Participant 12, senior College of Paramedics role, PIP.

I said to the HCPC, well look, I've got paramedics who've been accepted on to programmes who aren't working advanced level of practice. So what are you going to do about it? …Four months later a letter was sent to all the [universities] asking them to confirm that their paramedics were working at advanced level of practice… because we'd raised that. … there's never been a profession that's had prescribing rights removed. And I don't want paramedics to be the first. KS Participant 6, NHS England role. Paramedic.

Participants reported concerns that because of the variation in training and education amongst PIPs that currently exists, the assurances made to the CHM to secure PIP were not being delivered:

We sat there representing the profession at the Commission on Human Medicines, saying that the people that would be doing the prescribing would be this person. And we portrayed a picture of a very structured approach, that had got very specific qualifications and experience. And I think if we come away from that, I don't know, it almost makes it feel that we've over-promised at the beginning and now things are getting diluted. And I wouldn't want that to happen. KS Participant 1, ACP-EM, PIP, ongoing strategic involvement with national PIP implementation.

One key benefit from this level of postgraduate education was critical thinking skills that it allows PIPs to develop. Some felt that not all paramedics would have previously

developed this and it was perceived by participants to be integral to supporting safe, evidence-based decision-making, as part of an advanced level of clinical practice:

I think [PIP] needs to be part of an MSc. … Year one gives you all ability to clinically examine and diagnostic interpretation tests and stuff, and then, I think, the prescribing slots nicely on top of that. Then you know how to examine; now you know how to prescribe; and then you go on to do a clinical portfolio in year three. … I do think it needs to be a level seven programme. Just to give you that good understanding. KS Participant 1, ACP-EM, PIP, ongoing strategic involvement with national PIP implementation.

However, not all participants felt there was such a clear requirement for PIPs to attain a full master's award, and some differentiated between completing postgraduate education and a full master's program:

I think it's important that you do the prescribing module at level seven. Simply because, … it's just that academic rigour, it's the depth of the argument and the breadth of the argument you're making, the critique around the subject matter … people need to understand and argue around; sort of special groups, ethical dilemmas, de-prescribing, some of those other concepts that otherwise it just becomes protocolised. And that's really the step-change that we've made as profession. Moving away from highly protocolised medicine to clinical judgement-based medicine. KS Participant 9, senior leader for in ambulance service, PIP, senior College of Paramedics role.

Additionally, other participants disagreed that postgraduate level education is necessary for PIP and does not result in safer, more competent prescribers, which is more influenced by clinical exposure and experience:

Obviously, it's supposed to be at master's level …. The fact that you've got to write an essay at level seven as opposed to level six, probably doesn't make you a safer prescriber. If you're doing, say, an ACP course, and prescribing is incorporated in that at level seven, that's great. I don't necessarily think you have to do it at level seven. I think it's about safe prescribing; … I'd rather people came out competent, than being able to write a really good level seven essay… We've got some … advanced practitioners, … they've gained … level six education. And then we've got people with full advanced

practice master's. …Have I seen a difference in their prescribing? Not really. …. the education for prescribing itself is the same, because it's set nationally. KS Participant 11, senior leader for ambulance service, PIP, senior College of Paramedics role.

One participant with experience in strategic, regional IP education delivery perceived that it was the breadth and scope of PIP practice that dictated the need for postgraduate level study:

Often those doing [IP training] at level six, have been doing the job a very long time. …… doing particular roles. And they have all of that extra training for that, and they've been doing it for many years… We ask all of our paramedics to be on a master's pathway…aligned with the College of Paramedics … we kept firm with that. As in exactly what you were saying about the first time [PIP] was rejected, … people needed to demonstrate to us they were on a master's pathway… because often paramedics are sitting outside of their traditional role when undertaking independent prescribing. … And for me that sits with advanced practice. KS Participant 15, Strategic role in IP education delivery. Nurse IP, previous EUC clinical experience.

This viewpoint was also reflected by a participant who was a PIP and a clinical leader in an ambulance Trust, and who agreed the fundamental changes to scope of practice required a higher standard of academic attainment:

I think from a paramedic perspective, not only are we trying to learn a whole different sector of the health service, primary and urgent care, which is not our bread and butter; we're emergency. And we've grown by seeing complex, polypharmacy, multi-morbid patients, we've grown our thinking, and we've widened our understanding of these patients…. So it's such a massive portfolio to undertake that I think you need to have a grasp on level seven academia …you need to have that higher understanding to be able to pull it all together. KS participant 5, senior leader in ambulance service, PIP, senior College of Paramedics role.

However, participants described that since the work to introduce PIP for the profession (stakeholder and public consultations and meetings with the CHM), a more contemporary concept of advanced practice had emerged, involving work across

different pillars of practice including clinical, research, leadership and education. As a result, what had been considered as advanced practice during the proposal was now more reflective of contemporary definitions of specialist or enhanced practice. These are associated with postgraduate level education, but not necessarily a full master's award:

I don't think they need a full master's; I think … the problem is specialist practice, which … has kind of muddied the waters a little bit. Because, when the proposal was put forward …I think what was deemed as advanced practice back then… would perhaps be deemed as specialist practice now. KS Participant 13, senior College of Paramedics role, PIP.

Those working at senior levels in the College of Paramedics and within NHS England also described regularly receiving complaints from paramedics regarding the guidance around master's education recommendations, with many feeling it is too strict. Participants also described experiences of encountering significant resistance and complaints from paramedics who wanted to train in PIP without completing a master's programme or even postgraduate education. However, participants also reported how the wording within NHS England's Multi-Professional Framework for Advanced Practice added further ambiguity to these discussions, and as a result, led to continued misinterpretation of the guidance:

It's still an issue. Even now I still think there are people that are potentially accessing this which aren't working at advanced level of practice… The College of Paramedics had a very strong standpoint that they should be working at advanced level of practice… Unfortunately, in that multi-professional framework for advanced clinical practice it says those magical two words: [master's education] or equivalent… I campaigned …not to include those words. Because what is equivalent? KS Participant 6, NHS England role. Paramedic.

It appears therefore that a range of contrasting views existed amongst key stakeholders regarding the role of master's education and PIP. It was also clear from the experiences of participants that many paramedics do not agree with published recommendations,

and neither are they adhering to them. This points to a need for further research to explore the role of master's education as a facilitator of PIP in more detail.

5.7 Summary of findings

The findings from the key stakeholder interviews provided a rich and unique insight into the work involved to introduce PIP for the profession and how PIP was subsequently implemented into EUC services. The varied insights and experiences of key stakeholders provided a range of perspectives based on their strategic work and from their position of seniority within different organisations. These insights suggest PIP has improved patient access to treatment, enhanced autonomy and expanded PIPs' scope of practice. This enables them to manage whole episodes of care and increasing their contribution within EUC teams.

Whether PIP has resulted in the same improvements in the ambulance sector was unclear from the contrasting viewpoints of different key stakeholders. Participants described how particularly during face-to-face practice, the use of medicines was not substantially different from using PGDs. The uptake of PIP across the ambulance sector has also been limited in comparison to other settings, and clearly evidencing benefits was challenging. Despite this, leaders from ambulance services that had adopted PIP perceived that tangible benefits had been realised from using PIP in remote consultations. These were felt to improve patient access to medicines and enable the ambulance service to respond more effectively to lower acuity cases by manging them remotely.

Contrasting views were noted between participants regarding the role of master's education as a requirement for adopting PIP. Reassuring Commissioners that PIPs would hold master's education was fundamental to addressing their concerns about the level of training and education of PIPs. However, participants described that many PIPs have not completed master's education and had experienced reluctance by paramedics to engage in master's programmes. However, participants also noted that the landscape may have changed since the PIP proposal as contemporary definitions of advanced practice have evolved, suggesting that potentially this benchmark set in

national guidance may now be too high. Whilst contrasting views were expressed on the topic of education, all participants perceived further legislative changes would be needed to allow PIPs to prescribe a wider range of CDs in the future, alongside a sense of frustration with the lengthy process involved in work surrounding CD legislation.

Interviews with this sample of key stakeholders provided a unique and high-level insight into the research topic, from a more strategic viewpoint. This had been missing from the existing PIP evidence base. However, the literature review in Chapter 2 highlighted the existing evidence was also limited to mostly self-reported views of PIP practice, predominantly based on singular approaches to data collection such as using only interviews or a survey. This therefore emphasised the importance on conducting the detailed, mixed methods case study research in EUC, the findings of which are presented in the following two chapters.

Chapter 6 Findings: Emergency department case study

6.1 Introduction

This chapter presents the findings from the first of two mixed methods case studies, focusing on the use of PIP in an ED. An overview of the ED is provided, including the wider context of the regional district hospital in which it is situated. The findings from qualitative data from fieldwork and quantitative prescribing frequency data are then integrated to explain how PIP is used in the ED. The chapter then presents three key themes developed from the qualitative data analysis. These show how the introduction of PIP results in benefits to patient care and service delivery (Theme 1). Much of the everyday work of the PIPs also involves balancing high levels of clinical autonomy with managing risk, seeking medical support when required (Theme 2). The challenging environment of the ED, which was characterised by high levels of patient demand, and delays in providing care also influenced PIP practice (Theme 3).

Careful attention has been paid to participant and case site anonymity and so some information sources contained in the overview are not referenced.

6.2 Case site description

The hospital provides acute health services for a local population of approximately 340,000 people (Care Quality Commission report, 2020). The region is a largely rural county without any large cities. Despite having higher levels of adult obesity (27.8% vs national average of 26.4%), the county had better than average scores for cancer diagnosis at stage 1 and 2 (55.1% vs 54.4% national average) and lower rates of preventable circulatory mortality (23.4% vs 28.2% national average) (Office of National Statistics Census Data, 2021). Healthy life expectancy (the average years expected to be lived in good health) for the county in which the ED was situated were 63.2 years for both males and females. This was higher than the national average (female national average = 60.7, male national average = 60.6). The median average age across the

county in 2022 was 47.4 years, with people of working age (ages 16-64) representing 33.3% of the population. Unemployment rates are close to the national average (3.0% vs 3.4% national average). The sex ratio was 104.5 males to every 100 females.

The case site is classified as a Type 1 ED. These are consultant led, 24-hour units with full resuscitation facilities (NHS England, 2019). During 2022-2023, 79448 patients were seen by the case site ED, equating to 217.6 patients per day.

6.2.1 Emergency department staffing

During each 24-hour period, between two and five medical ED consultants are on duty, depending on the time and day, with less cover at the weekend. Overnight staffing includes on-call consultant cover with ED registrars (experienced speciality doctors in emergency medicine) replacing the consultants as the senior doctor in charge. Depending on the time of day, two to five ED registrars are present in the department, alongside three to six middle grade doctors (doctors completing speciality training in emergency medicine who have completed at least three years of this training). The four PIPs in the ED were all employed as ACP-EMs and were considered by the organisation to be equivalent in the level of clinical practice and rota position as middle grade doctors. An ED GP also works during daytime hours each day and predominantly works within the 'Integrated Front Door' of the ED, alongside a team of three to six emergency nurse practitioners. In this area, they and the ED GP assess and manage most cases of minor illness and injury. Situated in the major's area is the joint emergency therapist team. This includes physiotherapists and occupational therapists. The frailty team are also situated in this area and include one or two frailty ACPs. The team of various ED clinicians are supported each shift by a team of 12-13 ED nurses, 7-19 healthcare assistants and a team of administrative and operational staff such as receptionists, patient trackers, bed managers and site managers.

6.2.2 Patient triage and allocation of work in the emergency department

Patients can self-present to the ED reception or are brought in by an ambulance crew. When ambulance staff are enroute with a high acuity case, they contact the ED on a

specific phone line known as the ‘red phone’. ED staff also monitor all inbound ambulance cases electronically. Regardless of mode of arrival, all patients are triaged by an ED nurse who assigns a triage category and decides which area of the ED patients will be seen. Patients presenting with lower acuity presentations are usually asked to wait in the ED waiting room and are then seen in one of four cubicles within the Integrated Front Door area. Higher acuity cases such as more serious infections and medical complaints are triaged to the ambulatory majors if able to walk and are consulted in one of four cubicles, sitting on chairs in the ED corridor whilst waiting to be seen by an ED clinician. If patients are not ambulatory, they are triaged to one of twelve cubicles in the major’s area. Both the ED Doctors and ACP-EMs predominantly cover the majors areas as well as the resuscitation (’resus’) area, which contains five beds. The highest acuity cases are manged here, such as heart attacks, cardiac arrest and major trauma. Following assessment and management, patients are discharged home or admitted to another area of the hospital. Overnight, staffing levels reduce quite significantly so the ACP-EMs, middle grade doctors and ED registrars then cover all clinical areas of the ED.

6.2.3 Staff meetings

During each 24-hour period, staff handover meetings are held at 0800, 1600 and 2200. They are chaired by an ED medical consultant and attended by the ED doctors, ACP-EMs and medical students. The whole clinical team review and discuss the ongoing care of all patients in the department. Additionally, three times per week a larger ‘daily huddle’ meeting is held in the main shared staff area, which all ED staff attend if they are able. These are again chaired by an ED consultant where topics such as medicines management issues and recent demand and performance figures are discussed.

6.2.4 Overview of case site participants

Between November 2023-April 2024 a total of 93 hours were spent undertaking field work in the ED case site, observing all four of the paramedic ACP-EMs working in the ED during a range of day, late and night shifts throughout the week and weekends. At least two observation periods on different dates were spent with all participants. The total

time spent with each participant and length of observation period were influenced by participants working hours and by participant/researcher availability. Table 5 provides a summary of observation hours per participant.

Participant	Observation Hours
ED PIP P1	35.5
ED PIP P2	17
ED PIP P3:	22.5
ED PIP P4	18
TOTAL	93

Table 5: ED Case Site Observation Hours

All four paramedic ACP-EMs had completed a master's. As part of the final stage in officially qualifying or 'credentialling' as an ACP-EM, the PIP participants were required to submit a substantial portfolio of evidence to the Royal College of Emergency Medicine (RCEM). ED PIPs 1-3 were in the final stages of preparing their portfolios for submission. One participant (ED PIP P4) was already deemed a qualified ACP-EM and had worked in this capacity since 2017. However, P4 was also preparing to submit a retrospective portfolio of evidence to RCEM. All four ACP-EMs were viewed by the ED organisation as fully qualified and were expected to be able to practice with the same level of skill and autonomy as middle grade doctors.

In addition to their role as an ACP-EM, ED PIP P1 had also retained a bank working contract with the regional ambulance service. However, they had only been permitted to practice within the scope of a standard paramedic and were not permitted to use PIP in this role. ED PIP P1 described attending several recent cases where being able to prescribe would have been of significant benefit. These included patients who required

a simple antimicrobial prescription to be treated in the community, which they had to refer to the urgent care out-of-hours service for a prescription to be issued.

Eleven other site staff (Table 6) participated in online case study interviews, including ED registrars, consultants, an ED GP, Trust IP leads, consultant nurses and the Associate Director of Pharmacy.

6.2.5 Overview of qualitative data collected

A total of 73 paramedic patient care episodes were captured from observing all four ACP-EMs. Of these, 53/73 (72.6%) involved some form of medicines related activity. A total of 39/73 (53.4%) care episodes involved using PIP to prescribe acute treatments, and 48 drugs were prescribed in these episodes of care. In other patient care episodes involving medicines related activity, 2/73 (2.7%) involved the administration of Morphine under paramedic legislative exemptions. PIPs also transcribed drug charts to authorise the administration of medications on admission (n= 3/73, 4.1%) and provided advice on the use of over-the-counter medicines to patients (n= 2/73, 2.7%).

Table 6: Emergency Department Case Site Participant Summary.

Participant	Participant Summary
ED PIP P1	Paramedic ACP-EM. Also works part-time for regional ambulance service.
ED PIP P2	Paramedic ACP-EM.
ED PIP P3	Paramedic ACP-EM.
ED PIP P4	Paramedic ACP-EM.
ED Case Study Interview (CSI) 1	Emergency Department Consultant (Doctor).
ED CSI 2	Emergency Department Consultant (Doctor).
ED CSI 3	Associate Director of Pharmacy (Pharmacist).
ED CSI 4	Consultant ACP-EM (Nurse).
ED CSI 5	Non-Medical Prescribing Lead/Consultant Nurse.
ED CSI 6	Non-Medical Prescribing Lead (Nurse).
ED CSI 7	Emergency Department Registrar (Doctor).
ED CSI 8	Emergency Department General Practitioner and Ambulance Doctor.
ED CSI 9	Emergency Department Registrar (Doctor).
ED CSI 10	Trainee ACP in Cardiology (Paramedic).
ED CSI 11	Emergency Department Registrar (Doctor).

Table 7: Overview of Qualitative Data Collection

Data Source	Details
Observation of clinical cases	73 patient cases in total. Cases not requiring any form of medicines activity: 20/73 (27.3 %). Total cases involving all forms of medicines activity: 53/73 (72.6 %). Cases directly involving prescribing: 39/73 cases (53.4 %), 48 drugs prescribed. Cases which involved providing medicines advice to other clinicians: 2 cases, 2 drugs. Cases providing over the counter medicines advice to patients: 1 case, 1 drug. Cases involving transcribing of medication for administration into patient's hospital admission chart: 3 cases, 10 drugs. Schedule 17 administration of Morphine (prior to legislation change): 2 cases. Cases requiring PIP to seek third party CD prescription: 6 cases, 8 CDs.
Meeting observations?	ED staff handover meetings and daily huddles: 10. Online medicines governance meeting: 1.
Field notes	Field note word count: 97860
Case study interviews and informal	Online case study interviews: 11. Informal reflective conversations with other ED staff captured in field notes: 11. Including ED Nurses (n=3), middle grade doctor

reflective conversations during field work	(n=2), frailty ACPs (n=2), ambulance service specialist paramedics in emergency and urgent care (n=2), consultant ACP-EM (n=1), ambulance paramedic (n=1).
Case site documents	Case site documents: 20. Including non-medical prescribing and CD policies, ACP job description, prescribing guidelines, proformas and checklists.

6.2.6 Overview of quantitative data findings

Tables 7, 8 and 9 present the most frequently prescribed drugs and the most frequently prescribed for conditions by the paramedic ACP-EMs in 2023 and 2024. Full versions of these tables containing all drugs prescribed are included in Appendix L. The findings presented in these tables are integrated with qualitative data as a narrative summary in the following sections of this chapter.

Table 8: Most Frequently Prescribed for Conditions by PIPs in 2023

Indication	Frequency	Percentage
Pain	484	18.8
Sepsis	371	14.4
Dehydration and Fluid Replacement	230	8.9
Chest Infections	199	7.7
Nausea and Vomiting	198	7.6
Respiratory Conditions	179	6.9
UTI and Pyelonephritis	108	4.1

Arrythmia	82	3.1
Acute Coronary Syndromes	75	2.9
Fever and pain	65	2.5
Overdose	58	2.2
Regular Medication	55	2.1
Abdominal Complaints	45	1.7
Fever	43	1.6
Infection- Unclear source	41	1.5
Cellulitis	37	1.4
Gastric and Abdominal Infections	32	1.2
Headache and Migraine	31	1.2
Electrolyte Disturbance	26	1.0

Table 9: Most Frequently Prescribed Drug Categories by PIPs in 2023

Drug	Frequency	Percentage
Antibiotics	752	20.6
Fluids	747	20.4
Paracetamol	597	16.3
Antiemetics	315	8.6
Inhaled Respiratory	224	6.1
Anticoagulants and Antiplatelets	145	3.9
NSAIDs	137	3.7
Other/Misc.	121	3.3
Steroids	85	2.3
Anti Arrythmias and Beta Blockers	76	2.0
Overdose and alcohol treatments	63	1.7
PPI and GORD	60	1.6
Electrolytes and Vitamins	51	1.3
Parkinson's Treatment	40	1.0
Diuretics	37	1.0

Table 10: Most Frequently Prescribed Drug Categories by PIPs in 2024

Drug	Frequency	Percentage
Fluids	569	16.8
Antibiotics	556	16.4
CDs	513	15.1
Paracetamol	495	14.6
Antiemetics	284	8.3
NSAIDs	156	4.6
Inhaled Respiratory	138	4.0
Anticoagulants and Antiplatelets	134	3.9
Other/Misc.	93	2.7
Steroids	70	2.0
Overdose Treatment	64	1.8
Anti Arrythmias and Beta Blockers	48	1.4
Epilepsy Treatments	44	1.3
Electrolytes and Vitamins	40	1.1
PPI and GORD	38	1.1

6.3 The context of practice and prescribing in the emergency department

Almost all PIP was undertaken using the electronic prescribing system integrated within the ED computer system. This was used to prescribe drugs to be administered in the ED. Any drugs prescribed at the point of discharge are not captured by this system and are issued using a handwritten FP10 prescription pad or by prescribing and dispensing drugs directly from a limited stock held in the ED drug cupboard. The ACP-EM participants estimated this represented only 5-10% of their prescribing activity, emphasising how most prescribing was to provide treatment in the ED, rather than to issue treatment on discharge. Additionally, most Insulin prescribing occurred using paper drug charts, so this activity is also not captured in the electronic prescribing system. Participants estimated Insulin prescribing formed 10% of their prescribing activity.

Typically, prescribed drugs were administered by one of the ED nurses caring for the patient. Separating prescribing and administration was viewed as enhancing patient safety, providing an opportunity for prescribing errors to be identified and corrected prior to administration. During field work, ED nurses demonstrated the careful checks they undertake before administering prescribed treatments. This was guided by specific computer software called Medusa which enabled them to confirm the drug, dose, and usual indications for being prescribed. Two nurses encountered during field work also commented to me separately that they had noticed differences between the paramedic ACP-EMs and ED doctors, with PIP practice being more compliant with guidance and less prone to errors:

Field Note Extract: [The ED nurse] explained that in ED an important safety aspect to prescribing is separating prescribing and administration, with the administration being their responsibility as a nurse. They told me how they had to frequently go and double check with doctors the drug, dose and indication for what they had prescribed, which were often not correct or not in accordance with prescribing guidelines. This then often resulted in the doctor amending the prescription to correct the mistake. They told me that this situation had not yet occurred with any of the paramedic ACPs, who they felt were more careful in their prescribing and always correctly followed prescribing and

clinical guidance in comparison to the doctors, who were often a bit more 'gung ho' and less worried about the dose and choice of drugs they prescribed.

6.3.1 Requests to prescribe

Careful decision-making was required when deciding whether to agree to requests from nursing staff to prescribe for a patient PIPs had not assessed in person. This occurred when a nurse requested treatment such as analgesia, nebulizers, or antimicrobials which they felt were urgently required. Depending on the drug required and the situation, it was sometimes necessary and considered safe to prescribe these on request. However, each case was considered individually, as this practice could result in providing treatment for an incorrect diagnosis:

Field Note Extract: [ED PIP P3] gave a recent example of a patient …[who] the nurse thought… was showing signs of sepsis… However, they felt what the nurse was telling them didn't quite add up and so went to see the patient themself. On doing so it was apparent the patient did not have an infection, and their symptoms were likely due to a blood clot on the lung (a pulmonary embolism) which required completely different drugs [to be] prescribed.

6.3.2 Accessing information to support prescribing

Paramedic ACP-EMs regularly accessed historical patient data which underpinned clinical and prescribing decision-making. This included viewing detailed hospital records on the ED computer system and through a web-based viewing platform called EMIS Viewer. This provided the same level of detailed patient information that would be available within primary care, including all previous primary care consultation notes, letters from secondary care, detailed drug histories and diagnostic test results. These platforms were used in every patient encounter and frequently influenced prescribing decisions. For example, when prescribing to manage acute cardiac issues, the paramedic APC-EMs confirmed the existing cardiac drugs and doses patients were already prescribed by primary care. This informed their prescribing decision-making when manging the acute cardiac problem in the ED. Participants contrasted the detailed level of access with the limited information available to the ambulance service paramedics, perceiving this would make prescribing very challenging.

The paramedic ACP-EMs also accessed regional and hospital prescribing formularies, and national clinical guidance from a range of sources on the ED computers. ED proformas were also used such as to prescribe Insulin and specific analgesia regimes for conditions such as hip fractures or chest wall injuries. Treatment algorithms and protocols were consulted, especially for higher acuity work such as prescribing to manage cardiac arrythmias and acute coronary syndromes. Additional checklists were also required when prescribing sedation. These encouraged paramedic ACP-EMs to ensure the necessary skills, team and support were in place before prescribing and administering sedatives and anaesthetic drugs. Figures 13 and 14 provided examples of prescribing guidance site documents captured during field work.

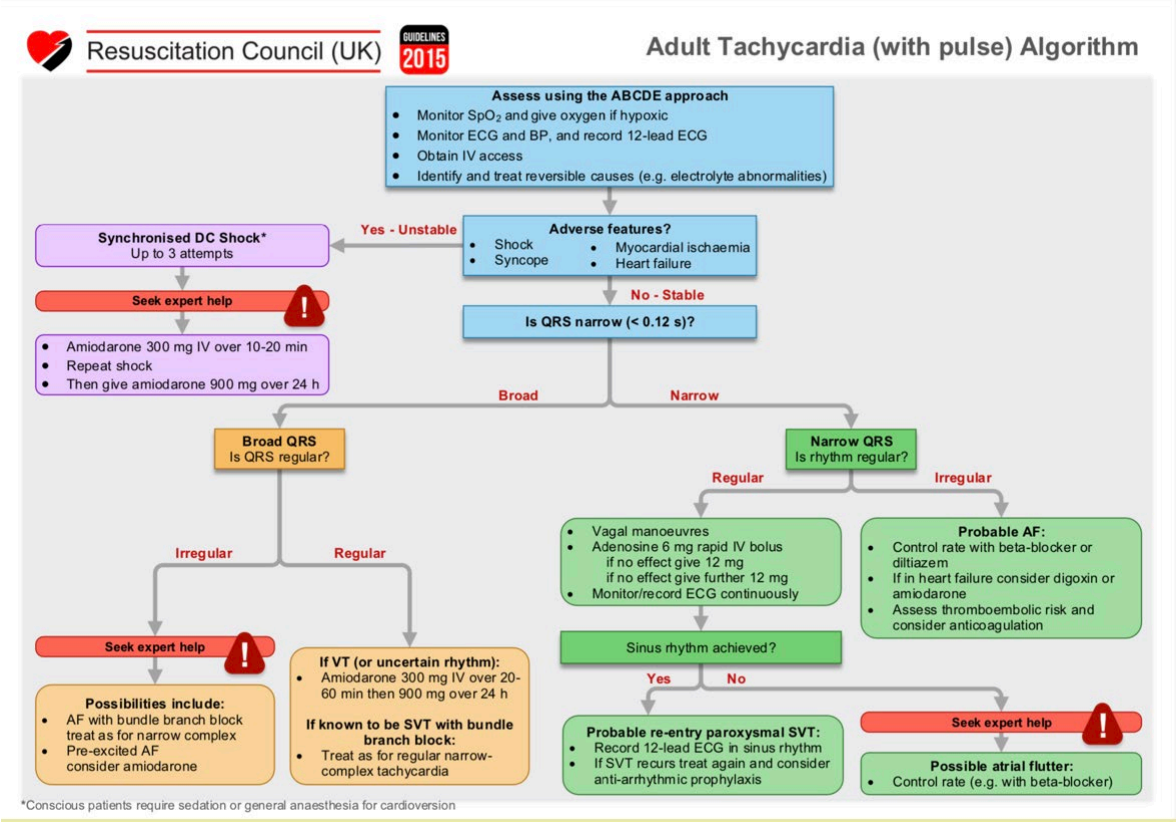


Figure 13: Cardiac Arrhythmia Prescribing Guidance Used by PIPs in ED

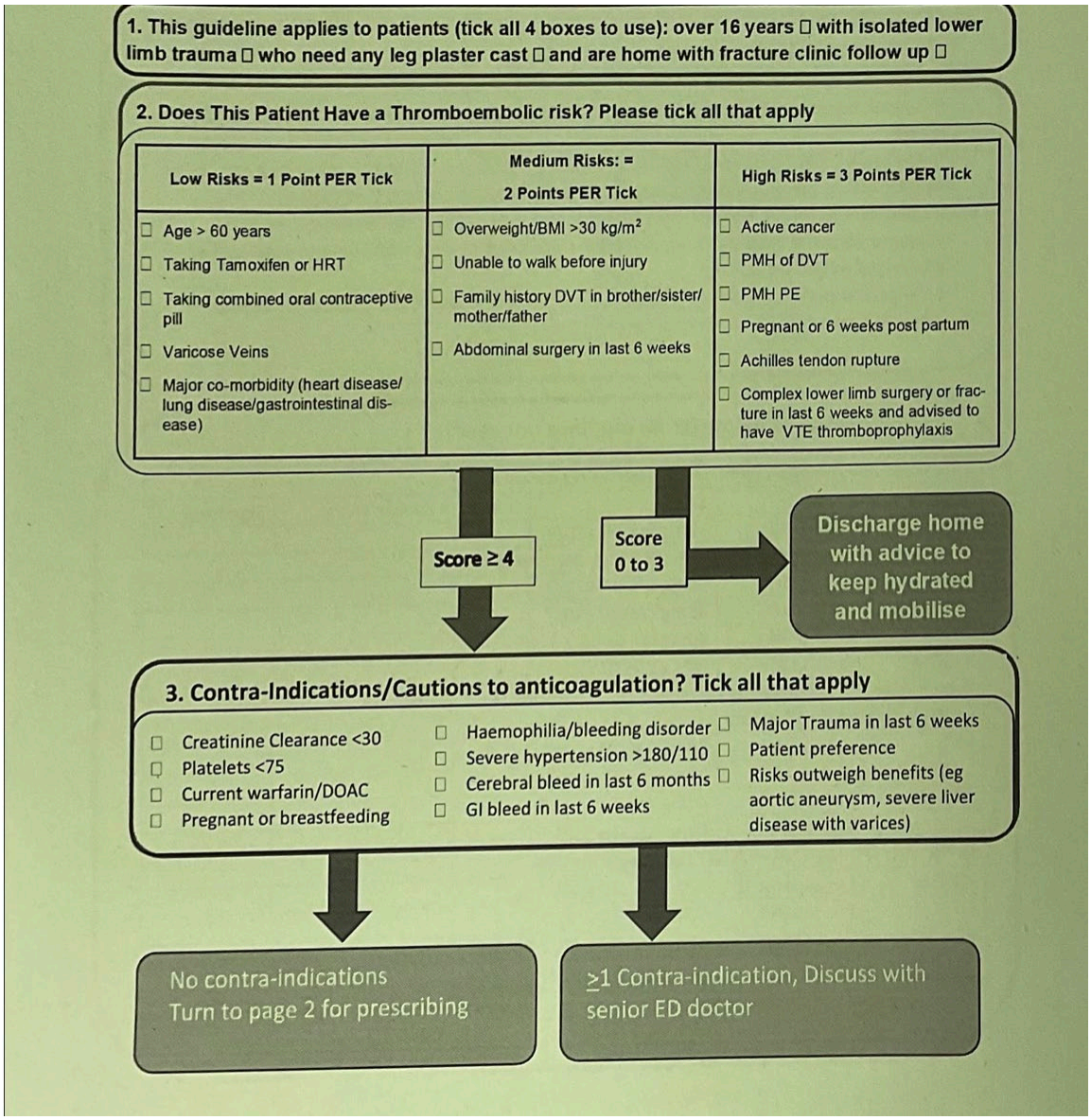


Figure 14: Anticoagulation Prescribing Guidance Used by PIPs in ED

6.3.3 Prescribing governance

Analysis of case site documents illustrated the internal governance arrangements surrounding PIP within the case site organisation. This was summarised using a flow chart within the IP policy (Figure 15). This shows that once the internal approval process has been completed, access is granted to the electronic prescribing system. Case site interviews and meeting observations provided some additional context to the governance of PIP. These included a strong focus on separating prescribing and administration of drugs across all departments in the hospital, as previously outlined. The organisation was also working to replace paper-based prescriptions with electronic alternatives given prescribing by these methods are not captured within the electronic prescribing system and so cannot be audited or monitored.

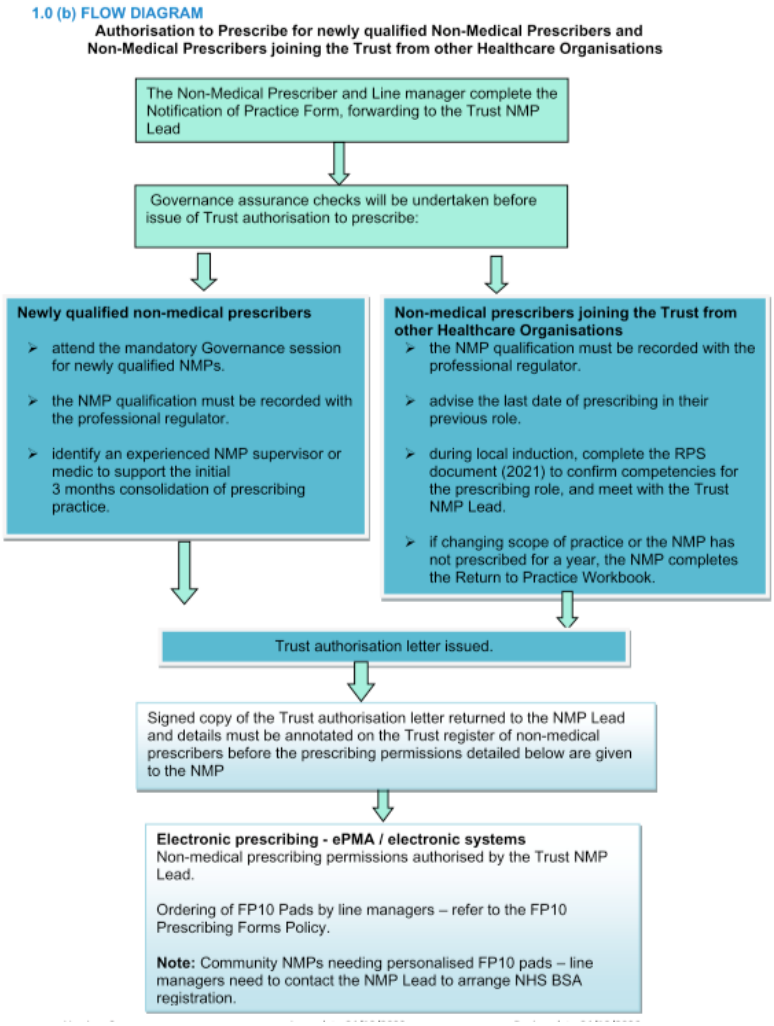


Figure 15: Overview of Case Site Independent Prescribing Governance Process

6.3.4 Drugs prescribed and conditions treated by paramedics in the emergency department

Most observed patient care episodes were higher acuity cases encountered in the major's area of the ED. A broad scope of practice was observed. This was also reflected in the quantitative data, with 193 different drugs prescribed 3646 times during 2023, averaging 303.8 paramedic prescriptions per month. In the 2024 dataset, 3380 prescriptions were issued over 209 days by ACP-EMs. This is an average of 422.5 prescriptions per month, a 39% increase in overall prescribing frequency compared to 2023. Whilst it was not possible to conclusively confirm why prescribing activity increased, it may reflect overall increases in ED activity which as outlined in Chapter 1 have occurred nationally. Furthermore, CD prescriptions accounted for 15.1% of the

total prescribing activity in 2024 following the change in CD legislation. This may also have also contributed to the increased prescribing activity seen.

Managing acute, severe infections was a significant part of prescribing practice. In 2023, 998/2573 (38.7%) of prescriptions were to treat infections with 37.1% of these cases (n=371/998) being sepsis. Whilst drugs prescribed for these conditions included Paracetamol and intravenous fluids, across both prescribing datasets, antimicrobials were prescribed in 18.6% (1308/7028) of cases. Field work reflected these findings, and 10/39 (25.6%) of prescribing cases were for acute infections.

Observed medical cases that used PIP (n=20/39, 51.2%) included allergic reactions, acute kidney injury, abdominal pain, renal colic, non-traumatic back pain, diabetic ketoacidosis, back pain, drug and alcohol withdrawal symptoms and vertigo. Paracetamol and intravenous fluids were also often prescribed to treat the wide range of medical complaints encountered. In conjunction with their use for acute infections, these therefore represented some of the most frequently used drugs across both 2023/2024 datasets (intravenous fluids n=1316/7028, 18.7%, paracetamol n= 1092/7028, 15.5%).

During field work, 6/39 (15.3%) acute cardiac emergency cases were observed, demonstrating the range of drugs that were prescribed. These included antiplatelets and anticoagulants (prescribed 279/7028, 3.9% times in the 2023 dataset) and anti-arrhythmic drugs (prescribed 124/7028, 1.7% times in 2023). Field work identified that Morphine was also often administered to treat cardiac chest pain, although the exact number of Morphine prescriptions specifically for cardiac chest pain was not clear from the quantitative data.

Autonomously interpreting a range of blood results and ECG readings were a key component of diagnosing acute coronary syndrome and guided subsequent prescribing activity. In one observation, a patient with chest pain was managed by ED PIP P1. However, the severity of their condition only became apparent once blood results were returned, as their ECG had appeared normal. On return of this result from the laboratory, ED PIP P1 rapidly prescribed the required treatments whilst ensuring the patient received prompt definitive care by the cardiology department:

*Field Note Extract: PIP P1 … then reviewed the requested blood results. 'Oh s***' he*

suddenly exclaimed; "his troponin is over 26000". I knew from my own experience this was a massively elevated resulted, and highly indicative of a myocardial infarction. PIP P1 quickly and calmly said, "well you're about to see some fast prescribing"! They quickly opened the electronic prescribing software and accessed a specific menu for patients requiring prescribing for acute coronary syndrome. This enabled them to quickly click and prescribe the required emergency cardiac drugs- Aspirin, GTN, Clopidogrel and Fondaparinux.

The ACP-EMs described how they were expected to be proficient and confident in managing acute cardiac emergencies. This work was viewed as quite high risk due to side effects and sudden deterioration, although they were confident in managing these cases from their experiences of doing so in the prehospital environment prior to working in the ED. Similarly to their prehospital management of these cases using a more limited range of drugs under paramedic exemptions, prescribing was quite protocolised, guided by prescribing and treatment algorithms (Figure 13).

6.3.4.1 Prescribing Controlled Drugs

Prescribing for trauma and injury was predominantly focused on pain management and sedation. Whilst analgesia was also required for medical complaints and cardiac emergencies, the trauma cases in particular highlighted the impact from CD restrictions. An inability to prescribe any of the CDs required in practice for several years had been very frustrating for PIPs and increased the work of the already busy ED doctors:

A lot of the work in ED is being interrupted forty-five times an hour while you're doing your main role…And then the poor paramedics… can't give any Codeine. … we do use it a lot and I think that that has slowed things down… part of having ACPs working at [middle grade doctor] level, actually that's kind of their job to do that… if they can't prescribe … a good deal of what we often do, which is Codeine and Oramorph [oral Morphine], that all falls down onto the senior doctors and frankly, there's enough to do. ED CSI Participant 9 (ED doctor).

However, the above quote emphasises that some of the most frequently needed CDs are now available to PIPs since the change in CD legislation at the end of 2023. The quantitative CD prescribing data also supported this conclusion, with the five CDs now

available to PIPs representing the most frequently prescribed in ED practice. Tables 11-13 present CD prescribing data from 2023 for the ED doctors (n=38), a nurse ACP-EM (n=1), and a consultant nurse ACP-EM (n=1). Table 14 displays the CD prescribing data during 2024 for the paramedic APC-EMs (n=4). CD prescribing frequencies across professions equate to 185 CDs per doctor, 71 per nurse IP, and 128.25 per PIP. Of note, the PIP CD data represents activity from 209 days not a full year. This does however suggest higher CD prescribing frequencies by PIPs than nurse ACP-EMs, although the small number of each group limits the strength of any comparisons, given individual prescribing frequencies would have also been influenced by factors such as clinical working hours. Overall however, the findings suggest ED doctors prescribe CDs more frequently and also prescribe a wider range of CDs than nurses. This may reflect their role in managing more complex cases (discussed later in the chapter) and would also have included any third-party prescribing requests from PIPs during 2023.

Table 11: Emergency Department Doctor Controlled Drug Prescribing Frequency Data for 2023

Drug	Total Prescriptions	Percentage
Morphine	3414	48.5
Codeine	1292	18.3
Oxycodone	958	13.6
Chlordiazepoxide	413	5.8
Diazepam	258	3.6
Fentanyl	256	3.6
Lorazepam	205	2.9
Ketamine	59	0.8
Gabapentin	46	0.6
Tramadol	44	0.6
Pregabalin	40	0.5
Zopiclone	11	0.1
Clonazepam	10	0.1
Clobazam	8	<1
Phenobarbital	6	<1
Buprenorphine	5	<1
Dihydrocodeine	2	<1
Methadone	2	<1
Diamorphine	1	<1

Pethidine	1	<1
OxyContin	1	<1
Hydromorphone	1	<1
Total	7033	

Table 12: Nurse ACP-EM Controlled Drug Prescribing Frequency Data for 2023

Drug	**Total Prescriptions**	**Percentage**
Morphine	82	57.7
Codeine	18	12.6
Oxycodone	15	10.5
Chlordiazepoxide	13	9.1
Diazepam	8	5.6
Pregabalin	3	2.1
Lorazepam	2	1.4
Gabapentin	1	0.7
Total	142	

Table 13: Consultant Nurse ACP-EM Controlled Drug Prescribing Data for 2023

Drug	Number of Prescriptions	Percentage
Oxycodone	106	49.3
Morphine	49	22.7
Codeine	16	7.4
Fentanyl	11	5.1
Chlordiazepoxide	9	4.1
Ketamine	7	3.2
Diazepam	6	2.7
Midazolam	5	2.3
Lorazepam	4	1.8
Pregabalin	2	0.9
Total	215	

Table 14: Paramedic Controlled Drug Prescriptions 01/01/2024 and 28/9/2024

CD	Total Prescriptions	Percentage
Morphine	375	73
Codeine	120	23.3
Diazepam	11	2.1
Lorazepam	4	0.7
Midazolam	3	0.5
Total	513	

Morphine was the most frequently prescribed CD by other non-paramedic ED clinicians during 2023 (n=3575/7390, 48.3%). Also, during 2023, the paramedic ACP-EMs administered Morphine 149 times under paramedic exemptions. However, following the change in legislation, it was prescribed 375 times in 209 days during 2024, demonstrating an increase in frequency once able to prescribe CDs. Morphine was also prescribed more often than Paracetamol by the PIPs during 2024.

Observations of practice confirmed that Schedule 17 exemptions limited the use of Morphine to direct administration of the current case the ACP-EMs were dealing with. However, once able to prescribe from the start of 2024, the paramedic ACP-EMs could then issue prescriptions of Morphine at the request of ED nurses for patients not directly in their care. These were often needed for patients in severe pain, requiring analgesia whilst they waited to be seen by an ED clinician, or whilst waiting for an X-ray or results of diagnostic tests. PIPs described how careful consideration was needed to decide if a brief consultation or review of the patient was required before prescribing, although often the request was to enable a repeat dose of Morphine to be given and so confirming a patient's observations with the nurse was sufficient to safely then prescribe an

additional dose. In one observation, ED PIP P4 decided to assess the patient directly before issuing the requested Morphine prescription, as the patient had a history of opioid misuse and had not yet been formally examined by an ED clinician.

Whilst the change in legislation enabled the paramedic ACP-EMs to prescribe Morphine, the restrictions prevented them from prescribing other CDs such as Oxycodone. This was prescribed 1079 times (14.6%) during 2023 by other ED clinicians, demonstrating it is required in practice relatively frequently. Field work also highlighted how all participants felt a wider formulary of CDs was required in practice, with Oxycodone given as the more frequent example. Participants reported that Oxycodone was more suitable than Morphine for frail elderly patients. For this reason, within specific proformas guiding the management of hip fractures and chest wall injuries in elderly patients, Oxycodone was recommended as the first drug of choice. Therefore, paramedic ACP-EMs were unable to follow this guidance without seeking support, resulting in additional work and distraction for other staff who were already busy. It also delayed the PIPs providing treatment to patients and in some cases, from discharging them from the overcrowded department:

Field Note Extract: PIP P1 located the doctor [who had previously agreed to issue a third-party CD prescription for his patient who was allergic to Morphine] …. He was however, in a cubical, deep in conversation with another patient he was seeing. …After around 15 minutes of standing in the corridor outside, the doctor finally emerged from the cubical appearing quite stressed and distracted. He did however smile at PIP P1 and say 'no problem' when asked he if would be happy to issue the prescription [of Oxycodone]. He followed this with "but you'll have to go and get the FP10 for me to quickly write, I've got several things on the bounce now"… Due to the length of time which had now passed in getting this prescription, the patient was getting more concerned about being able to get to the pharmacy in time… the patient and her husband hurried off to get to the pharmacy before it closed.

Data showed how during some sedations, Ketamine can be more suitable than Propofol, and Fentanyl is a more appropriate and safer analgesic during some sedations than Morphine. Therefore, participants described views that an important part of being a senior clinician in the ED is having the ability to use all of the CDs required in practice when they are indicated:

So, for things like … fentanyl, … we're expecting these ACPs to practice at this really senior level, and then they have to go and ask somebody else to prescribe those certain medications. ED CSI Participant 4, consultant ACP/nurse.

The ACP-EMs therefore had to decide whether it was appropriate to use the drugs available to them as PIPs such as Propofol and Morphine, or if third party prescriber support was needed:

Field Note Extract: [ED PIP P4] then went to speak with the consultant in charge …[they] told them they were about to sedate a patient [with] Propofol and Morphine. "Not 'Fent'?" they asked. "No I can't prescribe it" replied PIP P4 " Ah yes, that's right" they replied. "I'm happy to use 'Fent' if you think that's a better plan but as they've not had any opioid analgesia, I thought morphine would also be good for post procedural analgesia" ED PIP P4 explained, "Yes good plan" replied the consultant "I would have been happy to prescribe the 'Fent' but it's probably better you stick with the drugs you can use and are more comfortable with, carry on and I'm here if you need any support or help".

Although the views of participants highlighted the importance of CDs such as Fentanyl and Ketamine when they are needed in practice, neither drug were prescribed frequently by non-PIPs (fentanyl n=256, 3.6% doctors, n=11, 5.1% consultant nurse ACP-EM, Ketamine n=51, 0.8% doctors, n=7, 3.2% consultant nurse ACP-EM), potentially highlighting less overall impact on practice and patient care in comparison to other drugs such as Oxycodone being unavailable to PIPs.

Furthermore, not all drugs required for sedation are CDs. These included the anaesthetic drug Propofol and also an anaesthetic gas called Penthrox. Paramedic ACP-EMs were observed using these during field work and they reflected that the risks and responsibility of prescribing these drugs were similar to CDs. In one observed sedation case, a patient briefly stopped breathing as a result of being given Penthrox and participants described how Propofol was also a potentially dangerous drug. This contextualised the views of PIPs that restrictions did not make any sense in terms of safety and risk to patients: *It's ludicrous that I can knock somebody completely out with Propofol but nothing else*. ED PIP Participant 1, reflective conversation interview transcript.

However, field work confirmed the findings from the quantitative data to show that undertaking sedation and anesthesia is undertaken less frequently than other prescribing activity in the ED. Cases requiring sedation are also managed by a team of staff in the resus area. This usually included a paramedic ACP-EM and an ED consultant or registrar, who often supervise ACP-EMs during sedations which required intravenous drugs to be used, as they continued to gain confidence with this work. Consequently, the paramedic ACP-EMs would usually not be the only prescribing clinician present. However, both ACP-EMs and other site staff anticipated that over time, they would increase the frequency with which they undertook fully autonomous sedations, which may not always involve another prescribing clinician. This emphasised the need for the ACP-EMs to be able to eventually prescribe all of the drugs required. These aspirations were evident in the practice of ED PIP P4 who had more experience in sedation than the other ACP-EMs due to their longer experience as an ACP-EM. As a result, they undertook sedations using anesthetic drugs with significantly more autonomy and often without any direct medical supervision. In another observed sedation, ED PIP P1 was also permitted to sedate a patient without supervision as they were using only inhaled Penthrox and not intravenous sedation.

6.3.4.1.1 Controlled Drug restrictions for medical cases

CD restrictions also impacted on the autonomous management of patients experiencing acute alcohol withdrawal. A specific prescribing proforma was used by ED clinicians to guide prescribing decision-making. This recommended the use of the CD Chlordiazepoxide which PIPs are not permitted in legislation to prescribe. Therefore, third party prescriber support was sought in these cases. Whilst this did impact on patient care and reduced the autonomy of the PIPs, the quantitative data highlighted that Chlordiazepoxide prescriptions represented only between 4.1-9.1% of CD prescriptions by other clinicians. Additionally, participants described that the need for this treatment was usually not so urgent or immediate that seeking third party prescriber support resulted in any significant impact on patient care, although it still increased the workloads of colleagues when third-party requests were needed.

6.3.4.2 Personal and professional implications from Controlled Drug restrictions

Being unable to prescribe Controlled Drugs in a comparable way to other ED clinicians caused frustration for PIPs and their colleagues:

It's just you feel a bit impotent… you feel like you're an annoyance… And it almost feels like it devalues the role a little bit. ED PIP Participant 1 reflective conversation transcript.

So there's definitely a psychological leadership effect…they get frustrated because…, they can't complete that whole … package of care, … Whereas nurses … in exactly the same role have full scope of prescribing ability. ED CSI P4, consultant ACP/nurse.

An ACP is the equivalent of [a middle grade doctor] … a senior clinical decision maker …I don't see why they've got a limited list… If you've got that much clinical responsibility, you should be able to decide what you can and cannot prescribe. ED CSI Participant 4, ED Doctor.

Another concern expressed by participants was that third party prescribing often required clinicians to issue CD prescriptions without being directly involved in the patient's care. This was therefore not felt to represent best practice and that the clinician in charge of the patient's care should issue all of their required treatment.

Overall, the findings from this case study regarding CDs suggest that the introduction of the limited list of five CDs from the start of 2024 has enabled PIPs in the ED to now prescribe the most frequently required CDs in practice. Whilst this has resolved many of the frustrations and challenges participants had experienced from PIPs being unable to prescribe any CDs, the findings also showed that other CDs are needed outside of this limited list. This led to continued frustration for the ACP-EMs, increased work for other prescribers and delayed patient access to medicines. The continued disparity between paramedic ACP-EMs and other prescribers did not make sense to participants given their senior role as ACP-EMs, which requires the autonomous use of CDs.

The first part of this Chapter has outlined how PIP is used in the ED context. Presented as three key themes (Table 15), the chapter now considers the benefits associated with the introduction of PIP, how the ACP-EMs balance autonomy with risk management,

and how the complex and challenging post pandemic EUC landscape influenced and shaped PIP.

Theme	Sub Themes
1. Benefits from paramedic independent prescribing in the emergency department	
2. Managing complexity and risk in a bubble of autonomy	2.1 Complexity and Uncertainty in Prescribing Practice. 2.2 Managing, Accepting and Sharing Risk: The Importance of Medical Support. 2.3 Challenges in Seeking Medical Support.
3. The front door of the NHS: prescribing practice in the post pandemic era	

Table 15: Emergency Department Findings Key Themes and Sub Themes

6.4 Theme 1: Benefits from paramedic prescribing in the emergency department

The findings of the case study showed how PIP enhanced the professional practice of the ACP-EMs, in turn improving the care they provided to patients and the contribution they made within the ED team. The range of drugs prescribed and the frequency of their use, demonstrated by the quantitative and qualitative data, contrasted with PIPs' accounts of the very limited use of medicines without PIP. Both they and other case site staff described the important benefits to professional practice and patient care which had been realised from adopting PIP:

So I think it's fundamental. If we're expecting those individuals to be practicing at a senior autonomous and independent practice level, then then they need to be able to prescribe across the prescribing range in order to be able to deliver effective and safe care to patients... It's not just the prescription... It's the change in the medications, especially in our frail patients. It's deciding to stop certain medications and it's understanding the pharmacology ...which is just as important. ... which is why you need that level of practice and that autonomy. ED CSI Participant 4, consultant ACP/nurse.

The introduction of PIP had therefore substantially increased the autonomy of the ACP-EMs, and their ability to manage whole episodes of care. Two of the ED nurses I spoke with during field work viewed paramedic ACP-EMs as an essential part of the ED workforce and valued their extensive prehospital experience. Nurses also reported that PIP had noticeably improved the practice of the ACP-EMs, meaning they could now approach them with requests to prescribe treatments for patients when needed. Previously they would wait for an ED doctor to be free, who were often busy and not immediately available. The ability to independently and autonomously prescribe also reduced the previous burden the ACP-EMs placed on the ED doctors to issue prescriptions on their behalf:

The Royal College of Emergency Medicine have done some research in this... if I do a 10-hour shift, that's three hundred to six hundred times that I'm getting interrupted whilst also trying to see patients... ..., if the paramedic ACPs weren't able to prescribe, that would be an extra person in that situation ...And I just think if you're ...an independent practitioner ... Why do 80% of the job? ED CSI Participant 11, ED doctor.

Prior to PIP, practice was viewed as inefficient, given the frequency with which medications are required in their role. PIP therefore enhanced the efficiency and contribution of the ACP-EMs, which was now more aligned with the requirements of their role:

if you're in a clinician role, part of what you need to do is be able to formulate a management plan and be able to carry out all parts of that which include prescribing as well. It's a huge part of it... being able to prescribe, it is really important. ED CSI Participant 1, ED consultant.

In the context of the sustained pressures felt by all ED staff, innovations such as PIP and

the expansion of the wider MDT to include ACP-EMs were perceived as a necessary and positive development:

Field Note Extract: An ED consultant was showing three new medical students around the department. He introduced me and used my research as an opportunity to tell the students … how based on the rapidly changing landscape …and sustained pressure, the ACP-EM role had been created. … This role was also reflective he felt, of the increasingly multi-disciplinary nature of emergency medicine.

I think if you talk to the majority of emergency medicine doctors, the more the merrier please! Just because there's just not enough of us like for the amount of patients that we see through the front door… I don't really see a negative to it. ED CSI Participant 11, ED registrar.

Despite positive views of both PIP and the ACP-EM held by all ED doctors, some described that they were aware of wider negative views and concerns by the medical profession. Participants had witnessed these in their own practice, often when the paramedic ACP-EMs had encountered specialty doctors outside of the ED team, and also described what they were witnessing on social and mainstream media:

There's always debate, isn't there? When you haven't been to medical school, so why are you allowed to do these things? ED PIP Participant 9, ED registrar.

Whilst the ED doctors acknowledged and valued the benefits and overall contribution that PIPs could make within the ED team, some did describe frustrations that innovations such as PIP and the expansion of advanced, non-medical roles had become necessary due to workforce pressures in the NHS:

I think it would have been a damn sight easier if we just trained enough doctors. We haven't. Therefore, we need, clinicians, and I think that probably sums up the medical attitude to Allied Health Professionals … I think there's more of a problem, certainly in the BMA … with physician's associates … lightly qualified people that were supposed to be assisting doctors, but [are] ending up doing more and more … I think it does definitely make medicine threatened … it's bloody hard to… get through medical school… I don't think it's quite so much at an ACP level because we see them going through a very

similar training process… but … people are now seeing more non doctors…because all the doctors have given up and run away. ED CSI Participant 8, ED doctor.

However, as the above quote demonstrates, participants appeared to differentiate between roles such as the ACP-EM with that of PAs, which because of their lack of professional registration and ability to prescribe were viewed less favorably IP:

I think the concern is from the medics is also that the physician's associates are effectively doing a lot of the work that a junior doctor would do, without having all the training to go through and without having the debt as a result of all that training. ED CSI Participant 3, Associate Director of Pharmacy.

6.5 Theme 2: Managing complexity and risk in a bubble of autonomy

This second theme considers how paramedic ACP-EMs demonstrate and forge prescriptive and clinical autonomy whilst accepting and managing the potentially serious risks and consequences associated with this work. Being able to access medical support was integral to managing this balance, alongside acknowledging the boundaries of their knowledge and competence.

6.5.1 Complexity and uncertainty in prescribing practice

In some cases encountered by PIPs, the diagnosis of the presenting condition was unclear and the patient's symptoms indicative of several different serious conditions. Additional skills and knowledge in diagnostic decision-making and the use of investigations were therefore needed to support prescribing decision-making:

Field Note Extract: [The patient had] both a raised CRP and D-Dimer [and] some evidence of fluid on both lungs. … ED PIP P4 explained that he could either have congestive heart failure, or they may have a pulmonary embolism (PE). … if he were to prescribe diuretics, or drugs to control his fast atrial fibrillation, which might be causing the fluid overload, but the patient actually had a pulmonary embolism, this could make them more unwell … ED PIP P4 asked the consultant [for guidance], who [advised] to first order a CT scan to make the diagnosis clearer.

Participants explained how changes in the patient population also made clinical decision-making and prescribing in ED more complex and challenging. Paramedic ACP-EMs were expected to manage complex cases such as frail and elderly patients presenting with multimorbidity and polypharmacy. In some cases, it was possible to navigate the complexities of prescribing decision-making by utilising clinical and prescribing guidance. For example, ED PIP P4 needed to prescribe a range of drugs to treat a patient presenting with an acute coronary syndrome. However, due to the patient's existing co-morbidities, they were already prescribed drugs which would have interacted with those recommended in the treatment algorithm. This then required ED PIP P4 to use a range of information sources and his own experience and judgement to make an informed prescribing decision. The paramedic ACP-EMs therefore demonstrated the most autonomy and confidence in their prescribing decision-making when it could be directly informed by guidelines.

The ACP-EM's unique prehospital experience and training in protocolised, emergency care had also equipped them to autonomously manage and prescribe for the higher acuity cases encountered in the ED. Participants perceived they were actually more confident and able in managing these cases than junior doctors give this previous experience and training:

If you look at a lot of [junior] doctors that won't have done any paeds ... and they are definitely ... really reticent about seeing children, about understanding how to manage them. Whereas if you've got a wheezy child or a child in pain, or a hot child, or a child that's had a febrile convulsion, paramedics are much more comfortable with that because they have been exposed to it in the pre-hospital setting... ED CS Participant 1, ED consultant.

So you can have a paramedic ACP go and see the sickest patients. This is where the paramedic ACPs are really useful, they are very used to seeing very sick people ... So who better to have seeing the patient .... And also a great person to have around in terms of helping ... the junior ...doctors that are very new to medicine ... paramedic ACPs are a great [source] of information for them in terms of that emergency care management. ED CSI Participant 1, ED doctor.

However, observations and participant insights suggested that the paramedics were less confident in managing more complex cases, if decision-making could not be informed by protocols and clinical guidelines:

I think for the paramedics … because they were traditionally quite regulated by strict regimes, the ability to say actually, now that your scope of practice is now much broader and much less regulated and less defined, they take a bit of cajoling just to sort of embrace that challenge. ED CSI Participant 2, ED consultant.

Other participants described how in comparison to paramedic training, medical school equipped doctors to be able to manage complexity and uncertainty, often in cases involving frailty, multimorbidity and polypharmacy:

I think the key difference [between paramedics and doctors] is that when you're going through medical school and when you're going through foundation years, you tend to rotate through different areas, so you've become more used to kind of prescribing say for certain conditions such as you know for Parkinson's and elderly care or say working in GP and prescribing certain medication as well. ED CSI Participant 7 (ED Doctor):

A doctor who worked in the ED and in ambulance service settings also agreed with these views, describing the key difference between traditional paramedic training and medical training:

So I see some ACPs coming through the ambulance service who are just not very experienced, despite having an ACP qualification, they just haven't done or seen as many patients as the equivalent doctor would have done … a junior doctor has four or five years … in lots of different environments… And you gradually build up quite a broad body of experience … the ACPs … coming through, they're quite book smart, but they're not necessarily street smart. ED CSI Participant 8, ED doctor.

Participants also described a range of views on the role of master's level education. Whilst all paramedic ACP-EMs had completed their master's in line with wider, national guidance for the ACP-EM role, it was unclear if and how all of their master's program supported their prescribing practice. The paramedic ACP-EMs agreed that PIP should be studied as part of a package of postgraduate education, as this provided consistent, credible training in important aspects such as patient assessment and diagnostic reasoning. Documentary analysis also identified a full master's was explicitly required

in the ACP-EM job description. However, the more generic, Trust-wide non-medical prescribing policy stated that clinicians could complete IP training at either undergraduate or postgraduate level. The ACP-EMs explained they had therefore completed their master's to fulfil the requirements for their role. However, the non-clinical aspects of the program were not perceived to confer any clear benefit to their clinical practice or prescribing:

Field Note Extract: ED PIP P2 then outlined how his remaining modules on research methods, leadership and an evidence-based learning … had very little benefit or relevance to their clinical practice or their prescribing, and this learning and knowledge came from the first two clinical modules, the experience and supervision they had gained during their supervision as a trainee ACP and their previous experience as a paramedic … ED PIP P2 did agree that PIP should sit within advanced practice and level 7 education. However, they did not feel a full master's was definitely required.

Other case site participants suggested that support in practice and gaining clinical experience were more important than completing a master's award. The ACP-EMs had also completed their IP module part way through their master's training. This underpinned their views that PIP could be adopted into practice without firstly completing an entire master's program. Case site interviews with a range of staff also highlighted mixed views around the need for master's education to adopt PIP:

I've got some non-paramedic colleagues here in the hospital that have done their prescribing module as nurses not at level seven. I don't think that their ability to prescribe and the safety around that, there's not a great deal of difference to be honest with you, whether you're a nurse and you do it at a lower level or whether you're a paramedic and do it at level seven. ED CSI Participant 10, Paramedic trainee ACP in cardiology attending ED regularly for consultations.

I mean, I'm a bit of a dinosaur. I think that we keep using academic qualifications as proxies for clinical qualifications and they're not the same really. ED CSI Participant 8 ED doctor.

6.5.2 Managing, accepting and sharing risk: the importance of medical support

Given the breadth and complexity of prescribing undertaken by the paramedic ACP-EMs, there was a palpable sense of risk and gravity associated with this work. Whilst participants reported feeling and also were observed to appear confident, they also reflected that they are always conscious of the risks involved in this level of prescribing practice:

Field Note Extract: I asked [ED PIP P2] if they felt confident prescribing for and managing high acuity cardiac emergencies such as this. They told me that generally, they did feel confident as they had managed several cases like this now. Also, they knew both the treatment protocols and drugs they were prescribing and also knew they could ask for consultant support if they ever needed this. However, they told me it always makes them a bit nervous when they give Adenosine, as essentially, the patient's heart almost stops momentarily.

ED PIP P1 reflected on an observed case where they had treated a patient presenting with a myocardial infarction. This case involved prescribing a range of cardiac drugs, before rushing the patient to the cardiac catheterisation team for emergency angioplasty. After observing them calmly and confidently manage this case, I asked them if this observed confidence reflected how they felt about acting so autonomously in these potentially risky cases which involved the use of drugs with potential serious side effects:

*Field Note Extract: [ED PIP P1] answered this question with a laugh and said "that's why I come to work every day sh***** myself!". I reflected that despite their use of humour here, and perhaps an honest reflection of the responsibility and accountability of this advanced level of practice and prescribing, they did in fact manage the case calmly and confidently, at least outwardly.*

Aside from the immediate risks and gravity of prescribing decision-making, participants also described a wider acceptance of risk given the acuity and complexity of the cases they prescribed for. An important strategy of this risk management was to share critical decisions, and therefore the associated risks, with senior doctors.

However, ED PIP P3 described that despite such sharing of clinical risk in a recent case, the tragic outcome had greatly impacted on their confidence and autonomy. During the

current case I was observing, ED PIP P3 used a clinical decision scoring tool to determine if a patient required an anticoagulant prescription, which advised the drug was not required. However, ED PIP P3 seemed reluctant to accept this, and asked the ED consultant if they felt the drug should be prescribed anyway. The consultant told them to follow the advice of the scoring tool and confirmed they did not feel the patient required anticoagulation. ED PIP P3 told me they no longer felt confident in holding the potential risks of autonomously discharging a patient who might develop a blood clot after this recent case they had been involved with:

Field Note Extract: This case involved a male who presented with a significant swelling in his upper leg which they diagnosed as a deep vein thrombosis. Usually they explained, these present in the lower leg but can also occur in a higher femoral vein. … Given the unusual presentation, they had sought advice from a medical registrar … They agreed with their plan to prescribe the patient an anticoagulant … and discharge them … ED PIP P3 learnt that two days later the patient had … died… [and] they reported feeling quite anxious they had made the wrong decision, [although] all of the ED consultants… had reassured them … they had made the right decision.

One ED consultant summarised that the experience of ED PIP P3 is commonly encountered as ACPs and doctors journey through their training. This involves learning to accept and managing risk:

It's interesting the arc the ACP goes on in their three years, it is really difficult at the beginning because you're practicing in another environment that you might feel really uncomfortable in, and not confident in. And then often … you reach the stage where …they just feel like they know everything, or they've become overconfident …And then things happen that make them realise that… [bad outcomes] can happen, it's just part of clinical medicine. ED CSI Participant 1, ED consultant.

Despite the highly autonomous nature of their practice, the ACP-EMs valued and relied upon the experience of the ED doctors, especially the consultants. This not only allowed risk to be shared, it also supported their learning and development, whilst ensuring patient safety as they prescribed and managed complex cases:

Field Note Extracts: PIP P1 suspected the patient might be having a pulmonary embolus and so had prescribed Clexane, an anticoagulant, to treat this whilst further tests were arranged. This included waiting for the remaining blood results (specifically a D-Dimer) and ordering a 'contrast' CT angiogram of the patient's chest. … PIP P1 also discussed this case with the ED consultant who agreed with this treatment plan…[In another case] ED PIP P2 reflected that given they knew very little about the neuromuscular drug Pyridostigmine Bromide, they would need to look at this more closely and just discuss prescribing it with one of the consultants.

Exploring this dynamic balance between autonomy and seeking support or advice led me to develop a conceptual diagram (Figure 16), using this visual aid in reflective conversations around autonomy and risk. Participants reflected during these conversations that their prescribing occurs on a continuum of autonomy, and also within a 'bubble of support'. Central to this was their relationship with the ED doctors. The paramedic ACP-EMs described that their relationships with their medical colleagues was valuable and essential in balancing autonomy and risk:

Field Note Extract: [ED PIP P1 and I reflected together how] A continuum… exists between being completely unsure of a drug or decision, being fairly sure but just wanting a … sense check- 'would others do the same here'? And then at the other end, complete confidence in what they are doing or prescribing, where no support is needed … PIPs [in the ED] can easily work back and forth along this continuum, with little to no barriers in doing so… This relies on their own clinical knowledge and experience and also their ability to recognise the limits of this, asking for support when needed. However, given the autonomy they have, this support can be easily negotiated and provided by the senior staff [without]… getting involved in the case themselves. This therefore provides a good balance between the ACP-EMs really contributing to patient care and service delivery, within the safety net or bubble of support and advice when it is needed.

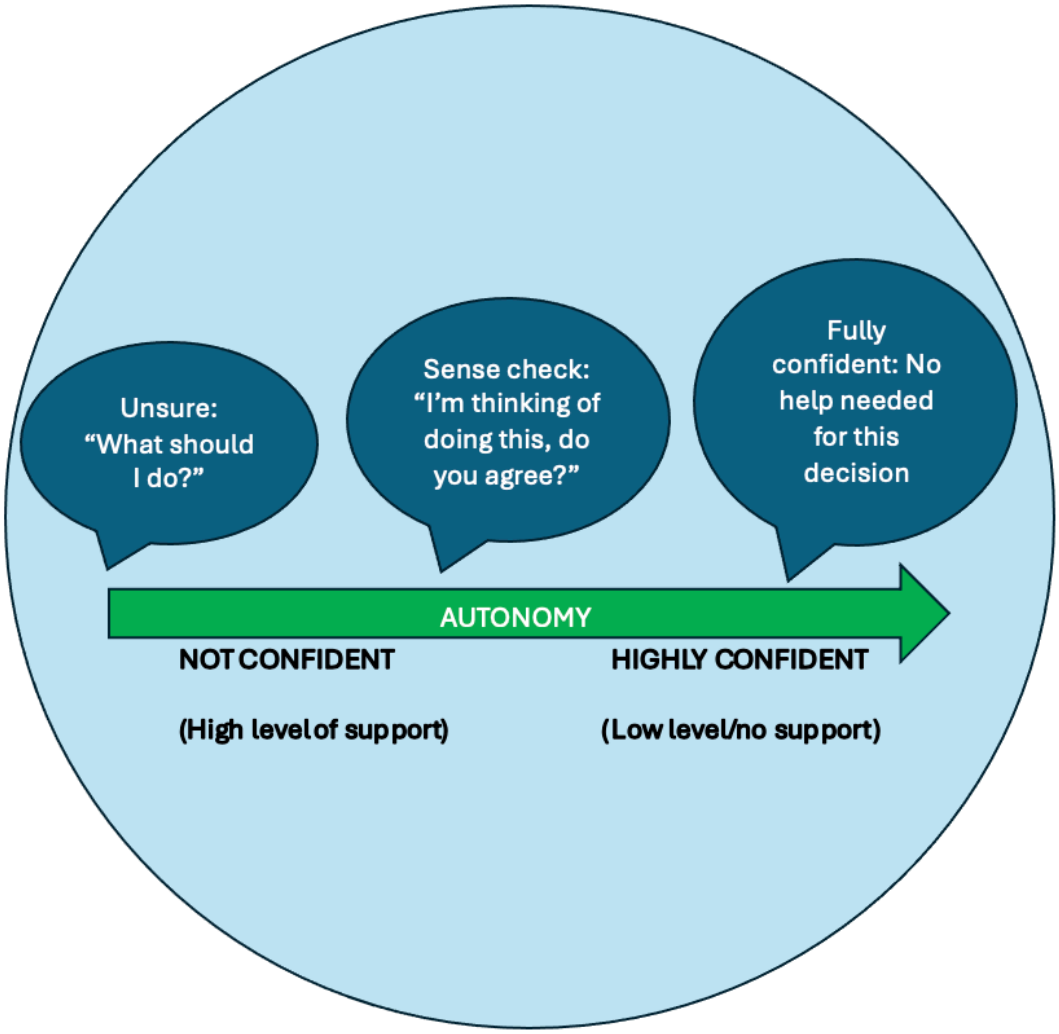


Figure 16: Conceptual Diagram: A Continuum of Autonomy in a Bubble of Support

6.5.3 Challenges in seeking medical support

Although the role of medical support was a key factor in balancing autonomy with risk management, negotiating this support was not without its challenges in the often-chaotic environment of the busy ED:

Field Note Extract: ED PIP P2 then embarked on a protracted process of trying to speak with one of the four consultants … This entailed several attempts to engage one of them in conversation, before quickly being interrupted as they were both distracted by another task… A different consultant then returned to the clinical hub area and ED PIP P2 then re-started the conversation with them …However, a few seconds… another of the nurses

came hurrying into the area waving an ECG [showing clear signs of a heart attack]. "This chap's just rocked up in the waiting room after developing chest pain at the gym" …The conversation between ED PIP P2 and the consultant came to an end as quickly as it had started.

Additionally, providing support to the ACP-EMs placed an additional strain on the senior doctors, who then had to balance the provision of advice and support with their own clinical work and responsibilities:

ED CSI P11 (ED Registrar): So, there's always the balance … because obviously everyone that you put in there that needs to discuss with a senior is an extra workload on one of the registrars or the consultants in the department. So that's always something to weigh up.

Maintaining the balance between autonomy and deference to the experience and advice of the consultants was also more challenging if conflicting advice was given. In one case, ED PIP P1 treated an unwell child, prescribing Paracetamol and Ibuprofen in attempt to treat their symptoms of fever and distress and to improve their temperature and vital signs. ED PIP P1 was initially advised to discharge the patient before their symptoms and observations had improved by a hospital paediatric consultant after they phoned the consultant for advice. However, ED PIP P1 was still required to gain authorisation to discharge the patient from an ED consultant as ED policy required this when ACP-EMs were discharging patients less than a year old. The ED consultant then disagreed with the advice of the paediatric consultant. They were robust in their feedback to ED PIP P1, telling them that they should have not considered following this advice given the patient was clearly not yet well enough to be discharged. ED PIP P1 reflected later they had felt quite frustrated and challenged by this situation. They also told me that receiving conflicting advice from doctors happened quite frequently.

In a further example, conflicting advice was more directly related to prescribing and two ED consultants both separately advised ED PIP P2 to prescribe different drugs to a patient presenting with a cardiac arrythmia. ED PIP P2 then had to then decide which advice to follow and the first drug they prescribed (Adenosine) turned out to be the incorrect choice, resulting in them subsequently following the other consultant's advice and prescribing their recommended treatment (Bisoprolol). Whilst the ACP-EMs explained to me these situations were frustrating and challenging, they described how

these more negative experiences were countered by the overall important benefits of being able to seek medical support and advice in their practice.

6.6 Theme 3: The front door of the NHS: Paramedic prescribing in the context of high levels of demand

> "*Ambulance services and emergency departments are the front door of the NHS. When everything else fails… you can't close the doors… you can't hang up the phone"* ED CSI Participant 4, consultant ACP.

Clinical and prescribing practice in the ED case site was characterised by a dynamic, pressured and often chaotic environment:

Field Note Extract: It was clearly a VERY busy department. The waiting room was full of people, far more than I had previously seen. The corridor where ambulance crews arrive was also full of ambulance staff …patients were on trolleys and wheelchairs in the corridors… attempting to eat hot meals… ED PIP P2 discussed how this patient had arrived earlier in the morning and had initially waited outside in the ambulance with the conveying crew for five hours until they had space to bring them inside… … All of the patients looked thoroughly fed up and I could hear many of them commenting to each other, or to people they were speaking to on their phones how they had been waiting hours to be seen.

Participants perceived that, due to high demand for services, patients did not really know or care if they were being seen by a doctor or another clinician, they were just pleased to be seen. Being able to prescribe was also integral to meeting patient expectations:

Y*ou know, twenty hours waiting for beds … from a patient's perspective, I don't think patients care who they see, as long as they get what they need. And I think … the only time I think people will be upset about not seeing a doctor, will be if they wanted like a prescription of something, if they see someone who can't prescribe… those are the only times I think that patients perceive there's an issue … And that doesn't happen in ED, so … I don't think people even know who they get seen by,* they just get seen. ED CSI

Participant 1, ED consultant.

These observations framed the wider views and insights provided by participants around the need for a multi-disciplinary workforce. This was described as being a necessary development to contribute to wider work force shortages and ensure patients could still receive assessment and care given these sustained pressures:

I've seen the transition pre COVID, in COVID and post COVID into what we have now, which is just truly like 24/7 patient attendance to the emergency department with very little respite. But actually… anyone who thinks that there is twenty-four-hour seven-day NHS provision for emergency care is… in a dream world because we don't have that, … So, I think the kind of MDT side of things just reflects that. ED CSI Participant 11 ED registrar.

During busy, overcrowded periods, large numbers of patients attending the department through the waiting room and by ambulance, combined with a lack of patient flow through the wider hospital, meant patients waited in the ED despite being accepted for admission elsewhere. As I observed the paramedic ACP-EMs practicing in this context, it was common for them to spend ten to fifteen minutes searching for, or waiting for space to become available, so they could consult and manage ambulatory patients. The ACP-EMs even asked me to stand in a free cubicle whilst they went to find the patient, so that another clinician did not take the space. Delays to prescribed medicines being administered were observed, alongside delays in prescription queries from nursing staff being answered:

Field Note Extract: [A] nurse came and spoke to PIP P1 to advise them… the nurse in charge had challenged why a rectal dose of one drug and an oral dose of another had both been prescribed… Also, the dose prescribed …was [not] available … and the nurse asked PIP P1 to log on to the electronic prescribing system and amend the dose … the nurse [had been] unable to find PIP P1 as they were [busy] … PIP P1 was visibly frustrated …[by the delay of over an hour since the prescription had been issued].

In times of such extremis, delays in admitting patients to hospital wards influenced PIP. Participants reflected on recent cases both retrospectively and during observed handover meetings. These included cases where patients had remained in the ED sometimes up to twenty-four hours whilst they waited for space to become available in

the hospital. This therefore required the ACP-EMs to prescribe patient's regular medications. Whilst this occurred relatively infrequently and routine medication was listed as a prescribing indication in only 55/2573 (2.1%) of prescriptions in the 2023, participants noticed it was becoming more frequent. They also described how this prescribing activity was necessary to control symptoms of chronic disease such as Parkinson's or epilepsy during the long waits for admission.

The paramedic ACP-EMs also prescribed prolonged Insulin infusions to manage diabetic issues and antimicrobial infusions to treat infection, sometimes over a whole day. Both of these treatment regimes would in the past have been given once a patient was admitted to a ward in the hospital:

Field Note Extract: it had been a really busy night shift and there was really poor flow in the wider hospital, meaning patients were having to remain in the ED long past the point they had been accepted for admission. As a result, the care given to some patients had moved beyond immediate assessment, treatment and stabilisation, and was more aligned with the ongoing management and care they would usually receive during their admission on a ward. ED PIP P2 told me how they had taken over the current patient from the night staff, who had prescribed the required treatments to stabilise the patient's high blood glucose levels and correct the derangement in their acid-base balance that had resulted from the illness. This had included ED PIP P2 prescribing repeated doses of intravenous fluids, potassium, Insulin and glucose.

It was clear therefore, that in addition to the very broad scope of practice required to manage the acute and emergent cases seen in the ED, prescribing treatments over much longer periods of time were also part of the scope of practice of the ACP-EMs. During field work, they described feeling confident and able to prescribe most of these drugs. However, at times needed to seek support from the doctors when deciding if these drugs should be prescribed.

Closely linked with periods of increased demand were observations around how frequently the paramedic ACP-EMs and other senior clinicians had to undertake their prescribing activity and clinical work in the face of very frequent interruptions and distractions. These included requests from other staff such as asking them to review blood results and ECGs or to prescribe treatments for other patients they were not currently managing. Answering the many calls received on the ambulance service 'red

phone' was also a common distraction, given the nearest clinician to the phone was expected to stop what they were doing and answer the call. These additional sources of work often distracted the ACP-EMs from the case they were dealing with, including delaying them from being able to issue prescriptions, write their notes or arrange diagnostic imaging requests. The often dynamic and unpredictable nature of the ED also presented additional challenges and distractions:

Field Note Extract: This work of adding the patient's prescribed medicines to their notes, writing the clinical notes for the case and booking the CT scan took around 25 minutes. During this entire time period, a teenage patient who had been brought to the ED due to mental health problems was causing a lot of noise and disruption … [also deliberately activating] a loud, wailing [staff panic alarm button]… The working environment over this time period could be described as nothing but chaotic. PIP P1 reflected how this is a daily occurrence in the ED, and they have to frequently undertake prescribing and other clinical tasks with this level of noise and distraction. They described mental resilience is needed to block it out and focus on the task in hand, although admitted it could easily cause prescribing and clinical errors.

6.7 Case summary

This case study explored how PIP is used within the ED, and how it has resulted in benefits to professional practice, service delivery and patient care. As ACP-EMs, the paramedics occupied a position of clinical seniority within the wider ED team. Prescribing practice was also broad, and a wide range acute problems such as severe infections, medical complaints, cardiac emergencies and trauma were encountered and prescribed for. The ACP-EMs were therefore expected to develop confidence and ability to autonomously manage the breath of cases encountered in emergency medicine. Equally, knowing when to seek medical support was important in managing the considerable risks associated with level of practice, especially during high acuity care and in cases of increased complexity and diagnostic uncertainty. Whilst the ACP-EM role required completion of a master's program, PIPs described adopting PIP part way through their master's education, and much of this training had not directly influenced their prescribing practice. As a result, they and other case site staff did not agree with national guidance requiring PIPs to complete master's level education.

The impact from the well-publicised, unrelenting demands being faced across EUC were clear to see during field work. These resulted in long delays for patients in receiving assessment and treatment, and that an 'all hands on deck' approach was essential to managing this. The findings therefore emphasised how within the ACP-EM role, the introduction of PIP had enabled the paramedics to meaningfully contribute to meeting the challenges being faced. The introduction of the limited list of CDs had also further enhanced their contribution and enabled them to now autonomously prescribe important and frequently required drugs such as Morphine. Whilst a wider range of CDs were prescribed relatively infrequently by other clinicians, they were still required in practice, with CDs such as Oxycodone being needed more frequently. The continued disparity between the PIPs and other prescribers with regards to CDs therefore impacted on their autonomy, resulting in frustration and increasing the workloads of other prescribers, often when the ED and its staff were already operating under significant strain and demand.

Chapter 7 Findings: Urgent care service case study

7.1 Chapter introduction

In this chapter, the findings from the case study in an out-of-hours CAS are presented. The chapter first presents the context of the case site organisation. The findings from the mixed methods data are then presented. This begins by describing the use of PIP in the case site, including the range and frequency of conditions treated by PIPs. This includes findings relating to PIPs experiencing pressure to prescribe antimicrobials, and the impact of CD restrictions on their practice. The findings which relate to the research objectives to understand the benefits, limitations, facilitators and barriers to PIP are then presented over four key themes (Table 23). As with the ED case site, care has been taken to maintain organisational and participant anonymity.

7.2 Urgent care case site description

The out-of-hours CAS is delivered by a larger organisation which provides a range of community NHS services across the region, including several primary care services. The organisation is a social enterprise and an employee-owned business where employees own shares and have input into how the organisation is run (UK Government, 2024). Employees of the organisation can also sit on the Board of Directors and one of the PIPs in the CAS held one of these positions as an Employee Director. The CAS provides out-of-hours urgent healthcare to a population of over one million people across a large geographical region in the UK. This includes a major city and a surrounding area of urban and rural communities (Source: Case Site Website and Site Documentation).

The median age in the city was 34, and 45 years in the wider region, compared to the English national average of 40 (Office for National Statistics, 2021). In the city, 5.9% of the population were over the age of 75, with 11.7% in the surrounding region (national average 8.5%). In the wider area, 51.5% of the population were female and 48.4% male (national average 51.0% and 49.0% respectively). Other relevant health statistics for the case site region include cigarette smoking (10.4% region, 12.7% city vs 11.4% national average), average female healthy life expectancy (the average number of years lived in good health) (62.6 national average, 68.1 region, 61.5 city) and average male healthy life expectancy (61.9 national average vs 61.9 region, 59.8 city).

7.2.1 Case site staffing

The out-of-hours CAS is provided by a team of nurse IPs (n=51), PIPs (n=8) and pharmacist prescribers (n=2). The pharmacist IPs in the CAS focus on specific medicines related enquiry cases and manage calls involving repeat prescription requests. Non-prescribers are also employed including three PAs, and two non-prescribing paramedics. Both paramedics were reportedly planning to train in PIP in the near future. Non-medical clinicians working in the CAS are employed under the multi-professional role of Integrated Urgent Care Practitioners. There is a larger workforce of doctors (n=189) working in the CAS, predominantly on a self-employed basis, with two doctors employed substantively as Medical Directors. Staff worked a variety of different hours, ranging from full-time to various part-time and flexible/bank working.

The CAS operates from 1800-0800 during weekdays and from 1800 on Friday to 0800 the following Monday. Within the region, the NHS 111 service is provided by a partner organisation. The CAS operates from organisation's central headquarters site and using five regional treatment centre locations. These are either daytime primary care or secondary care service buildings and are used by the CAS during out-of-hours periods. During weekends, the service aims to ensure around 25 clinicians (doctors and Integrated Urgent Care Practitioners), and 19 operational support staff are on duty. These include shift managers, operational support staff who allocate cases to clinicians as they are received from NHS 111, drivers, and treatment centre receptionists. Cases are allocated a target call back time by NHS 111 prior to being sent to the CAS. Ambulance staff from the regional service can also contact the CAS directly to request a callback from one of the clinicians. During weekday evenings, the workforce reduces to around 10 clinicians and 10 operational staff. However, field work revealed that staffing level targets are often not met. Sometimes, only 6-8 clinicians were on duty overnight. During field work, the number of calls waiting to be dealt with by a clinician varied from around 30-80 during weekday evenings, to over 300 during weekend periods.

7.2.2 Overview of practice and prescribing in the clinical assessment service

All cases are received and managed within a computer system called Adastra. This is used for overall case management, allocation and dispatch of resources by the operations team, patient record completion and also to issue electronic prescriptions.

Operational and clinical staff can also communicate with each other using the messaging function within Adastra.

Case site participants described how prior to the COVID-19 pandemic in 2020, patients were automatically booked in by NHS 111 to be seen face-to-face at one of the treatment centres. However, at the start of the pandemic, the CAS like most others nationally, switched to a fully remote delivery model where all patients were consulted by telephone. This very different model of care delivery has been retained after the pandemic as it was viewed as a more efficient model. The pandemic had also demonstrated that most patients could be managed through a remote consultation. However, since the pandemic, a hybrid model had been implemented, whereby all cases are initially managed as a remote consultation. If however, a patient then requires a face-to-face consultation, this is arranged as either a treatment centre appointment or a home visit. Data provided by the case site (in June 2024) reported that 123,970 patient cases were received by the CAS from NHS 111 in the previous twelve months, equating on average to 2384 cases per week or 339 cases per day. Of these, 108,192 (87.2%) were managed through remote assessment, 13,997 (11.2%) through treatment centre appointments and 2111 (1.7%) required a home visit.

PIPs were based at one of the CAS five regional treatment centres, working in a consultation room using a computer and telephone. During telephone consultations, PIPs could request that patients send photographs when required. For example, to allow them to view a rash or visualise the back of a patient's throat. These were sent by the patient by replying to a link sent to their smart phone through a secure messaging system called Accurx. This platform was also used in one observed case to conduct a video consultation.

If a face-to-face consultation was deemed to be necessary (to conduct a physical examination) following a remote consultation, the case was passed to the 'clinical coordinator'. This role was undertaken by a CAS doctor who was also available to offer advice and guidance to all clinicians, as well as review face-to-face consultation requests. If they approved a request, the operations team would book the patient an appointment to be seen at their nearest treatment centre location. If the patient was unable to attend due to being too unwell or housebound, a home visit could be arranged. The nearest available CAS clinician would be asked to attend and would

usually be driven there by an urgent care service driver although some paramedics drove themselves using the urgent care vehicles (Figure 17).

Where a prescription was required following a remote consultation or a face-to-face review at a treatment centre, clinicians could send prescriptions electronically using the Adastra system to a nearby pharmacy. The patient could collect this within pharmacy opening hours. However, most pharmacies across the CAS region closed in the early evening. The PIPs had to therefore decide if it was appropriate for the patient to wait until the pharmacy re-opened to start their treatment, or if they, or someone on their behalf needed to attend a CAS treatment centre for the drug to be dispensed from a limited stock kept at each site (Figure 18).

During home visits, PIPs worked using a laptop device known as a Tough Book (Figure 20). Whilst these devices had mobile connectivity with the Adastra platform, due to their age and technological limitations, electronic prescriptions could not be issued from them. Therefore, if a prescription was required during a home visit, it was issued from the limited stock of drugs carried in the urgent care vehicle or prescribed using a handwritten FP10 prescription for the patient to collect from a pharmacy. Both blank FP10s and specific pre-printed FP10s for end-of-life care prescriptions were carried for this purpose (Figure 19).

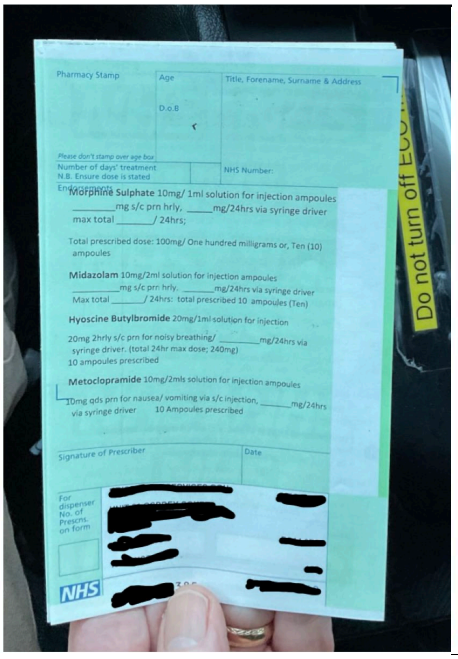


Figure 17: Urgent Care Car. Figure 18: Treatment Centre Drug Cupboard. Figure 19: Pre-Printed End-of-life FP10 Prescription. Figure 20: Tough Book Mobile Laptop Device

7.2.3 Overview of case site prescribing governance

Analysis of prescribing governance documents and observation of a medicines management meeting provided useful data about PIP governance. The CAS used a bespoke, internal governance and auditing process called clinical guardian. This involves a random selection of clinical cases for monthly peer review by both medical or

non-medical clinical leads to assess prescribing appropriateness and clinical decision-making. Case site leaders described that this process had highlighted generally high levels of prescribing safety and appropriateness by PIPs.

Other important governance arrangements included careful monitoring and use of medicines for immediate supply. The medicines management meeting highlighted both the considerable organisational costs from dispensing these drugs, alongside the fact that drug expiration dates can pass before they are used, resulting in wastage.

Another relevant aspect to the case site medicines governance was around the issuing of repeat prescriptions. The medicines management policy outlined how whilst this was recognised as a core component of prescribing practice in the CAS, it was essential that prescribers carefully review a patient's primary care record before agreeing to issue a repeat prescription. Any prescriptions issued were also recommended in the policy to not exceed a three-day course, emphasising the need to re-direct patients to primary care services for longer term treatment.

7.2.4 Overview of case study qualitative data and participants

Between March-August 2024 a total of 114 hours of non-participant observation were completed with 6/8 PIPs working in CAS. These covered a range of evening, overnight and daytime (weekend) shifts. At least two observation shifts were spent with all participants, except for ED PIP P2, who entered a period of long-term sickness after the initial observation shift. The total time spent with each participant and length of observation period were influenced by the participant's working hours and by participant/researcher availability. Table 16 provides a summary of observation hours per participant and Table 17 a summary of case site participants.

Participant	Observation Hours
UCS PIP P1	35.5
UCS PIP P2	8
UCS PIP P3:	12
UCS PIP P4	22
TOTAL	114

Table 16: Observation Hours per Urgent Care PIP Participant

A total of 153 patient cases were observed which included 67 drug prescriptions. An online medicines management meeting involving clinical and non-clinical organisational leaders was observed. This meeting focused on reviewing a range of medicines management issues. Relevant site documents such as IP policies and prescribing proformas were also retrieved for analysis (Table 17). The qualitative data collected during the case study are summarised in Table 18 and the observed prescribing activity during observations is summarised in Table 19.

In total, eight case study interviews were conducted. Three PIP participants held organisational leadership positions and so participated in a case study interview. Five other site staff working in organisational leadership positions were also interviewed. These included nurses (n=2) and doctors (n=2), and a non-clinical operational manager who was the Head of Integrated Urgent Care. A summary of all participants is provided in Table 16.

Table 17: Urgent Care Case Study Participant Summary

Participant	Summary
UCS PIP P1	PIP with four years of prescribing experience. Completed full MSc. Extensive ambulance service and urgent care background.
UCS PIP P2 (Also participated in a case study interview)	PIP with eighteen months prescribing experience. Clinical Lead. Currently completing MSc. Previous ambulance and primary care experience.
UCS PIP P3	PIP with three years prescribing experience. Completed full MSc. Experience in ambulance and primary care. Current ambulance service bank contract.
UCS PIP P4 (Also participated in a case study interview)	PIP with eighteen months prescribing experience. Employed as Clinical Director Currently completing MSc. Previous experience of working in senior leadership roles in an ambulance service.
UCS PIP P5	PIP with three years prescribing experience. Has completed full MSc. Previously worked in primary care. Current ambulance service bank contract.
UCS PIP P6 (Also participated in a case study interview)	PIP with four years prescribing experience. Has completed MSc. Currently works in primary care, is an Employee Director for CAS. Current bank contract with ambulance service.
UCS CSI P1	Nurse IP in CAS. Clinical Lead.
UCS CSI P2	Nurse IP in CAS. Clinical Lead.
UCS CSI P3	Doctor in CAS. Previously was medical director for CAS. Also working in general practice.
UCS CSI P4	Doctor in CAS. Deputy Medical Director.
UCS CSI P5	Non-Clinician. Head of Integrated Urgent Care. CAS operational shift manager.

Table 18: Overview of Qualitative Data Sources

Data Source	Details
Observation of clinical cases	153 cases in total. Remote consultation: 107, (69.9%). Face-to-face consultations: 23, (15%). Home visits: 23, (15%). Drugs prescribed during observed cases: 67 (43.7%).
Meeting observation	Medicines governance meeting observation lasting 90 minutes.
Field notes	Field note word count: 128390.
Case study interviews	Eight.
Case site documents	Case site documents (n=8) included medicines management policies, end-of-life prescription forms, prescribing proformas and PIP job description.

Table 19: Observed Prescribing Activity by PIPs

Details	Findings	Additional Information
Total cases where drug(s) prescribed	49/153 (32% of cases)	
Total drugs prescribed	67	Antimicrobials: 24 CDs: 5 Anti emetics: 4 Other/Misc: 4 PPIs: 4 Mental health drugs: 3 Topical ear preparations: 3 Anticoagulants/antiplatelets: 2 Antihistamines: 2 Anti-inflammatory throat spray: 2 Creams: (steroids/ emollients): 2 Laxatives: 2 Nasal sprays: 1 NSAIDs: 2 Oral steroids: 2 Antivirals: 1 Inhalers: 1

Prescribing cases involving the issue of patients repeat prescriptions	7/49	
Cases involving medication advice (use or adjustment of existing prescribed and over-the-counter medication)	36 (23.5%)	
Prescriptions Issued Electronically	33/49 (61.1%)	
Prescriptions Issued from treatment centre stock	10/49 (20.4%)	
Prescriptions Issued via handwritten FP10	5/49 (10.2%)	
Prescriptions Issued from car stock	1/49 (2.0%)	

7.2.5 Overview of practice and prescribing in the clinical assessment service

Of 153 cases observed, over two thirds were remote consultations (n= 107, 69.9%). The remainder were split equally between face-to-face consultations at treatment centres (n= 23, 15.0%), and home visits (n= 23, 15.0%). In two thirds of observed prescribing cases (67.3%, n= 33/49), the prescribed medication was issued electronically, with 20.4% (n=10/49) issued from treatment centre stock, 10.2% (n=5/49) using a handwritten FP10 and in one case (n=1/49, 2%) a medicine was supplied from stock held in the urgent care vehicle. Within the observed prescribing data summary (Table 18), five CD prescriptions are included. These were observed being issued either from medicines stocks or using handwritten FP10s.

In 23.5% of cases (n=36/153) the PIPs provided the patient with medicines related advice or verbal directions in the use of existing prescribed drugs. This included advising on the use of over-the-counter medicines or pharmacy supplied medicines, alongside advice on previously prescribed medicines such as stopping these or adjusting the previously prescribed dose. The quantitative PIP dataset for 2023 included 149 different drugs prescribed by PIPs (n=8). A total of 1483 drugs were prescribed, an average of four prescriptions per day.

Field work illustrated a wide range of different conditions were encountered and managed by PIPs. Treating acute infections was a large component of prescribing activity. These included different respiratory tract infections such as sore throat and acute cough, urinary tract infections, scarlet fever and whooping cough. Of the observed cases where a medication was prescribed, 35.8% (n=67) were antimicrobials. In the quantitative prescribing data (Table 20) antimicrobials accounted for over half (59%, n=876/1483) of all prescriptions. Other prescribing cases observed included cases of acute diarrhoea and vomiting, exacerbations of COPD and asthma, acute non-traumatic back pain, various musculoskeletal conditions, abdominal pain, rashes and high blood pressure.

Table 20: Drugs Prescribed by PIPs in 2023

Drug	Frequency	Percentage
Oral Antibiotics	876	59.0%
Oral Steroids	74	4.9%
Inhalers	74	4.9%
Topical ear preparations	43	2.8%
NSAIDs	41	2.7%
Topical creams	36	2.4%
PPIs	33	2.2%
Antiemetics	31	2.0%
Other/Misc.	31	2.0%
Anaesthetic Throat Spray	28	1.8%
Laxatives and enemas	28	1.8%
Medical Equipment	26	1.7%
Antivirals	20	1.3%
Antihypertensives and Beta Blockers	19	1.2%
Mental health drugs	17	1.1%

Anticoagulants and antiplatelets	14	0.9%
Mucosal and Oral Antifungal Treatments	14	0.9%
Topical eye treatments	13	0.8%
Nasal Sprays	12	0.8%
Oral Diabetic Medication	11	0.7%
Antihistamines	10	0.6%
Insulin	10	0.6%
Paracetamol	7	0.4%
Statins	7	0.4%
Amitriptyline	6	0.4%
Oral Contraceptives	2	0.1%
Total	1483	

7.2.5.1 Digital access to detailed patient information

In the CAS, PIPs had access to the EMIS Viewer platform, which as outlined in the previous chapter, was also used by the ACP-EMs in the ED case site. This digital technology was utilised in nearly every consultation in the CAS. PIPs could view all of a patient's primary care health records. This included detailed records on all current and past drug prescriptions, full primary care consultation notes, previous blood test and clinical image results. This level of information was fundamental to both prescribing and clinical decision-making. This included informing decisions in cases where concerns about drug dependency and misuse existed. Having access to EMIS Viewer also ensured that prescribing decision-making was consistent with those previously made in primary care:

Field Note Extract: When UCS PIP P3 rang the nurse, they explained the patient … had been prescribed Sertraline …and then later…Mirtazapine as well…They asked UCS PIP P3 if they could prescribe some so the patient had this to take over the weekend. However, the EMIS notes … detailed how … the Mirtazapine had been prescribed as a month-long course to help wean the patient of the Sertraline, with a plan to then stop both drugs once the course of Mirtazapine had finished [leading UCS PIP P3 to decline the prescription request as this would have not aligned with the intended treatment plan by primary care].

When discussing the level of access to patient information available in the CAS, several participants contrasted this with the very limited information available in ambulance services. This led participants to question whether PIP could be safely implemented in ambulance settings without comparable access to EMIS viewer:

UCS CSI Participant 4 (Deputy Medical Director, GP): I think … visibility of longitudinal medical records fundamentally makes prescribing safer… I'm not sure, that prescribing paramedics in [regional ambulance service] would have the same level of contextual information that they can access … I just think the risks associated with interactions, not knowing what someone's on, allergies that the patient may not know about … renal function that impacts on antimicrobial choice… you just don't get that level of granularity from the summary care record… there is [also] a cohort of patients… where their own GP has declined to issue the Tramadol or the opiate or the overused whatever drug … And unless you can see that recent contact, there is a real risk that we in urgent care undermine continuity of practice.

UCS PIP Participant 6: The portfolio career that I'm having at the moment, I see a lot of things from different angles. So in in the ambulance service at the moment where you don't have full access to the notes … you don't have … the information that you probably need to be a safe prescriber.

UCS PIP Participant 4 who was a Clinical Director for the CAS and had previously worked in senior ambulance leadership roles also questioned if access to EMIS Viewer was even possible for the ambulance sector. They described how the urgent care CAS is required to negotiate access through EMIS Viewer with individual primary care networks. They therefore questioned if this could be negotiated across the much larger geographical regions covered by each UK ambulance service.

7.2.5.2 The clinical toolkit: digital access to detailed prescribing and clinical guidance

The ability to quickly and easily access a range of clinical and prescribing guidance documents and resources was another important facilitator of prescribing. PIPs regularly accessed and consulted these during their prescribing decision-making. Figure 21 shows an example from a site document collected which enabled UCS PIP P6 to advise a patient during a call regarding their long-term inhaler therapy. The patient had not received a response to their enquiry by their primary care provider for over a week and so contacted the CAS for help as they wanted their query to be answered before going on holiday. The CAS organisation had developed a comprehensive and well-designed online dashboard called the clinical toolkit. This facilitated access to these important information sources by drawing together national, regional and organisation specific guidance into one easy to navigate platform. UCS PIP P6 was able to find the relevant guidance using this platform.

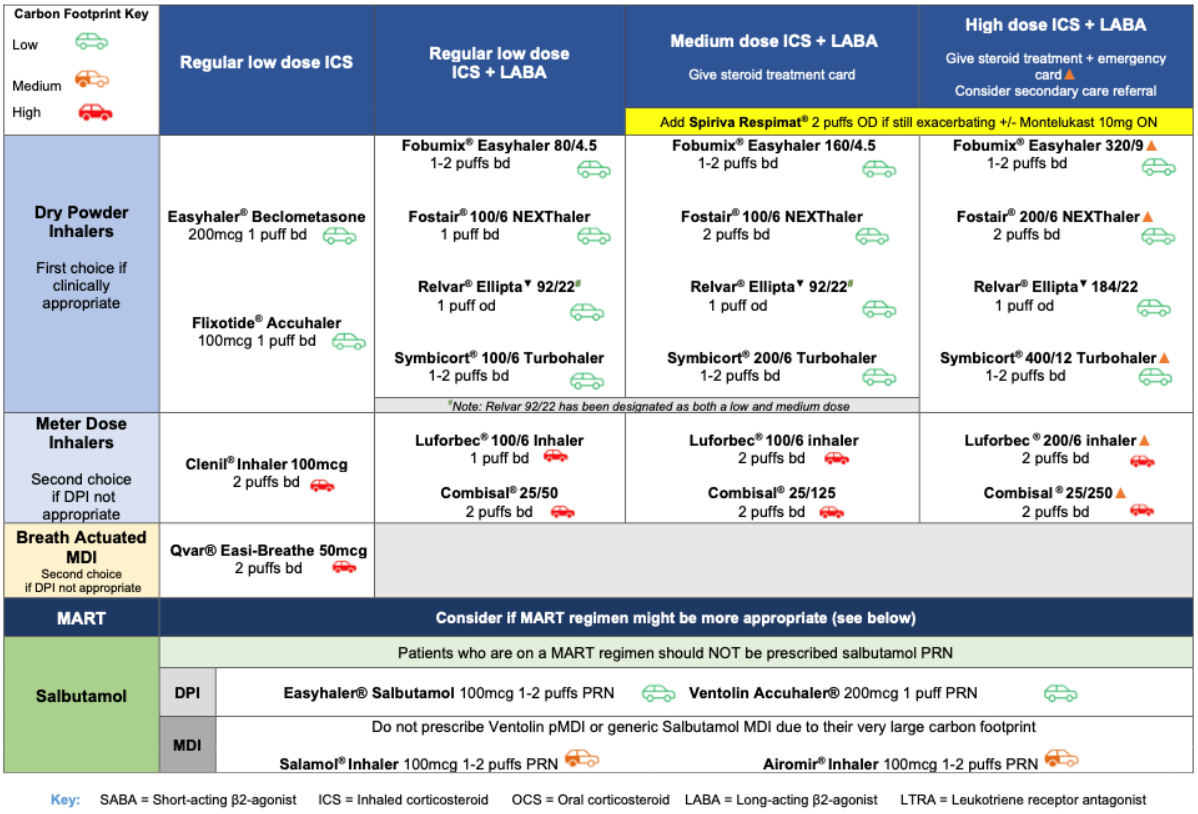


Figure 21: Example of Prescribing Guidance from Clinical Toolkit

7.2.5.3 Repeat prescription requests

In 7/49 (14.2%) observed cases of prescribing, the PIPs were required to issue a repeat prescription of patient's routine medication. They also reported how this was quite a

regular component of their work, especially when the two CAS pharmacists, who were employed specifically to manage these cases, were not on duty. This was reflected in the quantitative prescribing data, which included drugs associated with chronic disease management such as anti-hypertensives, steroid inhalers, statins, mental health treatments and topical skin treatments.

Field work identified that repeat prescriptions were sometimes requested from the CAS because patients had lost them. In other cases, they had run out of their medication after experiencing delays in the prescriptions being issued in primary care. Paramedic participants described that although many of these drugs would not be treatments that they would initiate during out-of-hours care, they felt it was both safe and appropriate to re-issue them, given they had been previously prescribed and deemed as necessary by routine healthcare providers. Participants described however that each case needed to be assessed on an individual basis and as outlined earlier in the chapter, governance arrangements were in place to guide this practice. These emphasised issuing only very short courses of treatment until patients could access their medicines through primary care.

7.2.5.4 Controlled Drug prescribing

Within the CAS, PIPs were restricted in their ability to prescribe CDs. Until 31st December 2023, they were unable to legally prescribe any CDs. Whilst from the start of 2024, they could legally prescribe the five CDs permitted by the change in legislation, the Adastra system had not been updated nationally to reflect this and would not allow PIPs to issue any CD prescriptions. As a result, PIPs could only prescribe these CDs using handwritten FP10s or by supplying them from stock. Given most prescribing relied on electronic, remote prescriptions, this presented only limited opportunities to prescribe CDs using these methods. Only five CD prescriptions were issued during observation shifts (Table 19). Of these, two end-of-life FP10s were issued which included Morphine and Midazolam and one prescription of Codeine was issued and supplied from stock. However, CD prescribing data from FP10s and supplying from stock are not currently captured by the Adastra software and so quantitative CD prescribing data for the PIPs were not available.

7.2.5.4.1 Controlled Drug prescribing by other professions

To contextualise the findings regarding CD restrictions, the prescribing frequency data for other clinicians working in the CAS were obtained for 2023 (summarised in Tables 21-23). These data show that Codeine, Morphine and Midazolam were frequently prescribed by GPs (n=189), nurse practitioners (n=52) and pharmacists (n=2). These drugs are included in the limited list of five drugs now available to PIPs following the changes in CD legislation. This finding therefore lends support to the views of participants that once local software restrictions are resolved, paramedics will be able to electronically prescribe the CDs more frequently required in practice in the CAS. However, a wider range (n=18) of other CDs were also prescribed by GPs, nurse and pharmacist prescribers, although relatively infrequently in comparison to Morphine and Codeine. These included Tramadol, Oxycodone and Zopiclone.

Fieldwork and the quantitative data emphasised that, unlike other drugs such as antimicrobials, CDs are not required in many cases encountered in the CAS. In the quantitative CD prescribing data, the annual total of CD prescriptions issued by doctors in the CAS (n=2948) averaged 15.5 prescriptions per doctor per year and for nurse prescribers, 18.1 per nurse (n=52). Pharmacist CD prescribing was much higher at 207.5 per pharmacist (n=2), although this likely reflects that their role in the CAS was not to undertake patient consultations but to only manage repeat prescription requests.

Table 21: Controlled Drugs Prescribed by Doctors (n=189) in 2023

Drug	Total Prescriptions	Percentage
Codeine	1349	45.7
Midazolam	340	11.5
Diazepam	373	12.6
Morphine	211	7.1
Tramadol	184	6.2
Oxycodone	152	5.1
Zopiclone	121	4.1
Lorazepam	64	2.1
Dihydrocodeine	40	1.3
Fentanyl	35	1.1
Buprenorphine	25	<1
Methadone	10	<1
Alfentanil	9	<1
Clonazepam	12	<1
Zolpidem	6	<1
Clobazam	6	<1
Diamorphine	4	<1
Methylphenidate	2	<1
Nitrazepam	2	<1
Oxazepam	1	<1
Temazepam	1	<1

Hydromorphone	1	<1
Grand Total	**2948**	

Table 22: Controlled Drugs Prescribed by Nurses (n=52) in 2023

Drug	Total Prescriptions	Percentage
Codeine	489	51.6
Midazolam	108	11.4
Diazepam	88	9.3
Morphine	72	7.6
Tramadol	58	6.1
Oxycodone	50	5.2
Zopiclone	23	2.4
Lorazepam	17	1.7
Fentanyl	15	1.5
Dihydrocodeine	8	<1
Buprenorphine	7	<1
Zolpidem	4	<1
Clonazepam	4	<1
Methylphenidate	1	<1
Temazepam	1	<1
Methadone	1	<1
Grand Total	**946**	

Table 23: Controlled Drugs Prescribed by Pharmacists (n=2) in 2023

Drug	Total Prescriptions	Percentage
Codeine	99	23.8
Diazepam	65	15.6
Tramadol	60	14.4
Buprenorphine	42	10.1
Oxycodone	41	9.8
Zopiclone	37	8.9
Morphine	18	4.3
Midazolam	13	3.1
Clobazam	10	2.4
Lorazepam	10	2.4
Fentanyl	7	1.6
Dihydrocodeine	5	1.2
Methylphenidate	3	<1
Alfentanil	2	<1
Zolpidem	2	<1
Methadone	1	<1
Total	**415**	

7.2.5.4.2 Challenges from Controlled Drug restrictions

Because of the restrictions from both legislation and the Adastra system, PIPs relied on colleagues to issue electronic CD prescriptions. When these were required, it was flagged in the Adastra case notes and placed in a queue for a nurse, pharmacist or doctor to review and action. This resulted in frustration for the paramedics, who described how this impacts on their autonomy. CD prescription requests usually take several hours to deal with, particularly during times of increased demand. This resulted in delays for patients in accessing medicines, as well as unnecessary duplication of work:

It makes it clunky. If you've got a paramedic who can't prescribe… Diazepam or Codeine for pain, they've then got to put that patient back in the queue… and wait for someone to generate a prescription and it's just a really poor patient experience and it adds additional pressure to the clinicians who are left… writing those prescriptions. UCS CSI Participant 1, Clinical Lead/Nurse IP.

In one example, UCS PIP P5 issued several repeat prescriptions for a patient whose medication was accidentally left on a hospital ward following discharge. However, one of these drugs (Gabapentin) was a CD, requiring UCS PIP P5 to pass the case to the clinical coordinator to issue this single drug. As a result, UCS PIP P5 was unable to complete the whole episode of care despite feeling confident and competent to do so. The patient had to then wait for several hours before they could collect the prescription from the pharmacy. This case highlighted that even if the restrictions from the Adastra system were resolved, the continued legislative restrictions would still prevent this drug from being prescribed.

A further case of a patient requiring a prescription of Codeine for severe back pain was observed and UCS PIP P3 was unable to electronically prescribe this. Since the CAS was under significant demand, it was highly unlikely that a prescription request would be reviewed by another prescriber before the pharmacy closed. The patient was also not able to attend a treatment centre to collect the medicine due to their symptoms and lack of transport. As a result, the patient was required to manage with only paracetamol despite being in considerable pain.

7.2.5.4.3 Challenges with Controlled Drug prescription requests

PIPs described how it was common for CD prescription requests to be challenged by their colleagues, who were sometimes reluctant to issue them, and this was also observed during field work. Where other prescribers were reluctant or unwilling to prescribe, this was due to differences in opinion regarding the need for the prescription or a lack of context to the request, given the other prescriber had not spoken with the patient themselves:

Most times, colleagues were fine, there were some that said… I don't feel comfortable… signing Codeine … [or] they would want to speak to the patient again. And so it sort of prolongs that patient contact … we're having to get them to make clinical decisions when they haven't been directly… speaking to the patient to get that clinical history. UCS PIP Participant 6 Interview Transcript.

Field Note Extract The doctor had seemed a bit reluctant to prescribe the Morphine… [UCS PIP P4] felt this was likely due to the fact that the doctor had not spoken to the patient directly and so some of the context and detail from the consultation had not been carried through in … their request for the prescription. [In another case] … The doctor again seemed slightly hesitant… [but] then agreed, although still seemed a bit reluctant and said, "Well I'm happy to prescribe the Codeine, although it doesn't sound like they're in considerable pain from what you're telling me, and I wonder if they could just wait till tomorrow, but I'll do it".

7.2.5.4.4 Controlled Drugs and end-of-life anticipatory prescribing

An important aspect of urgent out-of-hours care was the initiation and management of end-of-life anticipatory prescribing. Sometimes, CAS clinicians were required to manage the symptoms of existing end-of-life patients, but more often they prescribed drugs after deciding that a patient was entering the end-of-life phase of an illness. This involved prescribing drugs to manage the symptoms often associated with end-of-life, including pain, agitation, vomiting and secretions. Some of the core drugs required are CDs. These included opioids for pain and breathlessness and also benzodiazepines to treat terminal agitation. PIPs and other case site staff described that because the need for CD prescribing is so fundamental to managing these cases, paramedics had been

reluctant to attend them, given they could not prescribe the required treatments. Service leaders described this was frustrating since paramedics were often more willing and confident to attend home visits than their nursing colleagues, and because end-of-life cases are a significant part of the overall home visit caseload:

We see a lot of end-of-life patients... and usually the paramedic workforce are the ones who do the home visits. So if they are able to prescribe those drugs ... it's a huge benefit... that's the type of stuff that [in the past] we've avoided giving to paramedics. UCS CSI Participant 1, Clinical Lead, Nurse IP.

However, now PIPs can prescribe Morphine and Midazolam, the CDs most commonly prescribed for in end-of-life care, they had now begun to attend and manage these cases when the permitted drugs available to them were suitable. Also, because most end-of-life cases required a home visit, the drugs could be prescribed using specific handwritten end-of-life FP10 prescriptions (Figure 19). Participants did however describe other drugs not available to PIPs are sometimes needed in end-of-life care. This included Oxycodone (5% of CD prescriptions by both doctors and nurse IPs) which is prescribed to end-of-life patients who are not suitable to be given Morphine due to a reduced kidney function.

UCS PIP P1 in particular demonstrated high levels of confidence in prescribing end-of-life drugs. In one case, a patient was approaching the end-of-life phase, and their own GP had prescribed the required drugs the day before. However, Midazolam was not available at the pharmacy and the patient's family were very distressed by the thought of the patient needing sedation as they approached the end of their life, and it not being available. They explained to UCS PIP P1 that they required a separate prescription for the drug to enable them to attend a different pharmacy which did have Midazolam ampules in stock. During this home visit UCS PIP P1 was therefore able to issue a handwritten FP10 for Midazolam which enabled the family to ensure the patient could be given the treatment if needed.

UCS PIP P1 described their confidence was developed over time and through attending home visits where palliative care decisions were needed. In contrast to the other PIPs, they had encouraged the operations team to allocate these cases to them if needed.

Prior to being able to prescribe these medications, they had spoken with the CAS doctors who prescribed the medications electronically. Whilst this was often associated with lengthy delays and extended the time needed to be spent on the case, it did enable UCS PIP P1 to develop an understanding of the different drugs used and the doses prescribed. They had also undertaken self-directed learning and attended training with the regional hospice. Other PIP participants described being willing and keen to manage end-of-life cases now they could issue the required drugs. However, they also described a need to develop further confidence and experience, through both formal training with the regional hospice and by seeking medical support when required as described by UCS PIP P1. Whilst most patients could be prescribed the CDs now available to PIPs, in some cases they were however, not suitable, and participants reported how other CDs were also needed in end-of-life care:

I mean, my sense is why restrict?... is it just Morphine or is it Oxycodone as well? You know just thinking about that palliative patient where you're needing to make the prescribing decisions that are different opiates, but the fundamental process of decision-making, dosing and all of those things is the same, so why differentiate the individual drugs within class? ... it doesn't quite add up to me. UCS CSI Participant 4, Deputy Medical Director/Urgent Care Doctor.

Table 24: Summary of Urgent Care Case Study Key Themes

Theme Title	Sub Theme Title
Theme 1: The Benefits from the Introduction of PIP	1.1 Improved Professional Practice.
	1.2 Improved Service Delivery Efficiency.
Theme 2: An Overflowing Bowl: Demands from the Wider Healthcare Landscape	
	2.1 An Overflow of Prescribing Work from Primary Care.
	2.2 An Overflow of Prescribing Work from the Ambulance Service.
Theme 3: Paramedics in a Multi-Disciplinary Urgent Care Role	
	3.1 Educational and Experiential Requirements.
	3.2 Professional Differences Across the Multi-Disciplinary Workforce.
Theme 4: Courage or Fear Based Medicine: Balancing Autonomy, Managing Risk and Negotiating Medical Support.	
	4.1 Managing pressure to prescribe.
	4.2 Managing complexity and risk.
	4.3 Medical Support as a Facilitator of Prescribing.

7.3 Theme 1: The benefits from the introduction of PIP

The findings presented in this theme show the clear case of need for PIP within the CAS and the resulting benefits from its introduction. These were framed around the need for PIP in the predominantly remote delivery model, which had rendered alternative practice using PGDs largely obsolete. This made PIP fundamental to providing patient access to treatment. Adopting PIP had enabled paramedics to autonomously manage whole episodes of care, improving their overall contribution to service delivery in the CAS, reducing reliance on other staff to issue third party prescriptions for them.

7.3.1 Improved professional practice

Participants contrasted PIP with their previous practice using a small number of very restrictive PGDs or by asking colleagues to issue prescriptions. During field work, a non-prescribing paramedic who had recently joined the service and planned to complete PIP training as soon as possible echoed previous experiences described by PIPs. They described how being unable to prescribe significantly restricted their practice, particularly important given the number of cases requiring the ability to issue remote prescriptions. Prescribing was an important and frequent part of clinical practice in the CAS. Over half (n=85/153, 55.5%) of all observed cases required either a prescription to be issued or PIPs to use their prescribing knowledge and decision-making skills. This involved providing medicine-related advice and verbal instructions on the use of medicines. Participants also described the benefits of PIP included both enhancements to their professional scope of practice and ability to autonomously manage cases which in turn enabled them to provide improved patient care:

[PIP has] really, absolutely enhanced my practice. I think it is very difficult to work in an … urgent care environment without being a prescriber… because… you have to be that autonomous clinician and managing so many different undifferentiated conditions… and I think it helps your colleagues as well, because unfortunately you do slow down a lot if you're not a prescriber. UCS PIP Participant 6.

There's just ultimately some autonomous clinical decision-making that can sit behind

independent prescribing, that's frankly the point… So yes, it's materially better. And …the prescribing qualification moves people to being more independent decision makers as well because they're not deferring the prescribing decision to somebody else. UCS CSI Participant 4, Deputy Medical Director/Urgent Care GP.

7.3.2 Improved service delivery

Prior to the pandemic, all patients were seen face-to-face. As non-prescribers, paramedics could therefore use PGDs to provide medicines in certain cases. However, PGDs had since been withdrawn given their lack of utility in the current delivery model, because they can only be used for face-to-face patient encounters. Organisational leaders described that because of this fundamental change, without the introduction of PIP, they would have been unlikely to continue to recruit paramedics into the service given the increased focus on an ability to prescribe:

I think it's a massive benefit to the service; there's no doubt about it… you can tell the sort of prescribers versus the non-prescribers, whether they be nurses or paramedics, it makes a massive difference… particularly the overnight workforce … to be an autonomous advance practitioner, to be able to triage and assess and then treat, I think prescribing is a must really. UCS CSI Participant 2, Clinical Lead, nurse IP.

Delivering healthcare using remote consultations and prescribing was considered to be potentially riskier than face-to-face consultations in some cases, given the increased chance of making an incorrect diagnosis or missing serious symptoms which might be picked up during an examination:

I'm not sure that remote working is always the right thing for patients, I think that there are some inherent risks that you just can't mitigate for, no matter what you do in terms of photos, videos, there is no substitute to having a patient in a room to put your hand on their tummy. UCS CSI Participant 3, urgent care doctor.

However, case site staff and PIPs also described that for straightforward cases such as simple infections, the pandemic demonstrated that many patients do not require a face-to-face assessment. Participants described how managing these cases remotely and

providing treatments through remote prescribing improved patient experience and service efficiency as they took less time to complete. Observations of patient encounters also highlighted how remote consultations could be completed much more quickly than face-to-face treatment centre consultations or home visits, especially given the additional travel time required for patients or clinicians to complete these. Potential risks associated with remote consulting were mitigated by having the option to still arrange a face-to-face appointment, alongside the use of digital images taken by patients and using video calling if required. PIP therefore allowed paramedics to provide patients with a wide range of medicines through remote electronic prescribing and also during face-to-face encounters.

Four out of the six PIPs had worked in the CAS before and after the introduction of PIP. They all described how being able to now autonomously prescribe treatments reduced the duplication of work and burdens previously placed on other colleagues as non-prescribers. This avoided the delays to patient care and duplication of work involved with requesting third-party prescriptions from other staff, who were often already very busy themselves due to the high levels of demand. The remote nature of work in the CAS meant prescription requests involved first waiting to speak to another prescriber once they were free, before electronically passing the case back into the waiting call queue and flagging it as a prescription request. These were then actioned when the other clinician was able to fit the additional work in around speaking to other patients waiting for an initial call back or help other staff requiring clinical advice in the case of the clinical coordinator doctor. This often meant third party prescription requests were not dealt with for several hours:

UCS PIP P2: In the overnight period … there could be four of us working and we'll have three hundred patients on the queue. So, the time scale that that would take for that prescription to be done could be massive. For me now… I can do the electronic prescription, it will be done within a minute … You're not having to say to the patient, I need to ask somebody if they prescribe this, … It's … done and dusted.

So, I think [PIP] was an absolute must… a no brainer… it's crazy that it wasn't happening before… And frankly, it reduces my workload, because that's all I was doing before… just doing the actual prescribing for all of the clinical assessment that had gone on. UCS CSI Participant 3, urgent care doctor.

UCS PIP P4, summarised the benefits that had been realised from PIP:

From a patient perspective, it's … enabling us to meet patients' needs at the point of contact … and a better patient experience and… outcomes… From a professional perspective, I think it's satisfying to be able to complete and close your own cases rather than be reliant on other clinicians… And then from a service delivery perspective, you've … the efficiency gain and the additional resource pool … to delivering services in what is a difficult climate for resourcing and staffing. UCS PIP P4, Clinical Director/PIP.

7.4 Theme 2: An overflowing bowl: Demands from the wider healthcare system

During field work, the number of patients waiting for a telephone call from a CAS clinician varied widely. Often during weekday evenings, this number was between 50-100. However, over most weekends, the number of patients was often over 300 and target call times (based on the triage level of their call) were frequently not met. Field observations emphasised how this delayed patient access to treatment given the long waits they experienced to receive a call back. Wider pressures in services such as primary care also resulted in unmet patient needs during daytime hours, with patients then turning to the CAS to provide more routine care such as repeat prescriptions and issues that were not acute urgent care problems. A lack of PIP in the regional ambulance service also led to paramedics seeking prescription requestions from the CAS. Participants described how the organisation and wider NHS were already under significant strain before the COVID-19 pandemic, which had escalated to an unprecedented level in the post pandemic era:

I mean, nothing's really normal anymore since COVID, I think that was the tipping point. And I think health beliefs, health systems, people's resilience to manage, I think has changed… nationally … urgent care…primary care and … emergency care have borne the brunt of what appears to be a really complicated shift… and we're still facing winter pressures in March. UCS CSI Participant 2, Clinical Lead, nurse IP.

7.4.1 An overflow of prescribing work from primary care

The pressures in primary care resulted in PIPs issuing repeat prescriptions and also prescribing to manage sub-acute conditions in out-of-hours care. These included

manging ongoing pain, longer term exacerbations of skin complaints and illnesses that had been ongoing for several days or weeks, rather than suddenly occurring during the out-of-hours periods:

Field Note Extract: [The child's] mother had phoned 111 about a rash that the patient had developed for the past two days. They explained that they had felt a bit frustrated they had not been offered a face-to-face appointment at the surgery and so just wanted some further advice about the rash.... [in another case requiring an antimicrobial prescription] *the patient had phoned 111 as they were concerned about a spot on their neck which had been there for several weeks but in recent days had become red, swollen and painful... they [also] had... loose stools and a loss of appetite ... for the past four weeks*.

Participants reported that wider pressures faced in primary care resulted in considerably more routine work being encountered and prescribed for. Whilst PIPs were confident and willing to manage this additional 'less urgent' work, it also impacted on urgent care service delivery. When this was not managed, patients were more likely to escalate and attend ED rather than wait for help from urgent care:

It's a really difficult landscape... if I could wave one magic wand, I'd be saying invest in primary care, because if we could invest in primary care, we would ... avoid some of the overflow... urgent care is a really difficult space... if we can get the urgent care stuff right... fewer people would potentially be turning up to ED when they don't need to be there... So, it's a really difficult landscape. UCS CSI Participant 4, Assistant Medical Director, urgent care doctor.

Other patients did not answer the repeated calls backs during the middle of the night. PIPs perceived this was likely due to the fact they had initially rung the 111 service during daytime hours, often for a more routine issue, but had since gone to bed.

UCS PIP P1 painted a particularly bleak picture of the future from their experiences of working for the organisation for over a decade. They felt it would now be extremely challenging to get to a point where the service could meet the current demand even if both primary and urgent care were able to increase their resources and clinician numbers:

Field Note Extract: [UCS PIP P1] explained how [they think of] … the ever-increasing demand… [as] a glass bowl with water being poured into it. The water they explained, is the demand from patients which flows constantly, meaning the bowl is always full and overflowing. However, they felt that if the size of this glass bowl was increased [by increasing staffing and resources], to hold more water, it would still be overflowing… [because] if the NHS increases [its] capacity … demand will increase in response [as] only a proportion of patients get a telephone call or appointment each day, … patients are now so used to waiting or struggling to even get an appointment, many they felt, just give up.

7.4.2 An overflow of prescribing work from the ambulance service

In addition to the overflow of prescribing work from stretched primary care services, PIPs also described how they regularly spoke with ambulance crews who were ringing to request a prescription so a patient could be treated in the community. Often the ambulance crew had been dispatched to these lower acuity cases following NHS 111 referral to the ambulance service. This resulted in a circular patient journey which involved an NHS 111 assessment, an ambulance attendance and then further involvement with the CAS for a prescription. This situation was observed several times during field work:

Field Note Extract: [UCS PIP P1] rang the paramedic back and they explained they were with a 60-year-old patient …[who] had decided not to take the Codeine they had been prescribed on discharge, as this had previously caused constipation… The 111 service had then sent the paramedic crew … so they were ringing for advice… UCS PIP P1 then advised the paramedic they would prescribe the patient some laxatives… and issued an electronic prescription for Macrogol.

Participants described a range of opinions regarding this work, from acceptance and a willingness to support their ambulance colleagues, to views that there was clear need to expand PIP in the regional ambulance service:

So I think that there is a role for prescribing in [the ambulance service] …I think it is appropriate especially when dealing with crews as well… where we have… calls that will come in and… what often is a prescribing decision … I see that a lot more in out-of-

hours. I think those things still can transfer into the ambulance service. UCS PIP Participant 6.

UCS PIP P3, P5 and P6 had all retained part-time employment with the regional ambulance service. However, despite being experienced PIPs and urgent care practitioners, they were unable to prescribe when working for the ambulance service. This was because the service only permitted staff employed under specific, full-time specialist/advanced paramedic contracts to prescribe. As the case site participants were employed under alternative bank contract roles, they were not permitted to use PIP when attending patients on ambulances. UCS PIPs P5 and P5 held dual bank contracts to cover ambulance shifts and also remote triage shifts in the ambulance control room. Whilst under their remote triage contracts they were formally employed as advanced practitioners, because the service had also not implemented remote prescribing, they were still unable to prescribe in this role. All three participants described frustrations with these complex governance issues, perceiving they resulted in a missed opportunity given the overspill of prescribing work from the ambulance service into urgent care. They also described regularly encountering patients through remote triage and face-to-face practice in these ambulance service roles, who required treatments to be prescribed.

7.5 Theme 3: Paramedics in a multi-disciplinary urgent care role

In the CAS, PIPs were employed as Integrated Urgent Care Practitioners. This theme explores how the requirements of this multi-disciplinary role did not align with paramedic specific guidance regarding the required educational background for PIPs. This theme also considers how despite the multiprofessional nature of the role, paramedics were perceived as offering a unique contribution to patient care and service delivery within the CAS.

7.5.1 Educational and experiential requirements

Documentary analysis of the PIP's job description highlighted that previous education and experience in patient assessment, diagnostic reasoning and an ability to undertake remote consultations were required for their role as Integrated Urgent Care Practitioners. Previous experience in primary care or EUC was also required. IP was

described as preferred but not essential and previous education was only required to be at degree level. Master's level training was however specified in the job description as desirable. This suggested that more emphasis was placed on clinical experience and clinical skills than a specific level of academic attainment. Service leaders made a clear distinction between the role of the PIPs in the CAS and the concept of advanced clinical practice which involves practice across four pillars including research, education and leadership, as well as clinical work:

Field Note Extract: [UCS PIP P4] told me how personally, they questioned the value of all paramedic prescribers… completing a full master's. They did not agree this was essential for prescribing or clinical practice, and was more aligned with advanced clinical practice… they felt …it did not make sense to employ 'an army' of ACPs as they would need to be paid at a higher rate but were unlikely to all work across the four pillars … They also felt that completing a master's did not make you a competent urgent care clinician, and they had got far more benefit and learning from their medical mentors and other colleagues in the service than they had from their university education.

However, all PIP participants held or were working towards the completion of a master's in advanced practice. UCS PIP P3 described that in contrast to the views of UCS PIP P4, master's level education was important for their clinical role. However, this also contrasted with the views of other PIPs and a non-prescribing paramedic encountered during field work, who disagreed that they needed to complete a master's. They told me they intended to complete one postgraduate module and then the IP module at level seven. This was to comply with the minimum requirements set by the university for paramedics to enroll on the IP module. PIP participants also described how clinical experience and wider learning through non-accredited courses were also facilitators of prescribing, rather than formal master's education. Views that master's level education was not required for PIP were also expressed by other participants, including urgent care doctors and the Deputy Medical Director:

Actually, if you said to me what differentiates someone who's got the master's from someone whose got ten [years' experience] … there is a greyness in my mind… because…there are many people who don't have the master's but are functioning at that really high-level autonomous decision maker. And so, I'm not wedded to the master's as

the definition. UCS CSI Participant 4, Deputy Medical Director, urgent care doctor.

Field Note Extract: [UCS PIP P1 explained] that education needs to be relevant to practice and support paramedics to deliver the right care to patients. For this reason, they did not agree completing a master's was integral to supporting prescribing practice. They explained that key components that are required … such as clinical examination and diagnostic reasoning skills [which] can be taught in a variety of ways and importantly, must be underpinned by significant experience and mentorship in practice … being able to complete assignments at a certain academic level did not benefit prescribing practice …for practitioners to work as prescribers safely and competently in urgent care, a full master's was not needed… [but] it was right that [the PIP module] is completed at level seven and could be supported by other level seven modules in patient assessment and diagnostic reasoning, although these are not essential if they have been completed at level six prior to adopting prescribing.

7.5.2 Professional differences across the multi-disciplinary workforce

A key attribute of the PIPs was perceived to be their confidence in conducting home visits and embracing the entire breadth of conditions encountered in urgent care, because of the experience they had gained during ambulance service practice. Two doctors reported concerns that PAs were unable to practice competently and safely in comparison to PIPs and nurse IPs, who they felt had significantly more experience and training. However, participants also described that nurse IPs in the CAS were often less confident and willing to attend home visits in comparison to PIPs and more frequently set boundaries around their scope of practice:

With paramedics [pauses] in some ways, I think there's less restrictions than with some of our nursing team…I think I've been more inclined to just chuck things at the paramedic group and let them have a go and let me know when it's not appropriate… If you're a paramedic working on an ambulance, … you go to the next emergency and of course … it could be a child, could be an elderly patient. Whereas I think nurse, then you probably tend to go into more of a specialised area. UCS CSI Participant 5, Head of Integrated Urgent Care.

When I compare paramedics to nurses who are prescribers, I think there's a lot more anxiety as a prescriber from a nursing point of view. … I think all the exposure to medication [that paramedics have], and the potential side effects … probably other colleagues don't get to see… So, I think we do bring a bit of a unique perspective to it I think, a bit of confidence, but not bravado… I think we're just … quietly comfortable. UCS PIP Participant 5.

7.6 Theme 4: Courage or fear-based medicine: Balancing autonomy, managing risk and negotiating medical support

"We talk about courage-based medicine and fear-based medicine here in [the CAS]" UCS PIP Participant 4, Clinical Director, PIP.

This theme explores findings relating to confidence and autonomy in prescribing practice, considering how PIPs managed pressure to prescribe and the more complex and higher risk patient presentations they encountered. These cases often involved acutely unwell, multi-morbid patients, where complex decisions needed to be made around treatment which was not specifically covered by clinical guidelines. Whilst PIPs were observed to be confident and willing to manage clinical risk, access to medical support was an important facilitator in this process when they were unsure or needed to sense check their decision-making. The PIPs also reported to me that they felt the CAS doctors were more experienced and confident in holding risk and in making some of the more complex 'finger in the wind' prescribing decisions that were required in practice. Also considered in this theme, is how PIPs in the CAS frequently experienced pressure to prescribe, although were confident and able to manage and resist this pressure.

7.6.1 Resisting pressure to prescribe antimicrobials

PIPs were often placed under pressure to prescribe antimicrobials by patients and healthcare staff. In several cases, patient's demeanour during the call rapidly changed from being polite and friendly, to confrontational and abrupt, once they realised antimicrobials might not be prescribed. However, PIPs appeared confident in resisting this pressure and were able to balance a patient's expectations against their own judgement of what was appropriate under the circumstances:

I don't feel a massive pressure to be honest in in out-of-hours to prescribe. And maybe that's more just as a, having worked in [primary care] … I think that does make a big difference as well compared to just out-of-hours. I've got a better appreciation of when it's not unreasonable to hold off medication, to delay it slightly. To say actually, you don't need a prescription at the moment, because you've only had a sore throat for twenty-four hours, actually we can give this a couple of days. UCS PIP Participant 6.

Participants described and demonstrated how they used strategies to manage pressure to prescribe, such as taking time to understand the ideas, concerns and expectations which might be driving the perceived need for treatment. Understanding these enabled them to build a stronger and more patient centered case for their decision not to prescribe, which was then more than simply just saying no.

PIPs were also observed to encounter requests for antimicrobial prescriptions form other paramedics calling from the ambulance service. Whilst participants perceived most of the requests were appropriate, they sometimes disagreed with what was being requested. Similarly to patient calls, where the paramedics disagreed that antibiotics were indicated, they negotiated these requests by discussing the ideas, concerns and expectations of the ambulance paramedics and explaining their position and the evidence base behind this:

Field Note Extract: UCS PIP P1 then rang and spoke with the paramedic from the attending ambulance crew. Whilst this conversation was very light hearted and polite, it was quite cyclical and UCS PIP P1 had to explain their views and position several times, as the paramedic clearly was not in agreement with what they were saying … and told UCS PIP P1 as the patient would not come with them to hospital, they would feel much happier if they were prescribed antibiotics just in case they had an [urinary tract infection] and to prevent them getting more unwell and falling again.

It appears that whilst pressure to prescribe antimicrobials is regularly experienced, PIPs demonstrated confidence in resisting this. Despite antimicrobials representing the majority of prescriptions issued by PIPs in the quantitative data, qualitative findings demonstrate that careful decision-making underpins these prescribing decisions. Whilst an assessment of prescribing appropriateness was not an aim of this research, in

all observed cases the antimicrobial prescribing decisions of PIPs were reflective of relevant evidence-based guidance.

7.6.2 Managing complexity and risk

Prescribing in the CAS predominantly involved managing routine and straightforward cases, although in some cases, more complex or higher risk cases were also encountered. This therefore required more complex decision-making and holding risk both with regard to prescribing and overall case management. One example captured during observation was a face-to-face consultation where UCS PIP P3 encountered a patient at a treatment centre with symptoms of pneumonia. Whilst the patient wanted antimicrobials and to be sent home, UCS PIP P3 had to decide if this could result in further deterioration and whether the patient's symptoms indicated a need for intravenous antibiotics and close observation, which would require an admission to hospital. As part of this decision-making process, UCS PIP P3 discussed with the patient that they could consider prescribing a high dose, multi-drug antimicrobial regime to treat them in the community. However, on further discussions around the risks associated with this treatment plan, UCS PIP P3, the patient and their relative reached a shared decision that admission for treatment would be the most appropriate option. UCS PIP P3 reflected after the case that they did not feel the need to seek medical support despite the risks associated with the case. They would have also felt confident to autonomously manage the patient in the community had they decided together this was appropriate, reflecting how similar decision-making around community or hospital treatment was commonly encountered in their ambulance service practice.

In a further example, UCS PIP P3 attended a home visit during a Friday night shift for an acutely unwell patient who also had a complex history of multi-morbidity and polypharmacy. However, the patient was a younger adult in their late forties and so UCS PIP P3 felt they may be able to be safely managed in the community. UCS PIP P3 explained that this decision was associated with a degree of risk given the patient was quite unwell. To manage this risk and guide further decision-making, UCS PIP P3 took some blood samples which were then taken to the hospital laboratory. UCS PIP P3 spoke with the clinical coordinator to confirm they agreed with this plan and also that they would be happy to ensure another doctor reviewed the results of the tests and

follow the patient up the following morning to decide on a treatment plan.

In another home visit case, UCS PIP P1 prescribed Digoxin to a patient with an unstable heart rhythm which would usually be managed in an ED. However, due to severe dementia, admission was not deemed to be in their best interests. After seeking advice from the medical registrar at the regional hospital, UCS PIP P1 decided to manage the patient in the community. This they explained was associated with accepting a significant degree of risk given the condition would usually always require admission for treatment, and because the patient could not be so closely monitored in the community and so may become more unwell.

Participants described during case reflections how this element of their practice of managing more complex, less routine patient cases required confidence in accepting and holding risk, in the face of uncertainty:

Field Note Extract: [UCS PIP P6 explained how] In urgent care often complex decisions need to be made around admission or community treatment, often without knowing all of the information about a patient or having the luxury of time and additional tests that would be available in primary care. … This they explained required confidence and experience, as well as acknowledging you might not always get things right.

The work of accepting and holding this risk and uncertainty was clearly linked to gaining prescribing experience and participants described a lack of confidence when they first adopted PIP. During field work, those with the most experience (P1, P3, P5, P6) appeared the most confident in their prescribing practice and in managing risk without seeking medical support:

Now I feel confident making [prescribing decisions] because it's not that I've just seen it once, but I've, you know, I deal with it a couple of times in a week… I [also] think as an independent prescriber and a clinician that you go ok, well, actually it is ok that if someone gets worse that they recontact. That doesn't mean you've made a bad clinical decision … in the beginning I probably felt really crushed if something didn't quite go how it was planned. Where it's now I'm a bit older… I feel a bit more confident that actually if things change it's because situations change rather than it was a bad decision. UCS PIP

Participant 6, PIP and Employee Director.

Participants UCS PIP P3, P5 and P6 also had considerable experience of working in primary care, which they felt enabled them to feel more confident in holding risk around potential drug interactions in patients with complex polypharmacy and experience in prescribing for more complex patient groups such as pediatrics. However, participants also contrasted the more routine nature of primary care with the dynamic and complex nature of out-of-hour urgent care, which often involved prescribing in the face of limited information and increased risk:

It's quite high-risk roles in out-of-hours… you can be on your own quite a lot… working at I think a more of an advanced level, [and the] scope of what we can prescribe is massive. You know, technically it's the whole BNF … the risks that are there are huge… we're not comparing it to someone else who works in a specialist departments who only prescribe a few different drugs. UCS PIP Participant 5.

Field Note Extract: [UCS PIP P6] and I discussed how things can and do go wrong when prescribing for patients in urgent care particularly, given it is an environment where you only see the patient once and for a limited time, alongside many consultations being managed remotely. UCS PIP 6 felt this therefore requires them to develop a sense of confidence and ability in holding and accepting risk as an integral part of prescribing in this context, where you do have much more limited information at times in comparison to primary care. Also, patients can be more acutely unwell during out-of-hours although not so unwell to immediately warrant admission or escalation of care and so accepting, managing and holding risk in these cases is part of the prescribing practice.

In contrast, those who had less prescribing experience in this setting such as UCS PIP P2 and UCS PIP P4 described how they were still on a journey to developing this level of confidence although anticipated this would, like the other participants, be developed in the future. UCS PIP P4 for example described themselves as being inexperienced as a prescriber. They therefore ensured that all of their clinical shifts were undertaken at times when a doctor was also scheduled to be working at the treatment centre. Other participants who had been prescribing for longer described a similar reliance in the past but now required this much less as they had become more experienced. This was

described as a transition from a “what should I do” approach to a conversation framed more around “I’m thinking of doing this, do you agree?”

The organisational culture was also described by participants as an environment which supported them to autonomously accept, hold and manage risk in their practice, contrasting this with the very different culture of the ambulance service:

And I think I definitely feel this that as a paramedic historically especially for one that started many many years ago, that used to be right, I didn't get something right it’s wrong then that's it, you're in big trouble, you’re going to get sanctioned. You’re going to get disciplined. You going to lose your job and that creates a very fear-based approach. And one of the things in out-of-hours that our medical director talks about is about courage-based medicine… being able to… with gaps in a clinical picture…have the courage [to make prescribing decisions in the face of uncertainty]… but importantly, have safety netting in place to be able to support if things change. UCS PIP Participant 6, PIP and Employee Director.

Field Note Extract: UCS PIP P6 [elaborated on their interview comment during an observation shift], reflected how urgent care decision-making is often ‘grey’ as there is not always a clear-cut answer, or one right decision which requires what other colleagues have described as courage-based medicine. This they explained meant having the confidence to take all of your knowledge and experience and combine this with the information you have available, acknowledging some elements may remain unknown and therefore decision-making in this context requires clinicians to accept a degree of risk in their prescribing and clinical decisions.

7.6.3 Medical support as a facilitator of prescribing

Most of the PIPs prescribing activity and clinical decision-making were undertaken autonomously, whilst working in isolation at the treatment centers. However, all PIPs described that regardless of their level of experience and confidence, having ready access to medical advice and support was valued and important if they were unsure of the correct prescribing decision or it was beyond their scope of competence or confidence. During reflective conversations around how the PIPs balanced autonomy, managed risk and sought medical support, I again used the conceptual model

developed in the ED case study (Figure 16). Urgent care PIPs also agreed that this diagram illustrated how in practice, they can move along a continuum of autonomy, depending on the clinical case encountered. Equally, being able to access medical support as they reached the limits of confidence and knowledge was an important facilitator to their prescribing decision-making. Medical support was usually sought remotely by telephone in the CAS and sometimes virtually, by communicating with the doctors entirely through the messaging system of Adastra. Medical support was sought in n=8/49 (16.3%) of observed prescribing cases. In n=6/8 of these, advice was provided by the CAS clinical coordinator doctor on duty, and in n=2/8 by a specialist doctor in secondary care. These cases involved prescribing decision-making that was more complex and not directly supported by prescribing guidelines. One case involved seeking advice virtually through the Adastra messaging system from the CAS duty doctor about prescribing Insulin. The patient had accidentally broken their last dose of short acting Insulin which could not be replaced in the middle of night. This therefore required a judgement call to be made to use the additional doses of the patient's long-acting Insulin as a substitute, which was not covered by any prescribing guidance. In another case, specialist advice was also sought for a patient who had developed a rash after recently being prescribed antiplatelet treatment following a stroke. UCS PIP P6 initially consulted the CAS doctor, who then advised them to contact the on-call neurologist, as the decision required more specialist advice, and potentially stopping the drug could increase the risk of a stroke.

Although medical support from either the clinical coordinator or another doctor was usually readily available, participants did encounter a longer wait to be rung back during periods of increased demand as the doctors were busy managing other requests and patient cases. In one observed case where UCS PIP P3 required advice on managing a skin condition, they had to wait around thirty minutes as the clinical coordinator had two other clinicians to speak to first. UCS PIP P5 also described having to wait so long for an advice call in the past, they decided to go ahead and prescribe without waiting for advice.

7.7 Chapter summary

The findings demonstrated the broad scope of prescribing practice by PIPs in the CAS. Whilst managing acute infections formed a significant component of prescribing work, PIPs also managed sub-acute and chronic healthcare problems, issued repeat prescriptions and dealt with prescription requests from ambulance staff. This varied prescribing activity reflected participant insights that prescribing practice in the CAS is influenced by an overspill of prescribing work from both primary care and the ambulance service.

The case study findings also highlighted the very high demand for urgent care services. The introduction of PIP was reported by participants to have enhanced the ability of the paramedics to contribute effectively to patient care and service delivery by autonomously providing treatment to patients. These benefits had been emphasised by the transition to remote consultations, given an ability to prescribe was fundamental to delivering urgent care in this context.

Prescribing practice in out-of-hours urgent care is characterised by one off patient encounters and cases can vary from simple, low risk infections to occasionally, more complex illness involving multi-morbid patients who are at risk of further deterioration. This therefore requires PIPs working in this setting to be able and willing to accept and manage clinical risk. The organisational culture developed around them was an important facilitator of this decision-making and supported them to practice with ‘courage-based rather than fear-based medicine’. Having sufficient clinical experience developed in other settings such as primary care and the ambulance service, access to detailed patient records and also to medical support were clear facilitators of PIP. However, the role of master’s education as a facilitator was less clear based on the views of case study participants.

The current restrictions surrounding CD prescribing limited the autonomous practice of PIPs in cases where these drugs were required. This led to additional work for other prescribers, frustration for PIPs and delayed patient access to important medicines. The findings suggest that further site-level and wider legislative changes to CD prescribing would therefore benefit patient care by enabling the paramedics to provide all of the required treatments in their practice, whilst also avoiding duplication of work in an already over-stretched system.

Chapter 8 Cross case comparison of emergency department and urgent care case studies

Within this chapter, the key findings from the two case studies are compared and contrasted through a cross-case analysis. This explores similarities and differences in the use of PIP, influenced by the context of each case. The benefits of PIP and the facilitators and barriers identified are also compared to answer the research questions and aims of the study. A cross-case comparison summary matrix table is included in Table 25.

Table 25: Cross Case Comparisons

	ED	Urgent Care
Use of PIP in the context of EUC practice	- Predominantly to treat high acuity emergency cases through face-to-face practice: Serious infections, cardiac emergencies and trauma. Wide range of drugs prescribed most frequent categories were antimicrobials, fluids, and non-opioid and opioid (from 2024) analgesia. - Separation of prescribing and administration by ED nurses. - Infrequently needed to prescribe routine medications during prolonged ED stays. - Frequent, very high levels of patient demand in the ED and wider hospital observed and reported by participants. Patients waiting for hours in the department and outside in ambulances for admission and treatment. - Longer term treatments/infusions whilst waiting for transfer to ward-based care also prescribed.	- Predominant focus on management of lower acuity cases. Both acute, sub-acute and chronic conditions prescribed for. - Antimicrobials formed large proportion of prescribing activity although wide range of other drugs also prescribed. - Remote consultations used for majority of prescribing work. - Increasing involvement in end-of-life care following CD legislative update. - Frequent, very high levels of demand observed and reported by participants. Perceived to have escalated to previously unseen levels in the post pandemic era. Unmet patient needs in primary care and in the ambulance service noted which drove the need for and use of PIP in the CAS. - Managing repeat prescription requests a core part of prescribing work.
Benefits	- Non-PIP practice restricted to use of paramedic exemptions for administration, adopting PIP enabled wide formulary of drugs to be prescribed. - Adoption of PIP therefore enabled autonomous use of wide range of drugs required in practice. - Reduced burden and reliance on ED doctors for third party prescriptions.	- Non-PIP practice reliant on PGDs prior to pandemic. Able to supply treatment in certain cases, although PGDs very restrictive. - Move to remote consultations due to pandemic rendered PGDs largely obsolete, emphasising need for PIP, improving access to treatments,

	- Able to delegate administration to ED nurses, improving team efficiency and medicines safety. - Able to manage whole episodes of care from diagnosis to treatment. - Benefits valued by doctors and other staff given how busy ED could become.	and expanding range of medicines available to paramedics. - Reduced burden and reliance on doctors for third party prescriptions. - Benefits of improved autonomy, reduced burden on colleagues, ability to manage whole episodes of care and engage in remote consulting and prescribing valued given how busy service could become.
Autonomy and Risk Management	- ACP-EMs confident and able to balance autonomy, manage risk and identify when medical support was required in practice. - Views that paramedic ACP-EMs particularly well suited to the role with an aptitude and ability to confidently manage the breadth of conditions encountered, including higher acuity cases.	- PIPs demonstrated high levels of autonomy but equally a keen awareness of the boundaries of their competence and scope, identifying when medical support was required. - Participants described how paramedics have unique skill set and a willingness to attend most cases/patients given their experiences of doing this in the ambulance service.
Medical Support	- Working alongside the ED doctors enabled ACP-EMs to access medical support when required. - Consultant oversight was encouraged and also mandated for certain cases e.g. sedation or discharging paediatrics. - Medical support from senior ED doctors an important facilitator of prescribing decision-making as ACP-EMs reached boundaries of competence/confidence. Although largely operated with autonomy. - Busy, sometimes chaotic environment of ED made it challenging to negotiate medical support and find time for uninterrupted discussions.	- Medical support readily available to PIPs in out-of-hours urgent care. - PIPs and doctors infrequently co-located, and advice sought remotely via phone call or messaging in Adastra software. - Most cases managed autonomously however medical support valuable for more complex cases and when PIPs reached boundaries of knowledge and confidence. - Seeking medical support often involved a delay waiting for the doctor to be free, especially during busy periods. In a minority of historical cases,

	- Conflicting advice sometimes encountered between doctors. - Largely positive relationships between PIPs and doctors, some doctors reported challenges from increased workload/time management issues from providing support, especially when busy. - Some doctors reported frustration that ACP roles had become necessary due to workforce issues. Experiences of lack of medical acceptance outside of EUC and in mainstream and social media, also influenced by ongoing disputes over doctor's pay and working conditions.	PIPs reported abandoning the support request and deciding without it.
Master's Education	- All ACP-EMs had completed MSc in line with requirements by the ED case site and aligned with RCEM credentialing process. ACP-EM job description mandated MSc. - Most participants felt that beyond the clinically focused modules of their MSc, other modules conferred little to no direct benefit to prescribing practice, and MSc not required for PIP. - Trust-wide IP policy did not mandate MSc or postgraduate education specifically for adopting IP, reflective of multi-disciplinary nature of document.	- All PIPs had either completed MSc or were in final stages of doing so. - Case site organisation did not require MSc for Integrated Urgent Care Practitioner role, but fully supported staff financially to engage in MSc pathway if they wanted to. - Participants did not agree full MSc was required specifically for PIP over developing clinical experience and limited number of postgraduate modules. - MSc listed as desirable but not mandatory in job description for PIPs.
Controlled Drugs	- Prior to legislation change, ACP-EMs restricted to administering only Morphine and Diazepam under paramedic exemption. - Restrictions impacted on autonomous practice, burdening colleagues and being reliant on third party prescription requests.	- Despite change in legislation, PIPs largely unable to prescribe CDs effectively, even from limited list, due to issues with Adastra software. - Continued restrictions on practice, requiring third party prescription requests from colleagues.

	- Since limited list approved, able to independently prescribe the main drugs most frequently required in ED practice. - Prescribing data showed high levels of frequency following legislation change, particularly for Morphine. - Prescribing data from doctors and nurse ACP-EMs and qualitative findings illustrated wider formulary of drugs are needed, most notably Oxycodone and Chlordiazepoxide. - Sense of frustration regarding restrictions, views they simply do not make sense and impact on autonomous practice in the ED.	- Delays often encountered with third party prescription requests, impacting on patient access to treatment. - Other prescribers sometimes unwilling or reluctant to prescribe CDs, often due to lack of context and direct engagement with the patient to appreciate rationale for request. - PIPs limited to supplying from stock or issuing hand written prescriptions for permitted list of five CDs. - This did however enable them to contribute more effectively to end-of-life cases as most were encountered during home visits and handwritten prescription could easily be issued.
Ambulance Service Views/Experiences	- One ACP-EM had chosen to retain ambulance service employment. Described they had been denied ACP status/recognition by service and not permitted to use PIP in practice. - Concerns about governance in ambulance sector around enabling rotational working PIPs and access to detailed records which were used by PIPs in the ED in every case to inform decision-making.	- 3/6 PIPs held part-time/bank contracts with regional service, none were able to prescribe during this work. - Overspill of prescribing work into urgent care service from ambulance crews who were unable to access this support internally due to a lack of PIP and/or remote prescribing capability. - Concerns about lack of access to patient records which PIPs used in the case site for every case encountered to inform decision-making.

8.1 The use of PIP in EUC settings

Comparing and contrasting the findings from each case (Table 25) illustrates key contextual differences in the use of PIP. These included prescribing drugs to be administered for higher acuity cases in the ED and the use of remote prescribing in the CAS, which was used to manage lower acuity acute conditions, alongside longer-term complaints and repeat prescription requests. In both case studies, wider contextual factors shaped and influenced PIP. For example, working in the role of an ACP-EM required PIPs to practice in a comparable way to the ED doctors. This resulted in paramedic ACP-EMs prescribing across the entire spectrum of cases encountered. Prescribing practice was as a result, associated with higher levels of risk given the potential side effects of the drugs prescribed. The risk of harm from error was also higher with the drugs prescribed in this work, alongside the risk that critically unwell patients could deteriorate further. These findings contrast with previous research on IP in EUC (Chapter 3) where IPs prescribed only for lower acuity cases. This therefore suggests that the work of PIPs in the context of the ACP-EM role is different to previous IP practice. Whilst the ACP-EM role is multi-professional, the findings also highlighted how paramedics are particularly well suited to it, especially in confidently prescribing for and managing the higher acuity cases in the ED.

In urgent care, wider changes to practice since the COVID-19 pandemic emphasised the need for PIP, given the focus on remote healthcare and electronic prescribing. Adopting PIP in this context therefore enabled paramedics to practice efficiently and improved patient access to medicines. The pandemic had also driven increases in demand and challenges in service delivery across the NHS, and unmet patient needs in primary care resulted in an overspill of prescribing work into the CAS. This therefore required PIPs to prescribe for routine problems and repeat prescription requests which had not been managed by primary care. Equally, a lack of PIP capability in the regional ambulance service also resulted in an overspill of prescribing work to the urgent care CAS. Managing longer term issues, repeat prescription requests and prescribing through remote telephone consultations had not been widely reported in previous research on IP in EUC (Chapter 3). These findings show how in the context of the

complex, post pandemic landscape, PIPs are required to prescribe for a much broader range of issues in EUC in comparison to previous IP practice in these settings.

8.2 The role of medical support

In most cases, PIPs prescribed with high levels of autonomy. However, in the context of both high acuity, higher risk prescribing in the ED and the need to make prescribing decisions in the face of uncertainty in both case studies, the ability to seek medical advice and support was an important facilitator of PIP. This also suggests that whilst the scope of prescribing practice of PIP was broad, in both case studies doctors retained a jurisdictional claim over more complex 'finger in the wind' prescribing decisions.

In the ED, PIPs were physically co-located with doctors, facilitating access to advice and support. Whereas in urgent care, conversations usually occurred remotely by phone or through online messaging. In both settings, the busy nature of services and the considerable workload of the doctors did result in delays and challenges to securing advice. Whilst PIPs and doctors had forged positive, supportive relationships in both case sites, doctors reported that providing support can be challenging given their own high workload. Some doctors also described a sense of frustration that advanced roles such as those fulfilled by PIPs had become necessary because of wider challenges facing the medical profession which had resulted in significant gaps in the medical workforce. Participants also reported perceptions of less favourable views of advanced clinical roles existed more widely amongst doctors in the wider secondary care structure and on social media. However, despite potentially more negative views and lower levels of acceptance existing in the wider medical profession, the findings showed high levels of medical acceptance and willingness to support PIPs in EUC. The challenges for doctors in providing support to PIPs were balanced by the benefits to patient care and contributions to workforce gaps that had been enabled by PIP.

8.3 Controlled Drug restrictions

Although in both cases, CDs were prescribed less frequently than other drug categories, they remained important treatments in EUC. Prior to the change in legislation, the restrictions preventing PIPs from prescribing any CDs impacted on their autonomy and practice. This in turn increased work for their colleagues and resulted in delays to

patient treatment. In the ED case site, once the legislation had changed, the paramedics were able to immediately prescribe the most frequently required CDs in practice. However, in both settings other drugs such as Oxycodone were required to treat pain in frail, elderly patients in ED and end-of-life care patients in urgent care. Other CDs were also often needed in practice, such as Chlordiazepoxide in the ED, and a wider range of CDs to manage repeat prescription requests in urgent care. The ongoing restrictions resulted in frustration for PIPs and continued to increase the work of other prescribers. They were also not always willing to issue third party prescriptions, often due to a lack of contextual insight into the patient care episode. Wider service pressures also resulted in delays in managing third party CD requests particularly in urgent care where requests were managed alongside other tasks and priorities. The additional restrictions from out-of-date clinical software in the urgent care site also compounded these issues.

8.4 The role of master's education

Across both sites, most PIPs had completed or were nearing completion of a master's. However, participants did not agree that a full master's programme was needed for paramedics to adopt PIP. Disparity between professions were also highlighted, with other IPs such as nurses not being required by professional bodies to complete a master's. These views suggest that paramedics are considered differently to other IP professions at a strategic level and within national policy, despite now working in multidisciplinary EUC roles. Participants reported views that national policy regarding eligibility to adopt PIP should therefore be more consistent with other professions also working in these roles. Whilst at the ED case site, the ACP-EMs were required to complete a master's as part of their RCEM credentialling process, at the urgent care site, PIPs were not required to hold a master's. This was underpinned by an organisational stance that their role did not include responsibilities across the other pillars of advanced practice (research, education and leadership). Across both case studies, all PIPs had adopted PIP before completing master's level education. The clinical modules within master's programmes were considered by PIPs to be beneficial for developing prescribing competence. However, other modules on research and leadership were viewed as being more aligned with working across these other pillars of advanced practice, rather than being required to adopt the clinical skill of PIP.

In the following chapter, these findings are considered alongside the more strategic insights of key stakeholders on this aspect of PIP (Chapter 5). They are also discussed in the context of wider literature to consider if and how master's level education should remain a requirement for adopting PIP or if future changes to national policy are required.

8.5 Experiences of the ambulance service

None of the PIPs in either case study had been able to use PIP during part-time work in the ambulance sector. This led to frustration given they encountered cases where PIP would have been of benefit. An overall lack of PIP within the ambulance service was also observed to result in an overspill of prescribing work for the CAS. Organisational leaders in both case sites described that a wider adoption of PIP and better utilisation of external, part-time PIPs could improve patient care and reduce demands on their services. However, participants in both sites also reported that for PIP to be safe and effective in the ambulance service, access to detailed patient records through the EMIS Viewer platform would be needed. These views were underpinned by the observational data from both case studies which emphasised how access to detailed patient records and information were a clear facilitator of PIP. Participants in both case studies also perceived that ambulance service practice provides an opportunity for paramedics to develop a unique skill set from responding to 'everything and anything'. This equips them with important experience in managing a broad range of high and low acuity conditions, confidence in working in isolation in the community, applying autonomous decision-making and balancing clinical risk. These were perceived to be highly transferable and beneficial to prescribing and clinical practice in the case site EUC settings.

8.6 Chapter summary

This cross-case analysis shows that although the use of PIP was different between each case study, the scope of prescribing in both had been driven by wider contextual factors. These included the remit of the ACP-EM role which drove a broad scope of prescribing in the ED, including higher acuity case management. Wider unmet patient needs in primary care and the ambulance sector also drove a broad scope of prescribing in the CAS which ranged from treating acute problems, to issuing repeat

prescriptions and manging chronic illness. The resulting benefits from PIP were similar in both case studies. These included improving patient access to medicines and enhancing paramedics' overall contribution to patient care and service delivery by autonomously managing a broad range of conditions. The unique skill set developed by paramedics within the ambulance sector enhanced their prescribing and clinical practice in both settings. Key facilitators of PIP were also similar in both sites and included access to detailed patient records and the availability of medical support. While legislative changes had enabled PIPs to prescribe the most commonly required CDs in both settings, access to a broader formulary of CDs would enhance the practice and overall contribution of PIPs in EUC.

Differences were identified between sites regarding the expectation for master's level education; however, participants did not view this level of qualification as a clear facilitator of or prerequisite for PIP. Levels of medical acceptance for PIP were high in both case studies and PIPs practiced in the context of close-knit, multidisciplinary EUC teams. The additional work and challenges for doctors in providing support to PIPs were balanced against the benefits and contribution that had been realised from PIP. These were perceived to be important in addressing workforce gaps and the high levels of patient demand in the challenging, post-pandemic EUC landscape. The following chapter will explore these dynamics further, integrating findings from the literature reviews (Chapters 2 and 3) and key stakeholder interviews (Chapter 5) with wider research and theory.

Chapter 9 Discussion

This chapter synthesises the findings from all phases of the study, situating these within previous research and wider literature to answer the research questions. The benefits and limitations of PIP in EUC (Research Question 1) are explored in the first three sections of the chapter. The remaining sections address Research Question 2, focusing on key facilitators and barriers of PIP in EUC.

9.1 The impact of the COVID-19 pandemic

As outlined in Chapter 1, the research was conducted at a time when a perfect storm of pressures impacted the health and care system following the COVID-19 pandemic, and which were most visible across EUC as the 'front door' of the NHS (NHS England, 2023b). Existing workforce shortages and a lack of capacity from years of underfunding, exacerbated by the pandemic, contributed to sustained, high patient demand with long delays in providing assessment and treatment across EUC services (Royal College of Emergency Medicine, 2021). Since the pandemic, demand for EUC continues to surpass pre-pandemic levels. In 2024/25, there were approximately 16.8 million ED attendances and 4.8 million emergency admissions, far exceeding pre-pandemic figures (The King's Fund, 2025). NHS England performance data show a 6.9% annual increase in A&E attendances to January 2025 (NHS England, 2025a), with only 59% of patients managed within four hours in 2024/25 (NHS England, 2025a; House of Commons Library, 2023).

The pressure on EUC services was evident in the research findings of this study of PIP in EUC. In both case sites, participants described how demand had grown to levels never seen before the pandemic. These perceptions mirrored the qualitative findings from case studies, with patients being cared for in ED corridors, or waiting for hours to be contacted by the out of hours urgent care service. Given the challenges faced in providing timely patient care, the resulting benefits from PIP such as higher levels of autonomy and an ability to manage whole episodes of care were valued by EUC doctors and service leaders. Discussed further in later sections of the Discussion, the current post-pandemic landscape also directly influenced PIP in EUC. This included the rapid shift to remote consulting and electronic prescribing in urgent care, which emphasised the need for paramedics to adopt PIP over a continued reliance on PGDs in this space. Prolonged admissions in ED and an overspill of work from stretched primary care

services also resulted in a broader prescribing scope by PIPs. This included prescribing treatments to manage both acute and longer-term health issues, alongside dealing with repeat prescription requests. Overall, the sustained pressures felt across EUC services reinforced the benefits of PIP in EUC and the contribution that advanced paramedics are making as part of multi-disciplinary healthcare teams.

9.2 Realising the benefits of paramedic prescribing in emergency and urgent care

The findings of this research have provided the first detailed insight into PIP in EUC, confirming that a range of important benefits have been realised. These align with the benefits proposed in the PIP stakeholder and public consultation documents such as improving patient care, ensuring timely access to medicines and enhancing the contribution of paramedics within multi-disciplinary teams (NHS England, 2015a). The findings reflected these anticipated benefits to show for example, how in the ED, ACP-EMs were able to delegate the administration of prescribed drugs to ED nurses once qualified in PIP, maximising team efficiency. Being unable to delegate administration in this way was highlighted as a barrier to paramedic practice in EDs in previous research. This reportedly delayed patient access to medicines and increased the burden on other prescribers who were required to issue third party prescriptions (Clarke, 2019). These challenges were also described by participants in this study, whilst also confirming that adopting PIP had largely resolved them.

Within each case site, PIP enhanced the autonomy of paramedics, enabling whole episodes of care to be managed, without relying on other prescribers for assistance. This improved patient access to medicines and enhanced the contribution of PIPs in busy EUC services. The findings of the literature review in Chapter 3 also suggested similar benefits had been realised from the use of IP in EUC, through being able to autonomously initiate treatments. More broadly, other systematic reviews on IP in a wider range of settings such as primary and secondary care have also reported similar enhancements to clinician autonomy, improved patient access to medicines and reducing the burden placed on doctors (Cleary *et al.*, 2017; Abuzour, Lewis and Tully, 2018b; Graham-Clarke *et al.*, 2018; Jebara *et al.*, 2018; Fox *et al.*, 2022).

However, the findings of this study also highlighted some potentially unique benefits not reported in previous research. These included the benefits from remote, electronic prescribing, which was not widely used in EUC before the COVID-19 pandemic. As such, this study is perhaps the first to report on this use of IP in EUC. In the context of PIP this transition to remote urgent care resulted in PGDs becoming largely obsolete. This emphasised the need for PIP in this context, given it became essential to provide effective patient care. Similarly to participants' accounts of pre-pandemic EUC practice, most patient consultations in primary care were also conducted face-to-face. A similar rapid transition to remote consulting then occurred as the pandemic unfolded (Greenhalgh *et al.*, 2022). Since the pandemic, the hybrid approach seen in EUC has also evolved and nearly half of all primary care consultations are now conducted through remote delivery (Royal College of Emergency Medicine, 2021). Whilst efficiency gains, generally high levels of patient satisfaction and improved convenience for patients in primary care were reported in some studies (Greenhalgh *et al.*, 2022), PIPs reported concerns about issuing remote prescriptions in primary care, choosing to self-restrict their practice to prescribing only in face-to-face consolations (Pryor, Hand and Dunn, 2023). This previous research did not report why remote prescribing was perceived to be riskier than face-to-face practice. However, in this study on PIP in EUC, one urgent care doctor interviewed during the CAS case study reported concerns that remote consultations can result in symptoms and findings of more serious illness being missed. Other authors have also argued that remote consultations do not allow for some of the more nuanced and subtle conversations which occur when patients are seen face-to-face. These are described as 'door handle moments' where potentially serious symptoms such as those associated with suspected cancer which are not revealed until the patient is about to leave the consultation room (Greenhalgh *et al.*, 2022). Wider concerns around digital inequalities have also been raised as a potential issue of remote consulting (Imlach *et al.*, 2020; Royal College of Emergency Medicine, 2021). Equally, some studies have demonstrated higher frequencies of remote antimicrobial prescribing in comparison to face-to-face practice in primary care (Han *et al.*, 2020; Greenhalgh *et al.*, 2022; Vestesson *et al.*, 2023). However, most participants in this study viewed the use of remote consulting and electronic prescribing as positive innovations in the context of the more straightforward, acute patient cases encountered in urgent care. PIPs were also able to use digital photography or video conferencing or arrange a face-to-face review for more complex cases or where further diagnostic

testing or examination were required. PIPs in this research were also observed to demonstrate high levels of antimicrobial stewardship and confidence in resisting any pressure to prescribe antimicrobials.

The findings therefore suggest that the fears expressed about remote consultations in primary care were not apparent in the practice of PIPs in this study. This may however reflect that patients presenting to primary care are more likely to have complex, chronic issues. These may be more likely to involve 'door handle moments' and a need for face-to-face consultations in comparison to urgent care, where many cases are due to symptoms of acute, lower acuity illness, which can be appropriately managed through remote consultations.

9.3 Scope of paramedic prescribing in contemporary emergency and urgent care practice

The widely reported national pressures being faced by EUC services (House of Lords, 2023) were clearly apparent in the research findings. These also directly influenced the use of PIP in EUC, driving a broad scope of prescribing practice. This included prescribing drugs to manage not only the acute treatments expected in EUC, but also for more chronic complaints and repeat prescription requests in urgent care. PIPs were also required to initiate longer duration treatments in some cases in the ED, due to delays in patients being admitted to the wider hospital.

In the context of ED based practice, the findings also showed that paramedic ACP-EMs prescribed for high acuity cases. Whilst previous research had suggested PIPs in EUC were prescribing for higher acuity conditions such as trauma and major illness (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021), these findings lacked detail and specificity, which this study has now provided. The very broad scope of practice in both case studies, and the management of higher acuity cases in the ED contrasted with the previously reported practices of IPs in EUC. Whilst the literature review on IP in EUC (Chapter 3) identified that only a very limited body of research on contemporary UK EUC practice existed, the findings suggest that in the UK and internationally, IPs managed only lower acuity conditions. Wider international literature on advanced clinical roles in ED settings also confirms the findings of the literature review (Chapter 3), reporting that advanced nurse practitioners and PAs in EDs in the USA only manage lower acuity cases

(Wu and Darracq, 2021). It appears therefore, that at the current time, the scope of PIP demonstrated in this research is unique in this respect. Although this was largely due to paramedics adopting PIP in the context of the ACP-EM role, which specifically requires a broad scope of practice (Crouch and Brown, 2018; Royal College of Emergency Medicine (RCEM), 2022a).

Whilst initially only paramedics and nurses could train as ACP-EMs, the Royal College of Emergency Medicine has extended the list of eligible professions to other Allied Health Professions and pharmacists (Squire, Thompson and Boyes, 2025). This suggests that the broader scope of practice of PIPs shown in this research will also be demonstrated by other professions working as ACP-EMs. The findings of this research illustrated how the requisite skills and experience of paramedics prepares them to confidently prescribe for high acuity ED cases. In contrast, previous research identified in the literature review on IP in EUC (Chapter 3) has suggested that other professions may be less suited to this work. In one study, pharmacist ACPs in ED settings were able to offer their own unique contribution through providing pharmacological advice to other ED staff. However, pharmacist ACPs were perceived by other ED staff to be less suited to higher acuity work in the resuscitation area of the ED (Wright *et al.*, 2018). Only one study in the review reported higher acuity prescribing by nurse IPs and this was in the context of unexpected, high acuity cases needing to be managed in a minor injury unit (Brett Bowen, 2019). In this study, IPs found such cases stressful given they were outside of their usual scope of practice. As the number of different professions adopting the ACP-EM role expands, further research should explore if and how interprofessional differences influence clinical and prescribing practice.

The literature review on IP in EUC (Chapter 3) demonstrated how in the context of community urgent care services, IPs in retail clinics and community pharmacies focused on managing acute, uncomplicated infections. In contrast to the body of evidence on IP in these urgent care settings, both literature reviews presented in Chapters 2 and 3 identified only a small amount of research on out-of-hours urgent care. Previous research was also based on pre-pandemic practice in this setting (Williams *et al.*, 2018; Best and Taylor, 2021; Stenner, Van Even and Collen, 2021). As the first research to report in detail on the use of PIP in out-of-hours urgent care, the findings show the broad scope of PIP in this context, which contrasted with practice in other community urgent care settings and with other IPs working in out-of-hours urgent

care. This included prescribing not only for acute problems, but also to manage chronic conditions and repeat prescription requests. The need for this broader scope of prescribing was perceived by participants to be driven by the wider pressures faced in primary care. Fernandes and Ray (2023) lend support to these views, reporting how primary care activity has increased substantially since the pandemic, alongside a reduction of 2,133 fully qualified GPs between 2015 and 2023. Research by Pilbery *et al.* (2024) also reported that although NHS 111 advise nearly half of all patients to contact their primary care provider, less than half actually do make contact, and even when they do, they are often not reviewed in the expected time frame of 72 hours. Whilst referral rates to the out-of-hours CAS were not reported, 999 calls were higher when patients did not have contact with primary care and so were ED attendances. This lends support to the findings of this research that unmet needs in primary care can result in patients turning to EUC for treatment.

Only one included study in the literature review reported the management of repeat prescriptions in urgent care centres (Carey, Stenner and Courtenay, 2014). Whilst the findings of this research showed repeat prescription requests were a frequent and expected part of prescribing practice in the CAS, IPs in previous research felt that patients should not be seeking repeat prescriptions from urgent care services (Carey, Stenner and Courtenay, 2014). In other research, nurse and pharmacist IPs (Maddox *et al.*, 2016) and PIPs (Pryor, Hand and Dunn, 2023) all reported concerns with issuing repeat prescriptions in primary care. This was perceived to be associated with an increased level of risk and outside of the scope of practice of IPs (Maddox *et al.*, 2016). In the context of urgent care, only very short courses of repeat prescriptions were issued by PIPs, usually to provide three days of treatment. This may therefore represent a different level of perceived risk in comparison to initiating or continuing longer term treatment in primary care. However, the drugs prescribed by PIPs when managing repeat prescription request were not those typically used to manage acute, urgent care problems, such as blood pressure medications and mental health treatments. Being confident, able and willing to prescribe these treatments improved patient access to medicines and enhanced the contribution of PIPs. These finding also emphasised the benefits of PIP, given a previous reliance on PGDs only enabled one-off treatments to be supplied in certain cases and therefore did not allow for paramedics to manage repeat prescription requests.

It appears therefore that in the context of increasing demand and the development of a multi-professional EUC workforce, contemporary EUC practice now requires a much broader scope of prescribing in comparison to previous IP practice in these settings. This has further emphasised the case of need for PIP and the resulting benefits from its introduction.

9.4 Paramedic prescribing and the ambulance sector: Potential benefits and challenges

The PIP stakeholder and public consultation documents anticipated a clear need for PIP within the ambulance sector (Department of Health, 2010; NHS England, 2015b). However, key stakeholder participants in this research described how the CHM panel actually had significant concerns about introducing PIP in this setting. This resulted in discussions being re-framed around the need for PIP in a much broader range of clinical settings. Since the approval of PIP, key stakeholders described how the uptake of PIP in the ambulance sector has remained minimal, building on the more limited insights from previous PIP research suggesting this was the case (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021; Edwards, 2023). The views of key stakeholders also suggested that the existing utility of PGDs had resulted in an unclear case of need for PIP. This contrasts with the arguments made for PIP in the consultation documents, which outlined how PGDs were not sufficient for advanced paramedic practice (Department of Health, 2010; NHS England, 2015a). However, previous research also reported views that PGDs are sufficient for ambulance service practice and that advanced paramedics had decided not to adopt PIP given PGDs were perceived to be sufficient for practice in the ambulance sector (Best and Taylor, 2021; Edwards, 2023). Whilst a sample of specialist paramedics surveyed in previous research reported high levels of interest in adopting PIP, they also agreed that PGDs enabled community treatment of most urgent care cases they encountered (Bedson and Latter, 2018). More broadly, PGDs are also used to provide urgent treatment of acute illnesses in community pharmacies (Hall *et al.*, 2019 (NHS England, 2024c) and have also been used by non-prescribing nurses in EDs (McConnell, Slevin and McIlfatrick, 2013; Black and Dawood, 2014). The views of participants in this research therefore lend support to assumptions that PGDs do have a utility in EUC and can enable treatment for one off, urgent care presentations.

However, participants also described benefits from PIP in the context of electronic prescribing. This was used to remotely manage patients calling 999 with lower acuity issues, in a similar way to the out-of-hours CAS. However, only a minority of ambulance services were reported to have adopted PIP and even fewer use remote prescribing. Given all UK ambulance Trusts now undertake remote assessment and management of 999 calls (Brady, 2020), this is likely to represent a missed opportunity to improve patient access to medicines and improve service delivery. Observations during field work also lent support to this conclusion. Cases were observed which were a result of an overspill of prescribing work from the ambulance service due to a lack of internal PIP capability. This increased work for PIPs and other clinicians in the CAS.

Despite the potential for benefits to be realised, some key stakeholders described ambulance Trusts are unsure how to integrate the broader scope of practice made possible by PIP, with the more protocolised and restricted nature of ambulance service practice. Even where PIP had been implemented, restrictive governance processes had been put in place to limit the scope of PIPs to a restricted formulary. This contrasts with the results of the public consultation on PIP which favoured a fully unrestricted scope (NHS England, 2016). The findings therefore suggest that ambulance services are not organisationally ready for PIP. Key stakeholders and case site participants also described how ambulance Trusts prevented internal PIPs from prescribing during formally agreed rotational working contracts in other settings. The regional ambulance service also did not permit case study PIP participants in this study to prescribe during part-time ambulance work. Previous research also reported that of a small number of PIP survey respondents who were practising in the ambulance sector, only those (2/11) employed full-time actually used PIP in practice (Best and Taylor, 2021). Whilst the reasons for this were not confirmed in this previous research, PIPs in this study reported the barriers they experienced were because they were contracted to work under a standard paramedic contract which did not include or permit the use of PIP.

Key stakeholders in this study also described how the CHM panel raised concerns about PIP being undertaken without sufficient access to patient records and that currently ambulance paramedics have access to limited summary of care records. This much less detailed level of information was a source of concern for case study participants in this research, who contrasted this with the level of information available to PIPs through the EMIS Viewer platform. Previous research on IP in EUC (Chapter 3)

also reported that access to records is an important facilitator of IP in roles such as out-of-hours urgent palliative care.

The findings of this research therefore suggest that currently, the implementation of PIP in the ambulance sector is limited and characterised by a range of challenges. However, it is also clear that a case of need does exist, and further expansion of PIP could result in benefits for patients and EUC services, particularly in the context of enabling remote healthcare in ambulance services. Further research will however be required to confirm if PIP continues to expand across the ambulance sector. This will need to evaluate if ambulance services continue to restrict the scope of PIPs, if they choose to support part-time PIPs to prescribe in practice and if access to detailed patient records and remote prescribing are introduced.

9.5 The culture of paramedicine and its influence on prescribing in emergency and urgent care

The findings of this study suggest that a paradoxical relationship exists between PIP and the culture of paramedicine, the origins of which are rooted in ambulance service practice. On the one hand, paramedic culture is associated with high levels of autonomous clinical practice. The experience that paramedics develop in making autonomous decisions and in managing a wide range of conditions is also highly transferable to practice in other clinical settings. When combined with PIP, this unique skill set and experience equips paramedics to fulfil highly autonomous, advanced roles in EUC. Conversely, the very rigid, protocolised nature of paramedic practice contrasts with the almost unrestricted scope associated with PIP. As a result, key stakeholders in this study described how paramedics from ambulance services often struggled to articulate a clear gap in their practice which required them to adopt PIP.

However, despite the very protocolised nature of clinical practice and medicines usage, paramedics are required to apply unusually high levels of autonomous decision-making from the point of registration in comparison to other professions. This involves working in relative isolation in the community and undertaking complex decision-making regarding whether patients can be safely discharged in the community, instead of being conveyed to hospital (Department of Health, 2005;2010; NHS England, 2016; Bedson and Latter, 2018; Newton, Hunt and Williams, 2020; McCann, 2022). Unlike any other

profession, paramedics are also required to respond to ‘anything and everything’ (Collen, 2024). In contemporary paramedic practice, this includes managing high acuity cases such as cardiac emergencies and major trauma, as well as a broad range of much lower acuity minor illness and injury, therefore operating between the extreme and the mundane (Brewis and Godfrey, 2019; Henderson *et al.*, 2019).

During the COVID-19 pandemic, paramedics reported how their work was reminiscent of ‘the good old days’, as call volumes rapidly declined and the few cases that were attended were usually high acuity emergencies (McCann, 2022). However, whilst paramedics often view lower acuity cases with distain (Phillips, 2020; McCann, 2022), Eaton (2023) considers how it is the experience that paramedics forge in operating between the extreme and mundane that makes them so adaptable to roles in other settings. Similarly to the findings of this research, Drennan, Collins and Brimblecombe (2021) also reported that paramedics demonstrate confidence in managing higher acuity cases and sudden patient deteriorations when working in advanced ED roles. Ellis (2022) also reports that advanced paramedics working in primary care perceived themselves to be more confident in autonomous decision-making around prescribing and clinical care because of the experience they had gained in their ambulance service practice. These attributes reflect what others have described as paramedics’ unique selling point (McCann, 2022).

Paramedics are also permitted unusually high levels of autonomy in the use of drugs in comparison to other professions, through paramedic legislative exemptions (NHS England, 2015a). Unlike PGDs, which do not permit any deviation from the criteria in each PGD document, paramedics are not restricted by legislation in their scope and use of exemption drugs (UK Government, 2018). Mallinson (2020) claims that whilst clinical practice and the use of these drugs are informed by protocolised, evidence-based guidelines issued by the Joint Royal College Ambulance Liaison Committee (Brown, 2019), paramedics are increasingly applying ‘clinical courage’ to operate outside of guidance. This is due to the breadth and complexity of the cases they now encounter. However, Mallinson (2020) goes on to claim that such practice likely goes unreported by the profession, due to the cultural fear of repercussions and disciplinary action which exists in the ambulance sector.

McCann (2022) points out that whilst paramedic practice has rapidly evolved and professionalised through a transition to graduate level profession, in the ambulance sector at least, paramedics still retain much of the 'blue collar' aspects of their work. This results in a complex tension in demonstrating clinical autonomy within a rigid, controlling management structure and blame culture. As a result, paramedics have to practice autonomously, whilst at the same time fearing organisational and professional repercussions in doing so. McCann (2022) also points out that because paramedic practice has evolved from being an occupation of emergency service workers or 'ambulance drivers' to the autonomous profession they are today, they do not sit comfortably into any pre-existing category of occupation or profession.

Newton, Hunt and Williams (2020) also describe how the steep developmental trajectory of paramedics has not been mirrored by comparable pace of reform and modernisation in NHS ambulance services. This they claim, has led to a mismatch between the capabilities offered by paramedics and the professional opportunities available to them. This therefore hampers practitioners' ability to make full use of their skills. This perspective may explain why so many paramedics who have adopted PIP are now situated outside of the ambulance sector, despite the focus of the PIP stakeholder and public consultations on the case of need for PIP within ambulance services (Department of Health, 2010; NHS England, 2015a; Best and Taylor, 2021; Stenner, Van Even and Collen, 2021; Edwards, 2023).

In order to explain the complex nature and culture of paramedicine, McCann (2022) also draws on the notion of 'street-level bureaucracy', a concept originally formulated by Lipsky (2010). This is focused on understanding the complex work of different public officials, which is often influenced by aspects such as employee discretion, experiential judgement and a deep understanding of the 'grey areas' involved in public service work. McCann (2022) goes on to outline how the occupations focused on in previous literature regarding street level bureaucracy, such as policing, social work and teaching, are all professions which are often considered below the classic professions of medicine, law and accounting. These lower-level professions are still however very much characterised by the daily exercise of discretion and judgement available to higher level professions. However, in contrast, 'street-level professions' such as paramedicine, are afforded relatively low occupational status in complex professional hierarchies, bureaucracies and systems, whilst still holding much of the responsibility and stress

that goes with acting on personal judgement (McCann, 2022). The concept of street level bureaucracy therefore encapsulates the complex tensions in paramedic culture. These include a need to demonstrate autonomy at a 'street level', whilst lacking the occupational status and organisational support to feel confident in managing the associated risks and uncertainty in doing so.

In contrast to the culture of paramedicine, urgent care service case site participants described a culture of courage-based, rather than fear-based medicine existed. This culture was also reflected in the ED case study findings, with participants describing how accepting and holding clinical risk was expected and supported. PIPs articulated that this very different organisational culture gave them confidence when holding and managing risk in their prescribing decision-making. The concept of clinical courage has been previously discussed in the context of practising medicine in rural locations and during medical elective placements in developing countries (Gilbert *et al.*, 2013; Konkin *et al.*, 2020). In both contexts, a lack of support, resources or more experienced clinicians, can result in a necessity to practice beyond usual scope of practice. Mallinson (2020) relates this to the nature of paramedic practice, which is also characterised by similar applications of clinical courage when operating outside of rigid, treatment guidelines. However, as previously discussed, Mallinson (2020) goes on to claim that because of the complex blame culture of paramedicine, such displays of autonomy and clinical courage go unreported, due to fears of regulatory action and a lack of organisational support.

However, despite this challenging and complex culture surrounding paramedicine, participants in this research described how this actually equips paramedics with important, transferable skills. When combined with PIP, this experience enables paramedics to fulfil highly autonomous roles in other EUC settings, bringing with them a unique set of skills. These included an ability to confidently manage high acuity cases and unwell children in the ED and undertake home visits in the community in urgent care. Participants also described how unlike other professions, PIPs were willing to 'give most things a go', which they perceived was reflective of their unique culture and background.

The findings therefore show that paramedics are providing a unique contribution in EUC, which has been enhanced by adopting PIP. McCann (2022) describes how 'new

professions' such as paramedicine can stimulate social and organisational change in this way. In business and management literature, these are referred to as disruptive innovators (Newton, Hunt and Williams, 2020; McCann, 2022). It appears that whilst the existing culture of paramedicine within the ambulance sector does not support the use of clinical courage, it does provide an important proving ground in which unique skills and attributes can be developed, which benefit clinical practice and PIP in other EUC settings. The culture of paramedicine may therefore be evolving, as it transcends the boundaries of ambulance service practice, allowing PIPs to practice courage-based, rather than fear-based medicine in EUC.

9.6 Balancing autonomy and risk through shared decision-making

Despite their high levels of autonomy and wide scope of practice, PIPs maintained a keen sense of the boundaries of their competence and confidence and an awareness of the risks associated with PIP. Drawing on evidence-based prescribing guidance enabled them to balance their autonomy with managing risk. Equally, seeking medical support was also an important facilitator when guidance could not be readily applied to the situation.

Edwards, Coward, and Carey (2022) also found that adherence to evidence-based guidelines enhanced perceptions of competence among IPs, while prescribing outside these protocols was seen as risky and unprofessional, prompting them to defer decision-making to doctors. Similarly, Maddox et al. (2016) reported that nurse and pharmacist IPs in primary care were cautious about assuming responsibility for decisions outside of prescribing guidelines, deferring responsibility to medical prescribers. In urgent care, Williams et al. (2018a) also found that nurse IPs also favoured guideline-based prescribing, while doctors relied more on clinical intuition. Both groups in this study agreed that complex cases beyond guidelines should be managed by doctors.

PIPs in this research acknowledged that out-of-hours urgent care was potentially riskier than other practice settings such as primary care, given it is often characterised by one-off patient encounters and without ways of arranging a planned review or follow-up. Similar views of these inherent risks are also reported by nurse IPs working in out-of-hours urgent care (Williams *et al.*, 2018). However, the nature of practice for PIPs in EUC

settings is again arguably more familiar to paramedics given their experience of working in the ambulance service, where clinical and medicines-related decisions have to also be made in the context of these limitations. This may explain why PIPs in this study appeared willing to accept and manage the inherent risks associated with prescribing in EUC, demonstrating an aptitude to balance risk and autonomy in a similar way to their ambulance service practice.

Seeking medical support was an important facilitator of PIP in both case studies in this research, especially as PIPs navigated more complex cases or those not completely covered by guidelines. Nurse and pharmacist IPs have described in previous research studies how they engage in a process of shared decision-making with other healthcare professional team members. Whereas shared decision-making often occurs between healthcare staff and patients, this process of interprofessional shared decision-making involved IPs identifying the boundaries of their competence and confidence and sharing decision-making with doctors and other members of the multidisciplinary team when required (Abuzour, Lewis and Tully, 2018c;a). Previous evidence syntheses of IP research have also highlighted how shared decision-making with doctors and other healthcare staff is an important facilitator of IP in both primary and secondary care settings (Noblet *et al.*, 2017; Edwards, Coward and Carey, 2022; Xu, Qi and Mao, 2025).

However, once PIPs in this study had sought advice, unlike other IP professions studied in previous research, they autonomously prescribed the required treatment and retained overall responsibility for the patient's care. These differences may be explained by paramedic practice and culture being in many ways unique. Despite high levels of autonomy in medicines use (NHS England, 2016; Bedson & Latter, 2018; Eaton, 2023), paramedics engage in shared decision-making while retaining full responsibility for drug administration. For example, when repeat benzodiazepine doses are needed for prolonged seizures, paramedic guidance advises consulting an ED doctor due to complex risk–benefit considerations. However, this advice does not transfer legal responsibility to the prescriber, as benzodiazepines are CDs and cannot be administered under a formal verbal order (Brown, 2019; (UK Government, 2012). Such experiences may reinforce paramedics' willingness to maintain overall prescribing autonomy once support and shared decision-making has been sought from a doctor. In contrast to the more isolated nature of ambulance service practice, PIPs in this research study were embedded in multi-disciplinary EUC teams. Consequently, this

enabled them to demonstrate prescriptive autonomy whilst at the same time engaging in shared decision-making with doctors and other staff.

This balance between autonomy and shared decision-making is also reflected in the multi-professional guidance for all IPs issued by the Royal Pharmaceutical Society (2022). This emphasises the need for IPs to take responsibility for their own knowledge and competence to underpin safe independent prescribing decision-making. Equally, this guidance emphasises that IPs must also ensure they practice within the boundaries of their competence and scope. It is also the responsibility of individual IPs to ensure appropriate levels of support and supervision are available to them in practice and to work collaboratively with other healthcare professionals to share prescribing decision-making when needed (The Royal Pharmacutical Society, 2022).

Interprofessional shared decision-making is an inherently relational process in which clinical decision-making depends on role clarity, trust and mutual respect, to enable professionals to combine their expertise to address complex care needs (Légaré *et al.*, 2011). These principles were clearly reflected in this study's findings on PIP in EUC, where mutual respect between paramedics and doctors underpinned collaborative decision-making. Rather than being a transactional exchange in which paramedics sought permission or instruction, interactions between PIPs and doctors were characterised by a reciprocal exchange of ideas, reasoning, and clinical perspectives. Although doctors often steered the discussion toward a final decision, the paramedic's insight into the individual patient case and their own knowledge and clinical assessment were integral to the process. This collaborative process often also led to informal peer education to inform future prescribing decision-making, creating a safe space for professional growth, where autonomy was exercised within a supportive framework and where clinical accountability and risk were collectively shared. This interdependence allows autonomy to coexist with shared risk, reinforcing both safety and collective confidence in prescribing decisions.

9.7 Medical acceptance and jurisdictional claims over prescribing

The findings of this research highlighted the role of medical support as a means of balancing autonomy and the risks associated with PIP. This therefore is reliant on medical acceptance and support for PIP. Previous systematic reviews highlighted

negative views of IP by the medical profession in early research. Whilst these have abated over time (Cooper *et al.*, 2008; Graham-Clarke *et al.*, 2018) this is arguably in the context of the narrower scope of IP practice also demonstrated by these systematic reviews on IP, and in previous research on IP in EUC (Chapter 3). The findings of this research show how in contrast PIPs practice in prescribing domains historically only occupied by doctors. This shift is particularly visible in the development of roles such as the ACP-EM, which explicitly aims to prepare healthcare professionals to work at the level of a middle-grade emergency medicine doctor (Crouch and Brown, 2018; Royal College of Emergency Medicine (RCEM), 2022a). However, rather than being viewed negatively by doctors, positive views of PIP existed in this research. In the context of the high levels of patient demand, the contributions that PIPs could make in addressing workforce shortages and through providing autonomous patient care were valued by doctors and other case site staff. This influenced their positive views of PIP and as a result doctors were willing to support and advise PIPs when required.

However, the findings also emphasised how providing this support was challenging, as doctors had to also manage their own high workloads. In both case sites, PIPs represented a very small proportion of the overall workforce, and nationally, PIPs represent just 6% of the entire profession (HCPC, 2024). However, the rate of PIP expansion has been far more rapid than anticipated (Chapter 5), suggesting PIP numbers in EUC will continue to grow in the future. This could result in further challenges in obtaining medical support for PIP as the ratio of PIPs to doctors becomes higher. Doctors in this study did describe how providing support became challenging if the ratio between doctors and other clinicians requiring support was too high.

Doctors and other participants also described how in contrast to the high levels of medical support evident within the case site clinical teams, they had experienced concern and a lack of acceptance of advanced paramedic roles amongst the medical profession, often in the wider secondary care structure. Key stakeholders also reported that some members of the medical profession had also reported very negative views of PIP during the public consultation, stating they did not support the proposal, and PIP would compromise patient safety. Case study participants also reflected on the wider issues they were observing in mainstream and social media. These related to ongoing pay disputes and negative views on the expanding scope of medical roles in the UK, particularly in relation to PAs. Drennan, Collins and Brimblecombe (2021) lend support

to these insights, reporting how a range of key stakeholders with strategic insights into EUC described how emerging advanced practice roles were viewed as a potential threat by doctors. The study also found that ACP-EMs are usually more highly paid than the middle grade doctors who they are trained to substitute, which has the potential to create tension between PIPs and doctors. Recent survey data also found that 61% of respondents in advanced practice roles reported doctors' attitudes as a key barrier to implementation (The Nuffield Trust, 2025).

Internationally, the expansion of advanced practice roles such as nurse practitioners and PAs has similarly been used to address shortages in the medical workforce and increasing healthcare demand (Kurtzman, Barnow and Deoli, 2023). However, concerns have been raised by medical professionals in countries such as the USA and Australia regarding further extensions of autonomy or scope into high acuity prescribing work in EDs (Weiland, Mackinlay and Jelinek, 2010; Wu and Darracq, 2021). The literature review on IP in EUC also reported negative views existed regarding IPs providing urgent care in retail clinics and community pharmacy by doctors in the USA and Canada (Chapter 3).

While other countries appear to actively limit role expansion, NHS reforms over the past decade have in contrast, driven an expansion of advanced clinical practice across a broad range of professions and specialities (Nancarrow and Borthwick, 2021; McCann, 2022). In EUC, increasing the number of ACPs is a key strategy outlined in the NHS Delivery Plan for Recovering Emergency and Urgent Care (NHS England, 2023b). Nonetheless, as described by participants in this research, some UK doctors have expressed concern about the growing reliance on non-medical advanced roles, echoing the alarm seen internationally. Particularly against a backdrop of continuing disputes over medical pay and staffing (Eaton, 2023). However, this contrasts with the findings of this study, where medical acceptance of PIP and advanced practice roles were high.

However, the findings of this research do also show that doctors in EUC do also retain a degree of prescriptive control and authority over more complex 'finger in the wind' decisions, which were often associated with a need to make judgement calls in the absence of supporting clinical guidance. Both PIPs and doctors perceived that the medical profession were better placed and trained to make these decisions, echoing the findings of previous research into IP in EUC (Williams *et al.*, 2018).

Neo-Weberian theory, as articulated by Parkin (1979) and developed in health professions literature by Saks (1983; 2010) and Nancarrow and Borthwick (2021), provides a lens for understanding these findings. These consider how professional groups potentially compete for status and control through processes of social closure. These involve securing exclusive rights to perform certain tasks, while simultaneously seeking to exclude or resist incursions from other professional groups. Two forms of social closure are particularly relevant to PIP in EUC. These are exclusionary closure, which maintains existing boundaries by restricting access to privileged roles and usurpationary closure, whereby new or subordinate groups challenge these boundaries to claim jurisdiction over specific tasks (Nancarrow and Borthwick, 2021). In this research, the significant autonomy and broad prescriptive scope exercised by PIPs in EUC provides a clear example of usurpationary closure. At the same time, doctors retained control over higher-risk decisions and complex case management, arguably enacting exclusionary closure, demonstrating how their broader training and experience were required in manging such decisions.

This is also consistent with the analysis of IP and medical jurisdictional claims proposed by Weiss (2021) who argues that prescribing has historically been central to the medical professions' occupational identity and the expansion of IP by other healthcare professionals has forced a reframing of this medical jurisdiction. Drawing on Abbott's (2014) theory of jurisdictional boundaries, Weiss (2021) argues that medicine has not responded by defending its overall monopoly on prescribing rights. Instead, as demonstrated in this study, the medical profession has redefined different domains of prescribing, where doctors occupy the domain of complex prescribing decision-making in the face of diagnostic uncertainty.

However, rather than role boundaries and jurisdictional claims over prescribing being contested, this study found that the relationship between doctors and PIPs was characterised by mutual respect, acceptance and collaborative practice, which had been developed through close working relationships. Key stakeholders also described from their more strategic viewpoint, medical acceptance within close-knit EUC teams was high in comparison to the more negative views they had encountered more widely outside of this context. This aligns with wider evidence in the IP literature suggesting that interprofessional acceptance is stronger where there is shared clinical experience

or when doctors are involved in IP training and supervision (Graham-Clarke *et al.*, 2018; Edwards, Coward and Carey, 2022).

The findings of this research did however highlight that a degree of medical dominance was still evident. For instance, in the urgent care site, PIPs required authorisation from a clinical coordinator, a role always fulfilled by one of the doctors, before arranging a face-to-face consultation. The initial rejection of PIP was also decided by a panel comprised entirely of doctors. Key stakeholders described this decision was in their opinion, rooted in outdated assumptions about paramedic practice. This echoes the experiences of other Allied Health Professions, such as podiatry and physiotherapy. Leaders from these professions also described being met with scepticism by the CHM panel. Participants in this research also perceived that meetings with Commissioners were characterised by a similar lack of understanding of contemporary practice, or the need for IP in physiotherapy and podiatry (Fitzpatrick and Borthwick, 2022). However, unlike PIP, the more negative perceptions of Commissioners did not result in a rejection of the proposal.

Overall, these findings reflect how medical dominance is still exerted over IP rights. The concept of medical dominance was proposed by Freidson (1994) and describes the legal and institutional structures enabling doctors to control the work of other health professions. As Willis (2020) notes, medical dominance rests on three dimensions of control: authority, autonomy and sovereignty, of which the medical profession has historically held all three. However, this study suggests that while some aspects of this dominance persist, the practical delivery of care in EUC now involves genuinely collaborative and interdisciplinary working, where PIPs and doctors deliver care together, drawing on each other's strengths and acknowledging each other's contributions. However, as previously discussed, further research should evaluate whether these supportive and positive relationships continue as demand for EUC services goes unabated, as PIP numbers increase, and the challenges faced by the medical professionals continue.

9.8 The role of master's education

The findings of this research highlighted a range of views on the role of master's education as a facilitator of PIP. Most PIPs and other case site participants did not agree

with national recommendations, reporting views that completing some clinically focused, postgraduate modules could represent a more appropriate minimum requirement. Participants pointed out that the recommendations regarding PIP eligibility did not reflect those of other professions such as nurses and other Allied Health Professions, who are permitted to complete IP training at undergraduate level.

However, despite the historical precedent set by other IP professions, the CHM expressed concern about the level of training that PIPs would have, given the wide range of conditions they might encounter (Commission on Human Medicines, 2015). Key stakeholders interviewed in this study compared the broad scope of practice of PIPs with the narrower focus of other IP professions, such as specialist nurses, who often prescribe only from a limited formulary and for a narrow range of conditions. This they felt, emphasised the need for PIPs to at least hold postgraduate education in light of the breadth of their scope of prescribing practice. Those involved in the CHM meetings described how they addressed the concerns of Commissioners by emphasising that paramedics would first complete a master's degree before adopting PIP. However, both key stakeholders and previous research reported many PIPs are not completing master's level education (Best and Taylor, 2021; Stenner, Van Even and Collen, 2021; Eaton *et al.*, 2022; Edwards, 2023). Studies included in the literature review on IP in EUC (Chapter 3) also reported an equally broad range of qualifications amongst other IP professions.

Whilst the role of education as a facilitator of PIP has not been sufficiently explored, Edwards (2023) did report that of a small sample of PIPs in primary care (n=5), quantitative, self-reported data suggested PIPs who had completed a master's (n=3) prescribed more often, altered and stopped medication more frequently and prescribed less antimicrobials than those educated at degree level (n=2). However, the very small sample of PIPs on which these comparisons were made, could also reflect the influence of other attributes than just their level of academic attainment. This may have included participant experience, personal attributes or differences in the role and practice setting of these participants.

This research has provided a more detailed insight into this aspect of PIP, exploring the strategic views of key stakeholders and the lived experiences of case site participants. These highlight that whilst some key stakeholders perceived that master's level

education is required for PIP and were concerned that the assurances they made to the CHM are not being met, other key stakeholders and most case site participants, did not agree with the recommendations. Key stakeholders also described how in addition to the lack of compliance that was evident, the College of Paramedics receives regular complaints from paramedics regarding the recommendations.

Observations of PIP practice during the case studies led me to agree with participants' views that a clear link between completing a full master's programme and PIP is not apparent. Although, in the urgent care case site, PIPs described varying levels of confidence as prescribers, they described how this was influenced by the length of time they had been prescribing in practice and not due to their level of academic attainment. These views that prescribing confidence is generally low post qualification and builds over time has also been reported in previous research on both IP and PIP (Graham-Clarke *et al.*, 2018; Edwards, Coward and Carey, 2022).

Key stakeholders interviewed in this study perceived that the ambiguous wording contained in NHS England's Multiprofessional Framework for Advanced Practice (NHS England, 2017) had contributed to the lack of adherence to the recommendations. This was because the PIP guidance that had been written by the College of Paramedics was based on this document (Allied Health Professions Federation, 2018; College of Paramedics, 2021). As a result, these documents state paramedics who hold master's level education or 'equivalent' can train in PIP. This reflects the wording in the advanced practice guidelines by NHS England. These also state that 'master's level education or equivalent' is the benchmark for an advanced level of practice. However, none of these guidance documents confirm what is considered as an equivalent to a master's award. Key stakeholders felt it was this ambiguity that had contributed to the variation in educational backgrounds of PIPs. The PIP guidance also includes a contradictory statement that it is permissible for paramedics to complete PIP training at undergraduate level (College of Paramedics, 2021). Given other professions are also able to complete IP training at undergraduate level, this lack of clarity explains why paramedics, employers and universities have adopted differing positions and interpretations of the eligibility criteria for accepting paramedics onto IP modules. Edwards (2023) lends support to this conclusion, reporting how in primary care, decisions around eligibility to enrol on PIP modules were left to paramedics themselves rather than their employers.

Some key stakeholder participants in this research described how the concept of advanced practice has evolved over time. Consequently, what was considered as advanced practice when PIP was being proposed, is now more closely aligned with contemporary definitions of specialist or enhanced practice. These definitions encapsulate post registration, enhanced level practice, often underpinned by postgraduate education and training (NHS England, 2016;2025b). In contrast, the contemporary definition of ACP now involves working across four pillars of practice. These are clinical, research, education and leadership. Given ACP master's programmes provide training across these other pillars, including modules in leadership and research (NHS England, 2017), a more tangible link can be appreciated between this level of education and ACP. However, previous research has demonstrated that considerable variation also exists in the educational backgrounds of ACPs (NHS England, 2017; Hardy *et al.*, 2021; Fothergill *et al.*, 2022). One study commissioned by the Health and Care Professions Council (HCPC) (Hardy *et al.*, 2021) reported that of 3716 respondents (1.3% of all registrants), 1940 (52.2%) identified themselves as working towards or at an advanced level of practice. However, only 789 (40.7%) of these held a master's award. In their study, Hardy *et al.* (2021) also interviewed clinical and non-clinical managers to explore their views of advanced practice, who reported that the wording within multi-professional guidance of 'master's level or equivalent' as the benchmark for advanced practice was poorly understood by organisations and ACPs. Fothergill *et al.* (2022) also reported that many ACP survey respondents challenged the concept of 'advanced' being based on educational qualifications, advocating that clinical experience should also be considered.

Perhaps shedding further light on why PIPs may not be adhering to recommendations to complete a master's award, ACPs have reported feeling overwhelmed by the volume of academic work involved in completing master's level training alongside their clinical workloads (Hardy *et al.*, 2021). These views were also reported by PIP and non-PIP survey respondents working in primary care in another study, who also described a sense of overwhelm at trying to complete postgraduate education around busy, clinical roles (Eaton *et al.*, 2022). Fothergill *et al.* (2022) also reported that ACPs often highlighted the lack of protected study time or financial support for master's modules offered by their organisation. This study also found that across most ACP roles, the clinical pillar of advanced practice appeared to be consistently prioritised over the

remaining three pillars. This was attributed to the demanding nature of ACP roles, making it challenging to allocate time to the other three pillars. Only 11% (n=979) of respondents reported working across the research pillar of advanced practice (Fothergill *et al.*, 2022).

It appears therefore that despite national guidance recommending master's level education is necessary for ACP and for PIP, compliance with this guidance is low. Whilst in this research, PIPs in both case site organisations had financial and organisational support to complete their master's programme, the lack of compliance nationally may also be due to the challenges identified in the wider evidence such as financial and organisational support and time to complete this training around busy and demanding clinical roles. The challenges for many healthcare professionals in completing master's level education and its lack of direct benefit to PIP, therefore calls into question the utility of this level of training for PIP. More broadly, the need for master's education to support ACP roles is also unclear given the predominant clinical focus of most ACPs (Fothergill et al. 2022).

9.9 Making sense of Controlled Drug restrictions

This research study has provided the first detailed exploration of CD prescribing by PIPs . This includes providing data on practice since the start of 2024, where a limited range of five CDs became available to PIPs (Home Office, 2023). The key stakeholder interviews provided a unique view on this aspect of PIP, revealing how the work to introduce PIP was marked by significant concerns from the CHM regarding the appropriateness and safety of paramedics prescribing CDs. These concerns ultimately shaped a cautious legislative proposal and only a limited range of CDs. Whilst this list was approved by the Advisory Council on the Misuse of Drugs in 2019, the actual amendment to the legislation was delayed until early 2024 (UK Government, 2023). During this interim period, restrictions on CD prescribing led to a range of challenges for PIPs. These included compromised continuity of care, increased dependence on other prescribers and delays in medication access.

As the first study to report on EUC practice following the change in legislation, the findings show PIPs can now prescribe the most commonly required CDs in EUC. In urgent care this enabled PIPs to begin to more effectively provide end-of-life care, which

was highlighted as a particular area of impact from the restrictions in previous research (Stenner, Van Even and Collen, 2021). In ED settings, PIPs could also begin to delegate CD administration to nursing staff. This improved team efficiency and maximised medicines safety. These were highlighted as key concerns in previous research on ED based practice in the absence of PIP (Clarke, 2019). However, the findings also highlighted that the approved formulary does not meet the full scope of patient needs in EUC. Data collected from case sites revealed that other healthcare professionals regularly prescribed CDs beyond those available to PIPs and their absence from the PIP formulary limited the capacity of PIPs to provide comprehensive, timely care. Oxycodone, in particular, was described as an essential alternative in cases where Morphine was contraindicated. The literature review on IP in EUC (Chapter 3) also noted a wide range of CDs were prescribed in EUC, including Oxycodone.

Even with the availability of a limited list of CDs, the current distribution of CD prescribing rights across professions were also a source of frustration for PIPs. Although other professions such as physiotherapists and podiatrists are similarly restricted to only limited CD prescribing formularies, these include CDs that are required by PIPs in EUC, including Oxycodone and Fentanyl (Joint Formulary Committee, 2025). Equally, nurses and pharmacists are able to prescribe almost all CDs (Fitzpatrick and Borthwick, 2022; Joint Formulary Committee, 2025). An opinion article written by Hilton *et al.* (2019) echoes the views of participants in this study. The authors of this paper were all practising ACPs and perceived the agreed limited list of CDs is not sufficient for the autonomous roles paramedics now fulfil in a range of different settings. Fitzpatrick and Borthwick (2022) also argue that the complexities surrounding CD prescribing impact on the practice of all Allied Health Professions, stifling the intended benefits from IP by unnecessarily restricting practice.

Whilst legislation surrounding CD prescribing is focused on ensuring the safe and appropriate use of these drugs given their potential for misuse and harm, the findings of this research suggest that PIPs are able to safely and competently use CDs in their practice. Participants also described how the unique relationship paramedics have with CDs through their use of exemptions and PGDs, provides them with a proven track record of using CDs safely and appropriately. This therefore underpinned participant views that an inability to prescribe all of the CDs required in EUC practice simply did not make sense.

The legal commentaries of Gallagher (2021a; 2021b) also provide a further dimension to this debate. Gallagher (2021a; 2021b) argues that the original intent of the Misuse of Drugs legislation was to control the manufacture, supply and export of CDs, not the prescribing of them. According to this interpretation, the additional amendments introduced to allow CD prescribing by nurses, pharmacists, and then later, Allied Health Professionals were not legally necessary and have also led to contradictions in the legislation. Gallagher (2021a; 2021b) suggests that the current restrictions imposed on Allied Health Professions stem from a misinterpretation of the legislation by regulatory bodies. Gallagher (2021a; 2021b) therefore advocates for reconsideration of the interpretation as it currently stands. If accepted, this position could enable paramedics and other Allied Health Professionals to prescribe a wider range of CDs without further legislative amendments being necessary. Arguably however, whilst an interesting interpretation, this view is unlikely to gain sufficient traction to enact such change. What is more likely is that the College of Paramedics will need to continue to engage with the Home Office to lobby for additional legislative amendments for the profession.

Overall, the research findings show that the legislative amendment to allow limited CD prescribing by PIPs represents an important and positive milestone for PIPs. However, the findings also support calls for further expansion of CD prescribing rights to include drugs such as Oxycodone and Chlordiazepoxide. However, instead of further incremental legislative changes, it is arguably more appropriate for all IPs to have the ability to prescribe any CD within their scope of clinical competence. This would ensure consistency across professions and allow healthcare systems to more effectively harness the skills and contributions of PIPs and other IP professions.

9.10 Chapter summary

This chapter has synthesised findings from the literature reviews, key stakeholder interviews and case studies, linking them to broader theory and research. This highlighted the successful integration of PIP into ED and out-of-hours urgent care, supported by an established infrastructure and a strong case of need. In contrast, challenges regarding organisational readiness and perceptions of an unclear case of need are limiting PIP uptake in the ambulance sector, despite the potential for benefits to be realised.

PIPs had a broader scope of prescribing than previously demonstrated by other IPs in EUC, managing both acute high and low acuity cases, chronic conditions, prescribing remotely and issuing repeat prescriptions. This expanded role improved patient access to medicines and enhanced paramedic contributions within EUC teams. Whilst paramedic practice has previously been characterised by a complex blame culture, in the courage-based culture of other EUC settings, paramedics are using PIP to fulfil highly autonomous roles, bringing with them a unique contribution and skill set.

Despite the high levels of autonomy of PIPs, the ability to consult medical colleagues was an important facilitator of PIP. While most study PIP participants held master's-level education, participants questioned the need for this and that only specific clinical modules may be required to support PIP adoption. Although limited CD prescribing rights were granted in 2024, the inability to prescribe all necessary CDs continues to hinder practice, indicating a need for further legislative reform.

Chapter 10 Conclusions

This final chapter presents the conclusions that have been drawn from the research findings. It also considers the implications for further research, practice and policy, whilst discussing the key strengths and limitations of the research design.

10.1 Contributions to knowledge

This research study aimed to understand how PIP has been implemented in EUC, if and how it improves patient care and service delivery and if any facilitators and barriers existed. Given the significant gaps identified in the PIP evidence base (Chapter 2), this study is therefore the first to offer a detailed and contemporary insight of the use of PIP within the post pandemic EUC landscape. It is also the first to use quantitative prescribing data and non-participant observation of practice to evaluate PIP in EUC. These methods enabled rich data to be collected surrounding the use of PIP in EUC. Overall, the findings emphasise the important contribution PIPs are making as part of a modern, multidisciplinary EUC workforce. This includes a broad scope of practice from high acuity case management in ED, to manging a wide range of acute and longer-term issues in urgent care, including through remote prescribing. The findings also provide the first detailed insight into the impact of CD restrictions both before and after the change in legislation.

The findings suggest that wider changes in the EUC landscape have resulted in fundamental differences between PIP and the previous use of IP in EUC by other professions in the UK and internationally. This includes the rapid proliferation of remote consultations in urgent care, the higher acuity prescribing of the ACP-EMs in ED and the need for PIPs to prescribe routine medicines and repeat prescriptions. These aspects of IP in EUC were not previously reported in other research studies.

Additionally, this study is the first to explore the views and experiences of a range of key stakeholders involved in the work to introduce PIP for the profession and ongoing strategic work regarding its implementation and delivery. This unique lens on the research topic provided important context to the case study findings. This included understanding the rationale behind recommendations that PIPs should hold master's level education, why only a limited list of CDs were requested and why the uptake of PIP

in the ambulance sector has remained minimal in comparison to other EUC settings. The findings therefore showed that although the case of need for PIP was very clear in EUC services such as EDs and urgent care, the use of PIP in ambulance services has been a contentious issue since it was first proposed, with implementation slow and problematic. The findings of this research suggest that particularly in the context of remote consultations, PIP may have an important role in the ambulance sector. However, wider issues around organisational governance and culture and access to patient records will need to be addressed in order for ambulance Trusts to maximise the potential of PIP.

Restrictions for PIPs on the prescribing of CDs also limit the full benefits from PIP being realised in EUC, pointing to a need for further legislative changes. The current PIP eligibility guidance also needs to be re-considered and arguably revised to more closely algin with the expectations from other professional bodies.

10.1.1 Strengths of the study findings and research design

The use of a mixed methods design was selected to answer the research aims and objectives (Chapter 1). The use of a mixed methods design enabled a more complete and detailed understanding of the research topic than reliance on singular methods (O'Cathain, Murphy and Nicholl, 2010; Creswell, 2017; O'Cathain, 2020). One example of this were the findings regarding CD restrictions. Qualitative data sources captured the insightful and passionate frustrations of PIPs with phrases such as “being asked to go spear fishing without a spear”, and “feeling impotent”. However, whilst these treatments are clearly important to patient care, the quantitative prescribing data emphasised how overall, many cases in EUC do not require CDs. Also, the limited list now available to PIPs was demonstrated by the quantitative data to include the most frequently prescribed CDs in EUC. Therefore, understanding this important aspect of PIP in EUC from a mixed methods perspective provided a more balanced analysis of the issue.

This study was also the first to incorporate non-participant observation into a case study design to evaluate PIP implementation. As anticipated, this enabled rich and insightful data to be collected to address the research questions and aims and to triangulate different data sources in order to enhance the credibility and validity of the

findings. Drawing on the use of sedation drugs as an example, I was able to further understand the use of the drugs detailed in the quantitative prescribing data, by observing their use in practice. This also enabled me to contextualise the potential risks associated with these drugs that were described by PIPs, when I observed a patient briefly stopped breathing during a sedation. I was also able to draw on documentary analysis of sedation safety checklists which surrounded the prescribing of these drugs, combining this with observing their use in practice. The use of observation as part of a case study design therefore provided rich and more detailed qualitative data to be collected than had been provided in previous PIP research. The opportunity to immerse myself as the researcher into EUC settings also enabled me to develop a clear and detailed understanding of the challenges reportedly being faced across EUC (Royal College of Emergency Medicine, 2021; House of Lords, 2023; NHS England, 2023b). This provided further insight and meaning to the data. For example, framing the benefits and contribution from PIP in the context of an ED so stretched beyond capacity that patients were sitting on the floor of the corridor and waiting for hours outside the department in ambulances. This corroborated and contextualised participants' views and insights.

The findings have therefore enhanced the evidence base regarding PIP in EUC given the limited, one-dimensional insights previously available from self-reported data in open response survey questions (Bedson and Latter, 2018; Best and Taylor, 2021; Rae, 2024), semi structured interviews (Clarke, 2019; Stenner, Van Even and Collen, 2021; Pryor, Hand and Dunn, 2023) and focus groups (Duffy and Jones, 2017; Pryor, Hand and Dunn, 2023).

Additionally, exploring the views and experiences of key stakeholders was identified as an important component of the research design, as previous PIP research lacked the insights of subject experts, or the national leaders involved in both the work to introduce PIP and also its ongoing implementation and delivery. The challenges identified from case study research findings regarding PIP in the regional ambulance service could also be contrasted with the higher-level views of national PIP experts and senior ambulance leaders from other Trusts. This provided different perspectives on EUC service delivery with and without PIP being available in the ambulance sector.

10.1.2 Limitations of the research

Despite the overall strengths of the mixed methods research design, an important limitation was the absence of an ambulance service case study. This was due to challenges in securing a suitable case site which would enable sufficient data to be collected within the time frame of the research project. The limited number of potential sites was also reflective of the wider challenges and limited uptake of PIP implementation in the ambulance sector. Whilst the inclusion of an ambulance case site would have provided additional data to answer the research questions, important and meaningful data were still obtained regarding PIP in the ambulance sector from the key stakeholders interviews and case study participants' views. I was also able to observe cases in the urgent care CAS where PIPs spoke with ambulance crews in order to manage prescription requests due to an absence of PIP capability.

Although the research methods selected for the study did not allow for more generalisable, national level data, the findings from each case study are considered to hold transferability to other EUC settings. The concept of transferability refers to abstracting similarities across comparable people and contexts (Lincoln and Guba, 1985). The instrumental nature of the case sites (Stake, 1995) which were reflective of typical EUC settings and factors such as the national specification of the ACP-EM role, alongside the triangulation of data within cases all enhance the transferability of the findings to other EUC services.

It is however also important to acknowledge that within each case site, PIPs represented only a very small minority of the total clinical workforce and so whilst important benefits from the introduction of PIP were demonstrated, wider and more substantial impacts from these on overall service delivery and patient care will only be seen from a continued expansion of the PIP workforce in EUC.

Another important limitation of the research design was that the views of patients were not explored. Only one previous study has explored patient views and acceptance of PIP within primary care (Edwards, 2023) and so understanding the patient voice regarding PIP in EUC is still an important research priority. Although high levels of patient satisfaction and acceptance of PIP in primary care were reported by Edwards (2023) and also with IP in EUC by other professions (Chapter 3), one study by Williams *et al.* (2018) reported more negative patient views regarding IPs in UK based out-of-hours urgent

care. Exploring patients views and experiences of PIP in EUC is also particularly important given how much healthcare has changed for patients in EUC. This includes the expansion of advanced, multidisciplinary roles, the rapid proliferation of remote healthcare and the significant delays and challenges they can experience when accessing EUC. Although exploring patient views or experiences was not the focus of this study, reassuringly, observations during field work suggested patients were largely accepting of PIP and appeared satisfied with the care and treatment they received.

My positionality as the researcher in this work was considered in detail in Chapter 4. This included how I am myself a practising PIP in EUC and that some of the participants in this research were known to me. As described, none were considered more than professional acquaintances. Some had for example, worked in the same region as me in the ambulance service several years prior to conducting the research. Equally, most of the key stakeholders were known through ongoing collaborative work with them for example as part of special interest groups with the College of Paramedics.

Reflecting on this positionality at end of the research project has led me to conclude that overall, any prior relationships established with participants positively influenced data collection. This included being able to build on existing rapport and being considered as more of an 'insider' which appeared to place PIP participants at ease during observations of their practice. In a minority of cases, PIPs did ask me for my clinical opinion on a prescribing decision, I navigated these situations by politely and tactfully reminding PIPs that I was actively trying to avoid influencing their decision-making or practice, both for ethical and research governance reasons.

As anticipated, my positionality provided a useful and important lens through which to analyse the research data, and the use of reflexivity facilitated an open and honest approach to data analysis to minimise any influence from my views and perceptions ensuring the findings represented participant's views and not my own.

10.1.3 Recommendations for future policy, guidance and practice

1. It is recommended that the College of Paramedics continue to engage with the Home Office and the UK Government to lobby for the further expansion of CD prescribing by PIPs in legislation. Future discussions should also consider the arguments made by Gallagher (Gallagher, 2021a;b) which suggest further changes to legislation are not in fact required to support this recommendation and could therefore enable progress to be made more rapidly in order to maximise the potential of PIP in EUC.
2. It is also recommended that in light of the findings of this study, the College of Paramedics consider revising PIP practice and implementation guidance regarding the need for a full master's award to adopt PIP. Participants in this research did report that postgraduate modules in patient assessment and diagnostic reasoning had more of a direct benefit to prescribing practice. Completing these modules could therefore be considered as a revised minimum educational standard for PIP.

10.1.4 Recommendations for future research

1. Given the range of challenges highlighted by this research study regarding the implementation and delivery of PIP across the ambulance sector, further research is required on this aspect of PIP in EUC. This should confirm if there are sufficient benefits to patient care from PIP over a continued reliance on PGDs in the ambulance sector, particularly if remote prescribing is not supported. Future research should also evaluate if barriers such as providing access to detailed patient records and permitting part-time PIPs to prescribe are being addressed.
2. Whilst previous research does exist regarding patient's views and acceptance of IP, this has not been sufficiently explored in EUC settings. Additionally, only one single study to date has included patient's views on PIP. Addressing these evidence gaps is particularly important given how rapidly and significantly patient care in EUC has evolved in recent years. This includes the increasing use of a wide range of non-medical professions, including paramedics, who provide care as part of a multi-disciplinary team. These professions are also all using an expanded scope of clinical practice, which for paramedics now includes the adoption of PIP. Future research should therefore seek to understand patient's

experiences, views and acceptance of this more contemporary model of multi-disciplinary care, including the use of IP.

3. Neither this study or any previous PIP research has evaluated the cost effectiveness, the safety and appropriateness or the influence on patient outcomes or hospital admissions from PIP, especially regarding its use in out of hospital settings such as primary care, ambulance services and urgent care. These remain important future research priorities given the continued pressures being experienced across NHS secondary care.

10.2 Conclusion

This research study has provided the first comprehensive insight into the use of PIP in EUC, making an important contribution to the small, but growing PIP research evidence base. As the paramedic profession has evolved and developed, it has outgrown the existing legislative mechanisms which for many years enabled access to medicines in the context of prehospital emergency care. By joining the growing number of professions now able to independently prescribe medicines, paramedics have since been able to adopt a much broader and autonomous level of practice in EUC. The unique professional attributes of paramedics as generalist clinicians, capable of manging a wide spectrum of cases from the extreme to the mundane, has also enabled them to harness the potential of PIP. This has provided important and meaningful contributions to patient care and service delivery including the management of both high and low acuity cases, as well as being able to provide repeat prescriptions and routine medications when required. Adopting PIP has also enabled paramedics to innovate and provide remote healthcare in EUC, enhancing their contribution to service delivery and improving patient access to treatment.

When EUC services are facing their most challenging time in history, there is still work to be done to maximise the important potential of PIP. This includes securing further CD prescribing rights for the profession to enable them to provide all of the treatments that patients require in EUC. Equally, further expansion of PIP within the ambulance sector could also result in wider improvements to patient care and service delivery. Further revisions to national PIP implementation policy and guidance are also required. These should aim to strike a balance between ensuring paramedics are suitably trained and ready to adopt PIP into their practice, whilst also supporting the continued growth and

expansion of PIP without placing unnecessarily restrictive eligibility criteria around its adoption.

Appendices

Appendix A Paramedic independent prescribing literature review search strategy

A.1 Databases searched

Medline/PubMed, AMED, CINAHL, , EMBASE, SCOPUS, Web of Science, TRIP database, EThOS, the Cochrane Library databases, Google Scholar, ASSIA, BNI, ERIC, Open Grey, Open access theses and dissertations.

A.2 MeSH terms included in searching

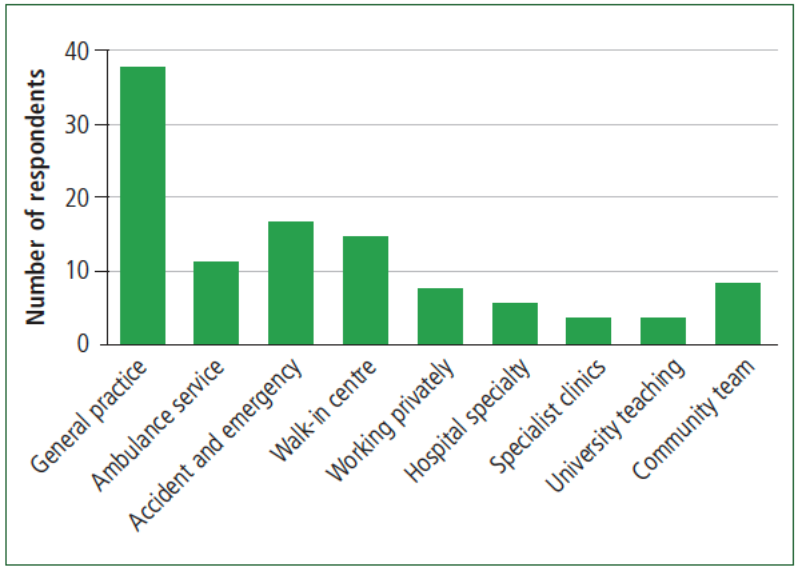
Allied Health Professionals, Emergency Medical Technicians, Nurses, emergencies, emergency responder, emergency nursing, emergency treatment, emergency service hospital, emergency medical services, ambulances, air ambulances, advanced practice nursing.

A.3 Key search terms

Paramedic AND prescrib*

A.4 Example of Data Extraction Table

Reference	Population/Participants (n= where provided)	Aims	Methods	Extracted data
Best and Taylor (2021)	60 PIPs working across multiple EUC settings (ambulance, ED, urgent care services) and primary care. Some rotating between these different settings. The sample represented an estimated 14.65% of the total number of paramedics registered as PIPs with the HCPC	To explore if paramedic prescribing is being practised as expected.	Web-based survey was conducted using convenience sampling.	In hospitals, PIPs worked in areas including acute medicine, intensive/critical care units and paediatric intensive care units. General practice was the most common setting for paramedic prescribers, with 38/60 respondents working in this area. Nearly half (47%; n=28/60) of respondents worked in more than one setting. There were more than 20 combinations of settings in which paramedics work. Eleven of 60 respondents (17%) were still working in an ambulance role as well as in other settings. Only two respondents were using their prescribing qualification in ambulance roles; both were working full-time for the service. Two respondents have been qualified as a paramedic for less than 3 years. Only 12% (*n*=7/60) of respondents have held the prescribing qualification for more than 1 year, and 27% (n=16/60) of respondents held the prescribing qualification for only 0–3 months. Just over three-quarters (78%; *n*=47/60) of respondents were already working in advanced primary or secondary care roles before gaining the prescribing qualification and 51% (*n*=31/60) worked for the ambulance service (including full-time, part-time and bank staff). After gaining the prescribing qualification, only 18% (*n*=11/60) continued to work for the ambulance service. Achieving the prescribing qualification resulted in some respondents moving from

				secondary to primary care; moving from accident and emergency to general practice was the most popular change  *Figure 2. Areas in which NMP paramedics practise*

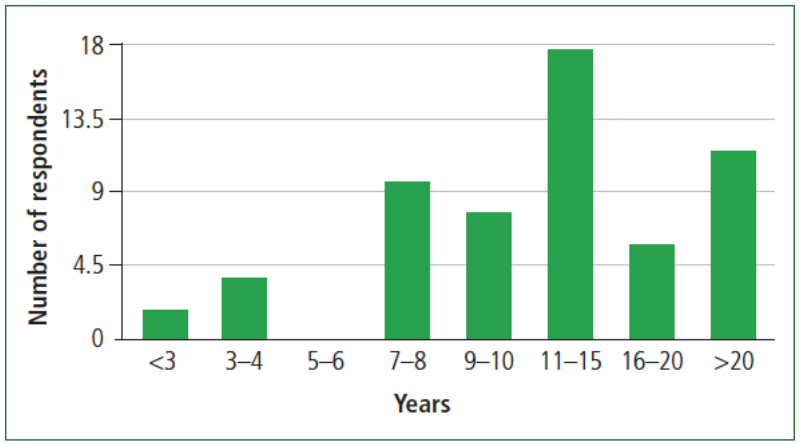


Figure 3. How many years have you been qualified as a paramedic?

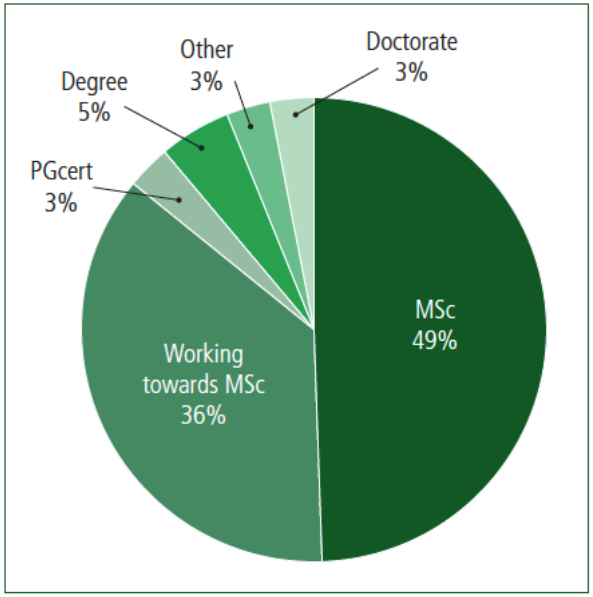


Figure 4. To what level are you qualified?

Respondents were with asked if they saw a role for prescribing paramedics within an ambulance service. Following thematic analysis, views fell into three categories.

First, some were keenly in favour of prescribing on ambulances. For one, it 'was the next logical evolutionary step' and another said it would 'keep more out of hospital'. These views were in a minority. Second, there were those who thought this was possible with conditions. These conditions included prescribing only by those in advanced/specialist roles. 'Maybe for ambulance paramedics to refer to specialist paramedics within certain parameters,' was one suggestion. Finally, there were those against, which formed the majority of the comments. Reasons given included: an inability to access patient

				records; PGDs and emergency exemptions being sufficient in frontline paramedic work; encouraging demand in an overstretched 999 system; and clinical governance not being in place in ambulance services. Paramedics were asked what classes of drugs they were issuing before and after qualification (Figure 7). The majority (15) of drug classes were given more following qualification (e.g. antibiotics). Ten drug classes, such as anti-arrhythmic, were given less commonly following qualification. Overall, gaining a prescribing qualification does not appear to lead to a substantial increase the range of drug classes being issued

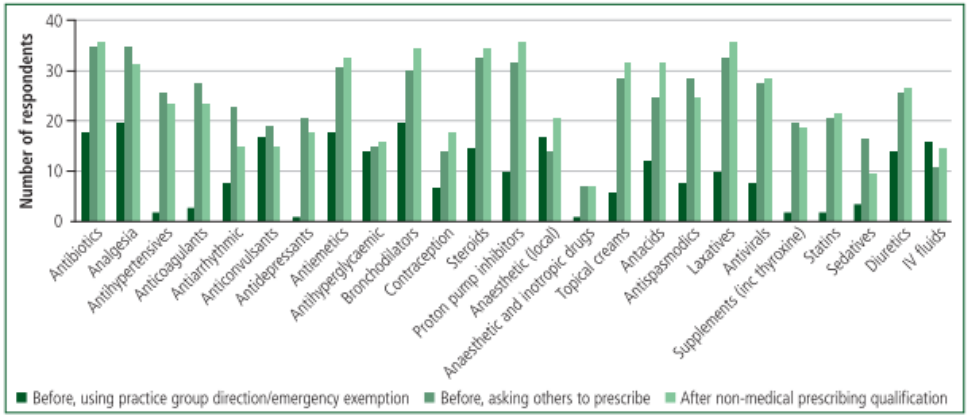


Figure 7. What groups of medication were you prescribing: before NMP qualification using practice group direction/ emergency exemption; before NMP qualification and asking others to prescribe; and after non-medical prescribing qualification?

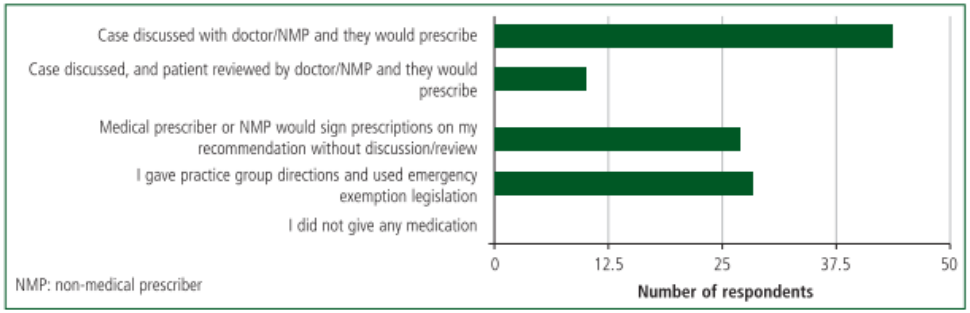


Figure 8. Before gaining a prescribing qualification, how did you get a patient a prescription?

Appendices

Appendix B Literature review on IP in EUC search strategy

B.1 Databases searched

Medline/PubMed, AMED, CINAHL, , EMBASE, SCOPUS, Web of Science, TRIP database, EThOS, the Cochrane Library databases, Google Scholar, ASSIA, BNI, , ERIC, Open Grey, Open access theses and dissertations.

B.2 Search terms

B.2.1 Professions search terms:

1. "advanced clinical practitioner"
2. "emergency nurse”
3. "emergency practitioner"
4. "nurs*
5. "midwi*
6. "Physician assistant"
7. "physician associate"
8. "podiatr*
9. “ emergency practitioner”
10. “ physician associate”
11. “ACP”
12. “advanced clinical practitioner”
13. “APP”
14. “emergency care practitioner”
15. “emergency nurse practitioner”
16. “emergency nurse”
17. “Physician assistant”
18. chiropod *
19. opt*

20. matron
21. paramedic
22. pharmac*
23. physiotherap*
24. radiograph*
25. “allied health prof*”

Combined with AND prescrib* AND setting search terms (below)

B.2.2 Setting Search Terms:

1. emerg*
2. accident
3. urgent
4. "Out of hour*"
5. unscheduled
6. “minor injury”
7. “walk in”
8. “crisis”
9. “retail clini*”
10. Pharmac*

B.3 Example data extraction table

Reference	Participants	Aim	Methods	Extracted data
Ganem et al. (2015) Country- USA	Physician Assistant IPs in ED (USA)	To describe opioid prescribing practices of ED providers when treating patients with chronic pain.	Retrospective record review 2009-2012 of ED prescriptions (n= 28,103) for chronic pain in ED.	Experience of IPs was not associated with any significant difference in opioid vs non opioid prescribing or frequency of prescribing overall. Physician assistant IPs more likely to prescribe rather than administer an opioid than medical prescribers, authors conclude that this is reflective of their role in treating lower acuity presentations such as chronic pain (e.g. headache/back pain) which are predominantly prescribed for at discharge. Providers were 79 % physicians, 19 % physician assistants (PAs), PAs wrote 55 % of opioid prescriptions, and physicians wrote 77 % of non-opioid prescriptions.

				PAs were more likely to prescribe an opioid for chronic pain than physicians (55 vs 23 %, $p < 0.0001$). PAs prescribed a higher M.E. dose per pill than physicians (7.5 [IQR 7.5–10] (range 2.5–120) vs 7.5 [IQR 7.5–7.5] (range 2.5–20), $p < 0.0001$) (Table 4). PAs also prescribed more pills (20 [IQR 20–40] (range 1–240) vs 20 [IQR 12–24] (range 3–84), $p < 0.0001$) and a higher total M.E. dose per prescription (225 [IQR 150–300] (range 15–6000) vs 150 [IQR 90–200] (range 25–630), $p < 0.0001$) (Table 4). Physicians were more likely to prescribe either hydrocodone (37 vs 24 %, $p = 0.0017$) or oxycodone (50 vs 36 %, $p = 0.003$) than PAs. PAs were more likely to prescribe codeine (4.2 vs 0.5 %, $p = 0.0070$), tramadol (12 vs 6 %, $p = 0.0391$), or other opioids (24 vs 5.4 %, $p < 0.0001$) than physicians (Fig. 1). Medications were 43 % oxycodone, 30 % hydrocodone, 9.5 % tramadol, 2.5 % codeine, and 15 % other. The number of pills was 20 [interquartile range (IQR) 15–30] (range 1–240), morphine equivalents (M.E.) per pill was 7.5 [7.5–7.5] (2.5–120) and total M.E. per prescription was 150 [112.5–270] (15–6000).

				Physicians were more likely to prescribe a non-opioid than PAs (77 vs 45 %, $p < 0.0001$). Provider experience level was not associated with whether a provider chose to prescribe a non-opioid or an opioid for chronic pain ($p = 0.817$). The experience level also had no relationship with the number of pills prescribed ($p = 0.398$). We found that patients with an ED discharge diagnosis of chronic pain were more likely to receive a prescription for a non-opioid analgesic; with opioids only being prescribed in 33 % of chronic pain cases. Civilian providers were more likely to prescribe an opioid analgesic than active-duty providers and PAs were more likely to prescribe opioids than physicians. Discussion PAs were more likely to prescribe opioids than physicians. PAs may be more likely to prescribe opioids due to the way our ED is organized. There is a fast-track area for less acutely ill patients and a main ED for those patients with more serious diagnoses. This lower acuity ED is primarily staffed by PAs with one supervising primary care physician. Typical patients in the fast track have chronic pain issues such as lower back pain or

				headaches. These PAs frequently see patients seeking refills of already existing opioid pain medications. This could explain the higher numbers of opioid prescriptions. PAs were also more likely to prescribe medications in the other opioid category. The other opioid category contains hydromorphone, morphine, long-acting oxycodone, and methadone. Medications like oral morphine and methadone are not typically given to a patient in an ED setting without prior exposure to opioids and are most likely prescribed as a refill of ongoing opioid medications. Our study was performed using data collected from two military facilities and may not be representative of the general population. While our hospitals are located on military bases, they reside in a city with a catchment area of 2 million with an even larger nonmilitary population. At both EDs civilian (nonuniformed members) account for 80 % of the patient volume and most of our admissions are geriatric patients as with most US emergency departments. As described in the "Methods" section, SAMMC is a level I trauma centre and cardiac centre receiving and treating civilian patients from the community. In addition, while most of our providers are active-

				duty military, 60 % are trained in civilian residencies and all ED residents are required to do more than one third of their residency training in civilian facilities. Thus, as every hospital is unique and each community is unique, our study should be comparable to similar studies at nonmilitary facilities

B.4 Detailed IP in EUC literature review summary table

	Reference	Country and Clinical Settings	Study Aims	Methods	IP Profession and/or Participant Details (n= where available)	Findings
1.	Agiro et al. (2018)	USA ED, Urgent Care and Retail Clinics. Comparison to primary care.	To compare antibiotic prescribing by treatment setting and clinician type (medical/non-medical)	Retrospective, observational cross-sectional study.	Doctors, nurse and PA IPs	Only 16% (n= 19,763/124,907 children) diagnosed with upper respiratory tract infection received antimicrobials. Compared with office paediatricians (9%, reference group), the lowest proportion of prescribing was seen in urgent care centre paediatricians (8%, *P* = 0.02), IPs in retail clinics (8%, *P* = 0.37) and in ED clinicians (14%, *P* = 0.001), contrasted with GPs in primary care (28%, *P* = 0.001), IPs in urgent care centres (29%, *P* = 0.001), GPs in urgent care centres

						(30%, *P* = 0.001) and IPs in primary care (30%, *P* = 0.001).
2.	Alsabbagh et al (2019)	Canada ED	To determine the proportion of ED visits that can potentially be managed by pharmacist IPs	Retrospective quantitative cohort study using clinical records.	Pharmacist IPs	Of n=34,550,020 ED visits identified, 12.4% (n = 4,293,807) were considered initially eligible according to the specified criteria. Of these, 1,494,887 (34.8%) were conditions considered to be potentially manageable by the pharmacist IPs, representing 4.3% of all ED visits.
3.	Armstrong (2015)	UK Urgent Care Centre.	To assess organisational readiness for the expansion of IP in the urgent care centre by exploring current views of how the service is operating.	Multi-method-Documentary analysis, Staff interviews, patient questionnaires.	Nurse IPs (n=3) Patients (n=20)	Nurse IPs reported perceptions that IP improved patient experience, speed and continuity of care, and improved access to important medicines such as analgesia, whilst creating more time for doctors to focus on more complex cases. Patient satisfaction with IP was high. IP at times was perceived to increase work load and interruptions from requests to prescribe from other non-prescribing staff.
4.	Beahm et al. (2018)	Canada. Community Pharmacy	To evaluate the appropriateness of antimicrobial prescribing by pharmacist IPs for patients with uncomplicated urinary tract infection.	Prospective registry trial using patient survey.	Pharmacist IPs Patients (n=750)	Survey completed by 398/750 enrolled patients (53.1%). 87.4% (n=348) of these presented first to a pharmacist IP rather than a medical prescriber. Of patients attending with a prescription from a doctor, pharmacist IPs

						modified this prescription in 40.4% (n=161) of cases. At 2-week follow-up, 88.9% (n=354) had sustained symptomatic resolution.
5.	Bhatia et al. (2017)	Canada. Community Pharmacy	To describe pharmacists' scopes of practice in community pharmacy settings.	Cross-sectional survey	Pharmacist IPs (n=13)	Respondents from different Canadian provinces reported prescribing for minor ailments. Some regions had regulations allowing pharmacists to prescribe for a list of minor ailments, leaving the specific pharmacologic therapy to the pharmacist's discretion whereas some regions specified a list of drugs that could be selected for the specified conditions.
6.	Black and Dalwood (2014)	UK ED	To compare nurse IP in ED using to use of patient group directions in ED.	Review of clinical records	Nurse IPs (n=4) and nurses using PGDs (n=6)	IPs commonly prescribed for soft tissue conditions (n=110, 27.3%), lacerations (10.4%, n = 42) and bone fractures (9.9%, n = 40). A total of n=274 drugs from a range of n=29 different medications were prescribed, with the most common medication types being non opioid analgesia (n=78 28.4%) opioid analgesia (n=74, 27%) and antimicrobials (n =67, 24.4%). Patients were 2.23 times more likely to receive medication if seen by IP than those using PGDs.

7.	Brett-Bowen (2019)	UK Minor Injury Unit	To explore nurse IPs experiences of managing acutely unwell patients in Minor Injury Units	Semi structured interviews	Nurse IP (n=6).	IPs described how despite working in a minor injury unit, they managed patients presenting with high acuity conditions such as meningitis, cardiac arrest, myocardial infarction, life threatening asthma and sepsis. IPs specifically reported prescribing injectable antibiotics (penicillin), cardiac drugs and oxygen to manage such cases. IPs described these cases as an inevitable occurrence but reported they were highly stressful and outside of their usual scope of practice.
8.	Buckley et al. (2013)	Australia ED	To explore which medications nurse IPs most frequently prescribe.	Online Survey	Nurse IPs (all settings) (n=209), (n=69) of participants in ED.	ED based IPs were largest cohort of respondents (33%), prescribed a greater diversity of medications and used IP qualification more (98.5 n=65) than IPs in other secondary care speciality settings. Antibiotics and analgesia were the most frequently prescribed drugs including a range of opioids.
9.	Campling et al. (2022)	UK Urgent Out-of-hours	To undertake an evaluation of patient and carer access to medicines at end-of-life within the context of models of service delivery.	Evaluative, mixed method case studies	Nurse IPs (n=3)	Nurse IPs working within a 24/7 telephone support line team could not prescribe directly to patients as they could only prescribe via paper and not via the electronic prescribing system. IPs therefore arranged access to out-of-hours

		Palliative Care				doctors for prescriptions when patients phoned with escalating symptoms and provided advice about how to best utilise existing medicines whilst waiting for the prescriber. Access to patients' medical records was essential for this work (e.g. types and dosages of medicines prescribed, co-morbidities and allergies).
10.	Carey et al. (2014)	UK Urgent Care Services	To explore how nurse IP is being used for patients with respiratory conditions	Semi Structured Interviews	Nurse IPs (n=40)	Within urgent care services IP expanded the type of care provided and enabled provision beyond the use of PGDs. IPs reported how sooner commencement of treatment reducing the likelihood of worsening symptoms or complications. However, some patients used urgent care services for repeat medicines that should have been obtained through GP.
11.	Connor and McHugh (2019)	UK ED	To evaluate IP in EDs in Ireland, exploring how the role is developing and determine possible barriers to role expansion.	In-depth interviews	Nurse IPs (n=6)	Perceptions of gaining autonomy was an important decision in adopting IP IP expedited analgesia provision, reduced delays waiting for medical prescriber input in analgesia provision,

						improved continuity of care, freeing up doctor time. Reticence that doctors influenced their prescriptive authority with 'final say' on prescribed medicines. Lack of managerial support or understanding around benefits of IP within EDs. Required adherence to clinical practice algorithms represented a barrier to autonomous IP.
12.	Desai et al (2020)	USA ED Urgent Care Centres	To describe the prevalence of antibiotic prescribing for viral respiratory infections in children.	Retrospective chart review.	Nurse IPs and PA IPs	Review of n= 132,458 clinical records. IPs dealt with 47.7% (n=63,169) of cases, non-paediatric doctors 35.9% (n= 47497), paediatric doctors 16.5% (n=21, 792). IPs had a higher rate of prescribing antibiotics for respiratory infections of suspected viral aetiology overall (3.89%) when compared to paediatric specialist doctors (3.22%). Their inappropriate prescribing rate was however slightly less than non-paediatric doctors (4.01% vs 3.98% for IPs).
13.	Drennan et al. (2009)	UK ED	To evaluate IP from a service perspective, evaluate patient	Multi-method: Record review	Nurse IPs	Analgesia most frequent category of prescribed medicine in EDs. Patients described how IPs in

			benefits, safety and satisfaction, whilst considering the views of key stakeholders.	and patient interviews.		ED reduced waiting time, improved overall journey through department and that IPs were able to autonomously manage their complete episode of care. No unscheduled reattendance of any patients seen by a nurse IP in ED during the study.
14.	Ganem et al. (2015)	USA ED	To describe opioid prescribing practices of ED providers when treating patients with chronic pain.	Retrospective record review	PA IPs	PA IPs prescribed a range of opioid and non-opioid analgesia for conditions such as back pain or headache. PAs were more likely to prescribe an opioid for chronic pain than doctors (55 vs 23 %, $p < 0.0001$) as PAs are predominantly tasked to prescribe for lower acuity cases such as chronic pain.
15.	Garbutt et al. (2013a)	USA Retail Clinics	To describe the rationale and experiences of families who use retail clinics for paediatric care.	Survey	Nurse IPs Parents of paediatric patients (n= 1484)	37.4% (n=555) of respondents had used a retail clinic for themselves and 23.2% (n=344) had done so for paediatric care. Most parents were satisfied (61.7%, n= 915) or very satisfied (32.8%, n=486) with the care their child received and 53.4% (n=792) indicated they would use RCs in the future for paediatric care (38.9%, n=577) responded maybe and 7.7% (n=114) would not. By parent report, antibiotics were prescribed to 85.2% of children with an ear

						infection, 78.6% of those with a sore throat, and 67.7% of those with a cold or flu. Of the 118 children being treated for a sore throat, 96 (81.4%) had a throat swab taken (reported by the parent as 70.8% positive, 21.9% negative, and 7.3% did not know). Antibiotics were prescribed to 6/ 21 patients (28.6%) who had a negative throat swab result. In 6/8 of children being treated for allergies parents reported receipt of an antibiotic prescription.
16.	Garbutt et al. (2013b)	USA Retail Health Clinics	To describe paediatric primary care providers' attitudes toward retail clinics and their experiences of retail clinics use by their patients	Survey	Paediatrician Doctors and paediatric nurse practitioners (n=206)	206 (91%) reported that they had provided additional care for patients after a retail clinic visit, whilst also reporting experiencing incorrect diagnoses (81% n=183), overuse (77% n=174) and misuse (68% n=153) of antibiotics, failure to conduct diagnostic tests (68% n=153) or ignoring the test results when making the treatment decision (69% n=156). Furthermore, only 20% (n=44) of participants agreed that retail clinics provided care within recommended clinical guidelines.

17.	Gridley at al. (2019)	Australia ED	To compare the prescribing practices of physiotherapists to their medical and nursing colleagues within the setting of treating musculoskeletal injuries in the ED.	Retrospective Review of Clinical Records.	Physiotherapist and Nurse IPs (Australia)	Emergency physiotherapist IPs prescribed for musculoskeletal complaints rather than broad range of cases, restricted to a limited drug formulary- predominantly analgesia, including some controlled drugs. Demonstrated comparable levels of quality and safety to nurse IPs and medical prescribers in ED.
18.	Hughes et al. (2017)	UK ED	To determine if ED visits could be clinically managed by pharmacists with or without advanced clinical practice training.	Cross-sectional observational study	Pharmacist IPs	Of n=18,613 cases observed, n= 719 (3.9%) were judged by IPs to be suitable for management by pharmacist IPs and a further 5202 (27.9%) by pharmacists with further advanced practice training.
19.	Isenor et al. (2018)	Canada Community Pharmacy	To identify the relationship between barriers and facilitators to pharmacist prescribing and self-reported prescribing activity	Online questionnaire	Pharmacist IPs (n=87)	Participants reported prescribing in emergencies (initiating any drug deemed to be required to manage conditions until another prescriber could be consulted) and prescribing for minor ailments. 26/87 (30%) disagreed or strongly disagreed they had access to enough patient health information to prescribe and another 20/87 (23%) indicated they were uncertain. 58/87 (67%) of respondents believed they had support of their employer and 67/87

						(78%) the support of their colleagues to discuss specific prescribing concerns.
20.	Jacoby et al. (2011)	USA Retail Health Clinics	To measure the frequencies of appropriate treatment of children with upper respiratory infections and appropriate testing of children with pharyngitis	Review of clinical records	Nurse IPs and PA IPs	IPs in retail health clinics correctly managed cases of suspected viral illness by not prescribing antibiotics in the majority (88.35%, n=5369/6077) of cases, in a significant minority (13.1%, n=708), antimicrobials were judged to have been prescribed for a suspected viral illness. In just over half (55%, n= 389/708) of these cases, the clinical record detailed that the antibiotic was prescribed because the child's parent had requested it. Patients with both viral and bacterial illness would have gone to a primary care physician (61.71% and 62.30%, respectively) or an urgent care centre (25.63% and 24.45%, respectively) had they not come to the retail clinic.
21.	Kim et al. (2021)	Canada Community Pharmacy	To examine the potential economic impact of pharmacists prescribing for minor ailments.	Economic evaluation using modelling of	Pharmacist IPs	Per n=30 000 patients, pharmacist IP for minor ailments was projected to lead to cumulative reductions in visits to the emergency department, primary care and walk-in clinics by n=799, n=3677 and n=5090, respectively. In

				prescribing data		100% of the simulated scenarios, IP by pharmacists led to cost savings.
22.	Klein et al. (2017)	USA ED	To measure how ED clinicians' perceptions of antibiotic prescribing risks affect their decision-making.	Mixed methods observational study.	Physician Assistant IPs (n=18) in ED compared to ED doctors (n=51).	Antimicrobial prescribing were slightly higher in the IP group (doctor 59.2%, resident grade doctor 66.6%, PA IP 68.7%). The study demonstrated how little difference existed between the antimicrobial practices of doctors and PAs. Furthermore, clinicians who displayed less concern regarding antimicrobial prescribing in their survey responses, also demonstrated higher antimicrobial prescribing frequencies OR 1.28 [95% CI, 1.06–1.54]) especially when antibiotics were not indicated (OR 1.32 [95% CI, 1.04–1.68]).
23.	Latham et al. (2018a) Latham et al. (2018b)	UK Urgent Out-of-hours Palliative Care	To explore experiences of clinical nurse specialist IPs for community palliative care	Semi structured interviews	Nurse IPs (n=6)	IP enabled seamless, holistic care and faster access to medicines, especially during end-of-life phase and at weekends. Less reliance on out-of-hours doctors, resulting in faster resolution of symptoms. Difficulty accessing patient records out-of-hours reported resulting in some participants avoiding prescribing as a result. Pressure to prescribe by other staff made management of own workload challenging.

						Anxiety expressed by some around the additional responsibilities associated with controlled drug prescribing. Challenges of trying to concentrate on IP whilst in a patient's home with family members present and background noise.
24.	Latter et al. (2020)	UK Urgent Out-of-hours Palliative Care	To evaluate health professionals' medicines access practices, perceived effectiveness and influencing factors.	Online questionnaire survey.	Nurse IPs (n=187) GPs (n=499) Community Pharmacists (n=370) Nurses (=301)	Overall, 43% (n=280) rated Clinical Nurse Specialist cover as Extremely or Very Effective; 36% (n=235) reported Somewhat and 22% (n=141) only Slightly or Not At All effective in providing out-of-hours care to patients with palliative care symptoms. Only 42% (n=67/160) of clinical nurse specialists were IPs. Analysis of comments indicated that Clinical Nurse Specialists' ability to prescribe medicines seemed to be critical in their perceived effectiveness during out-of-hours periods. IPs had limited access to either primary care or out-of-hours service records. Majority of IPs restricted to paper prescription pad. Only a minority were able to prescribe electronically in out-of-hours care.

25.	Lineberry et al. (2021)	USA ED	To develop and evaluate a targeted discharge prescription review process by pharmacist IPs in ED.	Single-centre, retrospective review	Pharmacist IPs	Pharmacist IPs reviewed n= 378 discharge prescriptions of which n=158 (41.7%) were identified as having a problem. In n=70/158 (44.3%) the original prescription(s) were modified. Highest number of interventions were made for anticoagulants (n=79, 50%) and antimicrobials (n=24.3, 15.4%).
26.	Mansell et al. (2015)	Canada Community Pharmacy	To determine whether patients prescribed such treatment by a pharmacist symptomatically improve within a set time frame.	Online patient questionnaire	Patients treated by Pharmacists IPs (n=125)	Of n=88 respondents who answered a question on what they would have done had a pharmacist not been available, n=31/88 (35.2%) would have seen a doctor in primary care and 3/88 (3.4%) would have attended an ED. Although n=38/88 (44.2%) would have tried an over-the-counter medicine. N=121/125 (96.8%) reported they did not need to see a doctor after their treatment. The most common conditions prescribed for were cold sores (34.4%) insect bites (20%) and seasonal allergies (19.2%). Trust in pharmacists and convenience were the most common reasons for choosing a pharmacist. Satisfaction was strong; only 5.6% felt a physician would have been more thorough. Condition improved in n=124 (99.2%)

27.	McConnell et al. (2013)	UK EDs and Minor Injury Units	To explore and clarify the role and scope of practice of emergency nurse practitioners in Ireland.	Questionnaire	Nurse IPs (n=14)	In total 23.3% (n = 14/60) had completed IP training, however only n=8 (13.3%),reported actually prescribing. Non-IPs who provided medicines in their role (n = 38) used PGDs (78.6%, n = 33) or asked doctors to sign their prescriptions(7.1%, n = 3). Focus on management of minor illness and injury.
28.	Mehrotra et al. (2009)	USA Retail Health Clinics	To compare the care received at retail clinics for three acute conditions with that received at other care settings.	Review of clinical records	Nurse IPs	Costs of 2100 care episodes initiated =at retail clinics were substantially lower than those of matched episodes initiated in primary care, urgent care centres, and emergency departments ($110 vs. $166, $156, and $570, respectively; P < 0.001)
29.	Mehrotra et al. (2015)	USA Retail Health Clinics	To describe trends in visits to urgent care centres, retail clinics, telemedicine, and EDs, with a focus on visits for treatment of low-acuity conditions.	Review of clinical records 2007-2009 (n=20.6 million)	Nurse IPs	In 2007 to 2009, there were 3 million, 167 million, and 29 million visits at retail clinics, primary care practices, and EDs, respectively for acute respiratory infections. Antibiotics were categorised as 'may be appropriate' by IPs in retail clinics in 95% of cases, by doctors in primary care in 85% and doctors in EDs in 83% of cases. For antibiotics never appropriate cases, the adjusted antibiotic prescribing rate at retail clinics was lower (34%) than at primary

						care practices (51%; P <.01) and EDs (48%; P <.01).
30.	Ogilvie et al. (2022)	Australia ED	To assess the safety and accuracy of inpatient medication charts within a pharmacist collaborative prescribing model (intervention), compared to the usual medical model (control)	Randomised trial	Pharmacist IPs compared to doctors	Pharmacist IPs demonstrated lower levels of prescribing errors: 279/357 prescribing errors by doctors (78% error rate), 68/412 (16% error rate) by pharmacist IPs. Pharmacist IPs also demonstrated better documentation of previous adverse drug reactions 23/38 control patients (61%) and 32/35 intervention patients (91%) (p = 0.002). Doctors completed venous thromboembolism risk assessment in 13% of eligible patients compared to 100% by pharmacist IPs. N=23 patients seen by doctors were deemed as high risk for VTE but only n=18 were prescribed anticoagulation and only n=14 patients were prescribed anticoagulation according to guidelines showing 61% (14/23) concordance. In Pharmacist IP group n=18 patients deemed high risk, all were prescribed anticoagulants.
31.	Pharmacy Association of Nova Scotia (PANS) (2013)	Community pharmacy, Canada.	To conduct an independent evaluation of a pilot study introducing IP for minor ailments within 27 community pharmacies.	Multi-method: Pharmacist data collection forms, patient satisfaction	Pharmacist IPs Patients (n= 587)	Of 1,002 assessments, the most commonly assessed conditions were herpes simplex (17%, n=167) and allergic rhinitis (15%, n=149). Eleven of the minor ailments were assessed fewer than 10 times (sore throat, cough, non-infectious

				survey and focus groups.		diarrhoea, dysmenorrhea, calluses and corns, dandruff, mild headache, nasal congestion, nausea, warts, and smoking cessation). Most assessments resulted in a prescription (93%, n=936). Patients reported at follow up their concern had been satisfactorily resolved (89%, n=772 of 871).
32.	Rafferty et al. (2017)	Canada Community Pharmacy	To perform an economic impact analysis of the pharmacists prescribing for minor ailments in one Canadian region.	Economic analysis.	Pharmacist IPs	10,739 pharmacy consultations for minor ailments in 2014 in region. Overall, Pharmacist IP saved approximately $801,347 and $201,552 in 2014 from societal and public payer perspectives, respectively. However, from the public payer perspective $8250 in actual public cost saving was estimated after subtracting the costs of providing pharmacist IP. Estimated cost savings over five years were $3,482,606 and $47,385 from societal and public payer perspectives respectively.
33.	Schindel et al. (2017)	Canada Community Pharmacy	To understand the perceptions of pharmacists, pharmacy students, technicians, other health care professionals, and the public of the pharmacist's role in Alberta.	Mixed methods- focus groups, interviews, online survey	Focus group sessions (n = 9) and individual interviews	Pharmacist IPs reportedly prescribed for minor ailments as part of their role in community pharmacy. Respondents commented how this was helpful and in more rural communities, pharmacist IPs were particularly valued where

					(n = 4) with pharmacists and other stakeholders Online survey of stakeholders (n = 416) 37% of which were pharmacist IPs'	healthcare provision through primary care was less accessible.
34.	Shearer et al. (2018)	Canada Community Pharmacy	To understand the factors affecting prescribing practices among pharmacist IPs and identify whether additional training methods would be beneficial.	Online questionnaire survey.	Pharmacists IP and non-IP	115/162 (71.0%) reported having completed training to allow them to prescribe for minor ailments. No IPs prescribed on a daily basis and 23.5% had not prescribed since being certified. 83.5% of IPs reported having encountered barriers to prescribing including a lack of sufficient revenue attached to expanded role (26.2%), lack of time at work (23.5%) and lack of patients presenting with minor ailments (11.9%). Open response question data also highlighted further barriers included a limited scope of practice and prescribing formulary, insufficient public awareness and an absence of

						adequate documentation and decision-making tools.
35.	Shrank et al. (2014)	USA Retail Clinics	To evaluate and compare the quality of care for otitis media, pharyngitis, and urinary tract infection.	Review of clinical records.	Nurse IPs	Out of n=75,886 episodes of care, n=20,153 were eligible for at least 1 quality measure. IPs at retail clinics performed better than prescribers in urgent care centres and EDs across all quality measures ([OR 0.42; 95% CI, 0.40-0.45; P <.0001; urgent care vs retail clinic] [OR 0.29; 95% CI, 0.27-0.31; P <.0001; ED vs retail clinic]). Results for each condition were significant at P <.0001. Unclear if ED and urgent care staff were only Doctors or also contained IPs.
36.	Taylor (2016)	Canada Community Pharmacy	To gauge the activity level involving minor ailments during medical appointments and perceived role of pharmacist IP for minor ailments.	Postal survey	Focus on Pharmacist IP. Participants were doctors (n=287).	Approximately one-third of respondents estimated that 10%–30% of minor ailments initially handled by pharmacists would need medical care relatively soon thereafter. This was based on perceptions that many cases of suspected minor ailments seen in primary care are often more complex and serious and subsequently require higher levels of care. Doctors reported having the most concerns

						about cases of headache (n= 240/287), gastric reflux (n= 190/287) and menstrual pain (n= 175/287) as those most likely to be due more serious causes.
37.	Taylor and Mansell, (2017)	Canada Community Pharmacy	To evaluate clinical outcomes for Pharmacist IP for minor ailments.	Online survey	Pharmacist IP. Sample were patients treated (m=48).	When asked what they would have done if they had not asked for help in the pharmacy, 1 would have done nothing, 4 would have used something already available at home, 20 would have purchased an over-the-counter medicine, 10 would have gone to a medical clinic, and 1 would have gone to an ED. 1 sought a second opinion from a doctor, although their appointment had already been booked for the same ailment which was kept.
38.	Webb and Gibson (2011)	UK Urgent Out-of-hours Palliative Care	To evaluate the impact of IP in one weekend clinical nurse specialist service in the UK.	6-month audit of prescribing data and survey of GPs (n=9).	Nurse IPs Doctors (n=9)	136 drugs were prescribed during 65 patient encounters. Of these, 36 (26.4%) were opiates, 31 (22.7%) were benzodiazepine sedatives, 28 (20.5%) were antiemetics, 12 (8.8%) antisecretory medications and 23 (16.9%) were

						categorised as other. All of the doctor participants perceived that IP by community palliative care nurses was an effective way to provide timely and appropriate symptom control for patients during out-of-hours.
39.	Williams et al. (2018)	UK Urgent Care Service	To explore UK GP and NP views on and experiences of prescribing antibiotics in urgent care out-of-hours services	Semi-structured interviews	Nurse IPs (n=15) and GPs (n=15)	IPs reported perceptions of greater accountability for their prescribing compared with GPs. All participants (n=30) agreed that more complex cases should be seen by GPs. IPs described patient distrust with a no-prescribing decision and that patients believed they would have been prescribed an antibiotic had they seen a doctor instead. Peer discussion with doctors and education played an important role in supporting treatment decisions. Due to the additional efforts in engaging with out-of-hours services, alongside an inability for IPs to offer any follow up, patients had increased expectations of being prescribed an antibiotic, resulting in pressure to prescribe. Patient anxiety led to prescriber anxiety, influencing prescribing decisions, especially in children and

						the elderly. Participants felt patients are generally sicker when they attend out-of-hours services than in-hours services, resulting in a perceived higher clinical risk and therefore an increased likelihood of antibiotics being prescribed. IPs were more likely to work to guidance and protocols, whereas GPs often prescribed based on clinical intuition. Access to medical records was variable- some reported no access, which led to uncertainty and additional pressure to make the correct prescribing decisions. Nurse IPs reported having more time to spend with patients, whereas GPs highlighted pressure to end a consultation influenced the likelihood of antibiotics being prescribed during a busy shift.
40.	Woodburn et al. (2007)	USA Retail Health Clinics	To assess the quality of care of IPs in retail health clinics regarding antibiotic prescriptions for sore throat presentations.	Review of clinical records	Nurse and PA IPs	Of n=39530 patients seen by IPs in retail health clinics with a sore throat who produced a negative rapid streptococcal test, IPs adhered to clinical guidelines in 99.05% (n=39154) of cases, withholding unnecessary antimicrobials. Furthermore, of the 13 471 (34%) of patients with a positive rapid strep test result, 99.75%

						(n=39431) received an antibiotic prescription. Of the 414 (1%) patients provided with an antibiotic outside of the clinical guidelines, 190 (45.89%) received these based on a valid documented reason based on clinical judgement. However, no rationale for issuing an antibiotic prescription was documented in the remaining 54% (224 of 414) of patients with a negative test result
41.	Wright et al. (2018) Country- UK- England	UK ED	To describe the most effective model for managing, educating, and training pharmacist advanced clinical practitioners in the urgent care centre setting.	Qualitative longitudinal cohort study using interviews and focus groups.	Pharmacist IPs (n=3) ED Nurses and Doctors (n=24)	Pharmacist IPs (n=9) who had trained as ACPs during the study evaluation period, as well as other ED staff such as nurses and doctors (n=24) described during interviews and focus groups, that an additional benefit from utilising pharmacist IPs within UK EDs, was that they were also able to provide pharmacological advice to other clinicians in the ED, including nurse IPs and junior doctors. Pharmacist IPs were perceived by some participants to be more suited to prescribing for lower acuity cases than high acuity work such as major trauma. Some participants also reported during interviews that on commencement, pharmacists lack skills, which have been taught and then practiced by

						nurses at the same stage in training as ACPs. This included anatomy, examination skills, use of equipment, venepuncture, and some consultation skills.
42.	Yang et al. (2019)	USA ED	To describe opioid prescribing practice patterns and trends in EDs by provider type.	Review of ten years of secondary data on opioid prescribing 2005-2015	Nurse and PA IPs	Out of the total 77, 213 patient visits, IPs independently managed and prescribed opioids for only a minority (5.59%, n=4322) of these cases. The remainder were prescribed by a doctor (n=64709 83.8%) with 8182 (10.59%) being seen by both a doctor or an IP. IPs prescribed the following drugs: Hydrocodone (n=2607, 53.35%), Codeine (n=869, 17.78%), Morphine (n=457, 9.35%), Hydromorphone (n= 411, 8.41%) Oxycodone (n=315m 6.44%), Fentanyl (n=57, 1.16%), with the remaining drugs (methadone, meperidine, and propoxyphene) grouped together (n=170, 3.47%). The conditions treated by nurse IPs was similar to that of physician assistant IPs, although physician assistants treated back/neck pain-related conditions more frequently than NP and physician providers (NP = 9.3%, PA = 11.9%, physician = 8.5%). Both NP and physician assistants prescribed for

						dental pain (NP = 9.6%. PA = 9.1% vs physician = 3.6%) and injury related pain (NP = 27.9%, PA = 29.0% vs physician = 19.7%) more frequently, whereas doctors treated more potentially complex, higher acuity cases more frequently including chest pain (NP = 1.1%, PA = 1.6% vs physician = 4.4%), abdominal pain (NP = 6.5%, PA = 6.7% vs physician = 12.9%), and other conditions (cancer-related pain, sickle cell anaemia, nephrolithiasis, and cholelithiasis) (NP = 2.1%, PA = 2.5%, physician = 6.3%).

Appendix C Key stakeholder recruitment emails and participant information sheet

C.1 Initial invitation email

Dear XXX

I hope you are well.

I am writing to invite you to participate in a research study which is being conducted as part of a PhD in Health Sciences at the University of Southampton. If you decide to participate, you will be offered a £20 online shopping gift voucher in recognition of your time and contribution to the study.

The focus of our research is to undertake an evaluation of paramedic independent prescribing in emergency and urgent healthcare. This includes exploring the views and experiences of a variety of key stakeholders. These include participants with experiences around the implementation of paramedic prescribing in emergency and urgent care settings. This also includes participants who have experience in providing advice and guidance on policy/guidance development, for example through participation in relevant special interest groups with the College of Paramedics.

As an identified key stakeholder on this topic, I am writing to invite to you to participate in an online interview at a time convenient to you, in order to obtain your views, insights and experiences regarding paramedic independent prescribing in emergency and urgent care settings. Your views and insights around paramedic prescribing, including how it is being implemented into emergency and urgent care settings, will help us to understand this research topic more clearly. The data we gather from these interviews will also help with the design and data analysis in the other stages of our research project. These include conducting case study research in emergency and urgent care settings and an online questionnaire.

Please find attached a participant information sheet which provides more details on the study and participation.

If you have any further questions, please do feel free to contact me by replying to this email.

If you would be willing to participate, please could you confirm by replying to this email and also sign and attach the consent form (also attached to this email).

I will then make contact with you to find a convenient time to hold the online interview, which I anticipate will last between 45-60 minutes.

Thank you for your consideration in this matter and please be assured that **there is no obligation to participate or reply to this email if you would not like to participate in the study.**

Best wishes

Adam Bedson

PhD Student and NIHR/HEE Clinical Doctoral Research Fellow

The University of Southampton

C.2 Initial email for snowball sampled participants

Dear XXX

I hope you are well.

I am writing to invite you to participate in a research study which is being conducted as part of my PhD in Health Sciences at the University of Southampton. If you decide to participate, you will be offered a £20 online shopping gift voucher in recognition of your time and contribution to the study.

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As an identified key stakeholder on this topic, I am writing to invite to you to participate in an online interview at a time convenient to you, in order to obtain your views, insights and experiences regarding paramedic independent prescribing in emergency and urgent care settings. Your views and insights around paramedic prescribing, including how it is being implemented into emergency and urgent care settings, will help us to understand this research topic more clearly. The data we gather from these interviews will also help with the design and data analysis in the other stages of our research project. These include conducting case study research in emergency and urgent care settings and an online questionnaire.

I have been provided with your email address by XXX who as a participant in this study has identified you as a key stakeholder on this topic. I am therefore writing to invite to you to participate in an online interview at a time convenient to you, in order to obtain your views, insights and experiences regarding paramedic independent prescribing in emergency and urgent care settings.

Please find attached a participant information sheet which provides more details on the study and participation.

If you have any further questions, please do feel free to contact me by replying to this email.

If you would be willing to participate, please could you confirm by replying to this email and also sign and attach the consent form (also attached to this email).

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Thank you for your consideration in this matter and please be assured that **there is no obligation to participate or reply to this email if you would not like to participate in the study.**

Best wishes

Adam Bedson

PhD Student and NIHR/HEE Clinical Doctoral Research Fellow

The University of Southampton

C.3 Follow up invitation emails

Dear XXX

I hope you are well.

Further to my previous email, I am writing again to invite you to participate in a research study which is being conducted as part of my PhD in Health Sciences at the University of Southampton. If you decide to participate, you will be offered a £20 online shopping gift voucher in recognition of your time and contribution to the study.

The focus of our research is to undertake an evaluation of paramedic independent prescribing in emergency and urgent healthcare. This includes exploring the views and experiences of a variety of key stakeholders. These include participants with experiences around the implementation of paramedic prescribing into emergency and urgent care settings. This also includes participants who have experience in providing advice and guidance on policy/guidance development, for example through participation in relevant special interest groups with the College of Paramedics.

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These include conducting case study research in emergency and urgent care settings and an online questionnaire.

Please find attached a participant information sheet which provides more details on the study and participation.

If you have any further questions, please do feel free to contact me by replying to this email.

If you would be willing to participate, please could you confirm by replying to this email and also sign and attach the consent form (also attached to this email).

I will then make contact with you to find a convenient time to hold the online interview, which I anticipate will last between 45-60 minutes.

Thank you for your consideration in this matter and please be assured that **there is no obligation to participate or reply to this email if you would not like to participate in the study.**

Best wishes

Adam Bedson

PhD Student and NIHR/HEE Clinical Doctoral Research Fellow

The University of Southampton

C.4 Follow up emails for snowball sampled participants

Dear XXX

I hope you are well.

I am again writing to invite you to participate in a research study which is being conducted as part of my PhD in Health Sciences at the University of Southampton. If you decide to participate, you will be offered a £20 online shopping gift voucher in recognition of your time and contribution to the study.

The focus of our research is to undertake an evaluation of paramedic independent prescribing in emergency and urgent healthcare. This includes exploring the views and experiences of a variety of key stakeholders. These include participants with experiences around the implementation of paramedic prescribing into emergency and urgent care settings. This also includes participants who have experience in providing advice and guidance on policy/guidance development, for example through participation in relevant special interest groups with the College of Paramedics.

As an identified key stakeholder on this topic, I am writing to invite to you to participate in an online interview at a time convenient to you, in order to obtain your views, insights and experiences regarding paramedic independent prescribing in emergency and urgent care settings. Your views and insights

around paramedic prescribing, including how it is being implemented into emergency and urgent care settings, will help us to understand this research topic more clearly. The data we gather from these interviews will also help with the design and data analysis in the other stages of our research project. These include conducting case study research in emergency and urgent care settings and an online questionnaire.

I have been provided with your email address by XXX who as a participant in this study has identified you as a key stakeholder on this topic. I am therefore writing to invite to you to participate in an online interview at a time convenient to you, in order to obtain your views, insights and experiences regarding paramedic independent prescribing in emergency and urgent care settings.

Please find attached a participant information sheet which provides more details on the study and participation.

If you have any further questions, please do feel free to contact me by replying to this email.

If you would be willing to participate, please could you confirm by replying to this email and also sign and attach the consent form (also attached to this email).

I will then make contact with you to find a convenient time to hold the online interview, which I anticipate will last between 45-60 minutes.

Thank you for your consideration in this matter and please be assured that **there is no obligation to participate or reply to this email if you would not like to participate in the study.**

Best wishes

Adam Bedson

PhD Student and NIHR/HEE Clinical Doctoral Research Fellow

The University of Southampton

C.5 Key stakeholder participant information sheet

Study Title: A Mixed Methods Investigation of Paramedic Independent Prescribing

in Emergency and Urgent Care- Key Stakeholder Interviews.

Researcher: Adam Bedson

ERGO number: 76847

You are being invited to take part in the above research study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. You may like to discuss it with others but it is up to you to decide whether or not to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

This study is being undertaken by Adam Bedson, as part of a larger mixed methods research study being completed as part of a PhD in Health Sciences at the University of Southampton. This PhD project is being funded by the National Institute for Health and Social Care Research (NIHR) as part of a Clinical Doctoral Research Fellowship (NIHR302127).

Using a mixed methods research approach, this study will investigate paramedic independent prescribing (PIP) within emergency and urgent healthcare. Following its introduction into paramedic practice in 2018, currently very little research has been undertaken to evaluate how it is contributing to patient care and healthcare service delivery, alongside establishing if any facilitators or barriers exist which influence its implementation or delivery. The focus of this study is on PIP specifically within emergency and urgent care settings, which includes emergency departments, ambulance services, urgent care centres and out-of-hours services.

The objective of this part of the study, is to explore the views of key stakeholders, including subject experts, national leaders and other stakeholders who have oversight and experience of the implementation and use of paramedic independent prescribing within emergency and urgent care settings. The findings of this initial stage will inform the design and data analysis of future work packages, which will include case study research and an online questionnaire to explore the views and experiences of paramedics using PIP in these settings.

Why have I been asked to participate?

You have been asked to participate as a key stakeholder because of the experience and knowledge you have regarding PIP. Whilst specific experience is likely to vary between participants, it will include experience of implementing (and for some also using) PIP within emergency and urgent care, and/or experience at a national or strategic level regarding PIP policy and guidance. Initially, participants known to the researcher will be contacted and asked to participate, whilst also providing the details of other subject experts who they feel might also be in a position to contribute to the study. This technique is known as snowball sampling and therefore, you may have received an invitation to participate through this route.

What will happen to me if I take part?

If you agree to participate, the researcher will find a convenient time to conduct an online semi structured interview with you, using a suitable platform such as Microsoft Teams or Skype video conferencing software. The audio from this video call will be recorded and later transcribed. It is anticipated that the interview will last between 45-60 minutes. During the interview, the researcher will guide the discussion to cover key areas of the research topic, however you will be able to provide your views and insights on any aspects of PIP you feel are relevant. You will be asked to briefly outline your role and your experiences of PIP, in particular your work as a key stakeholder.

Are there any benefits in my taking part?

It is anticipated that the data collected from the views of key stakeholders during this stage of the research project, will be of great benefit in understanding how PIP is being implemented into emergency and urgent healthcare. This will include a better understanding of the benefits and limitations of PIP are, alongside what facilitators and barriers exist currently. As a participant in this research, the benefits to you will include having an opportunity to utilise your views and experience, in order to contribute to expanding the research evidence base on the topic of PIP. Furthermore, in recognition of your time and contribution to the study, you will be offered a £20 online shopping gift voucher. Acceptance of this offer is optional and the researcher will confirm with you if you would like to receive a voucher after the interview.

Are there any risks involved?

Given the nature of this part of the study in which you are being involved in, it is not anticipated that there will be any physical risk involved, nor is it anticipated that any emotional or psychological impact will occur through exploring your views on PIP. In the unlikely event that any emotional distress should occur through participation, the researcher will be able to advise on any specific support services that might be required.

What data will be collected?

During the interview, with your permission, the conversation will be recorded by the researcher and later transcribed verbatim by a professional transcription service into a text document in order for the data to

be analysed. This transcript data and the original audio file will only be available to the researcher and their supervisors. It will be held securely on password protected university computer, with backup copies saved securely on the universities server and will not be shared with anyone else. Any identifiable information within the interview transcript will be removed following transcription and will not be included in the analysis or published. Your personal details, the original interview audio recordings and transcripts will be securely stored separately by the researcher and by the University of Southampton for a period of ten years, after which time all data will be deleted from the researcher's University computer and from the Universities data repository.

Will my participation be confidential?

Your participation and the information we collect about you during the course of the research will be kept strictly confidential.

Only the researcher and their supervisors and responsible members of the University of Southampton may be given access to data about you for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your data. All of these people have a duty to keep your information, as a research participant, strictly confidential.

Any identifiable information or data which could enable you to be identified will not be made available outside of researcher and supervisory team) and will not be published. Whilst open access publication of the results will be sought in a peer reviewed journal and a study website, all participants will be referred to only by a generic identification code such as 'Participant 1'. No further details of your role or affiliations will be included in any of these outputs.

Do I have to take part?

No, it is entirely up to you to decide whether or not to take part. If you decide you want to take part, you will need to sign a consent form to show you have agreed to take part. Please email this consent form to the research prior to the interview at ab11e15@soton.ac.uk.

What happens if I change my mind?

You have the right to change your mind and withdraw at any time before or during the interview, without giving a reason and without your participant rights being affected. If you choose to withdraw during the interview, any recording made will be deleted and it will not be transcribed. Once your data has been anonymised and analysis commenced, it will not be possible at this point to withdraw your data from the study. If you withdraw from the study, we will keep the information about you that we have already obtained for the purposes of achieving the objectives of the study only.

What will happen to the results of the research?

Your personal details will remain strictly confidential. Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent.

The findings from this study, including anonymised direct quotations from the interview data, will be published in a Doctoral thesis, alongside in an open access peer reviewed journal. They will also be made available on a public study website (www.paramedicprescribingresearch.co.uk)

The interview recordings will be deleted from the researcher's computer and University repository in April 2032. This data may be made available for future research studies as required.

Where can I get more information?

If you would like more information about the study, or have any questions about participation, please feel free to email the researcher Adam Bedson at ab11e15@soton.ac.uk. You may also wish to visit the study website www.paramedicprescribingresearch.co.uk

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researchers?? who will do their best to answer your questions. Please email Adam Bedson ab11e15@soton.ac.uk in the first instance.

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you.

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at http://www.southampton.ac.uk/assets/sharepoint/intranet/ls/Public/Research%20and%20Integrity%20Privacy%20Notice/Privacy%20Notice%20for%20Research%20Participants.pdf

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you for 10 years after the study has finished after which time any link between you and your information will be removed.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you *for taking the time to read the information sheet and considering taking part in the research*.

Appendix D Key stakeholder interview topic guide

Stage 1- Introduction and Context Setting

1. Introductions
2. Brief overview of research topic and focus
3. Overview of aims objectives and research question

Research Questions:

What are the benefits and the limitations of paramedic independent prescribing in emergency and urgent care settings?

What facilitators or barriers exist which influence the implementation or delivery of paramedic independent prescribing in emergency and urgent care?

Research Aim

The aim of this research is to undertake an evaluation of paramedic independent prescribing within emergency and urgent care settings and build an empirical evidence base. This will demonstrate whether PIP is contributing to an enhanced level of patient care and improving NHS service delivery. It will also evaluate if and how a range of contextual factors, such as controlled drug restrictions and AP training, impact upon PIP delivery.

Research Objectives:

- To explore key stakeholder views on the benefits and limitations of PIP in emergency and urgent care,

- To ascertain views regarding if/how PIP is contributing to patient care and service delivery

- To understand views on any facilitators or barriers influencing PIP implementation and delivery

4. Explain anonymity
5. Confirm participant understands interview is being recorded, outline anticipated length (45-60 mins), outline anticipated outputs (doctoral thesis, open access journal publication and study website) and outline data storage plans.
6. Discuss consent and withdrawal which is capped at point of data analysis.
7. Check if they have any questions on the above
8. Check they are happy to continue

Stage 2- Background

1. Ask participant to explain their professional background in relation to research topic of PIP, including their professional experience as a clinician and (if applicable) a prescriber, alongside work/experience which provide high level views of topic.

Stage 3- Main interview topics

Opening question:

"Do you think paramedic prescribing is contributing to patient care and service delivery in emergency and urgent care and if so, how is it doing so?"

1. Contribution of PIP
   - Contribution to patient care
   - Contribution to healthcare service delivery
2. Benefits of PIP

Opening question:

"Do you think that there are benefits from paramedic prescribing in emergency and urgent care for paramedics, patients and the NHS, if so, what do you feel these are?"

- Professional benefits for paramedics prescribers
- Benefits for patients
- Benefits For NHS service delivery
- Other perceived benefits
- Unique contributions of paramedic prescribers/how are they different?

Opening question:

"Do you feel that there are any limitations to paramedic prescribing in emergency and urgent care and if so, what do you think these are"?

- Formulary and CD restrictions
- Any limitations to scope and if this differs depending on location/setting?
- Increased work
- Increased Responsibility
- Any other perceived limitations

Opening question:

" Do you think that there are any factors which either facilitate paramedic prescribing in emergency and urgent care, or represent a barrier to its implementation or delivery?"

- Patient views/acceptance
- Organisational support
- Views on differences between settings and perceived need for PIP in different settings
- Access to patient records
- Access to medical support
- Controlled drug restrictions
- Education and training- MSc or not? What aspects are essential/useful

- Pressure to prescribe

- Autonomy

- Relationships with medical prescribers

- Thoughts on medical dominance over prescribing?

  - Contextual issues within emergency and urgent care such as

    - Perceptions of increased urgency or increased severity,

    - An inability to arrange any onward review or follow up,

    - Time pressure

    - Pressure to prescribe from colleagues?

    - Do they feel there are differences between these settings (ED, ambulance, urgent care centres/out-of-hours)

Stage 4- Conclusion

Opening question- " Thank you for sharing your views on paramedic prescribing in emergency and urgent care, we are coming to the end of the list of topics I wanted to ask you about now, is there anything else you would like to add?"

1. Thank them for their time
2. Reiterate confidentiality
3. Explain how they can ask questions
4. Ask permission to archive the anonymised transcript for research purposes
5. Explain snowball sampling approach and if they can provide the names/details of other potential participants?
6. Offer voucher/confirm if they would like one

Appendix E Key stakeholder framework matrix extract

An extract of the framework matrix from key stakeholder interview analysis is provided below, as the full framework was too large to be incorporated into the Thesis document. The full coding framework is also included below this extract.

Key Stakeholder Interviews Framework Matrix Extract:

Participant	Views and Experiences of PIP Proposal	Comparisons to Other Professions	Views on PIP in Wider Context of EUC	Benefits of PGDs in Comparison to PIP	Medical Support in Practice	Master's Level Education and Advanced Practice
Paramedic, ACP-EM, (PIP) Ongoing strategic involvement with national PIP implementation.	Panel were quite hostile during initial meeting. Perceptions that panel did not want PIP to go ahead. This changed significantly in second meeting once reassurances and more detail had been given.	PIPs in comparison to other professions have additional benefit of experience as paramedics in working autonomously in prehospital setting. Contrasts with nurses who are used to	Describes PIP in the context of higher acuity cases and how working in a multi-disciplinary team with consultant support being available in ED. Contrasts this with prescribing for same cases in ambulance settings, where support may not be available. Describes experiences of	No data	Describes high levels of medical support being available for PIPs in ED settings. This is important for more complex prescribing decisions and complex patient cases. Shared	Describes assurances made to CHM around MSc level education in response to concerns around diagnostic capabilities of PIP. Feels concerned these assurance are not always being met and are getting diluted. Feels that consistency with a high level of

	Concerns raised around CDs- Using these drugs prehospitally without patient follow up being possible. Midazolam used as an example. Describes doctor on CHM panel questioning diagnostic abilities of paramedics based on their experiences of this in past, where paramedics have made the wrong diagnosis. Could not assure the panel this would not happen but provided context that even doctors make a wrong diagnosis at times and PIPs would work within a defined scope of practice to mitigate against this. Describes focus of panel was on use	working under medical direction. PIPs therefore are able to safely and confidently work more autonomously than other professions as PIPs.	being asked to third party prescribe for patients not directly assessed or seen. This is often requested in busy ED settings and can present challenges when already managing multiple patients. Reports they would not prescribe unless they have seen the patient first, further adding to delays and challenges in then having to do this. Also, when doing so, other issues or concerns with the prescription request are raised. Also describes experience of pressure to prescribe antibiotics for viral illness. Also, being able to request bloods in ED to demonstrate to patients they likely have a viral infection can help with this situation.		decision-making is also encouraged in ED settings which supports this process. High levels of support also important in managing high acuity cases in ED There is also access to speciality support for PIPs in ED settings. Feels this important supportive element to PIP is not so available for PIPs in ambulance settings and may result in conveyance to ED. Feels ambulance based PIPs may also be under pressure from ambulance control to finish a case and be ready for another,	education/training as promised, will be important to future expansion of CD prescribing rights. Feels that MSc education is important to ACP roles and supports PIP through a structured, comprehensive and consistent training package and an advanced level around diagnostic reasoning and examination. Concerned about lack of consistency and regulation in ACP roles, and MSc education is an important element to consistency in the ACP role. Describes how as ACP roles become more embedded into practice, in their experience EDs are stipulating full MSc with required specific modules in examination etc. Feels less consistency exists in urgent care services/roles.

	of PIP in ambulance services and need to reassure panel it would not be all paramedics in this setting but those with MSc/ACP. Concerns that these assurances have not been met now with variation in education/training. Concerns focused on pre-hospital use of PIP- safe dispensing, safe ABx prescribing with access to records potentially impacting on ABx stewardship, access to records pre-hospital, security of prescription pads. Describes bringing focus towards non ambulance setting (ED/urgent care) in response to this.				further impacting on their ability to access to support, which may take time to arrange.	Describes some paramedics accessing IP modules even prior to legislation changing. Experience of some studying at level 6 and by accessing course so early, circumnavigated requirements set by CoP, which universities may not have been fully aware of at the time.
Consultant ACP-EM (PIP). Strategic work regarding advanced	No data	In ED, different roles complement each other as part	Describes times pressures and distractions when prescribing in ED-	PGDs more suited to ambulance roles, given frequent need for	In ED there is always someone more senior that	Given undergraduate paramedic education is level 6, hard to argue

practice roles and PIP implementation.		of an MDT. However, nurses often have more knowledge of hospital systems/working, that paramedics need to learn and adjust to. Conversely, paramedics are more used to and experienced in autonomous patient assessment and diagnostic reasoning, making decisions about discharge/referral as they are more used to doing this. Whilst ACPs from all backgrounds are finally homogenous, different professions bring different strengths and skills to the role. Paramedics more used to seeing entire age range of patients and in managing high	Example of transcribing prescription chart for admission overnight, sometimes difficult in a noisy, pressured department and being asked to hurry up so patient can be moved from ED. Common to all prescribers in this setting and not just PIPs.	immediate use/supply. A limited carried stock formulary is more suited to PGDs than PIP.	the PIP to support them. Pharmacist support available for more specialist prescribing queries for ED based PIPs. Speciality doctors available for complex cases/those requiring additional speciality support for ED based PIPs. As a consultant ACP, part of role is mentoring and training ACPs, not yet acted as a DPP as only supervised nurse ACPs to date, who had nursing supervisors. Points to use of DPP role in future however.	PIP/AP should not be level 7. Also concerned that undergraduate level paramedic education supports protocol driven practice, not ACP and does not provide the required level of pharmacology, A&P, pathophysiology is still not sufficient to support PIP adoption without MSc level education in this area. Feels other professions such as nurses studied IP at level 6 as they adopted IP rights whilst their profession was still at diploma entry and not BSc like paramedics are now. Alongside nurse IP more commonly used in specialist roles with limited scope in comparison to generalist PIP roles with more breadth. Critical thinking, applying evidence to practice are skills associated with level 7 and are essential to safe prescribing in ACP.

		acuity cases. Often paramedics have less experience than nurses in minor low acuity cases and have to develop experience with these. In comparison to other professions, paramedics have developed unique experience in medicines usage from exemptions and PGDs which gives confidence as prescribers, particularly for high acuity cases, as they are used to using these drugs.				
Advanced Paramedic (PIP), senior positions in EUC and College of Paramedics.	No data	Feels there is little difference between PIPs and other prescribing professions working in the same practice areas. However, in	No data	Starting with PGD medicines allows paramedics to develop experience in an extended formulary which can then be expanded on as prescribers. Trust audit PGD use/practice to	Describes requesting medical support for prescribing outside of scope. Feels more inclined to ask a doctor for support than another IP.	Describes APPs in their ambulance Trust do have wide variety of educational backgrounds and both level 6 and 7 (Trust does also employ nurses in this role). Feels there is little observed difference in the practice between those with level

		relation to CDRs feels frustration that despite the paramedic profession having more experience than nurses in using CDs, they are not allowed to prescribe them, but nurses are- Feels this does not make sense.		decide if APPs are ready to adopt PIP.	At an organisational level, the doctors are employed as clinicians and it's not a formal part of their role/contract to provide medical support, although they do this. They also at times ask the PIPs for peer support/advice. Positive experience in asking GPs employed by Trust for medical support when required, examples when started to remote prescribe to gain confidence. Important when working as a lone worker, to be able to have that support from others if unsure.	6 and level 7 education. Feels some level 6 courses/modules are better and more comprehensive than some level 7 ones. Writing an essay at level 7 rather than level 6 does not make you a safer prescriber. Would rather people are competent prescribers than can write a good level 7 essay. Contrasts PIP education guidance with nurses in similar roles, who can study at level 6 AND prescribe CDs, versus PIPS who are asked to study at level 7 and cannot prescribe as many drugs. Does not feel level 7 education necessarily results in safe prescribing practice in comparison to level 6.
Paramedic (PIP) Senior College of Paramedics role	No data	Paramedics do bring a unique skill set as prescribers and	No data	Given need for immediate use in ambulance settings, outside usual	Concerned about use of PIP by solo clinicians in ambulance roles	Feels HEIs need to tighten up their acceptance criteria given assurances made to CHM. Concerns

		their scope is more aligned to that of doctors in comparison to other IP professions who work in more specialist capacities such as podiatrists. Although nurses and pharmacists are also more generalised in their scope. Paramedics do have experience in making higher level decisions more quickly than other professions due to their background and in managing uncertainty. ACP then builds on this experience to further assess and manage uncertainty, all contributing to a unique skill set for PIPs.		pharmacy opening hours, well-written PGDs are more useful in this setting than PIP. PGDs more suited to ambulance roles given need for immediate use in this setting. Feels it would be cheaper for organisations to continue with PGDs in ambulance Trusts than adopt PIP. Feels comfortable with paramedics on ambulance (? regular paramedics) using PGDs and this is needed in current climate, however PIP should remain an advanced level skill.	who would not have the same level of medical oversight as those working in other EUC settings as part of MDTs. This could result in risk taking or difficulties in managing pressure to prescribe when working in isolation. Feels medical support is integral to facilitating PIP in all EUC settings. This is more readily available in ED and urgent care services. Feels college need to develop guidance around the new DPP role, to support peer supervision of trainee PIPs.	around self funding PIP training and then going straight into a new clinical role/area following this which is not safe. Describes a mismatch in some paramedics, who perceive themselves to be at an ACP level because they have adopted PIP, although may lack the other important elements from MSc education. Important elements of MSc education to support PIP include advanced assessment modules. Regulation of ACP roles would be beneficial in ensuring consistent standard of PIPs regarding education and experience. Feels it is important for profession to set and maintain a high standard of practice around prescribing, regardless of the level that other professions study IP at.

Paramedic (PIP) Senior College of Paramedics role)	No data	In comparison to pharmacist and physiotherapists who work in a more specialised way, paramedics (and nurses) are well suited to EUC roles that require them to treat unscheduled, undifferentiated patients, with polypharmacy and comorbidities. Important not to emphasis comparison over benefits of MDTs. Paramedics do not come better equipped for IP than other professions, it's an even playing field, although they do have a unique background of quickly identifying the acuity of patients and making decisions	PIPs well placed to manage patient presentations in EUC which are complex patients with polypharmacy and co-morbidities, in context of shortage of doctors and the associated costs of medical cover.	Increase patient access to medicines by non-prescribers Facilitate immediate supply/administration when patients need a medicine straight away or cannot access a pharmacy. PGDs may be seen as an easier option for organisations than supporting paramedics to train in PIP.	Little to no medical support provided in house within ambulance Trust, available via primary care during day.	As a senior CoP member, receives regular complaints by email that the PIP criteria are too strict. Feels strongly that IP is an advanced skill and needs to be part of a postgraduate package of education that equips PIPs to take an appropriate patient history and reach a diagnosis. The undergraduate paramedic programmes do not equip paramedics for PIP in the same way as an MSc/postgraduate education does. Ongoing work to address this and improve undergraduate paramedic pharmacology training. This is particularly important given the multi-morbid, poly pharmacy nature of the patients being treated by PIPs. Experience requirement could be amended given some paramedics can acquire experience quite

		around this. Pharmacists are the best prescribers, in the same way paramedics are the best at resuscitating people.				quickly . Potential issues with self-funders accessing PIP courses rather than those being sponsored by NHS Trusts.
Strategic academic/educational role in IP education delivery. Medical Director in EUC.	No data	"I think, the last time I saw a really sick kid was months and months ago. The last time they probably saw a really sick kid and identified the sick kid was probably yesterday" Paramedics are able to identify sick patients quicker and are good at managing risk. This comes from seeing so many patients with both high and low acuity presentations of similar problems. For example, paramedics see	Need to be careful that PIP is not intended to facilitate replacing doctors in EUC with paramedics. It does however facilitate their contribution as part of an MDT, which enables appropriate use of different skill sets to be utilised in EUC.	PGDs cover 60-70% of presentations encountered in urgent care. Examples include UTI, sore throat, chest infections and analgesia for painful conditions. Urgent care service that they lead are very proactive with PGDs and feel they are important.	Medical support in practice more readily available when PIPs are working alongside doctors in treatment centres. Can be difficult to get hold of medical support when in community on home visits. Accessing remote support in the organisation can be challenging if the PIPs and doctors do not know each other, and some doctors are reluctant to offer support/advice to paramedics they	Lack of understanding amongst doctors regarding need for MSc education, feels work to increase awareness is needed.

		patients with really bad chest infections and more minor ones, so are more comfortable leaving patients at home in comparison to other clinicians and even GPs, who encounter very ill patients only infrequently. Feels paramedics would be more comfortable prescribing in this uncertainty as a result, even if patients were a bit more unwell than a GP would feel comfortable with. Feels IP/PIP training is tougher than the training doctors get in the prescribing element of their medical degree. As a result IPs/PIPs are more thorough and careful, e.g.			do not know, particularly if a verbal order is required. MDT training and joint education events help to promote team working and support of IPs.	

		looking things up in BNF.				
Strategic role in IP education delivery. Nurse (IP). Previous EUC clinical experience.	Describes holding regional stakeholder event during PIP proposal period. This was attended predominantly by CCPs and critical care service leads, who were keen to adopt PIP. Specialist paramedics/ECP leads also attended. Felt concerned that they could not see the benefit of this, or how PIP would be operationalised into services that lacked the governance and a clear need for PIP. Particularly in CCP roles given they work so closely with doctors and drugs are required for immediate administration.	The benefits of IP/PIP are the same regardless of the profession. The benefit is from IP and not the specific profession using it.	No data	PGDs really do have a place and give protection for paramedics working in ambulance Trusts, which are very protocol driven and less suited to the autonomy that PIP provides. PGDs also better suited to lone workers given the additional safety profile. Ambulance paramedics struggle to articulate why they need to adopt PIP over PGDs and any clear limitations to their practice from PGDs.	No data	Their HEI required all paramedics to complete PIP module as part of a MSc pathway, causing 'angst' by paramedics around their interpretation of this guidance and following CoP guidance to the letter. Paramedics needed to demonstrate they were on a MSc pathway and not just module gathering. Insisted on at least one level 7 module first. Many chose a clinical skills module which then did not provide the required academic skills for the IP module. MSc education is important for PIPs, given they are operating outside of their traditional roles. When you sit outside your traditional role, you need extra education to go with that. Unsure if in time, this will

						show any difference in practice and in future, paramedics may be able to study at level 6. May be reflective of setting bar high in early stages of adoption. Level 6 IP education has a place for other professions such as nurses, who often prescribe in specialist roles, for which they have comprehensive level 6 education and experience and so level 6 IP is more suited to these roles, than PIP roles. Feels however, that currently, MSc is important facilitator of PIP.
Senior leader in ambulance service (PIP)	No data	No data	Some concerns around ensuring follow up in PIP roles. In ED, much more attuned to writing to primary care, this is difficult for ambulance APPs. Sometimes social circumstances of patients encountered by ambulance PIPs are more complex than those who self-mobilise to their GP.	APPs not trained in PIP have full suite of PGDs.	Access to medical support is limited in ambulance setting. APPs can liaise with pts GP in primary care. The Trust have an on call strategic medical advisor, however APPs	PIP is currently completed/studied after completion of full MSC. In future, may look to PIP being integrated in MSc pathway. Feels MSc is massively important and provides important underpinning knowledge to support safe and effective

			These can impact on concordance and its difficult for ambulance PIPs to be sure a patient took the prescribed medicine/actually collected it from pharmacy.		rarely contact them. Patients own GP may be a better source of support given pt is known to their service and advise is usually in the form of asking for additional background and some advice, rather than medical direction.	prescribing. Whilst MSc education is key, it has also got to be good and appropriate training, concerns that some generic MSC pathways are not tailored enough for PIP roles and there is also variation between courses, with some being better than others.
Consultant ACP (PIP), regional strategic work on advanced practice roles.	Disagrees with concerns around potential wide range of conditions PIPs might encounter, as this will be bound by their practice setting to an extent and will be comparable to other IPs in these settings.	Feels CD restrictions for paramedics do not reflect their experience in using these medicines, in comparison to nurses, who are able to prescribe these drugs but have less experience in their use.	Describes challenges from working in busy EUC services, with requests to third party prescribe for patients not directly in their care. Manages this by briefly seeing patient to ensure this process is safe, despite pressures and demand.	No data	Sharing decision-making within MDTs is a safer than prescribing decisions made in isolation.	Would be concerned about PIP being available to non-advanced paramedics. Describes how their MSc was aligned to RCEM ACP curriculum to ensure competency in patient assessment and history taking. Feels some MSc programmes are more vague/less structured. Does not understand why paramedics are different and cannot study PIP at level 6, aware that some HEIs are now offering it at level 6. Feels there is not

						a clear link between academic attainment/ability and clinical practice. "Critiquing a paper will not make a better prescribing decision".
Senior leader of ambulance service, senior College of Paramedics role.	No data	No data	An increasingly old and frail population is driving demand, this demand will not plateau till 2040's. Ambulance services need to continue to innovate and ensure lower acuity work is managed by PIPs. Ambulance services need to ensure PIPs are targeted at these calls. PIPs well suited and confident in dealing with this demand, which avoids the need to refer them to other stretched services such as primary care and hospital.	PGDs facilitate immediate supply and administration. Loose PGDs mean they cater for 60-70% of cases encountered. Use of PGDs an important foundation to build on with PIP	Doctors are not employed in clinical/patient facing capacity by their ambulance service, only at board level Contrasts access to support when working outside ambulance setting during rotational working e.g. out-of-hours services and when undertaking PIP in ambulance setting- Support much more available in other settings by comparison. However, feels PIPs should be less reliant on medical support in comparison to	In agreement that PIP needs to be part of MSc programme. This provides key experience in critical thinking which is needed as a prescriber. Feels this is in part reflective of previous training routes into profession and the current landscape at time of PIP proposal. The need for MSc education potentially could change in future as profession continues to develop.

					non-PIP advanced paramedics. Also describes difficulties arranging medical supervision during PIP training for ambulance settings. This is in part due to the financial incentives for primary care to support trainee GPs rather than PIPs, which they would do for free as this level of funding for PIP is not available, there is also the resource implications for GPs to give up time to support ambulance PIPs during their training. Describes support for PIP training will challenge plans to 'industrialise' PIP levels in ambulance settings. Although,	

					there is potential to supervise PIPs in house with changes to regulations for DPP roles, however currently the existing PIPs do not have the required prescribing experience for this role.	
Senior leader for ambulance service, senior College of Paramedics role (PIP)	No data	No data	No data	Describes how PIP has only recently been adopted, given the benefits from PGDs which have been utilised to good effect in past. Currently have 24 very broad PGDs which allow for some interpretation in the way they are written.	During rotational working, medical support more available Not currently available in ambulance service however there is peer support from senior on call clinicians and plans to develop this peer support further, using the experienced APPs.	MSc provides assurance and an important training journey over three years, to support adopting PIP. Also important in supporting paramedics as they move from traditional ambulance roles into more advanced roles such as rotating into primary and urgent care settings and dealing with complex, multimorbid, polypharmacy patients
NHS England Role. Paramedic.	Lack of understanding from CHM about how PIP would be implemented in	Feels paramedics do have a unique role/contribution as PIPs. Describes them	No data	No data	ED PIP roles have good level of medical and peer support during	MSc education is absolutely essential for PIP, because it is a massive responsibility.

	ambulance settings. Profession had to demonstrate maturity and convince panel that PIP would be safe, which was one of the biggest challenges. PIP proposal was framed around unrestricted prescribing from full BNF (excluding CDs). This was to ensure flexibility and future proofing, rather than starting with limited scope and having to go through additional consultations to expand this.	as specialist generalists. Paramedics are good at dealing with the unexpected because they never know what's behind the door until they get there and the wide range of cases, they encounter provides experience and versatility that they bring to their prescribing roles. However, PIP is enhanced when paramedics work as part of MDTs given they can then utilise the skills of others and learn from them.			practice as part of an MDT	MSc education provides important critical thinking and patient assessment skills, at a higher level than undergraduate/profession entry training. Although cannot be legally regulated and is only guidance from CoP. Whilst legislation was changed on basis of ACP/MSc education, it could not be changed to stipulate this, which has created issues with paramedics accessing PIP independently and avoiding these requirements. Participant describes actively interrupting this process at a regional level if they were aware of paramedics who did not meet recommended education level trying to access PIP module, by contacting HEIs to advise them of this. HEIs are not always robustly checking backgrounds of paramedics before

						accepting them on the course. Feels it is still an ongoing issue but might improve as HEE digital ACP badge becomes more embedded.
Senior ambulance service leader, nurse.	No data	Paramedics spend their formative clinical years in the acute assessment environment, so they are very much like a GP- They can turn up, meet a person for the first time, undertake a clinical assessment and make a decision on the right clinical outcome. So that is a unique position in comparison to nursing roles which is advantageous in terms of APP roles and PIP.	PIP in EUC needs to embrace remote consultations and that a digitally enabled future workforce will be key to improving efficiency in NHS.	PGDs may have a utility in expanding urgent care/enhanced treatment options to all paramedics in an ambulance service, given they are safe and this could further enhance patient access to medicines in safe, restricted way, for straight forward cases such as providing analgesia or antibiotics for uncomplicated infections, without all paramedics needing to adopt PIP.	No data	Feels that MSC education for PIP is the right route now, although may not be the case in the future/five years' time as profession develop towards a fully graduate level profession and as scope/practice continues to evolve and if undergraduate training continues to advance and develop, this may change the landscape around the need for PIP to be situated as an advanced skill.

Academic/Educational leader. Experienced Urgent Care Doctor	No data	PIPs appear to be more confident with clinical reasoning initially in comparison to nurses adopting ACP roles, however all professions end up being similar with experience in these roles.	Describes how as a GP they do far fewer community visits to care homes as ambulance crews now seem to attend these. This therefore suggests a need for PIP roles as many patients encountered will require treatments prescribing such as antibiotics to avoid conveyance to ED. Articulates how given the current crisis in emergency and urgent care, delivering care closer to home by clinicians competent in diagnosing and managing cases in the community is important to achieving good patient centred care. Out-of-hours services carry small stock of medicines for immediate supply, given issues out-of-hours with pharmacy not being open. However, in the organisation they work for, morphine is not carried in the car and has to be signed out of a safe at the base before attending a call, which can	PGDs are used as an alternative in OOH urgent care, although require frequent support from medical prescribers due to limitations.	Describes when working in a GP led urgent care centre, as a doctor they gets asked to provide advice and support only infrequently- Once every couple of shifts. Has not experienced ambulance PIPs calling them in hours for prescribing advice	Feels MSc and in particular advanced level education in patient assessment, diagnostic and critical reasoning are all important elements of this education to support PIP in EUC .

			presents challenges. Because 111 services effectively refer most potentially higher acuity cases to the ambulance serve, the nature of out-of-hours work has changed to become more similar to cases encountered in primary care i.e. lower acuity. Contrasts this with work in urgent care centres, where higher acuity cases just turn up and so are managed in this setting still.			
Senior leader for ambulance service, senior College of Paramedics role.	Describes perceptions of a transition from not really being taken seriously by the CHM, to demonstrating a good case of need for PIP and convincing them that the profession are able and ready to adopt IP rights. A lot of this was as	Paramedics do have unique elements to their practice around being decisive and managing high acuity rapid onset conditions, although this does not make paramedics 'better' prescribers than other professions but each	Feels role of PIPs in urgent care, in prescribing in the face of uncertainty, with limited patient background/information is the same for paramedics as it is for other professions. This is managed by focusing on managing the patients symptoms over the out-of-hours period, to enable other in hours services to onward manage them.	PGDs still have an important utility, particularly when an immediate supply is required. Although PGDs are over used by organisations on an industrial scale and should be used appropriately, for situations where an immediate supply is required they work well.	No data	MSc education requirements as part of PIP proposal were framed around the profession at the time, with many older paramedics not being educated at graduate level and variation amongst the workforce. Feels paramedic profession have now caught up with others as an all graduate profession. Feels this

	a result of changing the panels perception of paramedics from 'ambulance drivers' to autonomous, capable healthcare professionals. Developing case studies to present was also key. These illustrated that paramedics manage complex, exacerbations of chronic conditions and end-of-life situations, as well as emergencies. Despite focus at time of proposal for case of need for PIP in ambulance settings, currently far more working in primary and secondary care than in ambulance Trusts. In final stages, the panel still had concerns around	profession does bring its own skills to IP. Paramedics are the only profession to have all three legislative options available to them of exemptions, PGDs and IP, Feels these can and should be exploited fully by organisations to maximise the impact of employing paramedics.		PGDs are a good way for PIPs to develop initial experience in using an extended formulary of drugs, which can then form the basis of their personal prescribing formulary, once they adopt prescribing.		needs to now be built upon to embed some elements of postgraduate education into undergraduate training, to make paramedics more prescribing ready. Feels its important that PIP module is studied at level 7 for academic rigour and depth of critical thinking, but given paramedics now have a BSc, PIP and ACP can be achieved through portfolio routes and not just MSc.

	education and training, which were overcome through reassurances around ACP and MSc education and the use of personal formularies to restrict scope and robust organisational policies and governance, in the same way that IP is managed for other professions. MSc education requirement was reflective of the fact that paramedicine was not at the time, a fully graduate workforce and it was felt that given many paramedics had still only been trained via IHCD route, setting bar high was and still is important.					

E.1.1 Key stakeholder interviews full analytical coding framework

Name	Files	References
1 High Level Views and Experience	15	123
1.1 Views and Experiences of PIP Proposal Work	3	13
1.1.1 Views and Experiences of Proposal Work	5	16
1.1.2 The Changing Landscape Since This Work	7	10
1.2 Strategic Level Work	5	7
1.3 Views and Insights on PIP roles in EUC	3	10
1.3.1 Ambulance PIP Roles	15	47
1.3.2 ED PIP roles	8	22
1.3.3 Urgent Care PIP Roles	6	17
1.3.4 Comparisons to other PIP roles	1	1

Name	Files	References
1.3.5 Comparisons to other professions	13	38
1.3.6 Rotational Working of PIPs in EUC	10	24
1.3.7 Patients Views and Perspectives	7	13
1.4 Views on PIP in the wider context of EUC	10	18
1.5 More general views on paramedicine	2	2
1.6 PGDs Vs PIP in EUC	15	73
1.6.1 Benefits of PGDs in comparison to PIP	7	9
1.6.2 Limitations of PGDs in comparison to PIP	12	23
1.6.3 PGDs as an alternative to PIP	10	20
1.6.4 Views on prescriber use of PGDs	5	10
1.6.5 PGD experience to support PIP	3	3
1.6.6 PGDs for CDs	6	8
2 Benefits	14	98
2.1 Benefits to patient care and experience	12	24

Name	Files	References
2.2 Professional Benefits	9	21
2.3 Healthcare Service Benefits	11	36
2.4 Difficulty Demonstrating Benefits	7	17
3 Facilitators and Barriers	15	311
3.1 Controlled Drug Restrictions	14	108
3.1.1 CDRs Impact on patient care	6	11
3.1.2 CDRs Impact on professional practice	8	18
3.1.3 More General Negative views on CDRs	10	18
3.1.4 Positive or neutral views on CDRs	5	10
3.1.5 Views on the future of CDRs	9	19
3.1.6 CDRs and palliative care	8	17
3.1.7 CDRs Impact on NHS services	5	5
3.2 Organisational Aspects	14	64
3.2.1 Governance and Medicines Management (inc. formularies)	10	25

Name	Files	References
3.2.2 Staff retention	4	6
3.2.3 Utilisation of PIPs	3	4
3.2.4 Organisational Support	9	12
3.3 Access to Diagnostic Tests	2	3
3.4 Access to Records	11	16
3.5 Medical and peer support in practice	12	46
3.6 Methods of Prescribing- Electronic and paper FP10s, MAR charts	11	20
3.7 Negative medical opinions, dominance and jurisdictional claims	9	11
3.8 Medical and peer support during PIP training	10	23
3.9 Methods of Prescribing- Immediate supply and administration	10	20
4 Professional Aspects	15	133
4.1 Master's level advanced practice education	15	55
4.2 Managing Complexity	4	6
4.3 Autonomy and Confidence	8	14

Name	Files	References
4.4 Safe and appropriate prescribing	11	22
4.5 Pressure to prescribe	9	12
4.6 A need to prescribe in practice	4	7
4.7 Experience	9	17
Misc. Categories	15	66
Critical Care Roles	5	6
General Background of Participants	15	24
High Acuity Prescribing	8	36

Appendix F Field note examples

F.1 Example of field notes from emergency department case site

As with other shifts I had spent in the ED, today was another exceptionally busy day, with both the ED and wider hospital stretched beyond usual capacity, with long waiting times for admissions to the hospital from the ED, and for patients to be seen by one of the doctors or ACP-EMs. As I had observed on other busy shifts, patients were sitting in all available chairs in the corridors, with some also sat on the floor! One young patient was sat on the dirty floor next to a wall socket so they could charge their phone whilst watching a programme on it to pass the time. Other patients were eating sandwiches and chatting to their relatives, I overhead many of them commenting on how long they had been waiting. Despite arriving early, I found ED PIP P4 already involved in a case! After checking with them I had not got the shift times wrong, they told me that they had arrived fifteen minutes early but as the department was so busy had decided to get stuck in slightly ahead of their start time. They told me they had just been to see a patient in the ambulatory majors area of the ED. They were a 95-year-old patient who had been brought to the ED by ambulance after falling in their home and sustaining a laceration to their head. The patient they told ED PIP P4 they were unable to remember falling or hitting their head, suggesting either they had lost consciousness and fainted, or had knocked themselves out on falling. The patient was also taking an oral anticoagulant, which I knew increased the risk of having a cerebral haemorrhage. Because of this, ED PIP P4 had asked the nursing staff to perform an ECG, take some bloods and had requested a CT-head scan for the patient. They were currently handwriting the patients notes. Whilst they were writing these, we held several conversations about their role and wider experience…

… PIP P4 and I went to see the patient in their cubicle. They were sat up in bed and were with their daughter and son in law. After introducing themself and gaining consent for me to observe the patient's care, PIP P4 asked the patient what had brought them to the ED that day. They explained they had been making their breakfast at home when they suddenly felt unwell with palpitations and dizziness. They explained these symptoms

had continued until just a few minutes ago, when they felt them suddenly subside and were now feeling much better. However, the patient also explained that in recent weeks they had also been experiencing episodes of central chest pain and some slight shortness of breath when the pain was present, they had also had this pain that morning although explained it often comes on at rest and is usually not accompanied by any palpitations. PIP P4 then conducted an examination which included listening to their lungs and heart sounds and examining their limbs. They noticed the patients lower legs were quite swollen and had some pitting to the skin. This I knew was peripheral oedema, which was likely a symptom of heart failure.

PIP P4 then explained to the patient, they would go and review their ECG and the blood results from the blood tests that had been ordered by the nurse on their arrival and also look at their primary and secondary care records. They explained to me that where possible, they prefers to speak to the patient first and then review any investigations, rather than doing this the other way round, as they feels less likely to miss something if their history is not focused on any abnormal results.

We then returned to the clinical staff area where they found a free computer to log in and look at the patients notes and investigations. They explained to me that given their heart rate had now stabilised, their main concern was their ongoing symptoms of chest pain at rest. After checking the results of their investigation, this revealed that the patients ECG and troponin blood results confirmed their suspicions that the patients symptoms of intermittent chest pain were likely due to unstable angina, a symptom of partial coronary artery occlusion. They did however explain that although their troponin was raised, this could be due to their recent arrythmia which would also place strain on their heart and cause this blood result to become elevated, in the same way as angina would.

The patient's primary care notes, which they was able to view in detail also showed that they had a history of intermittent atrial fibrillation for several years, with several episodes of fast fibrillation episodes, which the patient had not mentioned to them. They reviewed their prescribed medication on their primary care record and noted that this included an anticoagulant and a beta blocker which has been prescribed following their diagnosis of atrial fibrillation. I asked PIP P4 if being able to view patients previous records was important when prescribing and they explained that they felt it was critical to be able to access these to prescribe safely. Not only does it allow you to see in detail

what patients are prescribed and why, it also allows you to understand any overuse or underuse of medicines prior to coming to the ED, which are shown as positive or negative percentages on EMIS viewer. This they explained is helpful if a patient has developed acute symptoms as a result of either not taking their prescribed medication or taking it too frequently, which they explained often goes unmonitored in primary care because they are so busy. This is often reflected in a patients prescribing history as a higher or lower percentage as they have been issued more frequent repeat prescriptions or had not been issued with enough due to not taking it as prescribed.

PIP P4 then spent some time (around 25 minutes) writing the patients notes for admission and arranging for a bed on the medical ward, as well as telemetry monitoring from the cardiology team. During this time they was interrupted several times by nurses and healthcare assistants to check and sign ECGs and blood gas results, which all senior clinicians were required to do. I asked them if this was a distraction from their clinical work and they told me it definitely was but is a necessary task as without the clinicians checking these important investigations as they are taken, as important decisions may need to be made based on these. There was also a lot of noise and distraction during this time as the red pre alert phone had rung and this had resulted in quite an animated discussion between the consultant in charge and the other clinical staff in the area, including PIP P4. The call had been from the air ambulance paramedics, who wanted to bring a patient to the ED with a severe head injury. The consultant in charge has asked them to fly the patient straight to the regional major trauma unit and not to their ED, as they would need a higher level of care. However, the air ambulance team had said they felt they should come directly to the case site ED and because of the bad weather around the major trauma unit and because the patient was too unwell for a longer journey time. They had been quite rude to the consultant and informed them they were coming and would discuss it when they arrive, which had made them quite cross because the ED was already really busy and they felt eventually, the patient would need a secondary transfer to the major trauma unit once a CT scan has revealed the extent of their injury, which was not good for the patient or the department. PIP P4 and the other ED staff agreed with their point of view but as the patient was already now on route, they spoke with the nurse in charge to clear some space in the 'resus' area of the ED. This proved quite challenging as all of the patient's

currently in the resus room needed to be there, but they decided that one case could be moved to the 'majors' area as long as they were carefully monitored.

After they had finished the patient's notes and arranged the admission, PIP P4 then checked to see if the earlier patient had now had their CT head scan, but on checking informed me they was still waiting for this, which was quite unusual and likely because the hospital and ED were currently so busy. A short while later PIP P4 was approached by one of the emergency nurse practitioners (ENPs) who asked them if they would be able to assist with a fracture dislocation that would require sedation to realign and plaster. The ENP pulled up the patients x-ray on the computer which should a significant fracture dislocation of the patients lower leg. The ENP explained the patient had fallen down some steps in a shop around two hours ago and had been brought to the ED by ambulance. PIP P4 agreed the fracture would need initial relocation and plastering before being reviewed by the orthopaedic team and that they would be happy to sedate the patient whilst the ENP managed the relocation and plastering of the limb. They asked the ENP if they would move the patient into the resus area and after checking with the nurse in charge, was told another patient had just come out of resus and so there was a spare bed now available for this patient. PIP P4 then phoned the trauma and orthopaedic team. However, the orthopaedic registrar was currently in surgery and so the SHO (junior doctor) had answered the call. After they had looked at the x-ray the SHO asked PIP P4 to go ahead and realign the fracture, placing the limb in a below knee backslab. PIP P4 asked them to confirm this and told the SHO they had planned to use an above knee backslab as this was usually how they managed lower leg fractures in ED. However, the SHO said again to use a below knee cast. After the call, PIP P4 asked one of the consultants about this and they agreed it was a strange decision and that had the registrar been available, they would have likely also said to use an above knee cast. The ED consultant advised PIP P4 to double check this with the SHO again before going ahead, as it would not be good for the patient to have to have another cast fitted if the registrar had a different opinion. PIP P4 bleeped the orthopaedic team again to double check with them, however after around fifteen minutes they had not had a reply and so following another discussion with the ED consultant, they decided to proceed with the procedure but to apply an above knee cast as they both agreed this would be the best choice for the patients injury and the SHO in their inexperience had given the incorrect advice.

A short while later PIP P4 and I met the patient in the resus room and they introduced us, also gaining the patients consent for me to observe their care. They explained to them that their leg was badly broken and would need to be manipulated back into place to ensure the blood and nerve supply did not remain compromised. A quick check of the patients foot confirmed only a weak pulse, and their foot was a dusky blue colour, as well as being visibly deformed and swollen. They explained to the patient that it would usually be very painful to move a fractured limb in this way, which is why they would like to give them a strong painkiller and anaesthetic drug to make sure they was not aware of the procedure and not in too much discomfort. They agreed to this and so they then went on to explain that this would not be a full anaesthetic and would be what is known as conscious sedation. This meant the patient would be asleep and unaware of what was happening, but not fully anesthetised. They did however explain to their that occasionally even light anaesthesia could result in airway complications and so they may then require a full anaesthetic to manager their airway should this occur. They then asked the patient to sign a consent form which they did. I noticed at this point that PIP P4 was referring regularly to a paper document they had taken out of one of the filing cabinets in the resus room. I asked them about this, and they explained that it was a sedation checklist. They took me through the whole document, which covered several pages and included items that had to be checked prior to starting the procedure. These included an assessment of the patients airway, that the required equipment was available and had been checked, such as suction and intubation equipment. I took a copy of a blank version of this form (available in the documents section of the field notes). PIP P4 also asked the nurse to administer high flow oxygen to the patient for several minutes before the procedure, which I knew was another requirement before starting a sedation, advising them they would later add this prescription to the patients record. At this point another two nurses had joined us in the resus room, to assist PIP P4 and the ENP with the sedation and procedure. One of these nurses asked PIP P4 what drugs they would like drawing up. They asked them to prepare Propofol for the sedation. The nurse asked 'you want Fent as well'? Referring to Fentanyl which I knew was a controlled drug not available for paramedics to prescribe currently. PIP P4 said no I'll use Morphine for analgesia. The nurse seemed surprised by this and said "oh.. really? Not Fent?" "I can't prescribe Fent" replied PIP P4. "Ah, that's right" said the nurse, " what about getting one of the Docs to prescribe it". " I'll check with [consultant in charge] but as they've not had any analgesia so far and will need some post procedure, I

think Morphine would be ok". "No problem replied the nurse, I'll get the propofol ready and wait for you to let me know about analgesia then". PIP P4 explained to me that usually, Fentanyl would be the drug of choice to use in this situation, as whilst the Propofol provides anaesthesia and amnesia, it is not a painkiller. Fentanyl is very quick acting they explained but wears off very quickly. As they are unable to prescribe Fentanyl, their plan was to use Morphine, which they can prescribe, whilst this takes longer to have an effect, it lasts far longer than Fentanyl and so would also provide the patient with longer lasting analgesia after the procedure and after the anaesthetic had worn off. PIP P4 then logged onto the computer and reviewed the patients primary care record which informed them they was allergic to codeine. They told me that whilst there was a small risk of a cross-sensitivity to other opioids, this was unusual to encounter in practice and so they should be fine with other opioids such as Morphine, they would however be alert for any allergy symptoms during their care based on this information.

They then went to speak with the consultant in charge, who happened to be in the next cubicle in resus. They explained that all ED clinicians speak to the consultant in charge before undertaking any high-risk procedures such as sedation, so they are aware the procedure is taking place. Also, this provides an important opportunity for peer review and support before starting. The consultant was speaking to another resus nurse about the incoming air ambulance case, again expressing their frustration the patient was coming there and how the air ambulance team had been unwilling to discuss this with their over the phone. PIP P4 told them they were about to sedate a patient for a limb manipulation and were planning to use Propofol and Morphine. "Not Fent?" they asked. "No I can't prescribe it yet" replied PIP P4 " Ah yes, that's right" they replied. "I'm happy to use Fent if you think that's a better plan but as they've not had any opioid analgesia, I though morphine would also be good for post procedural analgesia" "Yes good plan" replied the consultant "I would have been happy to prescribe the Fent but it's probably better you stick with the drugs you can use and are more comfortable with, carry on and I'm here if you need any support or help".

We then returned back to the patient and PIP P4 updated the nurse of this conversation and they went to the drug cupboard to prepare the Morphine. The nurse also asked PIP P4 if they would like a bag of saline to be set up. PIP P4 replied that they would and said "I'll just prescribe everything after the fact if that's ok" and the nurse replied "yes sure". Once it was prepared, they asked PIP P4 how much they would like them to give to the

patient and PIP P4 asked them to give 5mg initially by slow injection through the patients cannula in their arm. Whilst the nurse was doing this, PIP P4 informed the patient and the staff that they would start going through the pre sedation checklist, if everyone was ready. The checklist was one of the final pages of the sedation document they had been filling in over the past 15 minutes or so and they explained that formally going through this final part before starting was again a requirement. This involved checking the patient understood what was happening, that all team members had been assigned a role and knew what they needed to do, considering what support might be needed and talking through which drugs they would be using. A blank copy of the checklist part of the document is included below for context…

F.2 Example of field notes from urgent care case site

After UCS PIP P1 had finished writing their notes into ADASTRA for the consultation, I asked them if having access to patients primary care records was important as a facilitator to prescribing or not. They told me it absolutely was essential to support safe prescribing. They went on to explain that some of the most important elements of this were a patients' kidney function, through reports of eGFR, any allergies or intolerances to medicines, their medication usage history and any recent consultation notes. These last two examples they felt were very important in some cases as patients quite frequently speak to a primary care clinician who might decline to prescribe a medication prompting the patient to then phone the urgent care service during out-of-hours periods, in the hope they might agree to prescribe the drug. Examples of this they told me included drugs which had high rates of addiction such as diazepam and opioids. So being able to view how often these drugs have been prescribed in primary care, alongside any recent consultations where their use had been discussed with the patient were really important to ensuring good patient centred care, and that any prescribing decisions made were consistent with any approaches currently being taken by the patients GP such as trying to encourage a dose reduction in some of these medications to help patients with symptoms of addiction. They explained that if they as an urgent care clinician then decided to prescribe for these patients, it could interfere with any management plans started by their GP and also encounter further drug seeking behaviour, so for this reason access to EMIS was really useful, as well as supporting safe prescribing by knowing about allergies and sensitivities, alongside other

medications being taken to check for important interactions with anything they might prescribe.

UCS PIP P1 then tried twice to contact another patient, a 26-year-old patient complaining of diarrhoea and fever. However, the patient did not answer their calls and so UCS PIP P1 returned the call back to the clinical supervisor for them to decide whether to re-allocate the call later in the shift for another attempt or close the call. Each time, UCS PIP P1 left a voicemail message for the patient instructing them to call 111 again if they still required help from the urgent care service.

After sending this case back to the clinical hub for further review, UCS PIP P1 then opened the next case in their allocated queue, which was a 45-year-old Patient, also complaining of an acute sore throat. The photo this patient had sent in did open, and although it was quite a blurry image, we could see the patient had enlarged, red tonsils which also had a coating of pus on them. UCS PIP P1 rang the patient and introduced themself. After taking a history from the patient and asking a very similar range of questions as the previous case, which were framed around the FeverPain tool criteria, they discovered this patient did in fact meet more of the criteria to warrant considering antibiotics. This included having a fever, not having a cough, and having inflamed, swollen, pus covered tonsils. UCS PIP P1 started to explain to the patient, as they had done previously about the FeverPain guidance and its criteria and how these guided decision-making around treatment. However, they suddenly stopped mid conversation and said "Oh you're a nurse! You kept that quiet!" They told me after the consultation that the patient told them they was a registered nurse and worked privately for an ear micro suction company. UCS PIP P1 said to the patient "you kept that quiet didn't you! Ok, given you're a nurse, what do you feel you need?" The patient explained they had rung because in their opinion they would meet the criteria for antibiotics. UCS PIP P1 said "yes I agree, although your symptoms have been present for around five days, which is a bit long for a strep throat isn't it?" I knew from my own experience, the FeverPain guideline criteria was rapid onset in three days or less. However, UCS PIP P1 agreed with the patient that given their symptoms were now worsening, it was reasonable to prescribe their antibiotics, in case their symptoms were caused by a group A streptococcal infection. Whilst UCS PIP P1 completed an electronic prescription for Phenoxymethylpenicillin they chatted the nurse about their role and their experiences of micro suction. During the conversation they also asked their what

their preference would be for a pharmacy to send the prescription to. However, when UCS PIP P1 checked the nearest pharmacies on the system, most were about to close, and they explained most pharmacies in the area closed at lunchtime on a Saturday. They asked the patient if they could travel a bit further so they could send it to an ASDA supermarket and the patient said this would be fine. They explained they would issue a five-day course although they NICE guidance advises 5-10 days. They asked their to take the antibiotics for five days and if they still had symptoms on day five to contact their GP surgery and ask for a longer prescription. They outlined they would prefer this approach which allowed for a review if the patient felt they needed a longer course, given it had already been five days since their symptoms first started, than issuing a ten-day course without a further review. The patient told them they was happy with this and after providing some safety netting advice such as to contact 111 if they felt more unwell over the weekend, they ended the call.

Once they had finished writing their notes and had sent the electronic prescription to the pharmacy and asked UCS PIP P1 if they found calls involving healthcare professionals challenging, particularly around prescribing. They agreed that they could present a challenge and potentially involve some extra pressure to prescribe although they felt confident and able to manage this quite robustly. They explained that they often asks healthcare professional patients what they feel they need as a way of working out if they know what they are talking about, and this then helps to inform any negotiation for a prescription. They did however feel for the most part, most patients who they had encountered who were also healthcare professionals made reasonable requests for medicines and so the treatment outcomes they provided were the same as other patients because of this.

We then talked about using prescribing during remote consultations. I asked UCS PIP P1 if they felt this worked well and what they felt were the benefits and limitations or challenges with this process. They reflected how the COVID-19 pandemic had fundamentally changed their role within the urgent care service and prior to the pandemic, they really only saw patients through face-to-face consultations, either at the treatment centre or during home visits. As they had previously been reliant on PGDs pre pandemic, they was able to utilise these in many cases although as we had previously discussed, also frequently found they needed to seek support from a prescriber when patients could not be treated using the PGDs. Now remote prescribing was such a

significant part of their role in urgent care, they felt it absolutely facilitated the provision of medicines to patients given PGDs can only be used for face-to-face encounters. They discussed how several other important facilitators make this safe and possible and these included the role of photos to support remote consultations and again having access to primary care records. They felt that with good history taking and questioning, combined with photos for some cases where these are helpful, for many lower acuity presentations they is able to safely and appropriately prescribe the required treatments. For many patients, they felt this is preferrable for them as if there is no clear need for a face-to-face examination, it is quicker and more convenient for them to speak briefly with them on the phone and then go to a nearby pharmacy to collect the treatment they need. This they felt also improves the overall efficiency of their service, meaning overall wait times for a clinician are reduced for all patients, given remote consultations are a much quicker and more efficient way of working than face-to-face consultations at a treatment centre, and especially in comparison to home visits, which take far more time and resources. For this reason, patients are predominantly first offered a remote consultation and then only allocated a treatment centre appointment or home visit if this is essential. UCS PIP P1 explained that any treatment centre appointments and home visits are reviewed by the clinical coordinator in the hub, which is usually an experienced GP. They then decide if the patient requires a face-to-face assessment before a clinician is then allocated to the patient. I was surprised by this and that clinicians are not able to autonomously make this decision. However, I would later discover in the shift just how much time each home visit would take and later reflected how I could then appreciate why this needed to be tightly regulated to maximise service delivery. UCS PIP P1 compared this to pre pandemic practice, where the 111 service would speak with patients and then any that were referred to the urgent care service would just be booked an appointment slot at a treatment centre to be seen, without any further remote consultation with the urgent care clinicians.

From the two cases I had observed them manage remotely, these did appear to have been dealt with efficiently and appropriately. UCS PIP P1 told me that had they have seen both of these cases at the treatment centre, they felt sure they would have managed them in the same way and the face-to-face assessment would not have added any important information which would guide their decision-making or prescribing. I reflected that had I seen these cases in my own practice in urgent or primary care, I

would have also managed them in the same way had I seen them in this setting, deciding not to prescribe antibiotics for the first case and to prescribe antibiotics for the second case.

UCS PIP P1 then checked the home visit lists and told me they had now been allocated a visit to attend. As we got ready to leave the treatment centre room and attend the visit, I asked them to explain the different ways in which they provided prescribed medicines to patients. They outlined again that the Toughbook was quite limiting in that it could not issue remote electronic prescriptions and so in the car, there is an FP10 prescription pad. These are generic organisational FP10s rather than personal issue and can be used to handwrite a prescription and give this to a patient who can then take it to a pharmacy. This also needs to still be captured on the Toughbook using the ADASTRA software in the same way as they had done to create an electronic prescription during their telephone consultations. This is then saved to the patients notes as an electronic record of the prescription. UCS PIP P1 also outlined how pharmacy opening hours were quite a barrier to prescribing in out-of-hours urgent care and even though they worked in a city, most pharmacies closed at lunchtime on a Saturday and did not open on a Sunday. Some of the supermarket pharmacies opened later on Saturday and did open until 1600 on a Sunday but this meant patients had to travel further to collect prescriptions and after 1600 on a Sunday, sometimes only one pharmacy was open in the whole region until late evening, with sometimes one or none at all being open overnight. This often caused difficulties for patients to collect a prescription. UCS PIP P1 also outlined how they did carry a small stock of drugs in the car for immediate supply. These could be used outside of pharmacy opening hours and/or if patients would struggle to collect a prescription due to being housebound. They were also occasionally needed for immediate treatment of symptoms such as pain and vomiting. UCS PIP P1 also explained a small formulary of emergency drugs were carried such as parenteral antibiotics, sedatives for end-of-life care and mental health patients, adrenaline for anaphylaxis and antiseizure medication, although these were rarely needed, and they could not recall ever using these drugs for emergency treatment despite working in the urgent care service for over a decade. However, they did also carry in the car some drugs needed for immediate symptom management in end-of-life patients which were occasionally used. Later in the shift, UCS PIP P1 showed me the boxes of drugs that were kept in the car for immediate supply and immediate treatment (shown in the

images below). I also asked UCS PIP P1 if they prescribed for palliative care or end-of-life cases, and they explained this was a very frequent component of their prescribing work in the urgent care service. They outlined how this included know palliative patients who had suddenly deteriorated and, in some cases, did not have any anticipated medications prescribed. However, it was more common to encounter frail, elderly patients who had suddenly and acutely deteriorated and who had not previously had any advanced care planning undertaken, or anticipatory drugs prescribed. This situation was a common occurrence, and the service had specific forms to assist with managing these cases and prescribing the required drugs. These included printed drug administration charts and a separate stock of FP10s which were pre-printed with the recommended end-of-life drugs according to local palliative care guidance. UCS PIP P1 showed me these documents later in the shift as we ate our lunch at the side of a country road between visits (shown below). UCS PIP P1 explained that prior to the changes in legislation around controlled drug prescribing, they had been unable to prescribe the required drugs for this work and whilst was frequently sent to these cases, had to contact another prescriber remotely to request the prescription be completed. Whilst they were able to do this and supportive in doing so, it often involved delays wating to speak to them and for them to then find time to complete the prescription request. This would often be dealt with by the clinical coordinator or a pharmacist as the service employ pharmacists to issue remote prescriptions and manage prescribing enquiries. Since the law had been changed, they recalled several recent cases where they initiated end-of-life planning for patients as well as issuing the anticipatory prescribing using these FP10 pads.

I asked UCS PIP P1 if they felt the changes to medicines legislation had benefited their practice and patient care and they felt strongly that it had. They also felt that the list of five controlled drugs were well suited to their role in the urgent care service and there were not many other controlled drugs they would require in their role. They did however describe how it would be useful to be able to prescribe Lorazepam in tablet form as the legislation change only permits lorazepam to prescribed in injectable forms. They explained that for most elderly patients, Lorazepam is the drug of choice for anxiety or for mild sedation if needed over diazepam. This is because it has a shorter half-life and is better tolerated in the elderly. However, this was not a drug they needed to regularly prescribe and being able to prescribe morphine and midazolam were useful because

these were in the formulary of end-of-life drugs prescribed first line in the service. They also reflected how codeine was another useful addition to their prescribing formulary although they reiterated how they could only prescribe controlled drugs using handwritten FP10s or through direct supply from stock in the car, due to issues with the ADASTRA software and that currently, the system had not been updated to allow paramedic prescribers to issue controlled drug prescriptions. They also told me how previously, they had been able to supply codeine under PGD before these were removed from the service, however this only allowed them to supply 30mg tablets which they felt were too strong for some patients. However, they could now choose to prescribe 15mg tablets which enabled patients to commence on a lower initial starting dose and increase this as necessary. They could not recall the last time that Diazepam was needed in their role, given this is no longer routinely issued for acute back pain since the change in NICE guidance around this. For this reason, they did not feel Diazepam as a useful an addition for paramedic prescribers working in urgent out-of-hours care, although occasionally patients required Diazepam for anxiety and mental health complaints, however this was a common drug for which patients could be quite deceptive and ring urgent care out-of-hours services to seek additional prescriptions of the drug, often claiming they had lost the tablets recently prescribed by primary care. They also reflected that occasionally, drugs such as Oxycodone were required for some end-of-life patients who may not be suitable for morphine prescriptions due to allergies or sensitivities, although these were a minority of cases and could be dealt with by involving another prescriber, the clinical coordinator, or the hospice consultant on call. UCS PIP P1 also told me that the current issues with electronically prescribing controlled drugs meant they still sometimes needed to ask another prescriber such as the clinical coordinator or another colleague to electronically prescribe controlled drugs for them. I asked them if this process was easy and straightforward and they replied that for them, they felt it was, but this was because they was very experienced and had worked for the organisation for a long time, building up important trust relationships with their colleagues, so that they felt confident to prescribe for their patients because they trusted their judgement when they requested this. They wondered if newer paramedic prescribers would have the same experience given their colleagues might not hold the same level of trust given their lack of experience and also less time in the service which meant the other prescribers such as the GPs did not know them as well. I asked UCS PIP P1 if aside from the controlled drug legislative restrictions, there were any other

organisational restrictions placed on the scope of their prescribing, and they told me that there was not, and they was able to prescribe any drug within their own personal scope of competence and confidence. They also explained that for a period of time, as the organisation removed PGDs around 2018-2019, before they was able to prescribe controlled drugs, they was unable to supply patients with codeine for several years and had to frequently ask another prescriber to assist with these patients. Whilst now, the ADASTRA software still does not let them prescribe it, they can at least write handwritten FP10s or supply it from stock as a prescriber now. I asked them if they knew why the organisation had removed the PGDs and they explained that it was partly due to the administrative burden of maintaining the PGDs and that it also did not look good from a wider perspective, such as during CQC inspections, if the organisation was being commissioned to deliver a level of service and was reliant on non-prescribing clinicians to deliver this rather than employing GPs and prescribing non-medical staff. For these reasons, they told me that the organisation would no longer employ non prescribing clinicians as they had done previously, and they did not think there were any existing staff who had not now completed their independent prescriber training.

Appendix G Case study interview topic guide

Stage 1- Introduction and Context Setting

a) Introductions
b) Brief overview of research topic and focus
c) Overview of aims, objectives and research question

Research Questions:

What are the benefits of paramedic independent prescribing in emergency and urgent care settings?

What facilitators or barriers exist which influence the implementation or delivery of paramedic independent prescribing in emergency and urgent care?

Research Aim

The aim of this research is to undertake an evaluation of paramedic independent prescribing within emergency and urgent care settings and build an empirical evidence base. This will demonstrate whether PIP is contributing to an enhanced level of patient care and improving NHS service delivery. It will also evaluate if and how a range of contextual factors, such as controlled drug restrictions and AP training, impact upon PIP delivery.

Research Objectives:

1. To explore the views of a range of staff within the organisation around the benefits and limitations of PIP in emergency and urgent care,
2. To ascertain views regarding if/how PIP is contributing to patient care and service delivery

3. To understand views on any facilitators or barriers influencing PIP implementation and delivery

a) Explain anonymity
b) Confirm participant understands interview is being recorded, outline anticipated length (15-30 mins), outline anticipated outputs (doctoral thesis, open access journal publication and study website) and outline data storage plans.
c) Discuss consent and withdrawal which is capped at point of data analysis.
d) Check if they have any questions on the above
e) Check they are happy to continue

Stage 2- Background

Ask participant to explain their professional background in relation to research topic of PIP, including their professional experience as a clinician and (if applicable) a prescriber.

Stage 3- Main interview topics

Opening question:

"Do you think paramedic prescribing is contributing to patient care and service delivery in your organisation and if so, how is it doing so?"

a) Contribution of PIP?
b) Contribution to patient care?
c) Contribution to healthcare service delivery?

Opening question:

"Do you think that there are benefits from paramedic prescribing in the organisation for paramedics, patients and the NHS, if so, what do you feel these are?"

a) Professional benefits for paramedics prescribers
b) Benefits for patients
c) Benefits For NHS service delivery
d) Other perceived benefits
e) Organisational benefits
f) Unique contributions of paramedic prescribers/how are they different?
g) Participant views around practice without prescribing where relevant (e.g. non prescribing clinicians using PGDs)

Opening question: "Do you feel that there are any limitations to paramedic prescribing in the organisation and if so, what do you think these are"?

a) Formulary and CD restrictions
b) Any limitations to scope and if this differs depending on location/setting?
c) Increased work
d) Increased Responsibility
e) Any other perceived limitations

Opening question: " Do you think that there are any factors which either facilitate paramedic prescribing in the organisation, or represent a barrier to its implementation or delivery?"

a) Patient views/acceptance
b) Do patients know enough about paramedic medication supply in general e.g. exemptions, PGDs.
c) How much understanding do patients have about PIP?
d) Are they accepting/unaccepting?
e) Any other aspects of patient views/acceptance?
f) Organisational support
g) Views on differences between settings and perceived need for PIP in different settings
h) Access to patient records
i) Access to medical support

j) Controlled drug restrictions
k) Education and training- MSc or not? What aspects are essential/useful
l) Pressure to prescribe
m) Autonomy
n) Relationships with medical prescribers
o) Thoughts on medical dominance over prescribing?
p) Contextual issues within emergency and urgent care:
    a. Perceptions of increased urgency or increased severity.
    b. An inability to arrange any onward review or follow up.
    c. Time pressure
    d. Pressure to prescribe from colleagues?
q) Do they feel there are differences between these settings (ED, ambulance, urgent care centres/out-of-hours)?
r) Views around patient group directions

<u>Stage 4- Conclusion</u>

Opening question- " Thank you for sharing your views on paramedic prescribing in your organisation, we are coming to the end of the list of topics I wanted to ask you about now, is there anything else you would like to add?"

7. Thank them for their time
8. Reiterate confidentiality
9. Explain how they can ask questions
10. Ask permission to archive the anonymised transcript for research purposes
11. Ask if they can provide the names/details of other potential participants who will be emailed by a local collaborator/research staff member?

Appendix H Case study key documentation

H.1 Paramedic prescriber participant recruitment emails

First Recruitment Email for Paramedic Prescriber Participants

Dear Colleague

This email is to let you know about a research study that is being conducted in [Organisation], on the topic of paramedic independent prescribing in emergency and urgent care. The researcher, Adam Bedson, is a PhD student at the University of Southampton and specialist paramedic for South Western Ambulance Service NHS Foundation Trust.

As part of this research study, Adam would like to undertake non-participant observation of paramedics employed by [Organisation] who are qualified in independent prescribing and using this in their practice. If you decide to take part ,over the course of 4-6 shifts, Adam will observe the care you provide to patients, and when convenient and appropriate ask for your views about using independent prescribing in your practice.

If you would be interested in participating in the study, please read the attached participant information sheet and return the signed consent form (also attached to this email) to Adam at ab11e15@soton.ac.uk. You can also contact Adam by email if you have any questions or would like to have an informal conversation by phone or Microsoft Teams about participating before you decide.

Thank you very much for taking the time to read this email. There is no obligation for you to respond if you do not wish to do so.

[Local collaborator details]

Follow Up Emails for Paramedic Prescriber Participants

Dear Colleague

Further to my previous email, I am again contacting you to let you know about a research study that is being conducted in [Organisation], on the topic of paramedic independent prescribing in emergency and urgent care. Thank you if you have already responded. The researcher, Adam Bedson, is a PhD student at the University of Southampton and specialist paramedic for South Western Ambulance Service NHS Foundation Trust.

As part of this research study, Adam would like to undertake non-participant observation of paramedics employed by [Organisation] who are qualified in independent prescribing and using this in their practice. If you decide to take part, over the course of 4-6 shifts, Adam will observe the care you provide to patients, and when convenient and appropriate ask for your views about using independent prescribing in your practice.

If you would be interested in participating in the study, please read the attached participant information sheet and return the signed consent form (also attached to this email) to Adam at ab11e15@soton.ac.uk. You can also contact Adam by email if you have any questions or would like to have an informal conversation by phone or Microsoft Teams about participating before you decide.

Thank you very much for taking the time to read this email. There is no obligation for you to respond if you do not wish to do so.

Thank you very much

H.1.1 Case Study Interview Participant Initial Recruitment Email

First Recruitment Email for Case Study Participants

Dear Colleague

This email is to let you know about a research study that is being conducted in [Organisation], on the topic of paramedic independent prescribing in emergency and urgent care. The researcher, Adam Bedson, is a PhD student at the University of Southampton and specialist paramedic for South Western Ambulance Service NHS Foundation Trust.

As part of this research study, Adam would like to interview a range of different staff employed by [Organisation] who have relevant views, experience and insights into paramedic independent prescribing in the organisation. This may include experience of working alongside paramedic prescribers, or more of a strategic level view of this as an organisational leader.

Interviews can be conducted in person, or online using Microsoft Teams at a time that is convenient for you.

If you would be interested in participating in the study, please read the attached participant information sheet and return the signed consent form (also attached to this email) to Adam at ab11e15@soton.ac.uk. You can also contact Adam by email if you have any questions or would like to have an informal conversation by phone or Microsoft Teams about participating before you decide.

Thank you very much for taking the time to read this email. There is no obligation for you to respond if you do not wish to do so.

[Local collaborator details]

Case Study Interview Participant Follow Up Email

Dear Colleague

Further to my previous email, I am contacting you again to let you know about a research study that is being conducted in [Organisation], on the topic of paramedic independent prescribing in emergency and urgent care. Thank you if you have already responded. The researcher, Adam Bedson, is a PhD student at the University of Southampton and specialist paramedic for South Western Ambulance Service NHS Foundation Trust.

As part of this research study, Adam would like to interview a range of different staff employed by [Organisation] who have relevant views, experience and insights into paramedic independent prescribing in the organisation. This may include experience of working alongside paramedic prescribers, or more of a strategic level view of this as an organisational leader.

Interviews can be conducted in person, or online using Microsoft Teams at a time that is convenient for you.

If you would be interested in participating in the study, please read the attached participant information sheet and return the signed consent form (also attached to this email) to Adam at ab11e15@soton.ac.uk. You can also contact Adam by email if you have any questions or would like to have an informal conversation by phone or Microsoft Teams about participating before you decide.

Thank you very much for taking the time to read this email. There is no obligation for you to respond if you do not wish to do so.

[Local collaborator details]

H.2 Participant information sheets

H.2.1 Paramedic Independent Prescriber Participant Information Sheet

Study Title: A Mixed Methods Investigation of Paramedic Independent Prescribing in Emergency and Urgent Care- - Case Studies

Researcher: Adam Bedson

ERGO number: 69751

IRAS Number: 310457

You are being invited to take part in the above research study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. You may like to discuss it with others but it is up to you to decide whether or not to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

I (Adam Bedson), am undertaking this research as part of a larger mixed methods research study being completed for a PhD in Health Sciences at the University of Southampton. This PhD project is being funded by the National Institute for Health and Social Care Research (NIHR) as part of a Clinical Doctoral Research Fellowship (NIHR302127).

Using a mixed methods research approach, this study will investigate paramedic independent prescribing (PIP) within emergency and urgent healthcare. Following its introduction into paramedic practice in 2018, very little research has been undertaken to evaluate how it is contributing to patient care and healthcare service delivery, alongside establishing if any facilitators or barriers exist, which influence its implementation or delivery. The focus of this study is on PIP specifically within emergency and urgent care settings, which includes emergency departments, ambulance services, urgent care centres and out-of-hours services.

The objective of this part of the study, is to explore the benefits of PIP within emergency and urgent care settings, alongside understanding any facilitators or barriers to its implementation and delivery.

Why have I been asked to participate?

You have been asked to participate as you are a paramedic working in emergency and urgent care who is also qualified in independent prescribing and using this in your practice.

What will happen to me if I take part

If you do agree to participate, I will ask you to sign and return a consent form. Once this has been returned, I will arrange to join you at work, and observe you undertaking independent prescribing over 4-6 shifts. During these shifts, when appropriate (for example not during patient care episodes or when you are busy with other tasks/priorities), I will ask for your views, insights and experiences of using independent prescribing in your practice. If you agree, I will record the audio from these conversations, to help me capture the data in my written field notes. Once these notes have been fully written, the audio recording will be deleted within one week of making the recording. Only I would have access to these recordings and only relevant extracts will be recorded in my field notes, in order to answer the research question and aims.

If you feel you would like more information before deciding whether or not to take part, you can have an informal, no obligation conversation. Please email me to arrange this at ab11e15@soton.ac.uk.

Are there any benefits in my taking part?

Whilst there are no direct benefits for you as a participant from taking part, it is anticipated that the data collected, will be of great benefit in understanding how PIP is being implemented into emergency and urgent healthcare. This will include a better understanding of the benefits of PIP, alongside what facilitators and barriers exist currently. As a participant in this research, the benefits to you will include having an opportunity to share your views and experience, in order to contribute to expanding the research evidence base on the topic of PIP.

Are there any risks involved?

Given participation in this study will only involve allowing me to observe your clinical practice and discuss your views and insights, it is not anticipated that there will be any personal risk involved, nor is it anticipated that any emotional or psychological impact will occur. In the unlikely event that any emotional distress should occur through participation, I will be able to advise on accessing any specific support services that might be required, such as NHS employee assistance programmes and staying well services.

I am a qualified and practicing paramedic and so am experienced in working within emergency and urgent care. This includes having experience in undertaking dynamic risk assessments to ensure staff and patient safety are maintained, as would usually be expected during clinical practice. If for any reason my presence may cause an increase

in risk or cause distress to patients or staff, I will withdraw from the episode of care/situation if required. During the course of data collection, if any significantly distressing cases are encountered, I will discuss with you the appropriateness of me collecting data during these incidents. If it is decided I should not observe a particular case or incident, I will withdraw from the clinical area, for example by returning to a staff area or waiting in a parked vehicle.

If in the unlikely event any concerns were to arise around potentially unsafe practice, I will initially raise this directly with you, using an appropriate degree of tact and diplomacy if these were required during an episode of care. If any issues could not be resolved through this discussion, involvement of a relevant clinical manager would be sought, as I would have a duty to report any such situations.

What data will be collected?

During the observation shifts I will capture brief field notes of what I observe and discuss with you on an iPad, and will expand on these notes in more detail at the end of the shift. With your permission, I may also ask to record some of these conversations on the iPad, to assist with writing these more detailed notes. Any recordings made will be deleted once the detailed notes have been written. If you would like to review any of the notes made, either during or after each shift, I will share these with you by email. If you feel any changes or omissions to these notes are required, you can discuss this with the researcher.

I will store your personal details securely on a University Microsoft OneDrive account. The anonymised interview transcripts and field notes will be securely stored by the University of Southampton for a period of ten years, after which time all data will be deleted from the Universities data repository.

Will my participation be confidential?

You will not be identified in the data, at either a personal or organizational level. Whilst there is the potential for rich qualitative data to inadvertently reveal someone's identity, careful consideration will be given when presenting quotes and descriptions within any research outputs to ensure these will not inadvertently identify participants. Any personal information we collect about you during the course of the research will be kept strictly confidential.

Only I and responsible members of the University of Southampton will have access to research data, including your personal details, for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your data. All of these people have a duty to keep your information, as a research participant, strictly confidential.

Any identifiable information or data which could enable you to be identified will not be made available outside of researcher and supervisory team) and will not be published. Whilst open access publication of the results will be sought in a peer reviewed journal and a study website, all participants will be referred to only by a generic identification

code such as ‘Paramedic Participant 1’. No further details of your role or affiliations will be included in any of these outputs.

Do I have to take part?

No, it is entirely up to you to decide whether or not to take part. If you decide you want to take part, you will need to sign a consent form to show you have agreed to take part. Please email this consent form to the researcher prior to the interview at ab11e15@soton.ac.uk.

What happens if I change my mind?

You have the right to change your mind and withdraw from the study at any time before or during the observations and interviews, without giving a reason, and without your participant rights being affected. You can also request for any observation or interviews to be stopped for part or all of a shift, without giving a reason to the researcher. If for any reason a planned observation shift is no longer convenient or for any reason you wish to postpone the observation shift, you can let me know without giving a reason.

If you choose to withdraw fully from the study, any data collected will be deleted and it will not be included in the analysis. However, once your data has been anonymised and analysis commenced, it will not be possible at this point to withdraw your data from the study. Therefore, you will be able to withdraw from the study until a month after data collection has finished within your organisation.

What will happen to the results of the research?

Your personal details will remain strictly confidential. Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent.

The findings from this study, including anonymised direct quotations from the interview data, will be published in a Doctoral thesis, alongside in an open access peer reviewed journal. They will also be made available on a public study website (www.paramedicprescribingresearch.co.uk)

The interview audio files will be deleted once they have been transcribed and anonymised transcripts and field notes will be stored in the University repository in April 2033. This data may be made available for future research studies conducted by students and staff at the University of Southampton as required during this time.

Where can I get more information?

If you would like more information about the study, or have any questions about participation, please feel free to email the researcher Adam Bedson at ab11e15@soton.ac.uk. You may also wish to visit the study website www.paramedicprescribingresearch.co.uk

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researcher who will do their best to answer your questions. Please email Adam Bedson ab11e15@soton.ac.uk in the first instance.

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you.

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at http://www.southampton.ac.uk/assets/sharepoint/intranet/ls/Public/Research%20and%20Integrity%20Privacy%20Notice/Privacy%20Notice%20for%20Research%20Participants.pdf

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your

information and using it properly. The University of Southampton will keep identifiable information about you for 10 years after the study has finished after which time any link between you and your information will be removed.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you for taking the time to read the information sheet and considering taking part in the research.

H.2.2 Case Study Interview Participant Information Sheet

Study Title: A Mixed Methods Investigation of Paramedic Independent Prescribing in Emergency and Urgent Care- Case Studies.

Researcher: Adam Bedson

ERGO number: 69751

IRAS Number: 310457

You are being invited to take part in a short interview as part of the above research study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions by emailing the researcher (Adam Bedson ab11e15@soton.ac.uk) if anything is not clear or you would like more information before you decide to take part in this research. You may like to discuss it with others but it is up to you to decide whether or not to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

This study is being undertaken by Adam Bedson, as part of a larger mixed methods research study being completed as part of a PhD in Health Sciences at the University of Southampton. This PhD project is being funded by the National Institute for Health and

Social Care Research (NIHR) as part of a Clinical Doctoral Research Fellowship (NIHR302127).

Using a mixed methods research approach, this study will investigate paramedic independent prescribing (PIP) within emergency and urgent healthcare. Following its introduction into paramedic practice in 2018, very little research has been undertaken to evaluate how it is contributing to patient care and healthcare service delivery, alongside establishing if any facilitators or barriers exist which influence its implementation or delivery. The focus of this study is on PIP specifically within emergency and urgent care settings, which includes emergency departments, ambulance services, urgent care centres and out-of-hours services.

The objective of this part of the study, is to explore the benefits of PIP within emergency and urgent care settings, alongside understanding any facilitators or barriers to its implementation and delivery.

Why have I been asked to participate?

You have been asked to participate as you work in a clinical setting in which PIP is used. I would therefore like to ask you about your views and experiences of PIP, to help me more fully understand how PIP is being used in emergency and urgent care, alongside if there are any facilitators or barriers influencing this.

What will happen to me if I take part?

If you agree to participate, I will ask you to sign a consent form and email this to me. I will then find a convenient time to conduct a short interview. This could be completed in person whilst at work or online using Microsoft Teams at a time that is convenient for you.

It is anticipated that the interview will last between 15-30 minutes, During the interview, I will guide the discussion to cover key areas of the research topic, however you will be able to provide your views and insights on any aspects of PIP you feel are relevant. You will be asked to briefly outline your role and your experiences of PIP, in your role within the organisation.

Are there any benefits in my taking part?

The data collected from the views of staff members during this stage of the research project, will be of great benefit in understanding how PIP is being implemented into emergency and urgent healthcare. This will include a better understanding of any benefits from PIP, alongside what facilitators and barriers might exist. As a participant in this research, the benefits to you will include having an opportunity to share your views and experience, in order to contribute to expanding the research evidence base on the topic of PIP.

Are there any risks involved?

Given the nature of this part of the study in which you are being involved in, it is not anticipated that there will be any physical risk involved, nor is it anticipated that any emotional or psychological impact will occur through exploring your views on PIP. In the unlikely event that any emotional distress should occur through participation, I will be able to advise on any specific support services that might be required.

What data will be collected?

The audio from the interview will be recorded to assist me in transcribing relevant extracts into my field notes. Once the relevant information has been transcribed, the audio recording will be deleted.

This transcript data and your personal details contained in the consent form will only be available to my research supervisors and I. It will be held securely on the universities server and will not be shared with anyone else. Any identifiable information within the interview transcript will be removed following transcription and will not be included in the analysis or published. Your personal details will be stored securely by the researcher on a secure Microsoft OneDrive account. The anonymised interview transcripts will be securely stored by the University of Southampton for a period of ten years, after which time all data will be deleted from the Universities data repository.

Will my participation be confidential?

The information we collect about you during the course of the research will be kept strictly confidential.

Only my supervisors and I, alongside responsible members of the University of Southampton may be given access to data about you for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your data. All of these people have a duty to keep your information, as a research participant, strictly confidential.

You will not be identified in the data, at either a personal or organizational level. Whilst there is the potential for rich qualitative data to inadvertently reveal someone's identity, careful consideration will be given when presenting quotes and descriptions within any research outputs to ensure these will not inadvertently identify participants.

Any identifiable information or data which could enable you to be identified will not be made available outside of my supervisory team and will not be published. Whilst open access publication of the results will be sought in a peer reviewed journal and a study website, all participants will be referred to only by a generic identification code such as 'Participant 1'. No further details of your role or affiliations will be included in any of these outputs.

Do I have to take part?

No, it is entirely up to you to decide whether or not to take part. If you decide you want to take part, you will need to sign a consent form to show you have agreed to take part. I will ask you to sign an electronic form if interviewing you in person, or request you email the form to me if being interviewed online. Please email this consent form to me prior to the interview at ab11e15@soton.ac.uk.

What happens if I change my mind?

You have the right to change your mind and withdraw at any time before or during the interview, without giving a reason and without your participant rights being affected. If you choose to withdraw during the interview, any recording made will be deleted and it will not be transcribed. However, once your data has been anonymised and analysis commenced, it will not be possible at this point to withdraw your data from the study. Therefore, you will be able to withdraw until a month after data collection has finished within your organisation.

What will happen to the results of the research?

Your personal details will remain strictly confidential. Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent.

The findings from this study, including anonymised direct quotations from the interview data, will be published in a Doctoral thesis, alongside in an open access peer reviewed journal. They will also be made available on a public study website (www.paramedicprescribingresearch.co.uk)

The interview audio files will be deleted once they have been transcribed and checked. Anonymised transcripts and field notes will be stored in the University repository in April 2035. This data may be made available for future research studies conducted by students and staff at the University of Southampton as required during this time.

Where can I get more information?

If you would like more information about the study, or have any questions about participation, please feel free to email the researcher Adam Bedson at ab11e15@soton.ac.uk. You may also wish to visit the study website www.paramedicprescribingresearch.co.uk

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to me, I will do my best to answer your questions. Please email Adam Bedson ab11e15@soton.ac.uk in the first instance.

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you.

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at http://www.southampton.ac.uk/assets/sharepoint/intranet/ls/Public/Research%20and%20Integrity%20Privacy%20Notice/Privacy%20Notice%20for%20Research%20Participants.pdf

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you for 10 years after the study has finished after which time any link between you and your information will be removed.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output

to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you for taking the time to read the information sheet and considering taking part in the research.

H.3 Study Advertisement Leaflet

FUNDED BY NIHR | National Institute for Health and Care Research

UNIVERSITY OF Southampton

Study Information Sheet

Study Title: A Mixed Methods Investigation of Paramedic Independent Prescribing in Emergency and Urgent Care- - Case Studies

Researcher: Adam Bedson
ERGO number: 69751
IRAS Number: 310457

This information sheet has been circulated to all staff within [Organisation] to let them know about a research study being conducted between the dates of [Enter Dates].

What is the research about?

This study is being undertaken by Adam Bedson, as part of a mixed methods research study being completed for a PhD in Health Sciences at the University of Southampton. This PhD project is being funded by the National Institute for Health and Social Care Research (NIHR) as part of a Clinical Doctoral Research Fellowship (NIHR302127). Adam is a specialist paramedic practitioner with South Western Ambulance Service NHS Foundation Trust.

Using a mixed methods research approach, this study will investigate paramedic independent prescribing (PIP) within emergency and urgent healthcare. Following its introduction into paramedic practice in 2018, very little research has been undertaken to evaluate how it is contributing to patient care and healthcare service delivery, alongside establishing if any facilitators or barriers exist, which influence its implementation or delivery. The focus of this study is on PIP specifically within emergency and urgent care settings, which includes emergency departments, ambulance services, urgent care centres and out-of-hours services.

The objective of this part of the study, is to explore the benefits of PIP within emergency and urgent care settings, alongside understanding any facilitators or barriers to its implementation and delivery.

What will the researcher being doing within [Enter organisation name]?

Over a period of six months between [Enter dates], I will be observing some of the paramedics within [enter organisation] who are qualified in independent prescribing, as

they provide care to patients. I will not be participating in any form of clinical care or recruiting patients in this study, which will only involve staff. I will also be analysing anonymised prescribing data which is being provided by research staff at [enter organisation name]. This will include the types of medicines prescribed by all paramedics within [enter organisation name] and the frequencies with which these medicines have been prescribed in the past year. I will also be reviewing some organisational documents, such as independent prescribing and medicines management policies.

I will also be looking to conduct some brief interviews with relevant members of staff, to ask for their views and insights about paramedic prescribing. These interviews will be conducted either face-to-face or online. If you are interested in participating in an interview, please contact me at ab11e15@soton.ac.uk

Also, as part of their case study research, I will be looking for opportunities to observe a small number of meetings in [enter organisation name] which are relevant to the research topic of independent prescribing by paramedics. Any attendances at meetings (either in person or online) will only occur with the consent of both the meeting organisers and all staff in attendance.

Do I have to participate in this study?

No, only prescribing paramedics who consent to being observed or staff who consent to be interviewed will participate in the study. I will only be observing the prescribing activity of the paramedics who agree to participate in this aspect of the study within [enter organisation name], who have given consent for them to do so. I will not be observing any other staff during the study and will not expect any staff to contribute in sharing their views or allowing me to observe any meetings if they do not wish to.

If you have any questions about the study, or would like to know more, please do feel free to email me at ab11e15@soton.ac.uk. You may also like to visit the study website www.paramedicprescribingresearch.co.uk

Thank you for taking the time to read this information sheet

H.4 Patient Information Leaflet

FUNDED BY NIHR | National Institute for Health and Care Research

UNIVERSITY OF Southampton

Research Study on Paramedic Prescribing
Patient Information Leaflet

Thank you for taking the time to read this short information leaflet about a research study that is being undertaken in this NHS organisation by a PhD student, Adam Bedson, who is also a paramedic.

This study is investigating how paramedics use their prescribing skills to help patients.

I am hoping to understand how paramedic prescribing benefits patients and the NHS, and if it could be improved.

I am spending some time observing and making notes on how the paramedics here who are qualified in independent prescribing, use their prescribing skills to treat patients, and so may be present whilst the paramedics here are caring for you.

I am not collecting any personal data about you or collecting any data directly from you during this research.

If you would prefer that I am not present during your care, or have any further questions about this research, please let one of the staff here know.

If you would like to speak with me about this study, I can be contacted at ab11e15@soton.ac.uk

You may also like to visit our study website

www.paramedicprescribingresearch.co.uk

If you have a smart phone, you can point the camera at the QR symbol to be taken to the website.

Adam Bedson, Clinical Doctoral Research Fellow, (NIHR302127) is funded by Health Education England (HEE) / National Institute for Health Research(NIHR) for this research project. The views expressed in any related publications/outputs are those of the authors and not necessarily those of the NIHR, NHS or the UK Department of Health and Social Care. . IRAS Number: 310457 ERGO number: 69751

www.paramedicprescribingresearch.co.uk

Version No 1.1 10/06/2023 ERGO No. 69751 IRAS No. 810457

H.5 Participant Consent Form

CONSENT FORM

Study title: A Mixed Methods Investigation of Paramedic Independent Prescribing

in Emergency and Urgent Care- Case Studies in Emergency and Urgent Care

Researcher name: Adam Bedson

ERGO number: 69751

IRAS Number: 310457

Document Version Number: Version 1.2

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet [Version 1.1 18/05/2023] and have had the opportunity to ask questions about the study.	
I agree to take part in this research project and agree for my data to be used for the purpose of this study.	
I understand my participation is voluntary and I may withdraw my participation and data for any reason both during and after the study, up to the point of data analysis being commenced, without my participation rights being affected.	
I understand that I may be quoted directly in reports of the research but that I will not be directly identified (e.g. that my name will not be used).	

I understand that taking part in the study involves audio recording which will be transcribed, and the original recording held will then be destroyed once transcribed.	
I understand that the data collected by the researcher, may be made available for other research studies conducted by students and staff at the University of Southampton in the future.	

Name of participant (print name).....

Signature of participant.....

Date..... .....

Name of researcher (print name).....

Signature of researcher .....

Date.....

Appendix I Case Study Research Approval Documents

I.1 Health Research Authority Letter of Approval

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

Mr Adam Bedson
1
Limbury Terrace
Martock
TA12 6ETN/A

Email: approvals@hra.nhs.uk
HCRW.approvals@wales.nhs.uk

06 October 2023

Dear Mr Bedson

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	**A Mixed Methods Investigation of Paramedic Independent Prescribing in Emergency and Urgent Care- Work Package 3: Case Studies.**
IRAS project ID:	**310457**
Protocol number:	**ERGO 69751**
REC reference:	**23/HRA/3145**
Sponsor	**The University of Southampton**

I am pleased to confirm that **HRA and Health and Care Research Wales (HCRW) Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report (including this letter) have been sent to the coordinating centre of each participating nation. The relevant national coordinating function/s will contact you as appropriate.

Please see IRAS Help for information on working with NHS/HSC organisations in Northern Ireland and Scotland.

How should I work with participating non-NHS organisations?
HRA and HCRW Approval does not apply to non-NHS organisations. You should work with your non-NHS organisations to obtain local agreement in accordance with their procedures.

What are my notification responsibilities during the study?

The standard conditions document "*After Ethical Review – guidance for sponsors and investigators*", issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

Who should I contact for further information?
Please do not hesitate to contact me for assistance with this application. My contact details are below.

Your IRAS project ID is **310457**. Please quote this on all correspondence.

Yours sincerely,
Christie Ord

Approvals Specialist

Email: approvals@hra.nhs.uk

Copy to: *Ms Linda Hammond*

I.2 NHS Research Ethics Committee Approval Letter

Health Research Authority

London - Camden & Kings Cross Research Ethics Committee
2 Redman Place
Stratford
London
E20 1JQ

Telephone: 0207 104 8086

06 October 2023

Mr Adam Bedson
1
Limbury Terrace
Martock
TA12 6ET

Dear Mr Bedson

Study title:	**A Mixed Methods Investigation of Paramedic Independent Prescribing in Emergency and Urgent Care- Work Package 3: Case Studies.**
REC reference:	**23/HRA/3145**
Protocol number:	**ERGO 69751**
IRAS project ID:	**310457**

Thank you for your letter of 19th September 2023. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 01 September 2023

Documents received

The documents received were as follows:

Document	*Version*	*Date*
Other [NHS REC Changes Requested with Responses]	1.0	03 September 2023
Research protocol or project proposal [HRA Research Protocol]	1.4	07 September 2023

Approved documents

The final list of approved documentation for the study is therefore as follows:

Document	*Version*	*Date*
Copies of materials calling attention of potential participants to the research [Information Sheet for Staff Regarding Research Study]	1.2	10 June 2023
Evidence of Sponsor insurance or indemnity (non NHS Sponsors		01 August 2023

only) [Sponsor Certificate of Insurance]		
Interview schedules or topic guides for participants [Interview Topic Guide]	1.1	25 April 2023
IRAS Application Form [IRAS_Form_10082023]		10 August 2023
Letter from sponsor [Letter from Sponsor]		14 June 2023
Letters of invitation to participant [Participant Recruitment Emails]	1.1	10 June 2023
Other [Letter of support from research site]	1	20 June 2023
Other [Letter of Support]	1	20 June 2023
Other [Patient Information Leaflet about Research Study]	1.2	10 June 2023
Other [NHS REC Changes Requested with Responses]	1.0	03 September 2023
Participant consent form [Consent Form]	1.2	10 June 2023
Participant information sheet (PIS) [Paramedic Prescriber Participant Information Sheet]	1.1	18 May 2023
Participant information sheet (PIS) [Case Study Interview Participant Information Sheet]	1.1	18 May 2023
Research protocol or project proposal [HRA Research Protocol]	1.4	07 September 2023
Response to Additional Conditions Met		
Summary CV for Chief Investigator (CI) [CI CV]		22 March 2023
Summary CV for student [Student CV]		22 March 2023
Summary CV for supervisor (student research) [Supervisor CV]		24 March 2023

You should ensure that the sponsor has a copy of the final documentation for the study. It is the sponsor's responsibility to ensure that the documentation is made available to R&D offices at all participating sites.

IRAS Project ID: 310457	**Please quote this number on all correspondence**

Yours sincerely

pp

Dr Emily Cadman
Chair

E-mail: CamdenandKingsCross.REC@hra.nhs.uk

I.3 University Ethics Approval

Submission ID: 69751
Submission Title: A Mixed Methods Investigation of Paramedic Independent Prescribing in Emergency and Urgent Care Settings- Work Package 3- Case Studies
Submitter Name: Adam Bedson

The Research Integrity and Governance team have reviewed and approved your submission.

You may only begin your research once you have received all external approvals (e.g. NRES/HRA/MHRA/HMPPS/MoDREC etc or Health and Safety approval e.g. for a Genetic or Biological Materials Risk Assessment).

The following comments have been made:

-
- Your submission has been reviewed jointly by the Research Integrity and Governance team and Faculty Ethics Committee.
    - This study has now been approved by the Faculty Ethics Committee.
    - The Research Integrity and Governance team have reviewed and approved your submission.

  You may only begin your research once you have received all external approvals

I.4 Study Amendment Confirmation

IRAS 310457. Amendment

N

no-reply-IRAS <no-reply-iras@hra.... Today at 21:58

To: Adam Bedson

You don't often get email from no-reply-iras@hra.nhs.uk. Learn why this is important

IRAS Project ID: 310457
Sponsor amendment reference: 69751.A2

Thank you for submitting your study amendment. In accordance with the outcome of your completed amendment tool, this amendment requires no further regulatory review. Please now share this amendment with your UK research sites, in accordance with the instructions in your completed amendment tool.

For studies with more than one UK research site, your amendment will now be automatically shared with the R&D offices of any NHS/HSC research sites in Scotland and Northern Ireland, but you should share the amendment by email directly with those Research team/s.

For all NHS research sites in England and Wales, please now share this amendment by email directly with those sites, including both the R&D offices and research teams.

Do not reply to this email as this is an unmonitored address and replies to this email cannot be responded to or read.

This message may contain confidential information. If you are not the intended recipient please inform the sender that you have received the message in error before deleting it. Please do not disclose, copy or distribute information in this e-mail or take any action in relation to its contents. To do so is strictly prohibited and may be unlawful. Thank you for your co-operation..

I.4.1 Study Sponsorship Confirmation

23 June 2023

Project title: A Mixed Methods Investigation of Paramedic Independent Prescribing in Emergency and Urgent Care Settings- Work Package 3- Case Studies

ERGO submission number: 69751

This letter is to confirm that the University of Southampton has agreed to act as Sponsor for the above research study under the terms of the UK Policy Framework for Health and Social Care Research (2017). We encourage you to become fully conversant with the terms of this Policy Framework (UKPF):

https://www.hra.nhs.uk/planning-and-improving-research/policies-standards-legislation/uk-policy-framework-health-social-care-research/

Sponsorship will remain in effect until the completion of the study and the ongoing responsibilities of the Chief Investigator have been met. Should the Chief Investigator fail to notify the Research Integrity and Governance Team of an amendment to the study, this may result in incorrect indemnity or sponsorship cover and may invalidate our agreement to sponsor.

If your study has been designated a Clinical Trial of an Investigational Medicinal Product, I would like to remind you of your responsibilities under the Medicines for Human Use Act regulations (2004/2006), The Human Medicines Regulations (2012) and EU Directive 2010/84/EU regarding pharmacovigilance. If your study has been designated a 'Clinical Investigation of a Medical Device' you also need to be aware of the regulations regarding conduct of this work.

Further guidance can be found:

http://www.mhra.gov.uk/

The University of Southampton fulfils the role of Sponsor in ensuring management, monitoring and reporting arrangements for research. As the Chief Investigator you are responsible for the daily management for this study, and you are required to provide

regular reports on the progress of the study to the Research Integrity and Governance Team on this basis.

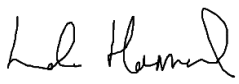
Please also familiarise yourself with the Terms and Conditions of Sponsorship attached, including reporting requirements of any Adverse Events to the Research Integrity and Governance Team and the hosting organisation.

If your project involves NHS patients or resources please send us a copy of your NHS REC and Trust approval letters when available. Please also be reminded that you may need a Research Passport to apply for an honorary research contract of employment from the hosting NHS Trust: https://intranet.soton.ac.uk/sites/researcherportal/Lists/Services1/testing.aspx?ID=607&RootFolder=%2A

Failure to comply with our Terms may invalidate your ethics approval and therefore the insurance agreement, affect funding and/or Sponsorship of your study; your study may need to be suspended and disciplinary proceedings may ensue.

Please do not hesitate to contact this office should you require any additional information or support. I would like to take this opportunity to wish you every success with your research.

Yours sincerely



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Appendix J Case study codes and categories

J.1 Emergency department codes and categories

Name	Sources	References
Access to information	11	182
Access to information in ED- General	5	7
Access to information- Patient history	5	23
Access to information- Prescribing and clinical guidance	6	47
Access to information- Previous diagnostic test results	3	3
Diagnostic Tests	7	102
Diagnostic Tests- Bloods	5	27
Diagnostic tests- Burden on staff and service delivery	1	1

Name	Sources	References
Diagnostic Tests- CT and MRI	4	33
Diagnostic Tests- X Ray	4	19
Diagnostics- Ultrasound	3	4
ECGs	6	18
Admissions	4	15
Ambulance Services	9	78
Ambulance service insights- Doctors views	1	1
Ambulance Services- General Views	1	4
PIP and ACP in ambulance services- Staff retention	1	1
PIP in ambulance services- access to information and diagnostic tests	4	9
PIP in ambulance services- Case of need	8	17
PIP in ambulance services- cost	1	2

Name	Sources	References
PIP in ambulance services- Education and Experience	3	3
PIP in ambulance services- General	1	3
PIP in ambulance services- medical support	2	3
PIP in ambulance services- organisational issues and governance	8	22
PIP in ambulance services- Simultaneous prescribing and administration	1	1
Prehospital critical care roles	2	11
Benefits	13	24
Benefits of PIP in emergency medicine	6	12
Benefits of PIP within an MDT	6	6
Prescribing needed for ACP role	4	6
Conditions	18	278
Conditions- Cardiac	8	50

Name	Sources	References
Conditions- ACS	4	12
Conditions- Cardiac arrest	3	3
Conditions- Cardiac arrythmias and CCF	4	12
Drugs- Cardiac drugs	6	18
Drugs- ACS Treatment	4	8
Drugs- Adenosine	1	2
Drugs- Bisoprolol	3	5
Drugs- Cardiac rate control	1	2
Drugs- Colchicine	1	1
Drugs- Diuretics	2	3
Conditions- Infections	11	56

Name	Sources	References
Conditions - Infection CAP	2	2
Conditions- Infection (General)	3	4
Conditions- Infection UTI	2	3
Conditions- Infections- Abdominal infections	3	9
Conditions- Infections- Sore Throat	1	1
Conditions- Sepsis	2	3
Drugs- Antibiotics	11	34
Conditions- Medical	12	81
Conditions- AKI	1	1
Conditions- Allergies and anaphylaxis	1	1
Conditions- Back pain	1	1

Name	Sources	References
Conditions- COPD	2	2
Conditions- DKA and diabetic issues	3	12
Conditions- DVT	1	1
Conditions- Eye problems	1	2
Conditions- Managing Chronic Conditions	3	3
Conditions- Paediatric Illness	3	6
Conditions- PE	1	1
Conditions- Pneumothorax	1	1
Conditions- Renal Colic	1	3
Conditions- Seizures	3	5
Conditions- Surgical abdominal cases	2	3

Name	Sources	References
Conditions- Vertigo	1	2
Drugs- Antihistamines	2	2
Drugs- Fluoresceine	1	1
Drugs- Insulin	4	13
Drugs- Levetiracetam	3	3
Drugs- Respiratory drugs	4	9
Drugs- Salbutamol	3	5
Drugs- Steroids	2	2
Drugs-Oxygen	1	2
Managing Medical Pain	4	9
Conditions- Trauma and injury	13	61

Name	Sources	References
Conditions- Major Trauma	3	7
Conditions- Managing pain in Trauma	2	6
Conditions- RSI	2	2
Conditions- Sedation	8	27
Conditions-Trauma	3	10
Drugs- Blood	2	2
Drugs- Sedation	1	3
Drugs - Propofol	4	9
Drugs- Penthrox	2	6
Drugs- TXA	1	2
Drug addiction and misuse	4	17

Name	Sources	References
Alcohol Dependency	2	3
Conditions- Drug Overdose	3	6
Drugs- Pabrinex	1	1
Non prescribing cases	4	13
Controlled drugs	18	299
Controlled drug restrictions	16	157
Controlled drug restrictions- Choosing alternatives	5	12
Controlled drug restrictions- Confusion	6	13
Controlled drug restrictions- Evaluation and generating evidence	2	2
Controlled drug restrictions- general views	6	8
Controlled drug restrictions- Impact on care and service delivery	10	23
Controlled Drug Restrictions- Lack of communication around issue	1	2

Name	Sources	References
Controlled drug restrictions- Limited list insufficient	6	12
Controlled drug restrictions- medical support	3	6
Controlled drug restrictions- Minimal impact on patient care and service provision	11	23
Controlled drug restrictions- PGDs	5	11
Controlled drug restrictions- Professional impact for paramedics	8	19
Controlled drug restrictions- Sc 17 administration	2	5
Controlled drug restrictions- Third party prescriptions	7	20
Controlled Drugs- Chlordiazepoxide	5	6
Controlled Drugs- Codeine	4	8
Controlled Drugs- Diamorphine	1	2
Controlled Drugs- Diazepam	3	5

Name	Sources	References
Controlled Drugs- Fentanyl	9	19
Controlled drugs- Governance and policy	7	14
Controlled Drugs- Ketamine	10	26
Controlled Drugs- Lorazepam	2	2
Controlled Drugs- Midazolam	3	4
Controlled Drugs- Morphine	9	32
Controlled Drugs- Oxycodone	9	20
Controlled Drugs- Patients own medication	2	2
Doctors	17	174
Comparisons with doctors	11	24
Doctors strikes	2	3
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Name	Sources	References
Medical support during training	6	9
Oversight and supervision	4	16
Senior clinician and medical support in practice	11	64
Speciality referrals and advice	5	20
Support from non medics and peers	2	5
Medical Views and Acceptance	11	33
Medical acceptance and views in wider secondary care structure	4	5
Medical acceptance and views- Generally	5	8
Medical views and acceptance in emergency medicine	8	11
Physician assistants and associates	6	9
Drugs	12	81
ADRs	1	2

Name	Sources	References
Drugs- Adrenaline	1	1
Drugs- Anticoagulants	5	11
Drugs- Antiemetics	2	5
Drugs- Ondansetron	2	3
Drugs- Prochlorperazine	1	2
Drugs- CT Contrast	3	5
Drugs- Discharge medication	2	3
Drugs- Fluids	5	16
Drugs- Gabapentin	1	1
Drugs- Ibuprofen	1	3
Drugs- Local anaesthetics and blocks	4	5

Name	Sources	References
Drugs- NSAIDs	2	5
Drugs- Paracetamol	5	16
Drugs- Patients own medication	2	3
Drugs- Potassium Chloride	2	2
Golden Nuggets	1	2
Non CD analgesia	0	0
Education and Training	18	58
IP module	3	3
Master's level education	15	24
Ongoing education and development	5	12
RCEM credentialling	6	19
Governance and policy	6	19
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Name	Sources	References
Researcher influence on clinical care and data collection	4	9
Researcher reflections	5	21
Site documents related to prescribing	6	35
Participant Background Data	0	0
ED CSI Participant Background	13	17
ED PIP Background	4	4
PGDs and Schedule 17	9	31
No PGDs in Trust so IP needed	2	3
PGD drawbacks	3	3
PGDs and exemptions (general)	4	6
PGDs for controlled drugs	2	4
PGDs vs IP	4	5

Name	Sources	References
Prescribing potentially not needed	1	3
Schedule 17 drugs	2	2
Schedule 17 drugs in ambulance services	2	2
Schedule 17 for controlled drug administration	1	3
Professional Aspects	16	108
Autonomy	6	13
Changing nature of paramedicine	3	4
Developing the ACPs and ACP role	1	2
Differences between ACPs Gender	1	1
General views on advanced practice	1	1
General views on IP	1	1
Increased job satisfaction	1	1

Name	Sources	References
Knowledge and confidence	10	27
Paramedic Background - Limitations	5	6
Paramedic background- Benefits	8	15
PIPs supervising, advising and mentoring others	3	5
Scope of practice	9	21
Complexity in emergency medicine - Children	5	12
Complexity in emergency medicine- Challenging patients	3	8
Complexity in emergency medicine- Frailty and Older Patients	8	17
Complexity in emergency medicine- unclear diagnosis and complex cases	4	17
The ACP-EM role	5	11
Specific Elements of Prescribing	11	98
Deprescribing	5	8

Name	Sources	References
Electronic prescribing system	6	17
FP10s	6	8
Higher acuity prescribing	4	8
PIPs providing prescribing advice to others	2	4
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Pressure to prescribe	2	2
Separating prescribing and administration	7	34
Transcribing	6	8
TTA's	2	5
The Context of Emergency Medicine	11	145
Busier periods in the ED	3	48
Demand and changing landscape in emergency care	7	13

Name	Sources	References
Handovers and Huddles	2	9
Interruptions, distractions and multi tasking	6	20
Other paramedic roles	1	2
Patients views	3	4
Pharmacists in ED	2	3
Quieter periods in the ED	3	5
The ED MDT	6	41
Interactions with HCAs	3	4
Interactions with nurses	4	54

J.2 Urgent care case study codes and categories

Name	Sources	References
Benefits and Limitations	14	50
Benefits of PIP	14	50
Case Site Delivery and Ops	22	166
Case Site Descriptions and Information	17	74
The IUC Clinician Role	2	7
UCS CSI Participant Background Information	5	10
UCS PIP Participant Background	10	31
Clinical Navigator Role	2	5
Governance and Auditing	7	25
PGDs in the Urgent Care Case Site	11	23
Professional or Patient Line Number	3	4

Name	Sources	References
UCS Duty Pharmacist	4	7
UCS Operations	10	28
Colleagues	19	163
Ambulance Paramedic Calls	8	22
Comparisons Between Professions	12	30
Medical Acceptance and Views of Doctors	5	15
Medical and Peer Support	17	86
Clinical Coordinator	15	36
Non Prescribing Paramedics	2	3
Physicians Assistants	5	7
Controlled Drugs and Restrictions	16	108
Adastra - Barrier to Controlled Drug Prescribing	12	32

Name	Sources	References
Controlled Drug Restrictions- Limited List Positive Views and Fit for Purpose	4	11
Controlled Drugs- General Views and Confusion	10	23
Controlled Drugs- Limited List Changes Required	8	14
Controlled Drugs- Limited List- Not so appropriate for urgent care	1	1
Controlled Drugs- Unable to deal with repeat prescription request	1	2
Third Party Prescribing- Controlled Drugs	9	24
Misc.	7	18
Researcher Reflections	7	18
Patient Cases - Conditions Encountered and Drugs Prescribed	21	577
Allergies	3	18
Case Follow Up Information	1	1
Cases in Nursing and Residential Care	3	15

Name	Sources	References
Conditions	10	127
Conditions -Dental Infections and Problems	5	7
Conditions- Acute Sore Throat	5	9
Conditions- Asthma	2	2
Conditions- Back Pain	2	2
Conditions- Breathing Issues	1	1
Conditions- Cardiac and Blood Pressure	3	7
Conditions- Constipation	3	5
Conditions- COPD	1	1
Conditions- D&V	3	8
Conditions- Drug and Alcohol Misuse and Addiction	1	1

Name	Sources	References
Conditions- Ear Infections	4	7
Conditions- Electric Shock	1	1
Conditions- GORD	1	1
Conditions- Gout	1	1
Conditions- Gynaecological and PV Bleeding	1	1
Conditions- Influenza	1	2
Conditions- LRTI and Cough	4	13
Conditions- MSK	4	5
Conditions- Pain	1	1
Conditions- Scarlet Fever	1	1
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Name	Sources	References
Conditions- Suspected PE	1	1
Conditions- Suspected Viral Illness in Adults	2	2
Conditions- Suspected Viral Illness in Children	2	2
Conditions- UTIs and Urological Cases	8	20
Conditions- Vertigo	1	1
Conditions- Whooping Cough	4	5
Conditions- Anxiety and Mental Health	2	2
Drugs	14	135
Drugs- Amoxicillin	2	3
Drugs- Antiemetics	4	6
Drugs- Antihistamine	1	1

Name	Sources	References
Drugs- Antivirals	1	2
Drugs- Buprenorphine	2	3
Drugs- Cardiac Drugs and Antihypertensives	3	6
Drugs- Clarithromycin	3	3
Drugs- Codeine	10	22
Drugs- Colchicine	1	1
Drugs- Diazepam	6	6
Drugs- Diflam Spray	2	3
Drugs- DOACs	3	3
Drugs- Doxycycline	2	4
Drugs- Ear Preparations	1	1

Name	Sources	References
Drugs- Flucloxacillin	3	5
Drugs- Gabapentin	1	1
Drugs- Inhalers	3	5
Drugs- Insulin	3	4
Drugs- Laxatives	3	4
Drugs- Lorazepam	1	1
Drugs- Mental Health Treatments	5	7
Drugs- Naproxen	4	7
Drugs- Nitrofurantoin	2	3
Drugs- Optical Medication	2	2
Drugs- Oxycodone	2	3

Name	Sources	References
Drugs- Pen V	3	4
Drugs- PPIs	3	5
Drugs- Statins	1	1
Drugs- Steroids	2	4
Drugs- Topical Ear Treatments	2	3
Drugs- Topical Skin Treatments	1	1
Drugs- Triptans	1	1
Drugs-Morphine	3	7
Drugs-NSAIDS	3	3
Face-to-face Treatment Centre Encounters	8	23
Failed Contacts and Cancellations	7	16

Name	Sources	References
Home Visits	7	53
Non Prescribing Cases	8	42
Onward review in primary care	6	14
Patients Views and Experiences	3	12
PIP and Palliative Care	17	57
JIC End-of-life Medication	13	26
Palliative Care	10	31
Potential Drug Seeking Behaviour	6	10
Safe guarding	1	1
Self Care and Worsening Advice	9	22
Urgent Admissions	4	7

Name	Sources	References
Urgent and Deranged Bloods	5	10
Urine Samples MC&S	7	13
Verification of Death	1	1
Professional Aspects	18	201
Clinical Decision-making	3	5
Confidence and Autonomy	9	30
Errors and Mistakes	3	4
Experience and Education	14	53
Advanced Clinical Practice	5	8
IP PIP Module	4	8
Master's and Education	12	23
Palliative Care Training	7	11

Name	Sources	References
Knowledge Gaps	2	2
Managing Risk, Uncertainty and Complexity	12	55
More Complex Prescribing Decision-making	2	2
Pressure to Prescribe	6	18
Scope of Prescribing and Practice	13	32
The Healthcare Landscape	18	148
Issues and concerns with prescriptions and care in primary care	4	14
Reflections and Comparisons on Prescribing and Practice in Primary Care	6	20
The EUC Landscape	18	110
Ambulance Service Views, Experience and Roles	12	45
Ambulance Service Practitioner Roles	8	19
Insights into ambulance service roles and practice	6	12

Name	Sources	References
PIP in ambulance settings	6	11
Changes from the COVID-19 Pandemic	9	19
Demand	11	22
Pharmacy Opening Hours and Issues	11	24
The Work of Prescribing	21	340
Deprescribing	3	4
Drug Stock at Treatment Centre	10	27
Drug Stock in Car	6	17
Electronic Prescriptions	11	22
Handwritten FP10s	5	16
Immediate Antibiotic Prescribing Decisions	3	6
Information	17	129

Name	Sources	References
Access to Patient Information- Issues and Barriers From Technology	1	4
Adastra- System Issues	3	4
Prescribing and Clinical Guidance Resources	9	22
Viewing patient information and history on EMIS	15	98
Medication Review, Advice on Drugs and Verbal Orders	8	26
No Antibiotic Prescribing Decisions	7	11
Remote Consultations	16	56
Photographs in Remote Consultations	11	27
Video Consultations	4	8
Views, Insights and Observations About Remote Consultations	11	21
Repeat Prescriptions	8	26

Appendix K Emergency department prescribing data full tables

2023 PIP prescription indication data

Indication	Frequency	Percentage
Pain	484	18.8
Sepsis	371	14.4
Dehydration and Fluid Replacement	230	8.9
Chest Infections	199	7.7
Nausea and Vomiting	198	7.6
Respiratory Conditions	179	6.9
UTI and Pyelonephritis	108	4.1
Arrythmia	82	3.1
ACS	75	2.9
Fever and pain	65	2.5
Overdose	58	2.2
Regular Medication	55	2.1
Abdominal Complaints	45	1.7

Fever	43	1.6
Infection- Unclear source	41	1.5
Cellulitis	37	1.4
Gastric and Abdominal Infections	32	1.2
Headache and Migraine	31	1.2
Electrolyte Disturbance	26	1.0
Constipation	23	<1
Wernicke-Korsakov syndrome (18) and Alcohol dependency related (4)	22	<1
Allergy Symptoms	20	<1
Trauma and Fractures	19	<1
Pulmonary Oedema/CCF	18	<1
PE	15	<1
Brain Infections/Meningitis	14	<1
Upper RTI Tonsillitis and Quinsy	12	<1
Renal Colic	10	<1
Stroke/TIA	8	<1
Epilepsy and Seizure Treatment	8	<1
Sedation and Anaesthesia	8	<1
Adrenal Insufficiency/Addison's	6	<1

Flu and COVID-19	6	<1
Diabetes Treatment	6	<1
Dental Infections	5	<1
DVT/VTE	4	<1
Metastatic Spinal Cord Compression	3	<1
Local anaesthesia	3	<1
Vertigo	2	<1
Hypertension	2	<1
Grand Total	2573	

Paramedic ACP-EM drug prescribing frequencies for 2023

Drug	Frequency	Percentage
Antibiotics	752	20.6
Fluids	747	20.4
Paracetamol	597	16.3
Antiemetics	315	8.6
Inhaled Respiratory	224	6.1
Anticoagulants and Antiplatelets	145	3.9
NSAIDs	137	3.7
Other/Misc.	121	3.3
Steroids	85	2.3
Anti Arrythmias and Beta Blockers	76	2.0
Overdose and alcohol treatments	63	1.7
PPI and GORD	60	1.6
Electrolytes and Vitamins	51	1.3
Parkinson's Treatment	40	1.0
Diuretics	37	1.0
Constipation Treatment	33	<1

Local anaesthetics	27	<1
Epilepsy Treatment	27	<1
Hypertension Treatments	25	<1
Antihistamines	22	<1
Sedation/Anaesthesia	17	<1
Bleeding Control Treatments	17	<1
Mental Health Treatments	16	<1
Diabetes Treatments	12	<1
Total	3646	

Paramedic ACP-EM drug prescribing frequencies for 2024

Drug	Frequency	Percentage
Fluids	569	16.8
Antibiotics	556	16.4
CDs	513	15.1
Paracetamol	495	14.6
Antiemetics	284	8.3
NSAIDs	156	4.6
Inhaled Respiratory	138	4.0
Anticoagulants and Antiplatelets	134	3.9
Other/Misc.	93	2.7
Steroids	70	2.0
Overdose Treatment	64	1.8
Anti Arrythmias and Beta Blockers	48	1.4
Epilepsy Treatments	44	1.3
Electrolytes and Vitamins	40	1.1
PPI and GORD	38	1.1
Diuretics	18	<1
Parkinson's Treatment	25	<1
Constipation Treatments	23	<1

Local Anaesthetics	15	<1
Hypertension Treatments	15	<1
Antihistamines	15	<1
Bleeding Control Treatments	12	<1
Diabetes Treatment	12	<1
Sedation/Anaesthesia	7	<1
Mental Health Treatments	7	<1
Total	3382	

Glossary of Terms

IP .....Independent Prescribing: Prescribing by a practitioner, who is responsible and accountable for the assessment of service users with undiagnosed or diagnosed conditions and for decisions about the clinical management required.

PGD .....Patient Group Direction: A written direction that allows the supply and administration of a specified medicine to a pre-defined group of patients PGDs are signed by a doctor or dentist and a pharmacist, and they relate to prescription-only medicines (POM) or pharmacy medicines (P).

CD.....Controlled Drugs: Drugs that are defined and governed by the Misuse of Drugs Act 1971 and associated regulations. Controlled drugs are closely regulated because they are susceptible to being misused and can cause harm.

EUC.....Emergency and Urgent Care: A range of healthcare services providing emergency care such as ambulance services and emergency departments, and urgent care of acute conditions in settings such as urgent care centres, minor injury units and out-of-hours services.

FP10.....Handwritten prescription on a specific NHS drug prescription form.

JRCALC .....Joint Royal Colleges Liaison Committee: A multi-professional committee who author and update UK ambulance service clinical guidelines.

AHPs .....Allied Health Professions: A range of non-medical healthcare professions including paramedics, physiotherapists, podiatrist and radiographers.

NHS .....National Health Service: Publicly funded healthcare system in the United Kingdom, providing free medical treatment for everyone in the UK, paid for by the government.

ACP.....Advanced Clinical Practitioner: Healthcare professionals, educated to master's level or equivalent, with the skills and knowledge to allow them to expand their scope of practice to better meet the needs of the people they care for. ACPs are deployed across all healthcare settings and work at a level of advanced

clinical practice that pulls together the four ACP pillars of clinical practice, leadership and management, education and research.

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