UNIVERSITY OF SOUTHAMPTON

SCHOOL OF HEALTH SCIENCES

How clinically appropriate is, and what are the influences on, antibiotic prescribing by Nurse Independent Prescribers, working in general practice settings?

by

Francine O'Malley

Thesis for the degree of Doctor of Philosophy

20th March 2020

Abstract

Antimicrobial resistance is a global public health concern. Inappropriate antibiotic prescribing is one of the factors related to this growing resistance. In the UK many nurse independent prescribers (NIPs) are employed in general practice settings and are prescribing antibiotics on a regular basis, potentially more than GPs. They are increasingly managing patients with minor illnesses, in on the day access clinics, when antibiotics are more likely to be prescribed. It is acknowledged, that there is an unexplained wide variation and a level of inappropriate antibiotic prescribing by GPs, but little is known about NIPs. GPs directly employ the NIPs who work in their practice and frequently act as medical supervisors and advisors to them. In the NHS this relationship is unique to general practice, elsewhere NIPs are employed by larger organisations such as hospital and community trusts.

Case study methodology was undertaken to explore the appropriateness of and influences on NIPs antibiotic prescribing in general practice, and whether the setting and relationship with the GP impacts on their prescribing, Quantitative and qualitative methods were employed, to mitigate the limitations of each method, and through triangulation of data to increase confidence in the validity and interpretation of the findings. A validated tool, the medicines appropriateness index (MAI) was used to evaluate the appropriateness of the NIPs antibiotic prescribing, by evaluating patient records where antibiotics were prescribed, 10 from each NIP in the month prior to consenting to take part in the study. 60 patient records in total were reviewed. Semi-structured interviews were undertaken with three NIPs in two Cases, and one GP in each Case. Non-participant observation, drawing on ethnographic methods, of the NIPs antibiotic prescribing practice was observed in 200 consultations until data saturation.

The NIPs demonstrated competence and confidence in treating minor illness presentations and prescribed antibiotics appropriately according to local and national guidelines. This may have contributed to the overall reduction in inappropriate antibiotic prescribing rates reported in the latest ESPAUR report (2019). The NIPs were influenced by a range of factors, mostly related to clinical issues, such as; co-morbidities and severity of illness, however there were other influencing factors, time, patient pressure and a desire to help the patient as best they could. Time and lack of it, was the influence that the NIPs found most difficult to manage. The NIPs valued the GPs knowledge, experience and support, however they asked for their advice infrequently about minor illness conditions and antibiotic prescribing, due to their own experience in treating common minor illnesses. The GPs did influence the NIPs as novice prescribers however this influence declined as the NIP gained experience, they then sought advice from experts such as microbiologists and pharmacists, when there was uncertainty related to antibiotic prescribing. They are valuable and highly skilled members of the workforce with the potential to reduce GP workload further with increased support.

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DECLARATION OF AUTHORSHIP

I, Francine O'Malley declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

'How clinically appropriate is, and what are the influences on, antibiotic prescribing by Nurse Independent Prescribers, working in general practice settings?'

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission

Signed: .....

Date: .....

Acknowledgements

I would like to sincerely thank my supervisors for their support and encouragement, Professor Sue Latter who has been constant throughout the journey, and Dr Kieran Hand, Dr Maggie Donovan-Hall and Dr Sue Faulds who at various stages have contributed their knowledge, advice and experience.

I would also like to thank my colleagues who have had to endure this journey with me. Especially those in building 45, who kept me going when times were tough, with their friendship and words of encouragement.

I would also like to thank my family.

Finally, and most of all I would like to thank the participants who honestly and openly let me into their work lives and without whom there would have been no study.

This document has been proofread. No changes of intellectual content were made as a result of this advice.

Abbreviations

AMR- antimicrobial resistance

ANP – advanced nurse practitioner

AP – Advanced practitioner

BMA- British Medical Association

BNF- British national formulary

BSc- Batchelor of Science

BTS- British Thoracic Society

CAG- Confidentiality Advisory Group

CCG- Clinical Commissioning Group

CHRE- Council for Healthcare Regulatory Excellence

COP- Communities of Practice

COPD – Chronic obstructive pulmonary disease

CPD- Continuous professional development

CRN- Clinical research network

DH –Department of Health

DMP- Designated medical practitioner

eGFR- estimated Glomerular Filtration Rate

ePACT- electronic Prescribing Analysis and Costs

ESPAUR- English Surveillance Programme for antimicrobial Utilisation and Resistance

F- Fieldnotes

GP- General practitioner

HEE – Health Education England

HRA- Health research authority

I- Interview

ICN- International council for nurses

IRAS- Integrated research application system

MAI- Medication Appropriateness Index

MSc- Master of Science

NHS- National Health Service

NICE – National Institute for Health and Care Excellence

NIP- Nurse independent prescriber

NMC- Nursing and Midwifery Council

NMP- Non-medical prescriber

OOHs- Out of Hours Service

PGD- Patient group directions

PHE - Public Health England

RCN- Royal College of Nursing

RPS- Royal pharmaceutical society

RTI- Respiratory tract infection

SCAN- South Central Antimicrobial Network Guidelines for Antibiotic Prescribing in the Community

SHIP- South Central, Hampshire, Isle of Wight and Portsmouth guidelines for Antibiotic Prescribing in the Community

SIGN- Scottish Intercollegiate Guidelines Network

UTI- Urinary tract Infection

WHO- World Health Organisation

WiC- Walk in Centre

Chapter 1: Background and Introduction

1.1 Introduction to chapter

Within this first chapter, I will discuss my background, which will highlight my extensive clinical experience in primary care settings, and my route into academia, which led to this research study being undertaken. The threat of increasing antimicrobial resistance, due to poor antibiotic prescribing habits will be outlined. The role of the nurse independent prescriber (NIP) will be introduced and an overview of the development of nurse prescribing will be outlined. The role of the NIP in a general practice setting, and what is known about their contribution to patient care, will be discussed, alongside what is known about antibiotic prescribing and GPs' antibiotic prescribing. The complexities of the doctor nurse relationship will be explored, and the influence that this relationship may have on the NIPs' antibiotic prescribing will be discussed. The chapter will end with an outline of the structure of the thesis and a brief summary of the following six chapters

My background and rationale for the research

The original research inquiry came from my experiences while working as a nurse practitioner and independent prescriber, in a first contact care setting at the primary care level. It was a nurse-led, walk-in centre (WiC) that operated both in hours and out of hours (OOHs). During the 'In hours' period the WiC served as an adjunct to primary care, dealing with the overflow from general practice as an initiative to improve access to healthcare for patients and to reduce attendance at the emergency department of the local hospital. In the 'out of hours period', at weekends and evenings, the WiC provided access to care for ill patients when there were no GP surgeries open and operated as an adjunct to the OOHs GP service. Although presentations were many and varied, the majority of patients presented with minor illnesses and minor injuries.

Patients frequently attended at the weekend, due to worsening symptoms, or symptoms that were not responding to antibiotics that their GP had prescribed. This situation was often because; an inappropriate antibiotic for their condition had been prescribed, that the dose was sub therapeutic and therefore inadequate to treat the condition, or that the patient had a viral illness, which would not improve by taking antibiotics.

Before this time, I worked in general practice for ten years, where I experienced a variety of antibiotic prescribing behaviours by the GP partners. Some GPs appeared to prescribe antibiotics for all minor illnesses, possibly through fear of missing something significant. Some GPs pacified patients by prescribing an antibiotic to keep them happy, but at a sub-therapeutic dose, so it would have little effect, and others restricted their antibiotic prescribing. So, experiencing some patients presenting at the WiC, who had been prescribed antibiotics inappropriately by GPs, was not a surprise. However, increasingly the patients reported that it was a nurse, who had prescribed the antibiotics, and that their symptoms were not improving. During the programme of education to become a nurse prescriber, it is explicit that medication must not be prescribed, unless there was a clear indication; this proviso applied especially to antibiotics. It was difficult to understand why some nurses were prescribing antibiotics in this way, so I probed by asking the patients whether the nurse had gone to the GP and come back into the room with a prescription, or whether they had been able to generate the prescription in the consulting room and sign it themselves. By this questioning I was able to identify whether the nurse was the prescriber or whether the antibiotic was prescribed by a GP. I was then able to confirm when the nurse had indeed prescribed the antibiotic and there were instances when their antibiotic prescribing was poor. The issue was most commonly due to sub therapeutic doses and treating viral conditions with antibiotics where symptoms are not resolved by the taking of antibiotics.

I first moved to higher education as a secondee from clinical practice, to teach physical assessment skills to post qualifying students. I then obtained a substantive full-time post at a university, teaching across a range of modules in the MSc advanced practice programme. After a short time, I became programme lead for the non-medical prescribing programme. While teaching, and during classroom discussions, some students reported challenges working with their medical mentor, and asked advice on how to manage disagreements about prescribing decisions. This was raised most frequently by the students in general practice, relating to their GP mentors and their antibiotic prescribing, which they felt was not ‘guideline driven’. Some students challenged the GP’s prescribing, but were largely ignored. One student felt so strongly, that she decided to leave the practice she worked in while doing the course and find another job. She came to the conclusion that she could not work there anymore, due to the poor antibiotic prescribing behaviours that she had observed; a situation exacerbated by the GPs refusal to address her concerns.

Working at the university provided me with the opportunity to undertake research. As a nurse with 30 years' experience, a clinician and independent prescriber, with experience of working in general practice and managing minor illness conditions, I had the unique qualifications to explore this concern further. I decided to investigate the phenomenon of nurse independent prescribers' antibiotic prescribing in general practice.

1.2 Development of Nurse independent prescribing

Nurse prescribing was originally recommended by the Royal College of Nursing (RCN) in 1978. It was proposed that nurses should be able to prescribe dressings and topical treatments for patients, instead of having to wait for doctors to prescribe for them. However, it was not until the publication of the Cumberledge Report (1986) that government recognised the possibility that nurse prescribing could improve health care in the community. Due to legislative changes required to the Medicines Act 1968 to enable nurses to prescribe, there was a delay. Therefore, and it was not until 1994 that a pilot of nurse prescribing was undertaken. Although doctors have expressed their views challenging the extension of prescribing rights to nurses (Day 2005), various governments have continued to push through their agenda of modernising the workforce. This appears to be driven by increasing demands, stemming from both public and workforce related needs (Avery and James 2007). The extension of prescriptive authority for nurses was intended to improve access and choice for patients, without compromising the safety of such patients (Department of Health (DH) 2006).

There are variations throughout the world; in the level and scope of prescriptive authority extended to nurses, the range of medications which can be prescribed, situations in which nurses can prescribe and the educational requirements of the nurse prescriber (ICN 2009, Kroezen et al 2011). The timeline in table one, illustrates the development of nurse prescribing together with the changes in 2012 gave NIPs in the UK, a very high level of prescriptive authority, comparable to doctors. In recognition of this professional development, the National Prescribing Centre (NPC) who previously published profession specific prescribing competency frameworks developed 'A single competency framework for all prescribers' (2012), this document has been superseded by the Royal Pharmaceutical Society's (RPS) Competency framework for all prescribers (2016).

NIPs in the UK have a higher level of prescriptive authority than elsewhere globally, although educational requirements are less stringent than in other Western Europe and Anglo-Saxon countries, where the qualification sits within a master's level nurse practitioner programme (Kroezen et al 2011). In the UK the non-medical prescribing programme can be accessed by nurses

as continued professional development, outside of a degree or master's programme and is currently assessed at BSc degree level (Nursing and Midwifery Council (NMC) 2019).

Table 1 Development of Nurse prescribing in the UK

1986 – Nurse prescribing is first recommended in a UK government report (Neighbourhood Nursing review: the Cumberledge Report)
1989- Crown Report 1 – Community nurse prescribing.
1994 – Nurse prescribing is introduced in the UK in eight demonstration sites. Appropriately trained community nurses are able to prescribe from a limited formulary (the Nurse Prescribers' Formulary). Nurses must hold a district nurse or health visitor qualification.
1998 – Crown Report II Part 1 and community nurse prescribing is extended to all parts of the United Kingdom.
1999 – Crown Report II Part 2
2002 – Extended nurse prescribing introduced. All registered nurses and midwives are eligible to train to prescribe from the extended Nurse Prescribers' Formulary (NPF). This prescribing covers four main areas: minor ailments, minor injuries, health promotion and palliative care.
2003 – Supplementary prescribing for nurses starts. All registered nurses and midwives are eligible to train to prescribe almost all drugs (except controlled drugs such as morphine), provided they have been specified in the clinical management plan agreed by the independent prescriber (a doctor) and the supplementary prescriber.
2006 – Nurse, midwife, health visitor, pharmacist independent prescribing. Nurses are able to prescribe any licensed, off licence medicine for any medical condition, including some controlled drugs.
2008 - An amendment allows Nurse Independent Prescribers to prescribe any unlicensed medicine.
2012 - In an amendment to the Misuse of Drugs Regulations (2001), Nurse Independent Prescribers are given prescriptive authority to enable them to prescribe controlled drugs in schedule 2-5 for any condition, with the exception of three drugs used in the treatment of addiction, which is restricted to Home Office licensed doctors. Nurse Independent Prescribers now have the same prescriptive authority as most medical practitioners.
After Hall (2004)

Early studies in the UK raised some concerns regarding nurses' level of pharmacology knowledge (Buckley et al 2006; Offredy et al 2008). However, since 2006, and the change to the programme of education as set out by DH (2006) and the NMC (2006), research suggests that having a degree level qualification is adequate preparation for a prescribing role (Latter et al 2010).

Latter et al (2010) in their evaluation of nurse prescribing in England via a cross-sectional national survey of 976 NIPs, found the relevant education programmes 'fit for purpose'. Although most NIPs (87%) felt that the programme of education met their learning needs, a small number (12.9%) felt that their learning needs were not met fully. After completing the educational programme there were some inconsistencies in the provision of continuing professional development (CPD) for NIPs. 18% of the 976 NIPs who completed a questionnaire survey in the study, reported that they did not have access to CPD.

During the programme of preparation for prescribing, the student must be supervised by a 'designated medical practitioner' (DMP), (NMC 2006). For students working in general practice this person is usually a GP from within the same practice. The DMP is the person who signs off the student NIP as safe and competent to undertake the prescribing role; without this sign off the student cannot register as a NIP with the NMC. The nurses are therefore being trained in prescribing practice, by their employer and so the GP has the potential to influence the nurse's prescribing, throughout the training period, and beyond, especially if the NIP stays in the same practice.

There is increasing patient demand in primary care as well as a decline in the medical workforce (Imison et al 2016). Due to the decreasing numbers of GPs, together with an increase in patient demand, NIPs are currently undertaking roles previously carried out by GPs. They are seeing on the day presentations, as well as managing minor illness clinics and are therefore potentially prescribing antibiotics more frequently than GPs (Bekkers et al 2010; Primary care workforce commission 2015).

Nurse prescribing in the UK is seen to make a significant contribution to patient care (Abuzour et al 2018; Latter et al 2010). The role has increased nurses' job satisfaction, as now they are able to complete episodes of care for patients. They are using their assessment and diagnostic skills and now prescribing themselves, rather than having to ask the doctor to prescribe (Hindi et al 2019; Latham and Nyatanga 2018; Ross 2015; Carey et al 2014; Cousins and Donnell 2012). Research has also shown that patients also view nurse prescribing positively and comparable with a GP consultation (Tinelli et al 2013), and in a systematic review by Weeks et al (2016).

The majority of research findings carried out on NIPs so far in the UK has used self- reported data (Latter et al 2010). Findings have been largely positive regarding patients' views; where patients report that they like the longer consultations and discussions that they have with NIPs, attitudes of other health professionals, and educational preparation for non-medical prescribing (Hindi et al

2019; Watterson et al 2009; Drennan et al 2009; Gerard et al 2014). Weeks et al (2016) undertook a Cochrane review to assess clinical, patients self- reported, and resource use outcomes, of non-medical prescribers and medical prescribers in both primary and secondary care. The authors found comparable outcomes between medical and non-medical prescribers for patients, across a range of indicators. However, of the 46 Studies included in the review, only six were undertaken in the UK. One of them related to pharmacist prescribing, and in the remaining five, none of the nurse participants were actually prescribing, they were writing to GPs advising medication, or titrating medication according to a management plan, with the doctor signing the prescription.

The number of NIPs is increasing year on year; in March 2018 there were 74,738 nurses or midwives registered with the Nursing and Midwifery Council (NMC) who held a nurse prescribing qualification; 48% were NIPs. The reduction in GP numbers and the increasing numbers of NIPs illustrates the need for more UK based research in this area.

1.3 Nurse practitioners

The role of nurse practitioners in general practice settings has developed from the model created in the United States. In the 1970s, nurse practitioners in primary care area were carrying out the role traditionally associated with medicine, the diagnosing and treatment of common conditions (Reedy 1978). The role of nurse practitioner in general practice in the UK has been driven by a reduction in the medical workforce, and increased demand for medical services in the community (Woodroffe 2006; Sibbald et al 2006)

The definition of the role by the ICN (International Council of Nurses), (2001 p1) is,

> ‘a registered nurse who has acquired the expert knowledge base, complex decision-making skills and clinical competencies for expanded practice, the characteristics of which are shaped by the context and/or country in which s/he is credentialed to practice. A master's degree is recommended for entry level’

The role, rather than an expansion of nursing practice, has been described as ‘medical role substitution’ and therefore a ‘hybrid’ model of practitioner combining both nursing and medical skills (Brook and Rushforth 2012). The authors highlight that with nurses taking on this traditional medical role, there is increasing clinical risk, and that it requires regulation is required in order to protect the public. The authors suggest that while nurses have historically developed their roles and added new skills beyond the point of registration, that when undertaking the additional skills of medical assessment, diagnosis and prescribing they are going beyond simply adding new skills. Diagnosis and prescribing medicine for patients have traditionally been seen as the cornerstone of the medical profession (Britten 2001). In the UK, the Council for Regulatory Healthcare (CHRE)

decided that there was no requirement for the role to be regulated separately, and that the requirements of the current regulatory body of the registrant were sufficient to ensure that there was no significant risk to the public (CHRE 2009). The term nurse practitioner is used throughout the world and in most countries the role is regulated at various levels either nationally or locally as in the USA, Ireland, Canada and Australia (Maier et al 2016). Within those countries it is expected that a person with the title of nurse practitioner hold a masters' degree and a prescribing qualification.

Currently in the UK the titles nurse practitioner and advanced nurse practitioner are used interchangeably and there is no protection of that title, so in effect it can be adopted by any practitioner. Leary et al (2017) in their study which aimed to understand the variation in job titles in the UK, found that 323 posts where titles such as advanced nurse practitioner or specialist nurse were being used, the post holders were not registrants with the NMC. They were not registered nurses and yet they were still able to use the aforementioned titles. A definition of the role and standards of education have not been agreed upon, but Health Education England (HEE) are currently reviewing this. Nurse independent prescribing is the only aspect of the advanced practice role that has been regulated by the NMC, leading to an annotation on the register (NMC 2006; 2019). It is not within the scope of this thesis to debate the regulation of the role of nurse practitioners/advanced nurse practitioners but to apply context to the role of the participants in this study.

1.4 NIPs in general practice

General practice was established in the UK by the National Insurance Act of 1911, when patients who paid national insurance were able to register on a GP list. This option was extended in 1948 to the whole population, following the establishment of the National Health Service (NHS). GPs in general practice are medical gatekeepers and control access of patients to secondary care and specialist treatments. GPs provide services, as independent contractors to the NHS, through the general medical services contract (Gillam 2017). This arrangement means that for the majority of patients in the UK, those without private healthcare, the GP is often the first port of call for medical concerns. The GP then has the power to refer that patient to specialists for treatments, if such action is deemed appropriate. GPs run their practices as a business and employ and train their own staff, such as receptionists, administrative staff and nurses. The GPs are also responsible for the upkeep of their premises (BMA 2018).

NIPs working in general practice are a discrete group of practitioners working in the primary care setting. They are directly employed by the GP who themselves are not employed by the NHS, but contract services to the NHS. The UK business model of GP partnership working and partners having a share hold in the practice is not replicated elsewhere, the partners employ their staff, including any NIPs. This arrangement distinguishes the NIPs working in general practice, from those working elsewhere in primary care, such as district nurses, community matrons and health visitors. The relationship between the NIP and GP working in close proximity in general practice is important, not just the employer/employee relationship, but also the professional relationship and its potential to influence or inform practice.

Over time and particularly recently, there has been an increase in workload in general practice and a declining GP workforce. GPs are reporting high levels of stress and burn out and for these reasons many are taking early retirement, further adding to the reduction in GP numbers seen over the past ten years (Baird et al 2016). Subsequently there have been initiatives to increase the workforce in general practice and healthcare professionals using extended skills such as non-medical prescribing. These initiatives have been identified as key to meeting these demands (Nelson et al 2018; Imison et al 2017) Nurse practitioner/prescriber have established roles within general practice, working alongside GPs, in order to prescribe antibiotics for a range of conditions (Courtney et al 2017). Gabbay and Le May (2004 p2) in their ethnographic study of nine GPs in two practices in England found that GPs also use a variety of sources of information to adhere to the local norm, which they refer to as 'collectively reinforced tacit guidelines' within their community. The GPs refer to peers and opinion leaders as a more valuable source of information than guidelines. NIPs working in general practice may also be influenced by this 'community' and the pressure it exerts.

Bowskill (2012) explored how nurses take on the prescribing role in primary and secondary care. It was found that the NIPs prescribing of medication in secondary care was much more restricted, than for those NIPs working in primary care. It was shown that the trusts and clinical organisations made decisions on what drugs could be prescribed, and who they can be prescribed for. There are few restrictions on NIPs prescribing in primary care and so NIPs are required to set their own professional boundaries and then work within them. Without these restrictions there may be the potential for NIPs working without formularies, to be influenced by local accepted practice.

1.5 Antimicrobial resistance

Antimicrobial resistance (AMR) develops when infection causing microorganisms such as bacteria, viruses and fungi, become resistant to the medications used to treat them. The concern that drives this study is bacterial infection and the development of resistance to antibiotics.
AMR is an increasing concern globally and is now described as one of the most serious threats to human health (WHO 2017). The misuse and overuse of antibiotic prescribing have contributed to increasing levels of antimicrobial resistance (Bryce et al 2016). The growth of AMR threatens the ability to treat common infections, adds risk to major surgery, and may result in longer stays in hospital (WHO 2017). For these reasons the prescribing, particularly the over-prescribing of antibiotics has received increased attention across the world, and the chief medical officer in England, has also expressed her concern regarding antimicrobial resistance, and the potential negative impact on personal and public health (Davies 2013).

The National Institute for Health and Care Excellence (NICE) and Public Health England (PHE), publish antibiotic guidelines, for the treatment of infections, to guide the prescriber on choice of antibiotic for the condition, dose and duration of treatment, and to combat AMR. Local antibiotic guidelines are generally based on the national guidelines, or other reputable sources, such as the Scottish Intercollegiate Guidelines Network (SIGN) guidelines. Local guidance is adapted to reflect patterns of resistance in the region where the guidance is developed.

1.6 Antibiotic prescribing in general practice

Approximately 72% of all antibiotics are prescribed in primary care (PHE 2019), and therefore safe and appropriate antibiotic prescribing is important for such a large number of people (Bhanbhro 2011). Prescribing of antibiotics in primary care differs from the prescribing of other medicines for two reasons. Firstly, patients are treated empirically, samples are not usually sent to the laboratory to identify the pathogen, and therefore the commonest likely pathogen is treated. Secondly, there are no other areas in of medicine where the prescribing of a drug for one patient, may not only adversely affect that patient, but have an impact on other patients, future patients and 'society at large' (Paul et al 2010 p 4860). There is much more autonomy in general practice and less diagnostic support compared to secondary care settings, and therefore symptoms may be influenced by subjective views and considerations (PHE 2015).

Excessive antibiotic prescribing is one of the main causes of antimicrobial resistance at the level of the individual and the population as a whole (Germeni et al 2018; Pouwels et al 2019). The use of broad-spectrum antibiotics destroys normal commensal flora, thereby making the patient more vulnerable to other infections such as methicillin-resistant staphylococcus aureus (MRSA) and clostridium difficile. In a systematic review and meta- analysis of the effects of antibiotic prescribing on microbial resistance in primary care, Costelloe et al (2010) found evidence for resistance to first line antibiotics prescribed for urinary and respiratory infections, for up to 12 months in individuals. Therefore, potentially paving the way for the increased use of second line antibiotics. The unnecessary issue of a prescription for antibiotics just adds to the problem of increased resistance. Amongst the many factors that affect the spread of antibiotic resistant bacteria is the quality of the prescribing decision, which also includes poor drug choice and inappropriate dosing and excessive treatment duration (Guillemot et al 1998; Ball et al 2002; DeRyke 2006 and Pouwels et al 2019).

A recent report from the English Surveillance Programme for antimicrobial Utilisation and Resistance (ESPAUR) Report (PHE 2019), states that initiatives have been somewhat successful in reducing overall number of antibiotics prescribed in general practice, together with a reduction in broad spectrum antibiotic prescribing. However, there is still a need for further improvement (PHE 2019). In the commentary, within the document, GP prescribing is discussed with no reference to any other prescribers working in general practice. NIPs have not been included or acknowledged in the discussions, yet these professionals are prescribing increasing amounts of antibiotics in general practice, possibly more so than GPs. NIPs are managing on the day presentations, which are predominantly minor illnesses, and therefore the potential to prescribe antibiotics is high (Courtney et al 2017; Ness 2016).

In 2019 the government produced an initiative titled: ‘Tackling antimicrobial resistance 2019-2024: the UKs five year national action plan’, once again, the identification of the role of NIPs as an important workforce, who are increasingly prescribing antibiotics, was neither addressed or acknowledged in the plan (Courtney et al 2019)

1.7 GP antibiotic prescribing

There is a wide range of levels of antibiotic prescribing throughout the UK. Wang et al (2009) reported a fivefold variance in antibiotic prescribing in a cross-sectional study of 8,057 general practices in England. There is a wide variability in prescribing for the most common infections, respiratory tract infections and urinary tract infections, as well as in high risk prescribing and safe prescribing between practices (Dolk et al 2018; Guthrie et al 2015; stocks et al 2015). Palin et al (2019) in their analysis of patient records in the UK from 2000 -2015 found that there was a large variation in prescribing antibiotics in general practice, and there was still significant prescribing of antibiotics for conditions that were likely to be viral. Many interventions have been implemented in an effort to improve this situation, but with little effect (Tonkin-Crine et al 2011).

1.7.1 Influences on GP prescribing

Grant (2010) in her ethnographic study on the influences on GPs prescribing of a range of medications in three GP practices in Scotland, found that antibiotics were the most requested medication by patients. These were the medicines that the GPs reported that they felt most pressure to prescribe, even if the decision was against their better judgement. In a mixed methods study of 1784 patients in the UK, on their expectations of antibiotics for respiratory tract infections McNulty et al (2013) reported that 26% of respondents asked for an antibiotic from the GP or NIP; and only 3.5% were refused antibiotics for this condition, which is usually of viral origin, and does not require treatment with antibiotics.

A perception that GP's feel that they are pressured by the patient to prescribe antibiotics is reported as a key influence throughout the literature over the last 25 years. (Macfarlane et al 1997; Cockburn et al 1997; Kumar et al 2003; Weiss et al 2004, van der Sande et al 2019). Although more recently the trend for patients demanding antibiotics is reported to be diminishing there still appears to be a perception amongst GPs that there is significant patient expectation of a prescription for antibiotics (van der Sande et al 2019). GPs report giving in to these demands and as a way of avoiding conflict, maintaining a good relationship with the patient and it makes them feels good to meet patient expectations (Comaroff 1976; Harris 1980; Kumar 2003; van der Sande 2019). When absolutely certain that there is no clinical indication to prescribe antibiotics, GPs found that making the decision not to prescribe is much easier. However, when there is some clinical uncertainty there is a fear of worsening symptoms, complaints and adverse events. The GPs found decision making in this uncertain context more difficult and they err on the side of

safety by prescribing antibiotics (Comaroff 1976; Kumar et al 2003; Simpson et al 2007; van der Sande et al 2019).

The length of the consultation time has also been highlighted as a non-clinical influence on GPs decision whether to prescribe antibiotics, as discussing the reasons for a no antibiotic prescribing decision was judged to be a longer process. Prescribing antibiotics is seen to be a quick fix by some to keep the up with the high number of patients presenting for treatment (Butler et al 1998; Kumar et al 2003; van der Sande et al 2019). Prescribing is also seen to save time as it signifies the end of the consultation in a ritualistic way that is recognised and accepted by the patient (Comaroff 1976; Avorn and Solomon 2000). Time in relation to resources is also a factor, when they are unable to bring the patient back for example at the weekend, GPs feel that it is safer to prescribe the antibiotic than not (van der Sande 2019)

PHE and the UK Department of Health (DH) published a report in February 2015 proposing interventions to mitigate antibiotic resistance. Within the document they identified key drivers to inappropriate prescribing by GPs in primary care. Using a theoretical domain framework setting out the evidence from the literature on influences on the prescribing of antibiotics in primary care, they proposed core target interventions to enhance the quality of GP prescribing. Within the document it is stated that the framework, and proposed interventions were also aimed at other non-medical prescribers. However, the authors did not review the literature on influences on non-medical prescribers and made the assumption that any influences would be similar to those experienced by GPs. The two key themes that emerged from the literature review within the report related to anxiety. Firstly, that if antibiotics were not prescribed, the patient's condition might worsen; secondly, that the patient would be unhappy if they were not prescribed antibiotics. We do not know if these are the key influences on NIPs' antibiotic prescribing. It is important that research on the quality of, and influences on, NIPs' antibiotic prescribing is undertaken so that if necessary, any interventions aimed at enhancing the quality of their prescribing are targeted appropriately.

1.8 The doctor nurse relationship

Diagnosis and prescribing medicine for patients have traditionally been seen as the cornerstone of the medical profession (Britten 2001). According to Abbott (1988) writing in the sociology literature, each profession has its jurisdiction which is supported by public, legal and political opinion. Autonomy is key to a professional jurisdiction; therefore Abbott (1998) proposed that nursing is a subordinate profession because it does not have power over its own jurisdiction and as a result lacks autonomy.

Now that nurses have prescriptive authority, and no longer rely on doctors to complete episodes of care, it might be argued that they do in fact have professional autonomy. This situation has led to a blurring of professional boundaries, as nurses take on the perceived medical skills of diagnosis and prescribing medicine (Kroezen et al 2014; Bowskill et al 2012). Schadewaldt et al (2016) proposed that despite this move towards a more medical role, medical dominance persists and that nurses, even those working at advanced practice level, engage in a medical dominant/ nurse submissive, relationship. Abbott (1998) suggests that the medical profession permits the delegation of routine work, that is deemed less important, and undertakes more specialist roles, in order to maintain this dominance. Prescribing could be seen as routine work and one that the medical profession is happy to relinquish. Nancarrow and Borthwick 2005) refer to this change in boundary as vertical substitution, where the scope of a profession is extended not necessarily with any increased financial reward or status. The authors describe that the extent to which this substitution happens is controlled by the more powerful discipline, in this case 'medicine'.

Holyoake (2011) argues that the "doctor/nurse game", as described by Stein (1967) in the USA, persists. That nurses are still handmaidens to doctors, and their behaviours when caring for patients, do not reflect the underlying tensions of the nurse possibly knowing more than the doctor in a given situation. They have to convey that knowledge without overtly doing so, in order to allow the doctor to maintain his hierarchal position. When revisited in 1990, Stein concluded that nurses no longer played the game, there were more female doctors and with the new advanced practitioner roles that nurses were undertaking, there was no requirement to continue with the game. However authors from the UK disagree, Holyoake (2011) argues that it was never the nurses game to give up, rather doctors to let go of what they valued less and since prescribing has become a routine activity supported by guidelines, they have redrawn their own boundaries and at least outwardly appear content with the situation, as it serves to enhance their dominance. Anderson (2017) in her study of the professional identity of advanced nurse practitioners in primary care in the UK, found the 'doctor/nurse game' still exists (in some cases overtly and in others subconsciously) despite the expansion of nurses' roles and the nursing profession,.

The hierarchical influence of medicine on junior staff is evident in the prescribing of antibiotics in secondary care. Charani et al (2013) undertook qualitative research to try to understand the determinants of antimicrobial prescribing in secondary care and carried out semi-structured interviews with 39 healthcare professionals (doctors, nurses and pharmacists) in four London hospitals. The prescribing within their study related to doctors only. An emerging theme from the data was the dominance of the senior medical practitioner over other health care professionals. The junior doctors prescribed as their senior colleagues dictated and were reluctant to challenge or change a prescription even when they knew that it was incorrect (Charani et al 2013). The

authors described the hierarchical influence on junior doctors as 'prescribing etiquette' where noncompliance with guidelines is readily accepted by other healthcare professionals and goes unchallenged. The senior practitioners within this study described patients as complex and not fitting neatly into guidelines, viewing the research as 'not appropriate' for their individual patient. Similarly, in their study with 40 GPs in Wales regarding responsible prescribing of antibiotics in primary care, Wood et al (2007) found that GPs reported that they prescribed antibiotics in the best interest of their patients. A they were aware of the problems with antibiotic resistance and the importance of evidenced based medicine, the GPs considered that their patients had much more complex needs than the participants included in clinical trials.

At the time of this research study NIP students were trained in their area of practice by a medical mentor who had the responsibility of signing the student off, as a safe and competent prescriber (NMC 2006; 2015) The student could pass all the theoretical aspects of the programme at the university, but without the medical mentor signing them off the nurses would not be able to qualify as a prescriber, and therefore would not have the qualification annotated on the NMC register. For NIP students in general practice, the mentor would most commonly be a GP from within the same practice. A concern that drove this study was the issue of GPs poor antibiotic prescribing behaviour within the inherent hierarchical structure of the medical profession. This could be extremely influential and in order for the student to be accepted within the hierarchical environment, similar poor prescribing behaviours would be adopted (Monrouxe 2010).

1.9 Chapter summary

This chapter has outlined the concerns about the increasing threat of AMR, and the link to high levels of antibiotic prescribing. The development of nurse independent prescribing has been outlined. The role of NIPs in general practice, and the complex relationship with the GPs as both mentors and employers, have both been discussed. GPs have been identified as requiring interventions to improve their antibiotic prescribing, so may not be the most appropriate professionals to support NIPs in this area of prescribing. It is important to know if the NIPs antibiotic prescribing is influenced by the dominance of the medical profession.

Nurse independent prescribers are an increasing workforce within general practice and are undertaking the role previously undertaken by GPs. NIPs are regularly prescribing antibiotics, potentially more often than GPs. The global risk of increasing antibiotic resistance is a real threat to public health, and NIPs are an increasing workforce in general practice. However, it would appear that NIPs have yet to be considered for inclusion in any government initiatives to combat the spread of AMR.

The aim of this study is to explore whether NIPs are prescribing antibiotics appropriately, and if they are not prescribing as recommended by antibiotic guidelines, to understand what and how other factors are influencing them.

1.9.1 The study overview

In chapter one, the rationale for undertaking the study provides background for the whole doctoral research. It also sets the scene of NIPs working in general practice settings, and the concerns that drove the study; in particular rising levels of AMR, high rates of antibiotic prescribing, the medical mentor and the doctor nurse relationship.

In Chapter two a literature review is undertaken to explore existing knowledge, and gaps in that knowledge, relative to the focus of this research study. Literature on the appropriateness of, and influences on, NIPs prescribing is critiqued and informs the methodological approaches taken in this study. The literature review is limited and highlights that this topic of concern an under-researched area.

Chapter three is divided into two parts. In part one the methodological stance is discussed, and the rational for case study explained and the methods considered. In part two, methods are described in detail including recruitment, data collection, data analysis and research governance,

In chapters four and five the findings from both Cases are presented. The story is told with rich, thick description, and findings on influences are presented in themes.

In chapter six, cross case synthesis is undertaken to compare and contrast findings from the cases, and key findings are highlighted.

In chapter seven, findings are discussed with reference to the known literature and theories, in order to explain findings from this study. Limitations and reflexivity are discussed, concluding with implications for practice and potential future research.

Chapter 2: Literature review

2.1 Introduction to chapter

Within this chapter, the research evidence is reviewed, in order to elicit what is known on the subject of, whether NIPs in general practice are prescribing antibiotics appropriately, and what influences their antibiotic prescribing. A brief scoping review identified that there was very little literature specific to this population in this setting and antibiotic prescribing. Therefore, the decision was made to carry out a systematic literature review, but without the inclusion of international studies, in order to explore the appropriateness of, and influences upon, NIPs prescribing of medication in either primary or secondary care settings in the UK. Cresswell (2009) states that there is a variety of ways to carry out a literature review but suggests that a systematic approach is always advisable. A framework for conducting mixed methods literature reviews was then chosen. Sandelowski et al (2006) describe three frameworks for conducting mixed methods literature reviews and synthesising the findings. The first framework is an integrated design, with the integration is achieved by transformation; turning qualitative findings into quantitative and *vice versa*. The second framework involves a contingent design, synthesising data using a cyclical approach, with each synthesis informing the next. The third framework is a segregated design, which was the model chosen to inform this review. This framework advises that papers are searched for, critically appraised and synthesised, and then configured; the findings will support each other, refute each other or add to each other. This approach aided the synthesis of the quantitative data on appropriateness, and the qualitative data on influences. The literature review will also identify any gaps in the knowledge and inform the methodology and research objectives outlined in chapter three (Munn et al 2018)

2.2 Search strategy

A comprehensive search strategy was undertaken. The Electronic databases listed below, were originally searched in July 2013, in February 2014 and July 2017 and finally during October 2019. The searching of 'grey' literature sources, and the hand searching of journals was also conducted during these time frames. Non-database searches were undertaken as described by Barroso et al (2003) such as looking at references in key articles and citation searching, finding other authors who have cites an article or book, and author searching.

A broad search using Delphi S was carried out to obtain an overview of the literature

Search Terms

Prescri* nurs*AND antibiotic OR antimicrobial

Prescri*nurs* AND influences

Prescri* nurs* AND appropriateness

Prescri* nurs* AND safety

Prescri* nurs* AND experience

Prescri* nurs* AND primary care

Combinations of these terms were searched using limiters and expanders with Boolean Logic. The search was repeated, in individual databases, Medline, CINAHL and Embase and Psych Info to ensure a thorough literature exploration was carried out.

Medical index subject headings (MESH terms) were also used.

Free text using the combinations above was used in Google scholar.

Table 2 Rationale for inclusion and exclusion

Rationale for Inclusion	**Rationale for Exclusion**
UK studies The general practice setting is unique to the UK. NIPs in the UK have different prescribing rights to nurse prescribers in other countries Unpublished PhD theses due to the paucity of published research studies	Non-UK studies; as the legal requirements, education and organizational conditions differ considerably throughout the world, and findings will not be comparable.
Research undertaken after nurse independent prescribing rights in 2006	Studies undertaken before 2006, when there were limitations to the prescribing formulary
Nurse independent prescribers as this group is the focus of the research and are the largest group of non-medical prescribers.	Doctor / Physician and other non-medical prescribers, as they are not the focus of this research
Independent prescribing, as this is type of prescribing is undertaken by most nurses and does not limit the drugs they can prescribe.	Studies focusing solely on supplementary prescribing, V100 and V150 prescribing as these prescribers have limitations on what they can prescribe

Table 3 Combinations of the search terms resulted in the following numbers of papers for review

Database	Nurs* Prescri* + Influences + primary care	Nurs* Prescri* + Anti*	Nurs* prescri* + Anti* + Primary care	Nurs* prescri*+ Appropriateness	Nurs* prescri*+ Appropriateness + anti*	Nurs* prescri* + safety	Nurs* prescri* + Experience	Total
DELPHIs	225	804	330	149	10	1376	1430	4324
Medline	114	160	53	35	4	328	280	984
CINAHL	100	150	43	22	3	297	240	855
EMBASE	90	185	40	20	2	440	418	1195
Psych INFO	0	0		6	0	0		108
TOTAL								7466

2.3 The review method

All records were screened using the inclusion exclusion criteria. The full text was read in 134 papers, as the type of prescriber and prescribing included in the papers was not always explicit in the abstract.

Assessment of the quality of the papers was conducted using a critical appraisal skills programme (CASP) tool, appropriate to the study design. Framework synthesis was undertaken as a method of integrating data from the qualitative research on influences to identify themes (Sandelowski et al 2006; Dixon-Woods 2011). Findings and emerging themes were set out on flip chart paper, and commonalities and differences between the studies identified, to aid the researcher. Data related to design, population, setting, findings and limitations were extracted from the studies and are presented in tabular form below.

A critique of the studies follows, on sample and setting, research design, data collection and analysis. The studies on influences are discussed under the themes identified within the studies reviewed and critiqued throughout.

See PRISMA diagram below for breakdown of material searched.

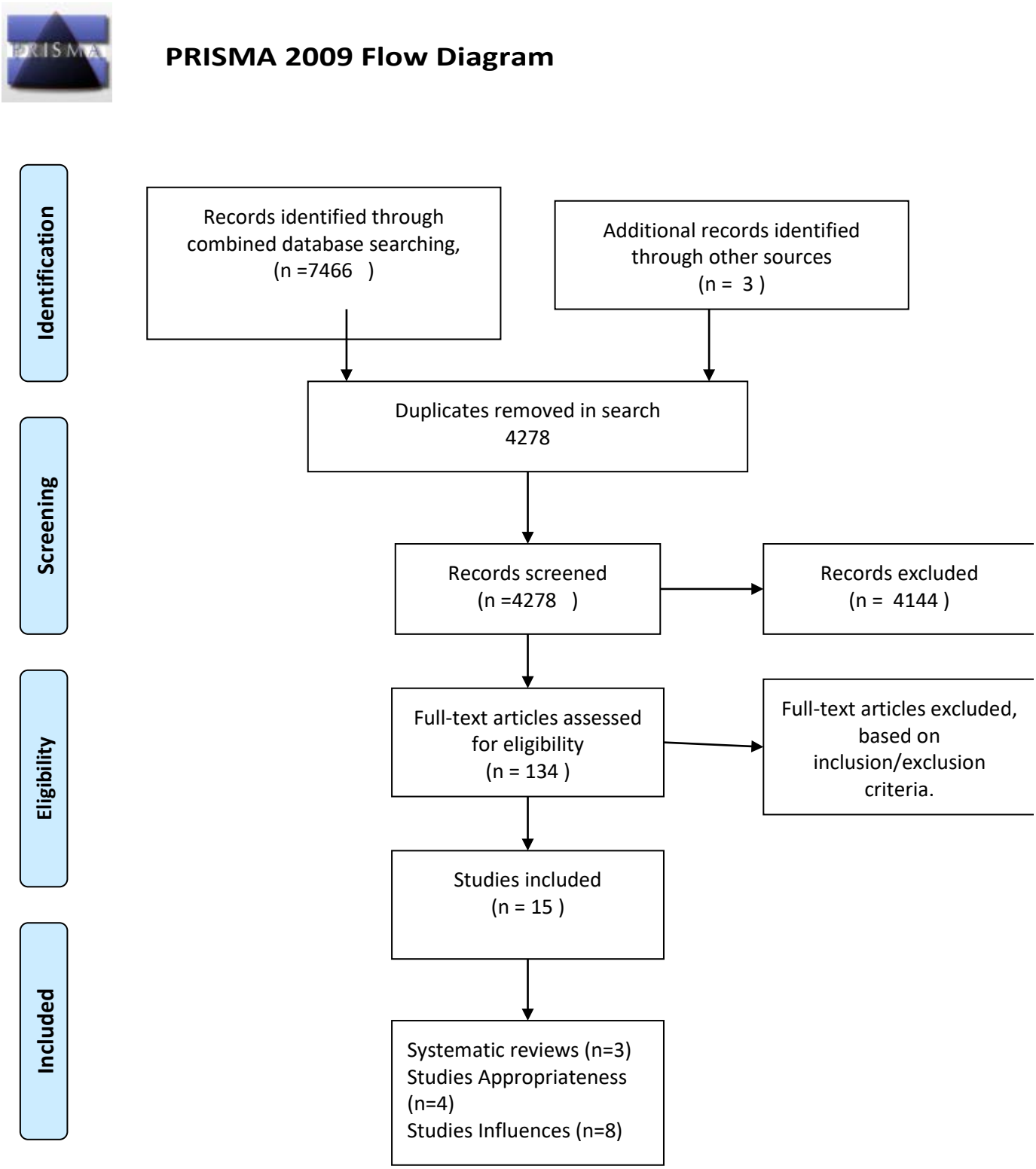


Figure 1 PRISMA diagram of search strategy

Literature was divided into two categories, one on appropriateness of NIP prescribing, and the other on influences on NIP prescribing. As stated above, due to the paucity of published literature addressing the research topics, unpublished PhD theses were also included.

2.4 The systematic reviews

Three systematic reviews (Ness et al 2016; McIntosh et al 2016; Djerbib 2018), have been undertaken on the influences on non-medical prescribers. Ness et al (2016) undertook a worldwide review of the literature on influences on NIPs antimicrobial prescribing, and found seven studies, including one from the UK which is presented in this literature review (Rowbotham et al 2012).

McIntosh et al (2016) reviewed UK literature only, and the review was not restricted to antibiotic prescribing, they found three studies, two of the studies are included in this review (Philp and Winfield 2010; Rowbotham et al 2012). The third study was excluded from this review, as it did not meet the inclusion criteria; the study reported on research carried out prior to 2006.

Djerbib (2018) undertook a systematic review of influences on NIPs prescribing decisions in primary care, from 1994 onwards. She reviewed 10 studies, three of which are included this review. The other seven are excluded as they did not meet the inclusion criteria: four were carried out before 2006, with the other three relating to experiences of taking on the prescribing role and role development, rather than actual influences on prescribing decisions.

The studies included in this literature review have been summarised in tabulated form, and are shown in table 4.

2.5 Research focused on the appropriateness of nurse independent prescribing

Table 4 Summary of papers

Author and title	Population	Setting	Study type/design	Key findings	Comments/ Limitations
Black A and Dawood M (2014) A comparison in independent nurse prescribing and patient group directions in the emergency department: A cross sectional review	Review of 382 clinical notes from prescribing episodes from 10 NIPs	Emergency Department	Retrospective data collection. Part of a larger study	NIPs prescribing was 99.7% appropriate	One reviewer only. Bias. Developed tool from local and national guidelines not validated. Not limited to antibiotic prescribing
Hart M (2013) Investigating the process of community matron prescribing	65 patient notes and 75 prescriptions from 13 community matron NIPs	Primary care, community	A mixed methods cross sectional retrospective study using MAI tool	88.95% prescribing appropriate	Range of conditions and medication prescribed not identified.
Latter et al (2012) Are nurse and pharmacist independent prescribers making clinically appropriate prescribing decisions? An analysis of consultations	100 audio recorded consultations from 5 NIPs and 4 pharmacist prescribers	Primary and secondary care two NIPs in general practice settings	Modified MAI tool used to evaluate consultations where medication was prescribed	Prescribing reported to be mostly safe and appropriate.	Self-selected sample. Awareness of being audio recorded. Included but not limited to antibiotic prescribing
Ness et al (2015) Growth in nurse prescribing of antibiotics: the Scottish experience 2007–13	All prescriptions for antibiotics prescribed by NIPs over a six-year period	Primary care 14 NHS boards Scotland	Retrospective analysis of national prescribing dataset against Scottish antimicrobial prescribing recommendations and SIGN guidelines	NIPs prescribing an increasing number of antibiotics over this period, but greater adherence to guidelines and lower prescribing of high-risk antibiotics (broad.	Although indicators are that prescribing is in line with guidelines, lack of information on the conditions where antibiotics prescribed means that it is difficult to say that it is appropriate. Limited to one geographical area.

Author and title	Population	Setting	Study type/design	Key findings	Comments/ limitations
				spectrum). NIPs prescribing more antibiotics than other prescribers in primary care	

2.5.1 Sample and setting

Two of the studies were in primary care (Hart 2013, Ness 2015), one in both primary and secondary care (Latter et al 2012) and one in secondary care only (Black and Dawood 2014). All included NIPs, community matrons in Hart (2013), advanced nurse practitioners (Latter et al 2012; Black and Dawood 2014 and Ness 2015) Latter et al (2012) also included pharmacists

2.5.2 Design

Three studies had a quantitative design (Latter et al 2012, Black and Dawood 2014, and Ness 2015) Hart's (2013) study used mixed methods, however only the quantitative aspect of the study is relevant to this review.

Two of the studies evaluated the appropriateness of nurse prescribing, using the validated MAI tool, and found prescribing to be mostly safe and appropriate (Latter et al 2012; and Hart 2013). All papers included prescribing medications for a range of conditions and were not limited to antibiotic prescribing.

2.5.3 The studies

The 2012 study by Latter et al included five NIPs, with two of the participants working in general practice. The study sites were not limited to general practice, pharmacists are also included. The data presented were not profession or site specific. The study was not limited to antibiotic prescribing but included antibiotics; the number of consultations related to antibiotic prescribing is not reported, so it is difficult to establish the appropriateness of antibiotic prescribing by NIPs in general practice.

The MAI tool (Hanlon 1992) was used to evaluate the NIP and pharmacists prescribing from audio- recorded consultations. The tool evaluated the appropriateness of the medication, i.e. that

it was suitable to prescribe for a specific condition, but not whether it was the first line recommendation, or that guidelines were adhered to. An antibiotic, such as Ciprofloxacin, would resolve a lower urinary tract infection, so could be deemed appropriate. However, it is a broad-spectrum antibiotic, which would also damage commensal flora, and is not recommended first treatment, Ciprofloxacin would be deemed inappropriate to prescribe in this way according to PHE guidance. There were a number of highly qualified raters (ten medical, seven pharmacist and three nurse prescribers) using the tool. However, it is not clear how the raters were measuring appropriateness, whether it was against their own experience/knowledge or guidelines, so findings may not be objective or accurate. The consultations were audio recorded which may have changed the participants behaviour; perhaps the "Hawthorne effect" came into play (Merrett 2006). Participants had responded in a national survey in the first phase of the study, in which they had indicated that they were interested in taking part, so may not be representative of the NIP prescribing population as a whole, resulting in self-selection bias (Lavrakas 2008). Cost was the issue that resulted in the most inappropriate ratings; however, cost is not an issue for antibiotic prescribing, as they are relatively inexpensive drugs. There were also some qualitative comments from the raters, regarding the quality of history taking, assessment and diagnosis, which were seen to be lacking in some consultations. However, it is unclear which practitioners this applied to and may not have been the NIPs in general practice, as primary care settings included walk-in centres and the OOH service.

Black and Dawood (2014) compared NIPs (called advanced nurse practitioners in this study) prescribing for a range of conditions in the emergency department, and nurse practitioners (who are non-prescribers) administering medication using patient group directions (PGDs). Only the findings from the NIPs are reported here. The researcher reviewed randomly selected case notes from 10 NIPs, and the 274 drugs they prescribed over a six-month period, 67 of which were antibiotics. The researcher concluded that prescribing was 99.7% appropriate in the cases reviewed. One researcher used guidelines and local policy to assess the appropriateness of prescribing, rather than a validated tool, and there was no inter-rater reliability reported.

Hart (2013) investigated 13 community matrons' prescribing performance, the matrons were all nurse independent prescribers. Over the period of one month, all matrons in the trust had a sample of 5 case notes randomly sampled for review. Hart used the validated MAI tool and reviewed 65 patients' notes where 75 prescriptions had been generated. She found that prescribing was 88.95% appropriate. The researcher and a pharmacist scored all consultations independently and there was some disagreement in their scoring; the pharmacist scored 71 of 75 appropriate and the researcher 74 out of 75. Hart explained that lack of familiarity with the tool had been demonstrated to cause this effect (Bregnhoj et al 2005). The pharmacist was not

familiar with the system and was using written instructions to guide him, rather than having an in-depth knowledge of the tool. The scores of each rater were combined by taking the mean of each score of each domain.

The range of drugs prescribed by the matrons in the study was not identified, but some antibiotics were included, as there was a discussion between the raters in the data analysis section about whether a dose was inappropriate as it was prescribed at a higher dose than indicated in the guidelines. The drug was an antibiotic and was deemed appropriate because a microbiologist's advice was sought, and this was documented in the notes. The amount of antibiotic prescribing included in the study is unclear and could be minimal. Therefore, assessing the appropriateness of antibiotic prescribing in this study is problematic. It might be possible to assume that if the rest of the prescribing was mostly appropriate, the antibiotic prescribing would also be. However, there is only one example of antibiotic prescribing cited in the report.

Ness et al (2015) carried out a retrospective analysis of antibiotic prescribing in Scotland by NIPs in primary care settings which, included but was not limited to general practice. The authors findings were that although the rate of antibiotic prescribing had increased over this period, 92.7% of antibiotics prescribed were first line, in accordance with national guidelines. This study analysed the prescription only, not the condition for which it was prescribed, and therefore the issue of appropriateness cannot be judged. However, adherence to guidelines is a positive finding for NIPs.

Although the main finding from the studies cited above is that NIP prescribing is mostly appropriate, the studies were are not limited to antibiotic prescribing or NIPs in a general practice setting and have a range of limitations. The limitations include, small sample size (Hart 2013 and Black and Dawood 2014), lack of detail on medications included (Hart 2013) and the number of antibiotics included (Latter et al 2012 and Hart 2013). There is also the possibility of self-selection bias and the Hawthorn effect being present in Latter et al (2012).

2.5.4 Summary

The overall evidence base for the appropriateness of NIPs prescribing is small, and the appropriateness of NIPs antibiotic prescribing in general practice is even smaller and difficult to elicit from some of the studies. The studies included in this review would appear to suggest that prescribing is on the whole appropriate. However, not all studies were explicit in stating how appropriateness was measured, and only two used a validated measuring tool. Context is not explored in any of the studies as having an influence on appropriate antibiotic prescribing or supporting good prescribing.

Therefore, this present research will focus on the appropriateness of NIPs antibiotic prescribing in general practice using a validated measuring tool and will explore whether context has an influence on the appropriateness of NIPs antibiotic prescribing. Retrospective case note analysis overcomes the 'Hawthorne effect' and utilising a validated measuring tool adds to the validity of the findings.

2.6 Research focused on the influences on nurse independent prescribing

Table 5 Summary of papers

Author	Population	Setting	Study type/Design	Key Findings	Comments /Limitations
Courtney et al (2019) Examining influences on antibiotic prescribing by nurse and pharmacist prescribers: a qualitative study using the Theoretical Domains Framework and COM-B	17 NIPs and four pharmacist prescribers	Primary care 13 NIPs in general practice	Qualitative design. Semi-structured interviews	Guidelines Awareness of role in AMR Worried about patient re consulting and getting antibiotics Awareness of own antibiotic prescribing rates Wanting to be the lowest antibiotic prescriber MMT teams identify high antibiotic prescribers Time of day, week, tiredness, stress. Those with extra time 15 mins, instead of 10 mins valued that time to educate patients	Small sample although state reached saturation Focused on antibiotic prescribing for RTIs only
Horwood et al (2016) Primary care clinician antibiotic prescribing decisions in consultations	22GPs and six NIPs	Primary care 6 GP practices and one walk in centre	Qualitative Semi structured interviews	Clinical symptoms Diagnostic uncertainty Experience Knowing the family; Repeat presentation Worry will not re- present if worsening symptoms Time	More GPs in the study than nurses. Most quotes used to underpin themes are from GPs.

Author	Population	Setting	Study type/Design	Key Findings	Comments /Limitations
for children with RTIs				related to clinic time and time of day/week Delayed prescribing used when pressured Less pressure from patients than before	
Maddox (2011) PhD thesis Influences on Non-Medical Prescribing: Nurse and Pharmacist Prescribers in Primary and Community care	Study 1: 14 NIPs and four pharmacist prescribers Study 2: 25 NIPS and five pharmacist prescribers Study 3: 34 NIPs and 22 pharmacists	Primary care Study 1: 2 NIPs in general practice Study 2: 8 NIPs in general practice Study 3: 13 NIPs in general practice.	Mixed methods Study 1: In-depth Interviews Study 2: Semi-structured interviews and focus groups Study 3: Q-method survey and cognitive interviews	Guidelines Clinical influences Fear of litigation Established practice, prescribing culture Reject influences of time and patient pressure	Self-reported data Not limited to antibiotic prescribing
McIntosh (2017) PhD thesis Social and cognitive influences on prescribing decisions among non-medical prescribers.	Nine pharmacist prescribers and five NIPs	Primary and secondary care All five NIPs in primary care setting	Qualitative Phenomenology using the theoretical domains framework Semi structured interviews and participant reflections	Knowledge of drug Experience, bad and good Knowing the patient Guidelines Consequences for the patient, worsening. Some happy to prescribe outside guidelines Doctors support in diagnosis and complexities Sought advice of experts Patient pressure Day of week (Friday) Empathy with end of life care patient	Small sample size Not limited to antibiotic prescribing Unpublished thesis, not peer reviewed

Author and title	Population	Setting	Study type/Design	Key Findings	Comments /Limitations
				Awareness of role in AMR	
Ness (2018) PhD thesis Factors associated with nurse prescribers' antibiotic prescribing practice: an exploratory study using the Reasoned Action approach	Phase 2: 27 NIPs interviewed Phase 3: 184 NIPs completed survey	Primary and secondary care Phase 2: 19 from a variety of primary care settings Phase 3: 113 survey respondents	Mixed methods Phase 2: Telephone interviews Phase 3: survey	Experience Patient pressure Social influence from other NMPs	Intention to treat RTI s only Unpublished thesis, not peer reviewed
Philp and Winfield (2010) Why prescribe antibiotics for otitis media in children?	Eight NIPs	General practice and OOHs settings	Qualitative semi-structured interviews	Other factors more influential than guidelines Parental anxiety Clinical influences	Limited to prescribing for children with otitis media. Small sample Self-reported data
Rowbotham et al (2012) Challenges to nurse prescribers of a no antibiotic prescribing strategy for managing self-limiting respiratory tract infections	34 NIPs, one physiotherapist and one pharmacist	Primary care 10 participants worked in general practice	Qualitative Semi-structured interviews and focus groups	Patient pressure Diagnostic uncertainty	Not limited to NIPs in general practice. Focus on usefulness of delayed prescribing but some interesting comments about antibiotic prescribing
Williams et al (2018) General practitioner and nurse prescriber experiences of prescribing	15 NIPs and 15 GPs	OOHs	Qualitative semi structured interviews	Patient pressure Time pressure although in some organisations the NIPs had longer appointment times than GPs	Small sample size. OOHs setting

Author and title	Population	setting	Study type/design	Key findings	Comments/ limitations
antibiotics for respiratory tract infections in UK primary care out of hours services				Concerns about follow up Parental anxiety Accountability	

2.6.1 Sample and setting

None of the studies was carried out exclusively in general practice, although all included participants who worked in general practice, as well as the research areas in the studies. One study was undertaken in general practice and out-of-hours settings (Philp and Winfield 2010). Similarly, Williams et al (2018), although primarily exploring the prescribing of antibiotics in the OOHs setting, included practitioners who also worked in general practice. The study by Horwood et al (2016) was undertaken in two primary care settings, six GP practices and one walk-in centre. The Rowbotham et al (2012) study was also in primary care settings and included GP practices, walk-in centres, out-of- hours and chronic illness services. Maddox's (2011) study was undertaken in primary and community care settings.

Two of the studies included NIPs in primary and secondary care (McIntosh 2017 and Ness 2018), and six studies included other non-nurse prescribers, Pharmacists (Courtney et al 2019; Maddox 2011; McIntosh 2017 and Rowbotham et al 2012), a physiotherapist (Rowbotham et al 2012) and GPs (Horwood et al 2016 and Williams et al 2018). Only two studies included NIPs exclusively (Ness 2018 and Philp and Winfield 2010).

In this review, five of the eight studies had a small sample size (Courtney at al 2019; Horwood et al 2016; McIntosh 2017; Philp and Winfield 2010; Williams et al 2018). This is not always significant in qualitative studies, especially where data saturation is reached and reported as in (Courtney et al 2019)

There are no studies exclusively in general practice settings, and report findings may not accurately reflect the influences on NIPs antibiotic prescribing in general practice settings. All but two of the eight studies included other prescribers, both medical and non-medical. It is therefore appropriate to suggest that the findings presented in all eight studies may not necessarily represent the NIPs views.

2.6.2 Design

Six of the eight studies were qualitative in design (Courtney et al 2019; Horwood et al 2016; McIntosh 2017; Philp and Winfield 2010; Rowbotham et al 2012; Williams et al 2018); the other two adopted a mixed methods model (Maddox 2011; Ness 2018). Semi-structured interviews were the most common information gathering method used in the six qualitative studies (Courtney et al 2019; Horwood et al 2016; McIntosh 2017; Philp and Winfield 2010; Rowbotham et al 2012 and Williams et al 2018); in addition focus groups were employed in two of the six (Maddox 2011; Rowbotham et al 2012). Surveys were the quantitative method used for data gathering in the two mixed method studies (Maddox 2011; Ness 2018).

All the studies have limitations due to the use of self-reported data (Cresswell 2009). Interviews and focus groups provide subjective data that may not be a reliable account of prescribing behaviour. Also, it is realistic to suggest that respondents will share an unwillingness to disclose anything that might put their registration at risk or that exposing poor patterns of prescribing may influence what participants report (Holloway and Wheeler 2010).

2.6.3 The studies

Five of the eight studies addressed only one issue: the prescribing of antibiotics to manage respiratory tract infections (Courtney et al 2019; Horwood et al 2016; Ness 2018; Rowbotham et al 2012; Williams et al 2018). One study explored antibiotic prescribing for otitis media only (Philp and Winfield 2010). Two addressed prescribing for a range of conditions and included antibiotics but lacked details on the numbers prescribed and conditions treated (Maddox 2011; McIntosh 2017). There is a dearth of studies that include or focus on NIPs antibiotic prescribing for a broad range of infections.

Two of the studies used a theoretical framework; Courtney et al (2019) used a theoretical domains framework and COM-B, and McIntosh (2017) employed a theoretical domains framework of behavioural determinants. Ness (2018) undertook a 'reasoned action' approach, proposing that intention predicts behaviour. Two of the studies (McIntosh 2017; Ness 2018) included self-reported data on participants' intentions to prescribe antibiotics, as well as their perceived influences, based on the fourteen domains of TDF. The application of theory to confine findings in pre-existing discreet boxes, in order to list them rather than understand them, is at odds with an interpretivist approach which suggests that meanings will vary and be context dependent (Gray 2018; Cresswell and Cresswell 2018). This approach imposed restrictions on the exploration of the participants' real world experiences by imposing meaning on them, rather than aiming to make sense of others' worlds.

In the six studies where NIPs were not the only participants (Courtney et al 2019; Maddox 2011; McIntosh 2017; Rowbotham et al 2012; Horwood et al 2016; Williams et al 2018), findings were reported in themes; therefore it was not always clear which influence or influences were reported by the NIPs. Where possible the findings reported are underpinned by quotes in the studies which identify the participant and those identified as NIPs are discussed. However, this was not possible where quotes were referenced as coming from a focus group.

2.6.4 Summary

The findings from all studies were from self-reported data and from a range of prescribers. Antibiotics were not the only medication prescribed in some of the studies; also, findings were reported in themes that may relate to the influences on prescribing other medications.

A summary of the main influences is presented below, in themes as the studies reported them. Comments on the quality of the papers are included.

2.7 Clinical influences

Clinical factors were reported by participants, in four studies, to be the most significant influence. Participants described symptoms such as fever, being systemically unwell, colour of sputum, duration of illness and with regards to children, looking unwell. (Maddox 2011; Philp and Winfield 2010; Horwood et al 2016; Williams et al 2018) Additionally participants in the OOHs setting reported that their patients were more unwell than those seen in normal hours (Williams et al 2018). One study explored intention to prescribe antibiotics and a question regarding the possible influence of clinical factors was not put to the participants (Ness 2018)

In three of the studies, antibiotics were prescribed in cases of diagnostic uncertainty, or in order to manage risk in frail patients and children (Rowbotham et al 2012; Horwood et al 2016; Courtney et al 2019). While some bacterial infections are visible and there are key features, such as pain, inflammation, discharge and fever to guide the practitioner, there are others such as respiratory tract infections that are more difficult to diagnose. In such situations it is very difficult to identify a bacterial cause from a viral cause. While practitioners know how to prescribe, or not, in well patients, as well as for those at the other extreme who were very unwell, it was the patients in between the two poles that were the most difficult to manage (Horwood et al 2016). However, in all studies it was evident that there were other non-clinical issues influencing antibiotic prescribing. These are discussed in themes below.

2.8 Non-Clinical Influences

2.8.1 Time pressure of day/week

In all studies time of the day and day of the week were influences (Horwood et al 2016; Philp and Winfield 2010; Maddox 2011; Rowbotham et al 2012 and Williams et al 2018; Courtney et al 2019; McIntosh 2017; Ness 2017). Friday afternoons, or when there was a bank holiday weekend, as well as a perceived lack of easy access for patients to out- of- hours care, were all issues reported to be of concern. NIPs reported that these were the times when they were most likely to prescribe antibiotics against their better judgement. Even participants working in the OOHs setting raised this time issue. The process involved to access another appointment, and concerns about medical cover the following day, influenced their decisions to prescribe (Williams et al 2018). Tiredness and stress on a weekday were also reported in one study (Courtney et al 2019). Where participants were able to provide longer consultation times than were offered from the GPs, they were very grateful. They described how it gave them more time to negotiate with and educate the patients, particularly regarding their 'no antibiotic prescribing' decision (Courtney et al 2019; Williams et al 2018). Time, and lack of it, had a negative influence on the NIPs prescribing and was an effect reported in all studies.

2.8.2 Patient pressure/expectations

In three of the eight studies where participants encountered patient pressure to prescribe, it was reported that this was most often related to antibiotic prescribing (Philp and Winfield 2010; Maddox 2011; Rowbotham et al 2012). NIPs in the studies discussed strategies to manage this pressure, such as educating the patient, using guidelines to support their decision, asking peers to come and see the patient to reinforce the decision not to prescribe, and using delayed antibiotic prescribing. However, in Williams et al (2018) participants reported not using delayed prescribing, not knowing the patient and having no access to follow them up was a barrier to issuing a delayed prescription. Experience and increasing confidence in their role helped NIPs to effectively manage parent pressure to prescribe antibiotics for their children (Philp and Winfield 2010).

Horwood et al (2016) and Williams et al (2018) found that some clinicians reported that they encountered less pressure to prescribe antibiotics than previous studies have suggested. However, two later studies reported patient pressure as a key influence and an influence on inappropriate antibiotic prescribing (Ness 2018; Courtney et al 2019). Maddox (2011), reported that NIPs did not succumb to such pressure and were comfortable to leave the patient dissatisfied with the outcome of the consultation. In the Maddox (2011) study NIPs were prescribing

medication for a range of conditions and it is not clear whether this relates to antibiotic prescribing. She describes how “the minority” who on a few occasions had succumbed to pressure, were uncomfortable, felt unhappy, and regretted their decision to prescribe antibiotics. What she meant by “most” or “minority” is not reported numerically.

Patient pressure to prescribe medication was an issue, to varying degrees, in all of the studies. Antibiotics were identified as the medication at which this pressure was most directed. Participants utilised a range of strategies to manage the pressure, such as issuing a delayed prescription. Experience was reported as being an inhibiting influence for not prescribing antibiotics in these circumstances. However, participants succumbed to patient pressure in some instances and prescribed antibiotics when it was inappropriate. However, when such an event occurred, they reported feelings of remorse.

2.8.3 Knowing the patient

In three of the studies in primary care, knowing the patient and the family dynamics was helpful to clinicians in deciding whether to prescribe antibiotics or not (Horwood et al 2016; Philp and Winfield 2010; McIntosh 2017). When working in out-of-hours clinics, where they did not know the patient, participants in two of the three studies reported that they were likely to prescribe antibiotics rather than decline (Horwood et al 2016; Philp and Winfield 2010). The research by William et al (2018) was carried out in the OOHs setting with the participants reporting contradictory views. Either they felt knowing the patient was beneficial in making the decision whether to prescribe or not, or they felt it made absolutely no difference to their decision making.

In the two studies (Horwood et al 2016; Philp and Winfield 2010), where clinicians reported that when they knew the patients were experiencing adverse social factors, such as low socio economic status, they would prescribe an antibiotic, even when they knew that the infection was likely to be viral in origin. Clinicians reported that they were worried that the patient may not re-present if their symptoms worsened. Conversely, in other situations where the family was known to them, clinicians felt able to ‘wait and see’; when, for example they knew the parent was sensible, and capable of looking after a sick child (Horrocks et al 2016; Phil and Winfield 2010)

Knowledge of the patients had both positive and negative influence on NIPs antibiotic prescribing. When NIPs knew the patient, they were able to assess how well the patient could cope with the illness, and whether they had the knowledge and resources available to return if their condition deteriorated. When NIPs knew the patients had poor social support, this knowledge had a negative influence; as a result the NIPs would prescribe antibiotics, albeit inappropriately. Not

knowing the patient at all also had a negative influence, creating a situation when the NIPs were also likely to prescribe antibiotics inappropriately.

2.8.4 Guidelines

In five studies, guidelines were considered to be an excellent resource and had a positive influence on prescribing behaviour (Philp and Winfield 2010; Maddox 2011; Rowbotham et al 2012; Courtney et al 2019; McIntosh 2017). Participants reported that on the whole, they adhered to antibiotic guidelines and described themselves as cautious prescribers. Although guidelines influenced prescribing, NIPs were able to describe external influences that would override evidenced-based decisions on whether to prescribe antibiotics or not.

Parental anxiety and knowledge of the patient were sometimes viewed as more important than guidelines (Philp and Winfield 2010; Williams et al 2018). One of the eight NIPs reported that the parents' inherent knowledge of the child and their anxiety about the child, even when the child did not appear unwell, carried greater weight than the influence of the guidelines. Although this is a small sample, and, this influence was reported by only one of the eight participants, it is significant as a possible example of inappropriate antibiotic prescribing.

Previous treatment failure was also discussed in Maddox (2011). When patients reported that the usual first line treatment did not work for them, for example in a patient with a urinary tract infection, an alternative antibiotic was prescribed. Prescribers felt comfortable with these decisions because they were able to justify them.

There was some uncertainty about the quality of the evidence within the guidelines, but what they mean by "quality" was not explored (Maddox 2011) Conversely, in Philp and Winfield (2010) NIPs described the guideline for treating otitis media as a "rigorous" and "accessible" source of information.

In one of the studies guidelines were seen by some to be too restrictive (Rowbotham et al 2012); however, there was no exploration of this view, or how that perception affected antibiotic prescribing.

On the whole it would appear that guidelines supported the NIPs in their antibiotic prescribing. They were viewed a good resource. Only one participant in all the studies reported prescribing outside the guidelines for a non- clinical reason; parent pressure.

2.8.5 Peers

In two of the studies, other non-medical prescribers in the team were viewed to be a convenient source of advice and information when they were available. Equally, peer support from other NIPs when participants were making important or difficult decisions, was also valued. NIPs in both studies were not explicitly asked, and they did not volunteer information on, whether their antibiotic prescribing was influenced by their peers (Maddox 2011; Rowbotham et al 2012). However, in two studies NIPs described being influenced by; other non- medical prescribers (NMPs) prescribing culture, an awareness of the NIPs own antibiotic prescribing rates and a desire to be the lowest antibiotic prescriber (Courtney et al 2019; Ness 2018). Peers were seen as supportive and valuable, in areas where there was more than one NIP. In relation to antibiotic prescribing, there was a desire to be seen to be prescribing appropriately and peers good prescribing influenced NIPs to follow that lead.

2.8.6 GPs

In two of the studies (Maddox 2011; Rowbotham et al 2012) the relationship with GP colleagues was described as 'complex'. NIPs valued their support and considered them to be a valuable source of information, and a good resource in diagnostic decision making (Maddox 2011; Rowbotham et al 2012; McIntosh 2017). Sometimes NIPs asked the GP to come into the consultation room to support them, when they perceived that the patient did not trust their judgement. In these cases, they were very clear, that they chose the GP who they knew would not prescribe antibiotics. Such an understanding suggests that there was a recognised difference in the quality of the prescribing between GPs in the same practice setting (Maddox 2011)

NIPs also reported that they were keen to dissociate themselves from the prescribing behaviour of GPs who they considered to be 'poor', especially regarding antibiotic prescribing. Participants also reported frustration with GP prescribing, describing situations when they had not treated a condition with antibiotics, and the GP then prescribed an antibiotic for the patient. (Rowbotham et al 2012; Williams et al 2018; Ness 2018)

NIPS are in a somewhat fortunate position, in that they have the ability to refer the patient on to the GP, they do not have to make the final decision about treatment. The NIPs described using this referral option when they considered that the patient's demands for a prescription for antibiotics were inappropriate, and they did not want to prescribe outside the guidelines (Maddox 2011).

Maddox (2011) inferred that some NIPs were influenced by GP's prescribing, because they checked the patients' notes after they had been referred to the GP for treatment. However, this was not explored with the NIPs and there was no evidence presented in the study that they would go on to actually prescribe similarly.

2.8.7 Accountability

NIPs described themselves as cautious prescribers; they self- restricted their prescribing in general and prescribed within their scope of competence. Fear of litigation, or of losing their job, were important influences, as they felt that their prescribing was under more scrutiny than GPs' prescribing performance. This concern was used to justify their prescribe antibiotics inappropriately (Maddox 2011; Rowbotham 2012 and Williams et al 2018).

Participants reported that they were conscious of the difference between their training and knowledge and that of the GP and were worried about making mistakes (Maddox 2011; Rowbotham et al 2012). Some NIPs reported that more complex patients should be seen by the GP, that they did not have the experience or expertise to manage complex conditions. (McIntosh 2017; Williams et al 2018). Examples of the type of condition that they refer to as complex were not given, and the GPs in Horwood et al (2016) reinforced that view stating the NIPs were more comfortable working with guidelines and protocols and that as GPs they were more able to see the variables of the presentation and manage the consultation.

NIPs worked within their scope of competence and self-regulated their prescribing. There is no evidence that their prescribing would be under more scrutiny than the GPs but the fear of this possibility encouraged them to prescribe within guidelines and refer more complex cases to the GP.

2.8.8 Awareness of Antimicrobial Resistance (AMR)

In four studies (Maddox 2011; Philp and Winfield 2010; Courtney et al 2019 and McIntosh 2017) participants reported a responsibility to limit prescribing of antibiotics, due to the increasing problem of AMR.

NIPs stated that they were aware of the problem but felt that it had no influence on their prescribing, as none of them had experienced AMR in their everyday practice. Knowledge of AMR was not explored in any of the studies.

2.9 Chapter summary

Within this chapter a systematic approach to searching the literature on prescription appropriateness and influences on NIPs prescribing has been outlined. Findings from the limited literature indicate that NIPs are prescribing appropriately and are informed by guidelines for the most part. However, qualitative data indicate that there are influences that challenge what may be perceived as best prescribing practice, and NIPs report having a range of issues influencing their prescribing. This present literature review identified that there are a number of complex and somewhat conflicting influences on NIPs prescribing.

The NIPs described themselves as cautious prescribers who, overall, adhere to guidelines; however, they were also willing and able to give examples of when they did not do so. As expected, clinical influences were the most frequently reported, but other influences were considered in order for the NIP to make a judgement on whether to prescribe antibiotics. Parental anxiety, patient pressure, day of the week and guidelines were reported to be significant influences. Some respondents found guidelines rigorous and robust, others found them too restrictive. Peer pressure to be a low antibiotic prescriber was highlighted in some of the later studies; a circumstance that appears to have developed with the medical world's increasing awareness of AMR.

NIPs reported having a complex relationship with the GP. They rely on the GP for mentorship and support, but at the same time describe some of their GP's prescribing as 'poor'. The NIPs also recognised variations in the standards of the GPs' prescribing behaviour. None of the studies explored the potential influence of a GP on the NIP'S antibiotic prescribing. All of these influences will be explored further in this study.

It is evident from the review of the literature that the influences on antibiotic prescribing of NIP's in general practice settings is an issue that has not been fully explored. None of the studies was exclusively focused on NIPs working in general practice, or on antibiotic prescribing for a range of conditions. There are suggestions from other areas of clinical practice about what may influence antibiotic prescribing; however, general practice is an area which requires further inquiry, with a focus on antibiotic prescribing in particular.

Two of the three systematic reviews recommend further research in this area, highlighting a need to include more than self -reported data. Additional research methods, such as observation, could serve to enhance data gathering in this under-researched field. (McIntosh et al 2016; Ness et al 2016). Research is necessary to explore what is happening in relation to NIPs antibiotic prescribing

in general practice; investigating: a) whether NIPs are prescribing appropriately, b) whether context is an influence, and c) what influences NIPs prescribing in relation to antibiotics.

The purpose of this literature review has been to synthesise what is known about NIPs antibiotic prescribing in general practice and to identify any gaps in the literature. Within the literature review the methodology and methods undertaken were critiqued in order to inform decisions on the best approach to undertake in this study. All the selected studies' findings were from both qualitative and quantitative self-reported data involving; interviews, focus groups, questionnaires, and surveys. Observation of NIPs' prescribing behaviour *in situ* did not take place.

From lack of evidence above it is reasonable to suggest that the NIPs' work is a seriously under-researched area, where context is key to understanding what is happening and why; the topic requires in depth study. It is therefore important to address the gaps in the literature on NIPs antibiotic prescribing in general practice, as well as try to understand the potential influence of the context in which the NIPs prescribe antibiotics.

2.10 Research Question

In order to develop and direct this study it was important to identify a research aim. After careful consideration of the literature, and drawing on experience, the question that underpin this work is:

How clinically appropriate is and what are the influences on antibiotic prescribing by NIPs working in general practice settings?

Sub-questions;

1. Are NIPs in general practice prescribing antibiotics appropriately?
2. What factors do NIPs in general practice settings perceive as influencing their prescribing?
3. How, if at all, does the context in which NIPs prescribe influence them?
4. How, if at all, does the GP/ NIP relationship influence the NIPs prescribing?

Chapter 3: Methodology and methods

3.1 Introduction

This chapter is divided into two parts. In the first part the aims of the research study and questions are outlined, and the rationale for methodological approaches and methods are discussed. In the second part, a mixed methods approach, involving both qualitative and quantitative methods, using a case study framework is discussed. Data collection for each stage of this one large research study, are discussed in detail.

3.2 Research aims and question

This research study was undertaken in order to explore the appropriateness of and influences on prescribing by nurse independent prescribers in the real-world context of general practice.

This is the research question is,

How clinically appropriate is and what are the influences on antibiotic prescribing by NIPs working in general practice settings?

Sub questions;

5. Are NIPs in general practice prescribing antibiotics appropriately?
6. What factors do NIPs in general practice settings perceive as influencing their prescribing?
7. How, if at all, does the context in which NIPs prescribe influence them?
8. How, if at all, does the GP/ NIP relationship influence the NIPs prescribing?

3.3 Epistemological and ontological stance

This section is written in the first person, to emphasise my personal perspective. How research is undertaken is dependent on the researcher's ontological and epistemological stance. What can be known about the social world and how that knowledge can be acquired (Mason 2002). Crotty (1998) describes the combination of both as a 'world view' and claims that it is impossible to separate them out into different elements. The main epistemological approaches in social research are positivism and interpretivism. Positivism views the social world as measurable and one that it can be valued objectively, this is the epistemological stance taken by those undertaking quantitative research (Cresswell 2009). In qualitative research the main epistemological stance is interpretivism which believes that the social world is not fixed, that people interpret their world differently and that it is ever changing. Interpretivists focus on

understanding the meaning of behaviour and rather than explaining it (Brewer 2002). An interpretivist approach was most suitable for this inquiry, as I wanted to understand what influences the NIPs antibiotic prescribing, so that if any behavioural change interventions were required to improve prescribing behaviour, a framework could be referred to and then applied.

When starting to undertake this study, after reading the literature and reflecting on my own practice, I became increasingly aware that the reality of prescribing medication was complex. It is not always black and white, right or wrong, there are grey areas. What is right for one patient may not be right for another; prescribing decisions are context and patient dependent. However, within that complexity some things do appear to be right or wrong, such as whether a chosen medication is appropriate to treat a clinical condition, so some judgements can be made. Due to the complexities, and management of grey areas and uncertainty, a pragmatic approach was undertaken.

Since I am a healthcare professional with many years clinical experience it might be expected that I would consider myself to be a pragmatist. Long et al (2018) suggest that many healthcare workers are pragmatists, focusing on what is possible and practical, rather than conforming to idealist notions. This means that rather than striving for perfection, whatever knowledge can be gained is useful when it is practical, and context dependent. Pragmatism is described by Creswell (2009) as a world view; one that offers an approach that overcomes the philosophical challenges of mixed methods research (Tashakkorie and Teddlie 2003). The pragmatist philosopher John Dewey rejects the word epistemology preferring instead to use the term inquiry. He proposes that

> 'Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituents, distinctions and relations as to convert the elements of original situation into a unified whole'
>
> (Dewey 1938 p108)

The purpose of the inquiry is to understand and to create knowledge and bring about improvement (Goldkuhl 2012) Pragmatist philosophers, while acknowledging the different epistemological approaches of qualitative and quantitative enquiry, advocate using both approaches to answer the research aim and construct knowledge that is grounded in the social world. Pragmatist research philosophy determines that answering the research question is more important than the underpinning research philosophy, and that both positivist and interpretivist approaches can be combined in one study to answer the research questions (Tashakkori and Teddlie 2003).

Although interpretivism and pragmatism may be viewed as different epistemological stances, some authors suggest that together they can be combined to produce a pragmatic interpretive

study (Goldkuhl 2012). Goldkuhl suggests that if undertaking a study with either paradigm as the "base" and the other in a supporting role, it is possible to combine them. The stance that I took was using interpretivism as the base and pragmatism in the supporting role, "an interpretive stance aiming for understanding that is appreciated for being interesting" (Goldkuhl 2012 p15) as interpretivism is key to a qualitative enquiry.

Cresswell (2009) outlines five methodologies that sit within an interpretivism research philosophy: phenomenology, narrative research, grounded theory, ethnography and case study.

Table 6 Methodologies

Methodology	**Rationale for not undertaking**
Phenomenology	Examines the lived experience of the participants and how they view their world, (Crotty 1996). This would not address all the research aims
Grounded theory	is best undertaken when little or nothing is known about the subject area, it has been criticised for ignoring the influence of social structure, culture and power on human behaviour (MacDonald 2001), these were influences that required exploration.
Narrative research	Usually focuses on an individual and involves storytelling about lived experiences (Cresswell 2009) this approach would not have achieved the research aims on appropriateness
Ethnography	Requires prolonged immersion in the setting to be studied Emerson et al (2011), which due to time constraints as a part time researcher, would not have been achievable.

Yin (2014) suggests that although there are many research strategies, the most important consideration is to choose the right strategy to answer the research question. Following on from this pragmatic interpretivist stance, the choice of methodology and methods was key in developing an understanding of the complexities of the study. Combining both approaches within case study methodology, where rich thick description and the use of a variety of methods allows a depth of understanding to emerge from, and across the cases was deemed most appropriate.

Crotty's four questions framework (1998) helped to structure the process and clarify the research approach.

Table 7 Crotty's framework

Epistemology	Pragmatic interpretivism
Theoretical perspective	Interpretivism
Methodology	Case study
Methods	Mixed: non-participant observation drawing on ethnography, qualitative semi-structured interview and analysis of case notes using a validated measuring tool.

3.4 Introduction to Case study methodology

Methodology is the overall approach to the to the research study from the theoretical underpinning through to data collection and analysis (Cresswell 2009). The aim of this study was to identify the appropriateness of and the influences on NIPs antibiotic prescribing in general practice. The strength of a case study is in the ability to gain deep understanding and insights of the phenomena in the context in which it is being explored (Simons 2015). Case study methodology is particularly suitable for this inquiry, as it allows for in depth exploration of a complex phenomenon, using a variety of methods in a real-life setting (Stake 2006, Yin 2014). Case study methodology is particularly useful in under researched areas as it supports theory building (Yin 2014) and increases knowledge and insight into the area of inquiry (Merriam 2009). The research literature outlined in chapter two, suggests there are several factors that influence NIPs' prescribing in general practice and in other settings, but there is a paucity of studies exploring NIP antibiotic prescribing in general practice. Case study research enables the researcher to undertake a holistic approach to data collection, and Yin (2014) describes case study as a research strategy that can be either quantitative, qualitative or a combination of both. Hancock and Algozzine (2006) and Yin (2014) assert that using a range of methods and collecting numerous sources of data provides a rich description of the phenomenon under investigation. This view supports the methodological approach undertaken, a variety of methods will enhance the understanding of the phenomena being explored, within a defined context.

Defining and binding the case is central to case study research (Stake 2006, Yin 2014,). This case is bound by activity and place, to understand the phenomenon of interest, and to avoid undertaking a broad inquiry that then fails to answer the research question. In this study, the case is the GP practice and the NIPs embedded units. The importance of the context in case study design (the

general practice setting) and the potential impact that it has on the phenomenon (the NIPs being studied) are key (Clarke and Reed 2010).

3.4.1 Case study approaches

A case study is an empirical enquiry and a research strategy rather than a research method (Yin 2014). Theory development differentiates case study research from other qualitative methods such as grounded theory or ethnography, which deliberately avoid having hypotheses from literature reviewed, prior to fieldwork in order to avoid presumptions (Yin 2014). Case study research enables the use of various methods both qualitative and quantitative to answer the research question. Pre- understanding and knowledge of the setting under study, enables the case and its boundaries to be defined. The study of the phenomenon; NIPs, within their real-life context; general practice, and by undertaking various methods of data collection, through a variety of lenses, allowed for triangulation of the data Yin (2014).

The two main advocates of case study methodology, Robert Yin and Robert Stake have different philosophical approaches to case study research. Yin takes a positivist/post positivist perspective in his approach to case study research and Stake orientates himself to an interpretivist/constructivist paradigm. Both agree that case study research is a process of inquiry that enhances understanding of the phenomenon of interest, and although Stake favours qualitative approaches, he recognises that quantitative approaches, as proposed by Yin, can also be useful (Stake 2005). It was determined that in order to answer the research question within this study, data which traditionally sits within both qualitative and quantitative paradigms would be drawn upon. This approach is underpinned by a pragmatic interpretive stance.

3.4.2 Type of case study

Yin's approach to case study research is thought to be more suitable for the novice researcher as he provides a detailed account of how the research can be undertaken, setting out a step by step guide (Appleton 2002). Although Yin's (2014) structured approach, was useful to guide the research design, Stake's description of types of case study was more appropriate in capturing the complexities involved in understanding the influences on the NIPs prescribing. He describes the 'instrumental case study' which can be used 'to provide insight into an issue or refinement of theory' Stake (1994 p237) and this is key to the inquiry.

Undertaking more than one case is described as a 'collective case study', Stake (2005) warns against the use of comparative cases to make judgements, and advises that each case should be presented, with enough thick description to allow the reader to make their own comparisons. He

does however also suggest that the use of more than one case can add to the value and trustworthiness of the knowledge gained. Silverman (2010) proposes that while it is difficult to achieve generalisability in qualitative research, studying several cases and using both qualitative and quantitative methods enhances this aim. Yin (2014) agrees that a multiple case study approach rather than one single case study will produce more compelling findings, provide more data for analysis. He also suggests that cross- case comparisons can be used for theory building; therefore, mixed methods across two Cases was undertaken.

3.5 Mixed methods

Mixed methods research, using both quantitative and qualitative approaches, enables a deeper exploration of the research inquiry, and a more complete understanding of the complexities of involved, particularly in healthcare. (Creswell and Plano Clark 2011, Cresswell 2009). Tashikkori and Teddie (2003) believe that mixing methods overcomes the paradigm debate. The pragmatists' view is that philosophical approaches should not determine the methods undertaken, and that the research question should drive the choice of methods. This pragmatic approach overcomes the limitations of using only one research method only (O'Cathain et al 2007). McKim (2017) suggests that using mixed methods enables the researcher to gain a deeper understanding of the The importance of the context in case study design (the general practice setting) and the potential impact that it has on the phenomenon (the NIPs being studied) are key (Clarke and Reed 2010). Although recognising that undertaking mixed methods can be challenging for a novice researcher, the use of two methods increases confidence in, and the validity of, the interpretation of findings (O'Cathain et al 2010; Tashakkori and Teddlie 2003).

The integration of mixed methods in case study research is well established (Yin 2014; Fetters et al 2013). However, how data from mixed methods research is integrated is not always clearly reported (Mason et al 2019; O'Cathain et al 2010). The commonest method undertaken is triangulation, which O'Cathain et al (2010 p2) describe as 'studying a problem using different methods to gain a more complete picture '. Morse (1991) describes two types of triangulation, simultaneous and sequential, in this study the findings of one data set would not influence the subsequent data collection, so simultaneous data collection was undertaken in this case study. Cresswell (2009) describes this strategy as 'concurrent triangulation' which results in well validated findings but Cresswell also warns of the risk of uncovering conflicting results. However, Cresswell and Plano Clark (2011) suggest that this conflict may not be a problem and that such a disparity may result in a greater understanding of the complexities of the inquiry and may highlight a need for further research. Combining both qualitative and quantitative

methods enables the researcher to tell the whole story, adding detail and analysis and the triangulation of data strengthening validity (Yin 2014, Stake 2005, Simons 2015)

Appropriateness of antibiotic prescribing was evaluated using both qualitative and quantitative methods in order to capture the complexities of clinical practice. There are several definitions of medicines appropriateness, Buetow et al (1997) define it as

> 'the outcome of the process of decision making that maximises net individual health gains within the society's available resources' (Buetow et al 1997p 261)

This is a utilitarian approach which is favoured by the NHS due to limited funding and resources and is driven by the need for cost effectiveness. However, Barber (1995) takes a more patient centred approach and states that appropriate prescribing of medication should also include consideration of the individual patient. He asserts that

> 'The prescriber should have four aims: to maximise effectiveness; to minimise risks; to minimise costs; to respect patient's choices' (Barber 1995 p923)

Barber goes further to expand on what he means when discussing patient choice, he explains that this is not related to a demand for treatment but rather a choice on whether to take the medication at all, and individual preferences on form of medication such as tablet or suspension. Successfully treating a condition is wholly dependent on this shared decision making (Barber 1995) If a patient is prescribed a medication that they are unable or unwilling to take as prescribed, then that condition will not be successfully treated. The patient may return with unresolved symptoms and be prescribed an alternative medication which in relation to antibiotics may lead to increased antibiotic prescribing. Shared decision making and enhancing adherence to the medication regimen is key in reducing repeated courses of antibiotics and adding to the increasing problem of AMR.

Spinewine et al (2007) support this view and conclude that the term appropriateness relates to the quality of the prescribing related to what the patient wants, the correct drug for their condition, one that is most pharmacologically appropriate and finally what is the best for society in general. Measuring these factors with a quantitative tool will not always capture these additional complexities. Antibiotic guidelines advise on appropriate medication for a given condition, however within each individual there may be co morbidities, allergies, age and other medications that need to be considered when deciding the most appropriate antibiotic to treat the condition. Within this study appropriateness is defined as good quality antibiotic prescribing in accordance with national guidelines whilst also taking into consideration the complexities of prescribing for the individual patient. The use of a quantitative tools which measures

appropriateness purely on pharmacological criteria omits to consider these factors (Barber et al 2005). Therefore, using a validated tool to measure appropriateness alongside my clinical knowledge and experience during the observation of and semi-structured interviews with the NIPs provides a more robust platform on which to judge the overall appropriateness of their antibiotic prescribing.

3.5.1 Qualitative methods

Qualitative research seeks to understand "what?", "why?" and "how?" rather than "how many?" (Cresswell 2009) The literature review presented in chapter two, identified that no observed practice had been undertaken in this research area, which relied heavily on self-reported data. The finding influenced the aim of this study, which sought to move beyond self-report data and to ask "what?" and led to the decision to draw on qualitative methods in order to understand the 'phenomenon of interest' in its natural world. Denzin and Lincoln (2005 p3) define qualitative research as:

> 'an interpretive, naturalist approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them'

There are various methods of collecting qualitative data, most common being one-to-one interviews, focus groups and observations. Focus groups are useful in generating data from a number of people in a relatively short time; however, considerable time is required to set up the group and then transcribe and analyse the data collected (Goodman and Evans 2010). The authors suggest that groups with a commonality of role and language can encourage sensitive information to be shared by participants, they are more likely to disclose. However, the skills required to facilitate the group can be challenging for a novice researcher. Due a lack of experience in this area, and the logistical challenges of gathering the participants together at the same time, focus groups were not were not used for information gathering in this study. Semi-structured interviews were undertaken to explore each individual participant's perspective; this approach was the most convenient for the participants, as well as being more manageable for this novice researcher, (Tod 2010)

3.5.2 Observation

Observation in real life contexts adds additional information and richness to the data, which other data collections methods cannot capture (Yin 2014). Non-participant observation is especially useful in case study research, in order to observe activities and interactions and to enable understanding of a phenomenon in its natural context (Watson et al 2010). Stake (2006) proposes that observational data is often the most meaningful and as Pope et al (2002 p149) assert 'it can be especially useful in uncovering what really happens'. Watson et al (2010) also propose that it can provide confirmation of self- reported data, and therefore strengthens and contributes to the trustworthiness of the inquiry. In research into district nurses' early input with patients receiving palliative care, avoidance techniques demonstrated by the nurses were uncovered; an issue which was not revealed during interviews (Griffiths et al 2010).

A criticism of observation as a method of data collection is that the participants will not behave as they would normally, if they were not being observed: known as the 'Hawthorne effect' (Lansberger 1955). Some authors would suggest that this effect does not last long, and the research participant soon becomes comfortable with the observer's presence. With the effect being negated (O'Reilly 2005; Schnelle et al 2005). However, it is impossible to know whether the presence of an observer has had an impact and many authors suggest that it would be naïve to think that it would not (Watson et al 2010). Trustworthiness can also be increased by the observer having knowledge and expertise relevant to the research setting; which limits any misinterpretations of participants' actions (Watson et al 2010). The researcher's experience and expertise in the area enables accurate recording of observational data gained via their non-participant role. By undertaking other data collection methods such as interviews and the use of the validated Medicines Appropriateness Index (MAI) tool (Hanlon 1992) to evaluate historical documentation, any potential limitations from the observations will be offset. By doing so will also strengthen the consistency of findings. As a non-participant observer, it is important to try not to influence the study, although Walshe et al (2010) suggest that any presence would have an impact, they also suggest that impact can be mitigated by the researcher positioning themselves in a way to make themselves as inconspicuous as possible. This influence was reduced by sitting in the corner of the room out of the NIPs eye line. To understand all the complexities on display, an interpretivist approach would be the most appropriate and to undertake observation. This method has not previously been included in studies and observation and interpretation are important in understanding the social world (Ormiston 2019). Drawing on the principles of another interpretivist approach: ethnographic non-participant observation was undertaken.

3.5.3 Interviews

Interviews are the most common form of data collection in qualitative research (Tod 2010) particularly in healthcare, where interviews can explore the participants' views and experiences (Tashakkori and Teddlie 2003). Interviews allow participants time to reflect on experiences and to clarify any ambiguity in the questions. Respondents can generate fuller and more thoughtful answers than questions put using other formats, such as questionnaires and surveys (Gray 2009). Three types of interviews can be used for data collection.

i) structured interviews are rigid and do not allow for the use of prompts or follow up questions, and although they take less time to carry out, they are not thought to be appropriate for an in-depth inquiry;

ii) unstructured interviews can take longer and are suitable for understanding a participants' lived experience, however a skilled researcher is required to keep the structure of the interview, so that the question can be answered, while allowing flexibility (Tod 2010);

iii) semi-structured interviews are the middle ground between structured and unstructured, they allow for further questioning and probing of answers, while still maintaining focus on answering the research question (DiCicco-Bloom and Crabtree 2006).

As an inexperienced researcher semi-structured interviews were deemed most appropriate, both for the researcher and the type of inquiry being undertaken. An interview schedule was developed using themes identified from the literature review and the researcher's own inquiry; whether the GP influenced the NIPs prescribing as outlined in Chapter one (Appendix E). A pilot interview was undertaken with a colleague who was also a NIP in general practice. The questions stayed broadly the same, but the phrasing was refined. An interview schedule was also developed for the GPs along similar themes to the NIPs (Appendix G).

3.6 Quantitative methods

Positivist thinking underpins quantitative methods, informed by the following beliefs; that data can be studied as an object; that the results are unbiased; are presented objectively, and that truth can be measured (Topping 2010). Some areas of the NIPs antibiotic prescribing can be measured, such as documentation. For example, is there a diagnosis written down, what antibiotic was prescribed and what dose was prescribed. A pragmatic approach allows for the combination of both qualitative and quantitative data, within a qualitative paradigm, as seen in this pragmatic interpretative study. In this inquiry, part of the research question seeks to explore the appropriateness of NIPs antibiotic prescribing. This required rating the appropriateness of the NIPs antibiotic prescribing documented in the patient case notes, using a quantitative approach that employed the validated MAI tool.

3.7 Analysis

3.7.1 Qualitative data analysis

The purpose of analysing qualitative data is to uncover meaning and provide thick description and the descriptive notes and interview transcripts require analysis to assign meaning and explanations to the data that has been gathered (Pope et al 2002). Large amounts of data can be difficult to make sense of, and require time spent reading and re reading to elicit themes and meanings (Cresswell 2009). For this reason, many qualitative researchers use qualitative software programme to code the data, that is to apply a label to a piece of data, which helps the researcher to identify key points on the way to answering their research question (Elliott 2018). However, being unfamiliar with the software programme and unable to undertake training in a timely manner meant that the data in this study were analysed manually.

Case study methodology as described by Yin (2014) lends itself to various qualitative measures of analysis; it was noted that he does not prescribe one as superior to another. An inductive approach was undertaken for the analysis, as there was no theoretical framework to apply. There are a variety of methods to analyse data.

Table 8 Methods of analysis

Method of analysis	Description of method
Content analysis	Is used to identify patterns in communication, A criticism is that it can be reductive in concentrating on key words or phrases to infer meaning rather than exploring other more subtle issues, such as context and ambiguity.
Narrative analysis	how language is used in a context and how meaning is created. not the purpose of this study
Discourse analysis	Use of language and written texts in a social context
Grounded theory	Used to build theory. Not the methodological approach undertaken in this study
Thematic analysis	A systematic approach which enables researchers to organise and analyse data and identify themes

(Based on Gerrish and Lacey 2010)

The most appropriate method for a novice researcher to analyse the qualitative data in this study was identified as thematic analysis, due to its structured approach. Thematic analysis provides a clear structure to the analysis using a step by step guide, which can be followed by even non-researchers (Gale et al 2013). Thematic analysis was undertaken drawing on the principles of Braun and Clarke's (2006) this thematic analysis framework offered a flexible approach, which could be used across the spectrum of methodologies and across a variety of data sets; an ideal option for a novice researcher to use. Due to this flexibility it could be used across both interview and observational data.

3.7.2 Quantitative data analysis

Evaluation of case records was undertaken to assess clinical appropriateness of antibiotic prescribing. The evaluation was carried out using the using the Medication appropriateness index (MAI) tool.

The MAI is a ten item tool which has been widely used to evaluate doctors prescribing, but it has also been used by some authors to evaluate the quality of non-medical prescribing (Latter et al 2007, Drennan et al 2009, Latter et al 2010) It enables experts to make value judgements about the appropriateness and quality of prescribing. Kaufman et al (2014) describe two types of tools to measure appropriateness explicit tools which can be applied with little or no clinical knowledge and implicit tools which require some clinical judgement such as the MAI tool. To assess overall

appropriateness while considering each patient as an individual Spinewine et al (2007) suggest that the use of such a tool together with the consideration of other patient specific factors enables appropriateness of prescribing to be more accurately assessed.

Although not used specifically in antibiotic prescribing, the reliability of the MAI tool for use in primary care was evaluated by Bregnhøj et al (2005). The authors found that it is useful for comparing results in similar settings, such as different GPs' practices. Spinewine et al (2006) in her study in geriatric medicine thought it was time consuming; however, she also reported that it had good intra- rater and inter-rater reliability values, as well as good face and content validity. Naughton et al (2012) in their evaluation of nurse and midwife prescribing in Ireland found it a valid and useful tool. The more subjective criteria, "duration of therapy" had a high level of disagreement between the experts in Latter (2007) and Naughton et al (2012), however the use of antibiotic prescribing guidelines where duration is clearly indicated will help to overcome this. The tool was modified for use in this study, with an additional question being added in order to assess whether guidelines were being followed. Previously the tool has been applied with the question 'is the medication effective for the condition?'. This could be scored as 'effective', but the antibiotic may not be the "most" appropriate and according to guidelines. The question added was "is this drug first line treatment according to local and national guidelines?"

The historical case records will also explore the quality of prescribing when a participant is not being observed, as the process of being observed may change the behaviour of the participant (Watson et al 2010). Findings are reported in tabular form using simple descriptive statistics.

3.7.3 Cross case synthesis

Thematic analysis of the findings from each case are presented, before cross case analysis is undertaken, as learning can develop from both the" uniqueness and commonalities" of the cases (Stake 2006). Cross case synthesis was undertaken to develop deeper understanding and explanation of the Cases, while also enhancing generalisability, by exploring relationships within and between studies (Miles and Huberman 1994). Although some authors would argue about whether this should ever be an aim of qualitative research (Lincoln and Guba 1981), Braun and Clarke (2006) propose that findings from qualitative research can be generalisable. However, this process occurs in a different way to quantitative research findings; the former may not be strictly generalisable but they can be considered comparable to the quantitative data (Goetz and Lecompte 1984). Stake (2006) proposes that case studies do not require explanation that they should be interpreted individually, with the reader constructing their own understanding of the case. However, he also states that cross case synthesis can be undertaken for "further illustration,

concept and hypothesis development" in case study research (Khan and VanWynsberghe 2008 p10)

There are a variety of approaches to case study synthesis, such as cross case analysis (Miles and Huberman 1984) and thematic synthesis (Thomas and Harden 2008). Tabular presentations and graphs to present data as Miles and Huberman (1984) suggest was thought to be a deductive approach and condensing the data into tables, was at odds with an interpretivist approach. Since thematic analysis will have already been undertaken in chapters four and five, it was thought that a different approach in chapter six would yield a greater depth of understanding from the Cases. Mays et al (2005 p15) suggest that using data that has undergone thematic analysis followed by a meta ethnography can lead to 'a higher order interpretation'. Meta-ethnography parallels meta-analysis but rather than synthesising data, it is an interpretivist study of the essence of qualitative studies (Noblit and Hare 1988) and the most commonly used method for cross case analysis of qualitative data. If undertaken correctly it can provide analytical depth which other methods cannot (Thorne et al 2004). Noblit and Hare (1988) advise that meta- ethnography is a method of synthesising interpretivist research, which also preserves the wholeness of the individual cases. The authors suggest that this approach covers all qualitative research models including case study. The unique qualities of the case should be maintained while undertaking cross case analysis and the findings not stripped down just so that comparisons can be made (Silverman 2010).

Noblit and Hare (1988) outline seven steps to undertake meta-ethnography, the last three steps are utilised as the previous four are not relevant as they relate to searching for studies and familiarising with them.

Table 9 Seven steps to undertake meta-ethnography

Getting started
Deciding what is relevant to the initial interest
Reading the studies
Determining how the studies are related
Translating the studies into one another
Synthesising translations
Expressing the synthesis

(source Noblit and Hare 1988)

3.8 Rigour in qualitative research

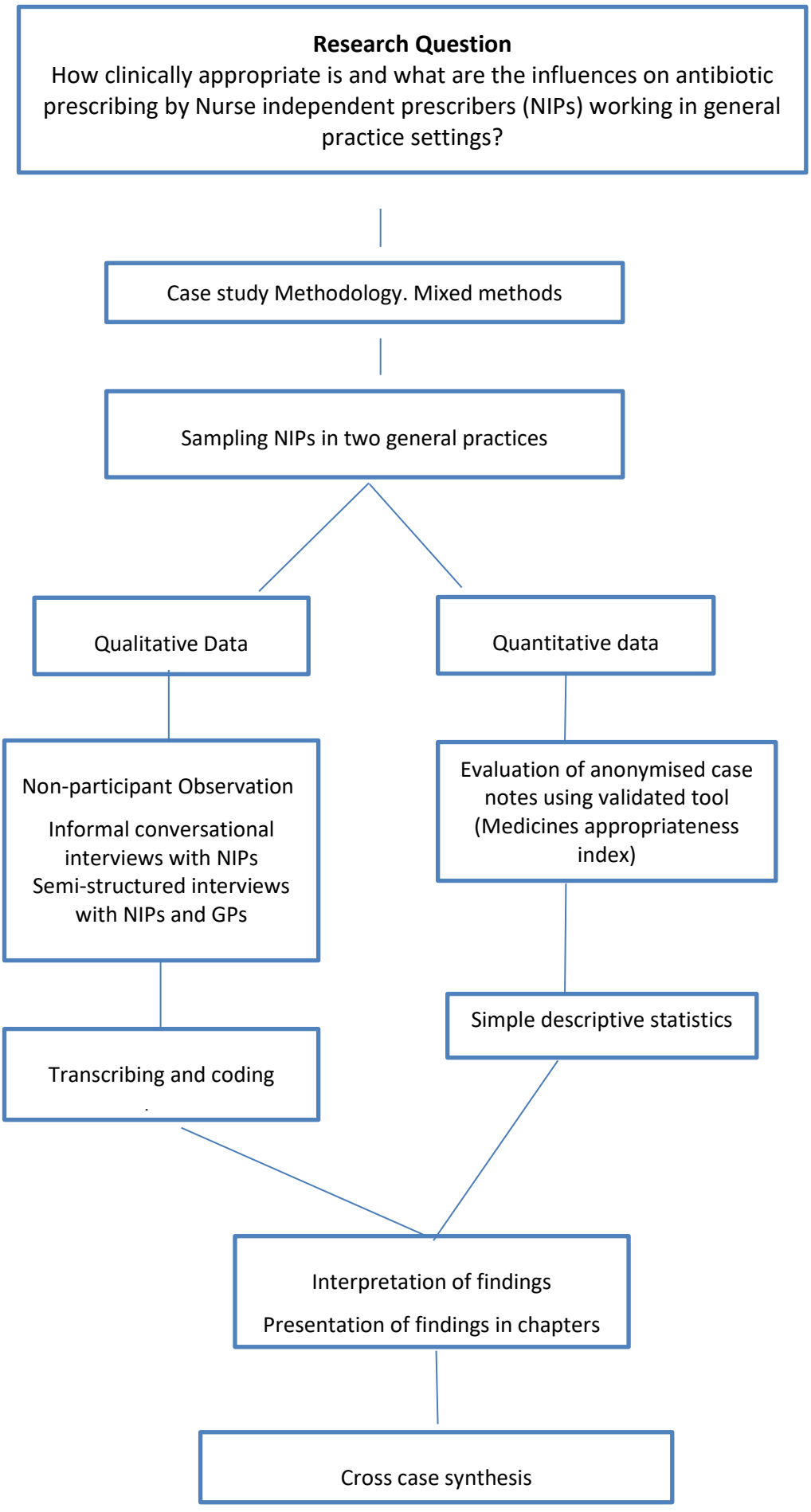
Rigour in qualitative research terms means following a strong research design throughout the study, thereby ensuring that the results are dependable (Mays and Pope 1995). To ensure rigour and therefore the quality of the research validity and reliability must be demonstrated, these terms are often rejected by qualitative researchers as they stem from the positivist paradigm (Lacey 2010) Guba and Lincoln (1982) and Yin (1994) refer to the concept of trustworthiness, instead of validity and reliability, as a measure to ensure rigour in qualitative research, describing it as how truthful are the findings from the research study and how confident the reader is in the results. Guba and Lincoln summarise concerns into four criteria and prose steps that the researcher might undertake to ensure trustworthiness. In later work by Yin (2014) following a positivist paradigm he suggested four methods by which validity can be achieved. The activities undertaken in this mixed methods case study to ensure trustworthiness and validity are combined using both authors criteria and set out in table ten.

Table 10 Strategies undertaken to ensure trustworthiness and validity

Criteria for trustworthiness	How achieved in study
Credibility	Undertaking credible research methods as described in chapter 3 Familiarity with research area from my previous clinical experience Peer review of research proposal as university protocol Ethical approval Reflexivity, diary Triangulation of data
Construct validity	Triangulation of multiple sources of evidence, observation, semi-structured interviews, evaluation of documentation. Clear chain of evidence from data collection and analysis in order to answer the research question as described in chapter 3.
Transferability	Thick description of cases in findings, chapter 4 and 5 Data analysis supported by quotations from participants
Internal validity	Using robust analytic methods such as pattern matching, undertaking a variety of methods to test hypotheses and triangulate findings. Where patterns do not match, alternative explanations will be explored and discussed in chapter 5 of the final thesis.
Dependability	Audit trail In depth description of research process and detail of data collection in chapter 3 Peer debriefing throughout with supervisors Reflexivity
External validity	Replication logic, undertaking two case studies
Confirmability	Audit trail Triangulation of data to reduce researcher bias Reflexivity. Limitations discussed in final write up
Reliability	Use of case study protocol and data collection procedures as discussed in Chapter 3 to allow for replication. Supporting documentation in the appendices.

Sourced from Guba and Lincoln (1982) and Yin (2014)

Table 11 Flowchart to illustrate the stages of the research process



3.9 Research Design

This research involves a mixed methods study within a case study framework. Data were collected using a variety of methods, with the aim of observing whether propositions, as reported in the literature regarding perceived influences upon, and the behaviour of NIPs were in fact impacting on the NIPs antibiotic prescribing. Semi-structured interviews with NIPs and GPs were carried out, and historical case notes were evaluated using the validated MAI tool. Drawing on techniques from ethnography, non-participant observation was also undertaken, in order to answer the research question.

3.9.1 Recruitment of Cases

The initial proposition was to purposefully sample participants, using Department of Health (DH) quality indicators on antibiotic prescribing, identified through ePACT (electronic prescribing analysis and cost tabulation) data. This information is collected nationally and reported at a local level to medicines management teams in CCGs (Clinical commissioning groups). From these data, two practices would be identified, one with high rates of antibiotic prescribing compared to the national average and one with low rates compared to the national average. The cases chosen would ideally represent 'the phenomenon writ large' (Stake 2005 p 451).

Purposive sampling is widely used in qualitative research as it is designed to identify groups from which rich sources of information are easily available, and whose members have experience of the phenomenon being explored (Cresswell and Plano Clark 2011). This method would extract data removed from the complexity of the context from which it is derived but would guide the sampling process to ensure the suitability of participants to be included in the case studies (Rubin and Rubin 2005). Bowling (2002 p187) describes this method of sampling as a

> 'deliberate non-random method of sampling which aims to sample a group of people or settings with a particular characteristic'.

Table 12 Sampling criteria

Inclusion criteria	Exclusion criteria
Nurse independent prescriber	Other non-medical prescribers
Working in GP practice, employed by GP	Working in other community settings or in GP practices run by trusts
Managing on-the-day minor illness presentations	Managing chronic disease clinics, where less likely to prescribe antibiotics regularly.

Using the data provided by the medicines management lead in the Clinical Commissioning Group (CCG), four practices were identified, that met the criteria of high or low prescribing practice, and where there were NIPs prescribing antibiotics regularly. Two of the practices had above average antibiotic prescribing and two below. Two practices were contacted simultaneously one from the higher prescribing group and one from the lower. An email was sent to the practice manager and followed up with phone calls. The receptionists were always unable to contact the practice manager, so messages were left for them. Practice managers did not return the calls. A GP in one practice was identified, as the training lead on the practice website, an email was sent to him directly, but he did not reply. The same applied to all the practices approached in this manner. The gatekeepers, as Silverman (2010) describes them provide access to a research area, which is not open and easily accessible. In this instance, their non-response blocked access to the study site.

On the advice of senior research colleagues in primary care, it decided to approach the NIPs directly. Walshe et al (2011) advises that in observational studies, the gatekeeper role is particularly significant, and access to the participants can be aided by the researcher promoting their clinical and academic experience in the area. NMP leads within CCGs were contacted by email, with a description of the study and participant information sheets (PIS), (Appendix C). Details of the researcher's background, knowledge and expertise in the area, were included in the email to aid credibility. The NMP leads were asked to send the information and the (PIS) to all NIPs working in general practice in their area, the NMP leads were also asked if there were any upcoming forums or events where the proposed study could be discussed. All NMP leads disseminated the information and one emailed with an offer of a slot to speak at a NIP forum. Six NIPs attended the forum where the details of the study were discussed, and participant information sheets were disseminated. The PIS was sent by email to all forum members by the chair, following the meeting. One participant made contact after receiving the email following this event. Another participant responded to the email sent from the NMP leads in their CCG. They were colleagues who knew me in the past, either through work or from attending educational courses. They contacted offering their 'help' with the research, Silverman (2010) suggests that using existing contacts makes access to study areas much easier, and a pragmatic approach is sometimes required regarding the difficulty and time to access a clinical area. The first participant to respond knew me as a colleague as we had worked together in the past, she thought it would be fun to take part in the study. The second participant to respond knew me as he had undertaken the non-medical prescribing programme at the University and was very grateful for the support he received so he also wanted to help by contributing to the study.

In case study research representativeness is not the key focus, but the population being studied should have some commonalities (Proctor et al 2010), and both cases met the original inclusion criteria. Once one NIP in each case agreed to participate, the others also agreed, no NIPs in either setting excluded themselves from the study. This type of snowball sampling is common in difficult to access areas, knowing one participant creates access and then others agree to take part in the study (Cresswell 2009).

3.9.2 Consent

Participants information sheets were emailed more than two weeks prior to written consent being obtained, to all participants, (Appendix D). Participants were informed that they could withdraw from the study at any time. Participants were informed that any unsafe or unprofessional behaviour would be reported to their employer and potentially the NMC.

A poster was prepared for the waiting room and was displayed at the reception desk informing patients that there was a nurse researcher sitting in with the nurse practitioner, (Appendix H). The NIPs obtained verbal consent from the patients prior to the consultation when they collected them from the waiting room. Two patients in Case Two, asked to be seen alone by the NIP, and I left the room.

The GPs were recruited by the NIPs to undertake interviews. The GPs then emailed me, and I replied and sent the PIS, (Appendix F). Dates and times for interviews were arranged between us. The PIS was discussed with the GPs and consent forms were signed, prior to the interviews, (Appendix D).

The retrospective case note review, consisted of anonymised data: consequently, individual patient consent was not required (Confidential Advisory Group 2015)

3.9.3 Research governance and ethical approval

Ethical approval was sought and gained from the University of Southampton Faculty of Health Sciences ethics committee following internal faculty peer review. Ref no. 15805. Research and development authorisation were gained from the Wessex Clinical Research Network (CRN) (Appendix B). An application was submitted through the Integrated research application system (IRAS) to the health research authority (HRA). however, it was advised that since patients were not participants their approval was not required.

Sponsorship and insurance were obtained from the University of Southampton (Appendix A). No incentives were offered to the participants, to take part in the research study, and the researcher

had no relationship with the organisations in which the research participants were employed. There were two instances in Case Two when I arrived at 9am and a NIP, or another member of the team were off sick, so the participant was undertaking a different role. In this Case it was home visiting for the morning rather than a clinic session. The NIP offered to let me could come along with her, but I had to inform her that ethical approval did not cover home visits, so I was unable to collect any data on those days.

3.9.4 Data storage and confidentiality

In accordance with the Data Protection Act (2018) and General Data Protection Regulation (GDPR 2018) no identifiable information was included either in fieldnotes or in transcripts resulting from observations, semi-structured interviews or case notes evaluated with the MAI tool. Maintaining anonymity in case study research is challenging, due to the significance of the context on the phenomenon being explored (Clarke and Reed 2010). Participants and organisations have been anonymised, and some minor details of the practices and have been omitted, but none that detract from the overall picture. The reason for this constraint is that if the details are changed too much the 'story' may no longer be credible (Braun and Clarke 2006).

Fieldnotes were stored in a locked drawer, only accessible by the researcher, and in a locked room. Electronic data were stored on a password protected computer, behind university firewalls. Audio recordings were transcribed on the day of data collection and deleted. Anonymised case notes were evaluated using the MAI tool, and then shredded immediately. The researcher and supervisors had access to the data, which was made explicit to participants in the participant information sheet. University of Southampton data protection policy was adhered to.

3.10 Data collection

Data were collected using a variety of methods, with the aim of exploring the appropriateness of and influences on NIPs antibiotic prescribing and observing whether propositions on self-reported influences and behaviours as reported in the literature, were in fact impacting on the NIPs antibiotic prescribing. Semi-structured interviews with NIPs and GPs were carried out, and case notes were evaluated using the validated MAI tool. Drawing on techniques from ethnography, non-participant observation was undertaken in an attempt to gather data in order to answer the research question.

3.10.1 Observation

There is a lack of data in the literature on NIPs antibiotic prescribing in general practice; an omission which was highlighted by Ness et al (2016) in their systematic review of influences on nurse prescribers' antimicrobial prescribing behaviour. The authors proposed that more observation techniques should be undertaken, to expose and counteract the potential bias from self- reported data.

Initial contact from the participants was made by email and a date and time to visit the site with the participant was agreed. This arrangement was the process for communicating with all participants, throughout the study period. The GP receptionists informed the participant, by telephoning their rooms or by sending a message on the computer, that I had arrived. The NIP participant then came out to greet me, and we went into the consultation room together. On the first visit, time was spent discussing the study, with the researcher asking if there were any questions arising from the participant information sheet, which they had been sent by email 2 weeks prior to the visit. When all was explained, and they were happy to continue, the consent form was signed.

A poster was provided to be displayed at the reception desk which notified patients that there was a researcher in the room with the NIP and asking them to inform the receptionist if they would like the researcher to leave the room during their consultation. The poster was left with the receptionists and was displayed each time I visited. The NIPs also reminded patients that a researcher was in the room, when they collected the patients from the waiting room and asked their permission for the consultation to be observed. A position was taken in the consultation room out of the eye line of the NIP. in Case One this location was in the corner behind the NIP but due to the small size of the room, visible to the patient. In Case Two the room was bigger, so the position taken was out of view of the patient and the NIP. A small notebook was used to record field notes Field notes from observed practice were written up immediately after the time in the field, using the jottings taken down contemporaneously during the observations (Emerson et al 1995). Reflections on the session were also written up immediately, as advised by Brewer (2002) in order to aid reflexivity. All consultations were observed during the clinic sessions, not just those where antibiotics might be prescribed. This was to avoid disruption, by coming in and out of the room, and to ensure that all potential antibiotic prescribing was observed.

All NIPs in both Cases were observed in duty sessions where they managed patients with on the day presentations, which were mostly minor illnesses; and where they will be more likely to be prescribing antibiotics. Observations were undertaken during morning and afternoon sessions, and various days of the week; to explore whether the day or time of day influenced the NIPs antibiotic prescribing. Observation of sessions continued until data saturation, and there were no

new themes emerging. Bryman (2012) suggests that this approach involves the complex process of data collection and analysis at the same time and it is not practicable to state numbers prior to data collection. The first participant in Case One was observed in four clinic sessions and no new themes were emerging after the third session, so the other two NIPs were observed in three sessions. This was replicated in Case Two for the sake of equity. 200 consultations were observed over the two Cases. 74.5 hours of observed consultations was undertaken between September and October 2016, in Case One. 104 hours of observed consultations was undertaken between November 2017 and July 2018 in Case Two. The extended study period in Case Two was due long-term sickness and workplace pressures on the NIPs. See tables below for details.

Table 13 Case One: 39.5 hours of observed sessions

Participant	Day and time of session	Number patients
1a	Wednesday 2-6pm	9
1a	Friday 9-1pm	8
1a	Wednesday 2-6pm	13
1a	Monday 2-6pm	8
1b	Friday 9.30-1pm	4
1b	Monday 9-1pm	7
1b	Friday 2-6pm	10
1c	Monday 9-1pm	9
1c	Tuesday 9-1pm	7
1c	Friday 9-1pm	15
Total		90

Table 14 Case two: 35 hours of Non-participant observed sessions

Participant	Day and time of session	Number patients
2a	Tuesday 2.30-6pm	14
2a	Friday 9.30-12.30pm	9
2a	Tuesday 2.30-6.00pm	12
2a	Monday 2-6pm	14
2b	Wednesday 9.30-12.30pm	14
2b	Wednesday 9.30-12.30pm	9
2b	Wednesday 9.30-12.30pm	8
2c	Friday 2-6pm	3
2c	Thursday 2-6pm	13
2c	Tuesday 2-6pm	14
Total		110

When making notes about the episodes related to antibiotic prescribing, initially only those situations where discussions or questions about the antibiotic prescribing decision were highlighted. then questions were asked such as 'why did you prescribe that?' When prescribing had been in line with national and local guidelines, and completely appropriate, this question was not asked. Consequently, this approach led to an over inclusion of potential 'negative' consultations. This bias became apparent during discussion with supervisors. So, during subsequent consultations the question was asked about every antibiotic prescribing episode. The question elicited many similar repetitive comments, 'I just know', 'I've looked this up before', 'experience'.

Observations in the setting, and interactions between staff were observed and noted. All field notes from the observations and informal discussions were transcribed and stored as electronic documents on a password protected computer as electronic documents (Appendix I).

3.10.2 Semi-structured interviews

Interviews are the most common form of data collection in qualitative research (Tod 2010); an observation that particularly applies to the field of healthcare, where interviews can explore the participants' views and experiences in depth (Tashakkori and Teddlie 2003). Semi structured interviews allow for further questioning and probing of answers, while still maintaining focus on answering the research question (DiCicco-Bloom and Crabtree 2006). An interview guide was developed using themes identified from the literature review and the researchers own inquiry: the focus was on whether the GP influenced the way the NIPs prescribed antibiotics as outlined in Chapter one. Audio-recorded semi-structured interviews were carried out to explore the NIPs' perception of the influences on their prescribing. The face to face semi-structured interviews were undertaken at a time most convenient for the participant. All interviews were carried out in the consultation rooms, using a password protected audio recording device. Cresswell (2009) advocates audio recording of interviews rather than note taking to ensure accuracy of the account. Interview data were transcribed by the researcher, as it was important to be very familiar with, and immersed in, the data (Holloway and Wheeler 2010). The language used by the participants may not have been easily understood by someone without clinical knowledge, as all the participants used shortened versions of the names of drugs and medical conditions. Software was installed on the computer that allowed the interview recording to be played at low speed, so that typing, and listening were undertaken at the same time. The recording was listened to at normal speed, to check that no information or nuances in the speech were missed. The transcripts from the recordings included non- verbal pauses and some repetition of words, so commas were

added to aid interpretation. The transcripts were stored electronically on a password protected computer.

In Case One, the NIPs semi-structured interviews lasted between 20- 30 minutes and were carried out when convenient for the NIPs; for two participants, this was over a lunchtime break, and the third was able to block some time off during the morning session, as it was very quiet on that day. Also, there was another NIP and the duty doctor present, who were both available to see the patients. The interviews took place at various times throughout the study period; with all of them being carried out only after some of the observed sessions had taken place. In Case Two the NIPs semi-structured interviews lasted between 20- 35 minutes and were carried out when convenient; for two participants this was over a lunchtime break and the third in the afternoon of her "admin" day. The interviews took place in the consultation rooms, after some of the clinic sessions had been observed, as it was not convenient for the participants to be interviewed prior to a morning clinic session. In both Cases the GPs' semi-structured interviews were undertaken at the end of the study period, as this timing was the most convenient for those doctors. The interviews took place in the GP's own consultation room. Their responses were audio-recorded and transcribed following the same procedure as for the NIP interviews.

Informal conversational interviews took place with the NIPs, between patients, to clarify any issues that arose, and to give the NIP the opportunity to verbalise some of their thought processes, regarding their decision to prescribe antibiotics, or not. These conversations were written contemporaneously in a small notebook, with quotes attributed, and typed out fully with all the observational data on return from the study area; a procedure advised by Emerson et al (2011) in their guide to writing ethnographic field notes.

3.10.3 Historical anonymised case notes

The NIPs were asked to produce ten sets of case notes where they had prescribed antibiotics in the weeks prior to consenting to take part in the study. The number of case notes required was discussed with a statistician for, in quantitative research, the sample size needs to ensure enough power to detect statistical significance and to answer the research question (Lacey 2010). The statistician calculated that in order to power the study appropriately, hundreds of case notes would be needed; a requirement that would mean going back to case notes that were several years old. The case notes would not be contemporaneous with the prescribing behaviour being observed, and the number would be too large for one researcher to evaluate within the timescale of the study. A decision was taken to limit the number of case notes to 10 for each participant, as

it was anticipated that this would be the average number of antibiotics prescribed in the previous month, as some of the participants only worked part-time.

No funding was available to pay the practices for administrative time, to print and anonymise the case notes, or for printing costs. This ensured that the notes were contemporaneous and reflected current practice; therefore, a pragmatic approach was adopted. In Case One the NIPs spoke to the IT lead and he agreed to print off the notes and the NIPs agreed to anonymise the data. However, in Case Two, there was no IT lead and so the NIPs offered to retrieve and anonymise the data themselves. This historical data was difficult to retrieve manually and proved to be time consuming for the NIPs. The NIPs had to go through each one of their clinic sessions and open each consultation, where they thought they might have prescribed antibiotics, such as a presentation of cough or sore throat. This was a cumbersome process as in many cases antibiotics were not prescribed. The NIPs commented, that they were surprised at how few times they prescribed antibiotics, and conversely how questionable some of their prescribing was. One NIP said 'I prescribed for sinusitis, what was I thinking?' (2b F), as she handed the anonymised notes over to me.

3.11 Data analysis

The process for data analysis is described in the paragraphs below and this analysis led to the findings reported in chapters four and five. Data were drawn from the non-participant observation of 200 consultations across two Cases and six NIPs when working as part of the 'duty' team, where they saw on-the-day presentations, which consisted of many patients with minor illness presentations. Also included are the data from the semi-structured interviews undertaken with the six NIPs and two GPs, one from each Case. The purpose of analysing qualitative data is to uncover meaning and provide thick description and the descriptive notes and interview transcripts require analysis to assign meaning and explanations to the findings (Pope et al 2007)

Case study methodology, as described by Yin (2014), lends itself to various qualitative measures of analysis; one measure is not preferred or prescribed over another. Drawing on the principles of Braun and Clarke (2006) their thematic analysis framework offered a flexible approach, which could be used across the spectrum of methodologies and across a variety of data sets; which was ideal for me, as a novice researcher, to use. The framework meant that it could be used across both interview and observational data. The framework from Braun and Clarke (2006), and how it was applied in this study, is presented in table 14.

Table 15 Braun and Clarkes thematic analysis as applied to this study

Braun and Clarke's thematic analysis	How it was applied in this study
Familiarising yourself with the data	All data were collected by the researcher, so when it came to analysis, some ideas and thoughts had already developed, and the descriptive words written on the field notes, later developed into codes. Field notes from observations were read and re read and transcribed. Audio-recorded semi-structured interviews were listened to several times and transcribed by the researcher
Generating initial codes	Codes from the field notes were underpinned with extracts from the observations and interviews as examples. Lumper codes were applied
Searching for themes	Codes were brought together into broader themes. When all data was collected it was reviewed further into overarching themes.
Reviewing themes	Themes were reviewed with extracts from all data sets. Themes were merged and overarching "candidate" themes developed.
Defining and naming themes	Overarching themes named using data extracts to support them. The Theme's name embodies the meaning of the data captured within it.
Producing the report	Findings reported with thick rich description in chapters four and five.

3.11.1 Observational Data

Data were analysed in a cyclical and iterative fashion (Braun and Clarke 2006). Yin (2014) suggests that data analysis should be ongoing throughout the research process as this approach can guide the researcher into areas they might want to consider exploring further. Although no theoretical framework was developed prior to data collection, knowledge gained from the literature review, together with personal experience, informed some concepts that required exploration. Pragmatic interpretivism guided the analysis; it was important to be open minded to new themes evolving and therefore both deductive and inductive approaches were undertaken (Braun and Clarke 2006). DeCuir-Gumby et al (2011) propose that the combination of deductive 'theory driven' codes alongside 'data-driven' codes enables some of the emerging hypotheses to be challenged

and disproved. The authors advise this approach in their guide to coding interview data, but it was equally applicable to observational data.

Observational data were analysed first, simply because they were the first data collected. Analytical memos were made directly onto the transcript of the field notes from the observed sessions, so the process of analysis had begun at this very early stage of the research inquiry (Saldana 2016) Data were read and reread, to ensure immersion, so that all the information was fully explored. While it is impossible for the researcher to record everything observed in the field, the observed data was put into context and illustrated the complex nature of the situation, by describing the clinical scenario of each antibiotic prescribing or non-prescribing episode. Emerson et al (2011) suggest adopting this approach in their guide to writing ethnographic field notes, and although full ethnographic methodology was not undertaken, aspects were adopted to write up. This approach ensured rich description, which is key in qualitative research, and in aiding the account to be credible (Denzin 1989). Many field notes were taken as all consultations were observed, rather than going in and out of the consulting room and trying to guess which consultations might be appropriate for use in the study. This method provided a good overview of the practitioner's workload and activities and added depth to the context, however, those details that were not related to the research inquiry were not included in the final write up. A tabulated overview of the presentations is provided for each case in the findings chapters, four and five, for reference.

3.11.1.1 Interview data

Interview data were initially coded, under themes from the questions asked; some of the questions were informed by themes developed from the literature review presented in chapter two. Although Braun and Clarke (2006) criticise this method as being purely deductive, the interviews were semi structured and allowed flexibility in asking questions and probing further to elicit more information. DeCuir-Gumby et al (2011) describe undertaking semi structured interviews as using both deductive and inductive approaches. More direct questions were added in order to answer the research questions such as' Does the GP influence your antibiotic prescribing?' and if 'yes' to what degree

3.11.2 Theming the data

Although themes are usually generated from coding they can be used to label and begin to analyse the data (Saldana 2016). Rubin and Rubin (2012) describe themes as statements that describe what is going on or why something is done a certain way. The themes are then winnowed down to overarching themes, to be explored in greater depth which, when brought

together, tell the full story. Both interview and observation data sets were analysed by drawing on the principles of thematic analysis (Braun and Clarke 2006). The resulting data were then triangulated to support or refute the emerging themes.

During the first part of coding, the themes from the literature review, together with the knowledge gaps identified, were used to inform the semi-structured interview questions, guiding the themes under which the data was grouped. Field notes were revisited, and where appropriate, added under these themes (Braun and Clarke 2006). The remaining data was read and re-read, and analytical memos applied, providing a brief description of the emerging theme (Saldana 2016).

Quotes were applied to the emerging themes; this method of coding is described by Saldana (2016) as 'lumper' coding (Appendix J). Line by line coding loses the meaning of the data and full responses to a question were required to interpret significant meaning. Lumper coding has been criticised by some (Charmaz 2008) as subtle nuances from the data might be missed; however, it suited the current research goals, and made the handling of data easier for this novice researcher. As themes emerged, they were coded in the same way using analytical memos, with 'lumper' coding to break the data up and make it more manageable.

> Eg in children, the flavour of suspensions. In order to aid adherence, the NIP prescribed clarithromycin for child with no allergy to penicillin "the amount of times we have parents ring up saying the child won't take the medicine because of the taste, you wouldn't believe" (1a) Theme: Adherence.

The section above demonstrates how the influence of the importance of maximising the opportunity to help the patient adhere to their medication regimen was coded. As illustrated in the quote, the NIP is aware of the unpleasant taste of the medication from her prescribing experience. This knowledge was an important consideration in her decision on which antibiotic to prescribe. Penicillin is first line treatment and clarithromycin is normally prescribed if there is an allergy to penicillin. Both drugs are appropriate according to guidelines, but the NIP chose to prescribe one drug over the other because of their concern about adherence.

Coding was cyclical and as the data was read, and re read, the codes were changed, and data moved around as a deeper understanding emerged. As Braun and Clarke (2006) advise, the data was revisited throughout the process even back to field notes to check that nothing was missed. Coding was undertaken by hand rather than using a software programme. Initially this method was decided upon as I had no experience of using such software, but as it happened the hands-on approach allowed me to feel ownership of the data and that I had a responsibility to the

participants to record and report all the meaningful information they had given me (Saldana 2016). The data were read through and highlighted with different coloured fonts as themes emerged, the same colour for that theme was then applied to subsequent data analysis, with a key to reference the qualitative descriptors applied. This process was extremely time consuming, but it was a robust method that ensured that no data were missed. The themes were then typed up with quotes and filed note jottings applied under each one. As the data were grouped into themes, and qualitative descriptors applied, it became evident which of the themes related to all participants and where the data in the themes seemed thickest; for example, 'clinical factors'. However, it should be noted that the importance of a theme should not be judged by how often it occurs, but by how important it is in answering the research question. Therefore, all the data were reviewed with my research questions in mind, and a rich description of the whole data set was produced. Braun and Clarke (2006) describe this method as valuable in under-researched areas. Themes were named by me to capture the meaning as succinctly as possible.

3.11.3 Evaluation of case notes

Simple descriptive statistics were used to analyse data from the evaluation of case notes. Percentages of appropriateness and inappropriateness are presented across all MAI indicators, in all of the case notes. Reviewer one was the researcher, reviewer two was a supervisor (pharmacist independent prescriber (PIP), and consultant antimicrobial pharmacist). Case notes were scored independently by both reviewers, four from each NIP. There was good inter-rater concordance, between the reviewers in all case notes. There was no difference in the scoring between the two reviewers on any of the items in the MAI tool. The remaining case notes were reviewed by the researcher. All notes were shredded after the evaluation had been undertaken.

3.11.4 Cross case synthesis

Cross case synthesis of the two Cases was carried out, drawing on the last three stages of Noblit and Hare's (1988) guide to undertaking meta ethnography. This type of analysis is usually carried out across a range of cases and by a team of researchers. However, since the researcher had undertaken the research in the two cases, the previous stages were omitted, as there was also no need to become familiar with the data before carrying out the translation and the authors suggest. The final three stages are:

Translating studies into one and other

Noblit and Hare (1988) describe one method of translation as 'reciprocal', and state that studies can be combined due to their similarities, as in the two case studies. When combining the data, the similarities were drawn together, and the differences identified. This *procedure* was carried out by re-reading the very familiar data from the study findings and mapping out the main themes using the same colour coding techniques that were employed when analysing the findings from each case. Noblit and Hare (1988 p28) call this process, the 'synthesis of texts'.

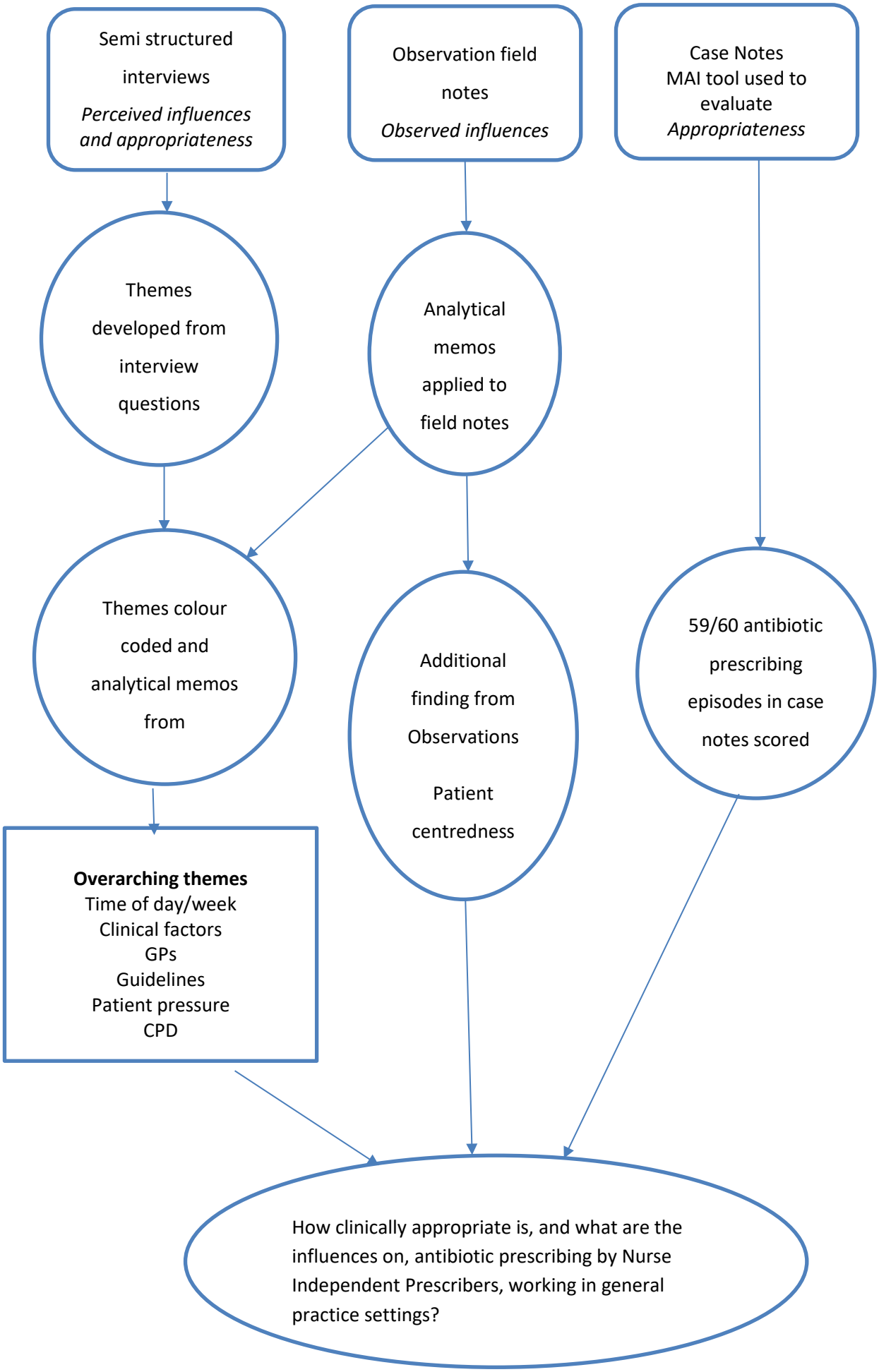
Synthesising translations

Synthesising was done by reviewing the main themes from each case and grouping them into metaphors. Noblit and Hare (1988 P28) describe this as 'second level synthesis' in which overarching concepts are developed. The metaphors applied were developed using quotes from the participants.

Expressing the synthesis

The synthesis was then written up and presented using metaphors, to ensure clarity and authenticity.

Table 16 Flowchart of development of findings



3.12 Reflexivity

As a nurse it might be assumed that I would be skilled in being reflective, as reflecting on cases is an inherent aspect of nursing. However, in research, reflexivity requires the researcher to be self-aware in the research process and make sense of how they have an impact on that process, while at the same time living the experience. Reflexivity has been defined as 'thoughtful conscious self-awareness' (Finlay 2002 p532). It is important that the researcher's knowledge and background is known to the participants, and also that the researcher's knowledge and background will have an impact on the study. The researcher will always have an impact on the participants; they spend time with the participants and are responsible for the interpretation of the findings. Therefore, reflexivity improves the rigour and credibility of the research (Finley 2002; McNair et al 2008; Alvesson 2011). It is imperative that the researcher identifies any bias that they might bring to the study, such as previous experience and knowledge of the subject area, as interpretation of the data and giving it meaning, is bound to be influenced by this prior knowledge (Cresswell 2009).

Finlay (2002) suggested that reflexivity should be threaded through the entire research process from inception to completion, using personal experience and what is known on the subject to identify the research question. Therefore, this thesis begins with an outline of my background, what I bring to the study and the rationale for undertaking the research. Reflexivity is threaded throughout this chapter, the findings chapter and finally the discussion chapter. To aid reflexivity this section is written in the first person (Webb 1992).

I worked in general practice as a practice nurse for 10 years and then in a nurse-led walk -in centre for almost another 10 years, where I was a nurse practitioner and independent prescriber (a NIP). I saw patients who presented with undiagnosed, undifferentiated conditions. Many presentations involved minor illness and/or minor injury; the presentations were very similar to those seen with 'on the day' appointments in general practice settings.

For the past seven years I have been the programme lead for non-medical prescribing at the University of Southampton, and I am very familiar with the guidelines for antibiotic prescribing, and the Royal Pharmaceutical Society's (RPS) competency framework for all prescribers. I regularly carry out assessments of non-medical prescribers in their practice settings, and therefore maintain links with clinical areas.

Practitioner research in familiar areas can be challenging, due to anxieties around potential researcher bias and the subjective nature of the findings (Reed 2010). However, my 'practitioner knowledge' (Meerabeau 1995 p32) guided the research question and the study, and it could be argued that without this knowledge and experience the study could not have been undertaken. As

an experienced nurse prescriber, it was key to acknowledge the impact this might have on the study. This clinical experience and knowledge enabled me to carry out the study, and also helped to recruit participants. However, it was important that this influence was recognised and that I remained reflexively aware throughout the study. I achieved this goal by keeping a reflexive diary during the fieldwork.

Reflexivity is integral to the research process. Therefore, the researcher should reflect throughout the study on how their own actions, values and preconceptions may impact on the research setting and possibly affect data collection and analysis (Gerrish and Lacey 2010). Lincoln and Guba (1985) suggest that keeping a reflexive diary throughout the research process, in which decision-making can be explored and reflected upon, is good practice for both the interpretation of data and the research process itself. Strauss and Corbin (1998) stress the need for objectivity in qualitative research, but it has to be recognised that this is difficult to achieve when researching a familiar area, with participants that the researcher may have had a professional relationship with (Watson et al 2010)

There were also times during the study when I also found my non-participant observation role difficult and I wanted to examine the patient myself. For example, in Case One a patient presented with earache and discharge. The NIP thought that there was a small perforation in the tympanic membrane (ear drum), but she had difficulty seeing clearly, due to discharge in the ear canal, which was obscuring the ear drum. I have a lot of experience in this area, and wanted to help, but obviously, I was unable to examine the patient. This experience was acknowledged by the NIP; after the patient had left the consultation room, she said 'I would have loved if you could have looked in that ear'. Hay-Smith et al (2016 p9), refer to my feelings, as the researcher's 'desire to help', an especially sensitive situation with the participant knowing that the researcher has clinical expertise in the area. The authors describe how experienced nurse researchers identify with the clinical environment, and clinicians so much that they do not want to disclose negative information that might reflect badly on their profession.

Some authors propose that remaining unbiased during observation is unachievable because as human beings we interpret and construct meaning subjectively (Gray 2009), and the 'observer paradox', as described by Labov (1972), when the observer contaminates the setting and modifies the behaviour of those being observed, will always be an issue. However, through recognising this effect, by thoughtful reflexivity, and combining different data collection methods observer interference and influence can be mitigated. (Hazel 2015; Polit and Beck 2010)

Although clinicians are more likely to agree to take part in research if they know the researcher professionally (Silverman 2010; Mc Evoy 2001), they may also be concerned about being judged by

that researcher just because he or she is so familiar with the clinical context of the research (Chew-Graham et al 2002). One of the participants did vocalise this concern prior to observation; however, I was able to reassure her that my role was not to judge, but to explore what was happening in this under-researched area. I reiterated that she could withdraw at any time and I asked if she wanted me to leave. This explanation reassured her, and she became so comfortable with my presence, that she reported that she missed me sitting in the corner of her room, at the end of the study.

In my researcher role, I was not giving any of the participants either feedback or guidance. I was also conscious of one of the NIP's discomfort at the start of my observation sessions and although it quickly resolved, I didn't want her to think that I was judging her. So, I tried to make light of what I was doing, by saying that I was just there to understand what was happening in this under researched area. Although in fact, rather than supporting the NIPs, I would be reporting what they were doing to the outside world, and in effect opening them up to judgement from others.

Finlay and Evans (2008), in their paper on ethical dimensions of relational research, describe this as an ethical dilemma, trying to reduce the impact of the presence of the researcher and trying to adjust the power imbalance between researchers and participants. To counteract this unequal power dynamic, I gave the participants a voice, so that they had some input into the research rather than just being reported on. Finlay and Evans (2008 p7) describes how researchers can feel uncomfortable about treating participants 'as objects' to 'talk about', rather than as persons to 'talk with'

The last data collected were the historical case notes. I took the case notes away from the research setting area for evaluation at the end of the study period and had no further contact with the NIPs. Hillier and Vears (2015) discuss the probability that practitioner participants will expect feedback and suggest that the participants should be made aware that this is not part of the research process. I specifically made all participants aware of this proviso from the start. I would like to have contacted them to reassure them that they had done well, but instead I was now going to talk about them with my supervisors and to write about them; an outcome which caused me some considerable discomfort. Although it can be uncomfortable to leave the research area and have no more contact with the former participants, Finlay and Evans (2008) suggest that it is important to do this and any consideration of member checking, where findings are sent to the participant to read and check for accuracy, should be thought through carefully. Although member checking is considered by some to validate the data, it is risky as participants' memories of what they said or did may differ from the researcher's interpretation; such a dissonance could potentially derail the study. Therefore, for these reasons member checking was not carried out.

McConnell-Henry et al (2010) advise that participants should be thanked for their contribution to the body of the research. Participants were sent a thank you card and a small gift after disengagement with each case.

3.12.1 Emic and Etic perspectives:

Emic and etic are two different approaches to the research question. An etic approach is aligned with deductive methods coming from the outside and applying tests to develop knowledge. An emic approach is inductive and is undertaken to develop an understanding of the insiders' perspective.

Yin stated: 'an emic perspective attempts to capture participants' indigenous meanings of real-world events' (2010 p.11).

While I took an emic approach, there was some conflict with my role as researcher coming from the outside in, with pre-existing theories and hypotheses that guided the study. The tension between the two approaches is widely recognised and some authors would argue that both perspectives are necessary to gain understanding of the phenomenon being investigated (Agar 2011). In order to provide a more objective report on the findings, than those with an emic perspective, Holloway and Todres (2010 p 167) advise taking the view of the 'cultural stranger'. Emerson (2011) describes how an observer can set themselves apart from the participants by writing, indicating that their priorities differed from the participants. I used this technique to disengage somewhat, and to try to distance myself from the consultation. However, I also had an understanding of the insiders' perspectives due to my professional and clinical experience, and at times I was a little uncomfortable maintaining this etic approach. As the researcher I did not like being an outsider.

The tension between the two perspectives was difficult for me to deal with and I trod a fine line between the two. My position was challenging at the time, as it was essential that I remained balanced between both perspectives. However, providing rich description and using the participants' voices, limits the researcher's application of their own subjectivity when analysing data (Yin 2010).

3.13 Chapter summary.

This study aims to explore the appropriateness of and influences on the antibiotic prescribing of NIPs working in GP settings. How underpinning epistemological and ontological perspectives have guided the choice of methodology and methods has been investigated as well as demonstrated.

Case study design was undertaken, using both qualitative and quantitative methods, semi structured interviews, non-participant observation and evaluation of case notes. The participants were NIPs working in general practice and directly employed by the GPs. Quantitative date analysis from the evaluation of 60 case notes, was undertaken using the validated MAI tool (Hanlon 1992) to assess the appropriateness of the NIPs antibiotic prescribing. Qualitative data from eight semi-structured interviews and non-participant observation of 200 consultations were analysed, drawing on the principles of Braun and Clarke's (2006) thematic analysis, to determine both the appropriateness of, and influences on, the NIPs antibiotic prescribing. Further cross-case analysis was undertaken drawing on the principles of the guide created by Noblit and Hare (1998) using meta-ethnography to draw together the similarities and differences in the cases and to identify key findings. The overarching themes are presented, using metaphors developed from the participants' voices. Reflexivity is threaded throughout the researcher's actions, adding to the study's rigour and credibility. Strategies to demonstrate trustworthiness and robustness were employed to ensure the quality of the research. An ethnographic approach to presenting the findings in the next chapter allowed for a rich, thick description of the cases.

Chapter 4: Case One

4.1 Introduction

In this chapter, Case One will be introduced and the research findings presented. Information was gathered from semi-structured interviews, observational data and analysis of case notes. The participants' voices and field notes are used to demonstrate the emergence of themes and initial conclusions. The use of all data sets supports the analysis, providing the opportunity to interrogate the themes, seeking those where the two are either similar or different. This triangulation of the data sets adds to the validity and rigour of the conclusions and increases confidence in the analysis of the influences on, and the appropriateness of, the NIPs antibiotic prescribing. Data from Interviews are identified by the letter I, and data from fieldnotes are identified by the letter F.

4.2 The Case

The study was undertaken at a semi-rural GP practice in the South of England. The practice had approximately 11,600 practice for doctors training to become GPs, and it was a clinical placement for medical students during their training.

There were three nurse practitioners, a lead practice nurse, three senior practice nurses, a practice nurse, two health care assistants and a phlebotomist. The practice also had administrative staff, which included secretaries, a business partner, receptionists and a patient service manager/deputy manager. The practice reception and phone lines were open between 8.30am and 6.30pm Monday to Friday. As well as pre-bookable appointments patients could access on the day appointments with the duty team which consisted of a GP and the nurse practitioners.

In the month preceding the study period, the antibiotic prescribing data for the practice was accessed through a public information site. The overall antibiotic prescribing (number of prescriptions issued) item-based Specific Therapeutic group Age-sex Related Prescribing Unit (STAR-PU) was on the 39th centile, just below the national median. STAR-PU is a value calculated to reflect not just the number of patients in a practice but their age and gender as this information can affect prescribing rates.

The number of prescriptions for broad-spectrum antibiotics, which for the most part should only be prescribed after other treatment has failed to avoid drug resistant bacteria developing, was on

the 93rd centile, way above the national median. These results are for the practice, as a whole and all prescribers, individual prescribing data is not publicly available.

4.3 The participants

Within this practice setting there were three NIPs who consented to participate in semi structured interviews and observation of their practice. All NIPs in the practice consented to take part in the study. Each NIP was observed for 12-16 hours, in their role as 'nurse practitioners' managing on the day presentations, as part of the 'duty' team. The 'duty' team consisted of one GP and two NIPs in the morning sessions 8.30-1pm and one GP and one NIP in the afternoon sessions 1pm-6.30pm daily.

Participants are referred to as 1a, 1b and 1c to maintain anonymity. Each NIP in this case came to the practice from other settings, where they were already established nurse practitioners and independent nurse prescribers. They were not trained into the role by GPs in a general practice setting. They came from similar backgrounds; the emergency department of the local general hospital, nurse led services such as walk in centres, minor injuries units and the Out of Hours service. They had all worked with each other at some time in the past and knew me from working in the WiC where they had all worked for a period of time. Participant 1b had worked in several other GPs practices prior to this one, the others had only ever worked in this GP practice. They were all female and had been educated to different academic levels.

Table 17 Participant demographics

Participant	Gender	Age	Level of academic achievement	Length of time qualified as nurse	Length of time qualified as NIP	Length of time working in general practice
1a	Female	58yrs	No degree	35yrs	6yrs	6yrs
1b	Female	50yrs	MSc	24yrs	8yrs	8yrs
1c	Female	38yrs	BSc	16yrs	9yrs	2 1/2 yrs

Participant 1a volunteered to take part in the study and then helped recruit the two other NIPs in the practice by sharing the participant information sheet with them. She was very keen to take part and was very clear that she was not concerned about her practice or any judgements of it. When discussing the findings, from the study, she said 'I don't care what you write about me' Participants 1b and 1c were initially a little more cautious and feared 'being judged'; however,

after a time they became much more relaxed and comfortable with a researcher- observer in their consultation rooms. The NIPs worked in this role all of the time; they did not undertake any other duties as all chronic disease management was undertaken by practice nurses.

Initially consent to participate was given by the NIPs only. The GPs agreed that a researcher could come into the practice to undertake the study with the NIPs but did not initially consent to participate in the study themselves. However, one GP did consent to an interview at the end of the study period.

4.4 Findings

The study was undertaken at the start of the influenza ('flu) season. On arrival at the practice there was an overwhelming number of signs and promotional information for the 'flu vaccine, including banners and purple balloons. At a quick glance there were no visible posters related to antibiotics. On another day the number of posters on the walls of the waiting room was counted and there were 80. Only one of them related to antibiotics and sore throats, advising patients that most sore throats were resolved without the need for antibiotics.

Access to the research area was welcoming and efficient, as the NIP had informed the receptionists that a researcher was coming to the practice. Introductions were made to the practice manager, at which time a confidentiality agreement was signed, and to the duty GP who shook my hand and smiled but did not speak any further. No questions were asked about the study.

In the consultation room the study was discussed with the NIP and the consent form signed. She took the poster informing patients that a researcher was present in the consultation room to reception where it was displayed at the section where patients booked in.

The process by which the duty team manage the patient list, was discussed. The GP and NIPs chose patients from computerised list of patients requiring on the day treatment. Those with ongoing problems were advised to make a routine appointment with the GP. There was some negotiation with the GP about the patients on the list and who should take what; for example' the male GP jokingly said that the NIP should see the patient on the list with a gynaecological problem as he wasn't comfortable seeing that presentation. There was friendly interaction between them. NIPs left patients on the list for the GP to see if they felt that they were not competent or confident to manage the presenting complaint. They worked within their scope of competence, which is a requirement of their professional body, the NMC. At some times during the observed sessions, the NIPs were unable to choose which patients they saw, because the GP was busy or

out on calls. In this instance, they assessed the patient who has been waiting the longest time or seemed to be the most unwell. When these patient presentations were outside their scope of practice, they were triaged by the NIP to ensure that they were safe to wait for the GP. If they were not safe to wait the patients were referred to secondary care, either to the emergency department or directly to an assessment unit.

Appointment times were generally 10 mins but there was flexibility in that, so in most cases there was no time pressure on the NIP being observed, which meant that discussions could be had in between seeing patients. Occasionally, when the practice was very busy, there was less time to discuss cases: a situation that most frequently arose in the afternoon when there were fewer staff in the 'duty team'. The number of patients seen by each practitioner was available to view on the computerised system by the GPs and nurse practitioners. One NIP observed that there was no indication that any management action had ever been taken if someone seemed to be seeing fewer patients than their colleagues. The patients were given a time to attend by the hour, so for example they were told to come at 10am and then they will wait their turn.

The consultation room had a removable sign on the door so the sign could be changed depending on who was using the room; it would have 'nurse practitioner' on it rather than the name of the NIP. The room was quite small with a chair for the patient, a couch, a desk with computer and telephone and a trolley with some equipment. When I was there the NIP removed the trolley to make more room. There were shelves above the desk and there were up-to-date British National Formularies (BNF), which is a publication from the British Medical Association and the Royal Pharmaceutical Society providing up-to-date information about medicines: a BNF and a BNF for children. There were no posters on walls about antibiotics or any medicines or illnesses. Just posters about informing patients that they could ask for a chaperone if they wanted one; a poster about health and safety and a framed picture of the GP and his family on the wall. A position was taken up by the researcher which was out of the eye line between the NIP and patient. A small notebook was used to write field notes, and no engagement or involvement in the consultations was undertaken by the researcher.

The NIP collected patients from the waiting room and reminded them that there was someone else in the room observing, as she guided them towards the consultation room, she introduced me as 'Francine from the university' or 'my colleague from the university'. As a training practice, the GPs often had medical students working with them, and patients seemed very comfortable with observers in the consultation room. No patients objected to having an observer in the room, several said 'hello' but most did not. This process was carried out by all three NIPs in this Case.

Two NIPs (1b and 1c) were observed in three, four-hour sessions and one NIP (1a) in four, four-hour sessions. In the fourth observed session with 1a no new findings emerged. Minor illness presentations were similar in each session and the management was consistent throughout, so a fourth observed session with the other two participants was not considered necessary

Table 18 39.5 hrs of observed sessions 14/9/16 - 28/10/16

Participant	Day and time	Number of patients	Potential to need antibiotics	Treated
1a	Wednesday 2-6pm	9	3	3
1a	Friday 9-1pm	8	5	4
1a	Wednesday 2-6pm	13	6	3
1b	Monday 2-6pm	8	5	3
1b	Friday 9.30-1pm	4	3	2
1c	Monday 9-1pm	7	4	4
1b	Friday 2-6pm	10	8	5
1c	Monday 9-1pm	9	6	1
1c	Tuesday 9-1pm	7	3	1
1a	Friday 9-1pm	15	10	3
Total		90	53	29

Table 19 Presenting complaints Case One. 92 presentations

ENT & Lymph	Respiratory	Abdominal	Neurological	Musculoskeletal	Cardiac	Skin	Other
Earache n=10	Cough/chest infection n=12	UTI n=7	Dizzy n=1	Knee/foot/shoulder pain n=8	Chest pain n=1	Wound/skin infection n=7	Fever/unwell n=1
Sore throat n=9	Wheeze n=2	Abdominal pain n=4	Trapped nerve n=1	Back pain n=3		Rash n=7	Cold n=1
Red eye/infection n=4	SOB n=1	Diarrhoea n=1	Headache n=1	Fall n=3		Eczema n=1	Check up after RTC n2
Sinus problem n=2				Swollen leg n=1		Bee sting n=1	
Sore mouth n=1							
n=26	n=15	n=12	n=3	n=15	n=1	n=16	n=4

Table 20 Diagnoses and antibiotics prescribed

	Soft tissue infection	UTI	Community acquired pneumonia	Otitis media	tonsillitis	sinusitis	conjunctivitis	URTI Delayed prescription
Amoxicillin			n=3	n=4		n=1		n=2
Flucloxacillin	n=8							
Clarithromycin	n=1				n=1			
Doxycycline	n=1		n=1					
Co-Amoxiclav	n=2		n=1					
Nitrofurantoin		n=2						
Chloramphenicol Eye drops							n=2	

Table 17 provides an overview of the presentations seen by the NIPs during the study period. Some patients had more than one presentation, for example sore throat and earache, which is why the number of presentations is higher than the number of patients. The commonest presenting complaint was cough/chest infections. Respiratory tract infections are usually self-limiting viral infections which do not need treatment with antibiotics. Prescribing for upper respiratory tract infections (URTIs) was appropriate as delayed prescribing was used. Lower respiratory tract infections (LRTIs) were treated appropriately with antibiotics by the NIPs in 25% of those patients who presented with symptoms. Prescribing for sore throats, a condition which is also usually of viral origin, was appropriately low with only one of the nine sore throat presentations, treated with antibiotics. Soft tissue infections which included wound infections were the conditions where antibiotics were most frequently prescribed (see table 18).

4.5 Influences

Influences on the NIPs antibiotic prescribing, that were observed, and discussed during the semi-structured interviews are set out in themes below.

4.5.1 Clinical factors

Clinical factors were perceived to be an influence by all NIPs in the interviews. It was the first thing that they all said when asked about what influences their antibiotic prescribing:

> "How unwell they are, their signs and symptoms" (1a. I. 7)

> "First and foremost I'm looking at the patient in front of me….erm, whether they're well or not" (1b. I. 39)

> "Whether they're systemically well, unwell.." (1c. I. 12)

This influence was also evident in the observed practice. There were patterns of practice common to all the NIPs. They took a full history from the patient or carer, carried out physical examinations on all patients and recorded their clinical observations, temperature, pulse, oxygen saturations, respiratory rate and blood pressure where necessary. However, all patients were seen and treated as individuals, meaning that all subsequent decisions were made looking at a range of factors as outlined below. The NIPs tailored their decisions to individual patient's circumstances and provided a rationale when prescribing off-guideline. When the patients were unwell and needed treatment, the NIPs were very much attuned to the potential risks and acted quickly and decisively. For example after examining an unwell 23 week old baby who had otitis media, a fever and was not feeding well, the NIP prescribed antibiotics, and gave the mother precise advice on how to recognise worsening symptoms and when to bring the baby back, when asked for her thoughts afterwards she said:

> 'That wasn't open for negotiation, I felt that she (the baby) needed some intervention today' (1b. F)

Similarly, 1c was very directive when she saw a patient who had undergone a femoral popliteal bypass graft, to improve the circulation in his leg. He presented with an inflamed sloughy wound and she was very concerned. A swab of the wound had been taken by the district nurse and the result was available to view on the computer, the NIP checked it and said "there's no growth" an indication that the result was showing that there was no infection. She did however prescribe antibiotics. With her clinical knowledge and experience of infection, the patient's clinical signs and symptoms led her to conclude that there was infection despite the report from the lab stated that no bacteria were identified on the swab taken. When asked her rationale, she said:

> 'I'm going to treat that as a surgical wound infection even though the swab is negative…. we need to save that graft' (1c. F)

In both these instances, the NIPs decided to prescribe without much shared decision making between the prescriber and the patient. Shared decision making is advised as best practice, as it helps the patient understand why they need to take the medication and to check that they are willing to do so (RPS Competency Framework 2016). The perception of worsening or poor outcomes for the patient was the driver behind this behaviour. In other circumstances, where antibiotics were prescribed, this behaviour was not observed. The NIPs concern for these patients was evident to see; they were very serious and showed this concern, both in their language and behaviour, making sure they prescribed antibiotics and arranged follow up for the patients. On follow up both of these patients' symptoms were much improved.

The GP interviewed described the NIPs as having excellent clinical skills:

'Clinically they're fantastic… they do a brilliant job' (GP. I. 23)

The NIPs were also able to make decisions quickly when patients appeared well; however, they always carried out a full examination and listened to the patient's concerns, demonstrating an awareness of their professional responsibilities. In one case an eight year old girl presenting with earache and cough skipped into the consultation room with mum and brother following behind; the eight year old patient appeared very well. The NIP listened to the child telling her own story: she had earache and couldn't hear the teacher very well in school and had developed a cough. Her observations were taken, a full ears, nose and throat (ENT) and respiratory examination was carried out. The child and mum were told that she had a viral illness and so self- management advice was given. They left happy. The NIP was asked if she had decided not to treat with antibiotics, when she saw the child skipping into the room, she said:

> 'No.. it was when I saw her running around the waiting room… but you have to be careful, sometimes those ones bite you on the bum' (1b. F)

The overarching theme of clinical factors had many subdivisions. The clinical condition of the patient, whether they were systemically well or unwell, was not the only influence seen. There were various other clinical factors observed that had an influence on antibiotic prescribing.

4.5.2 Co-morbidities

Underlying medical conditions were considered by all NIPs, for example when treating a patient with oral antibiotics for folliculitis, a condition that usually does not require antibiotic treatment the NIP said that the patient had insulin dependent diabetes (which can make some patients more prone to infection) and this condition had influenced her:

> 'I would just have given the Dermol (a skin wash containing a mild antimicrobial) if she didn't have diabetes' (1a. F)

Throughout the observed sessions the NIPs were seen to check the computer for patients' blood results, as well as their renal and liver function prior to prescribing. These are key indicators of the patient's ability to metabolise and excrete a drug and are therefore very important. The NIPs also checked the co-morbidities and medication the patients had been prescribed recently, as well as in the past. When they were about to write the prescription, they would often say: 'I see you've had this in the past, how did you get on with it'. This is also an effective way of assessing possible non-adherence to the medication regimen, which is another example of good practice.

This good practice was also identified during interview, when discussing the major influences on their prescribing:

'Their age, co morbidities, current medication that they're taking' (1c. F)

The patient's medical condition and the medication taken which caused immunosuppression and increased risk of infection was also seen as an influence, a patient who had rheumatoid arthritis and was on a drug, Methotrexate (which can suppress the immune system) was treated with antibiotics for a laceration on her lower leg which was not healing. The patient also had swollen legs due to fluid retention. NIPs used their knowledge of medical conditions and medications when making an assessment whether oral antibiotics were appropriate and necessary. The NIP explained to the patient why she was giving antibiotics:

'You don't have a very good blood supply because of the swelling and fluid in your legs, so you need some antibiotics to help heal that up' (1b. F)

Conversely another patient with a similar wound that was not healing, but with no underlying medical condition was treated with a topical antibiotic cream, when asked why oral antibiotics had not been prescribed the NIP said:

'it's very localised….. we'll wait and see' (1a. F)

In the case of a teenage girl the option to have a topical antibiotic cream or oral antibiotics was also thought through, and considered by the NIP, again reflecting what they said at interview about seeing the patient in front of them; viewing them as a whole rather than just symptoms. This was also noted by the GP:

'They think things through very well' (GP. I. 9)

In this case the teenage girl had a lesion on her face diagnosed as impetigo (a skin infection). The NIP considered both topical and oral antibiotics. Although not a serious infection, the lesion was quite small, and the patient was very well; the age and gender of the patient had an influence here. The NIP was concerned that the infection should be resolved quickly so that it would have as little impact on the girl as possible. The trial of a topical cream might have been unsuccessful, and this type of infection can spread rapidly, leading to many unsightly lesions. The NIP weighed up the options and chose the one that she knew would work, to avoid unnecessary distress for the patient:

'I might have prescribed something topical like Fucidin (an antibiotic cream) if it had been somewhere else' (1a. F)

4.5.3 GPs role and view of NIPs antibiotic prescribing

During the observed sessions and the interviews, it was apparent that the NIPs and GPs had a mutual respect for each other's knowledge and experience. When asked if the GPs influenced their antibiotic prescribing the NIPs all said 'yes'. This influence was observed to be on the choice of antibiotic prescribed, rather than whether an antibiotic was necessary. There was a very friendly professional relationship observed between the NIPs and the GPs. The latter never appeared harassed or questioned why the NIPs asked their advice or asked them to see a patient. The GP reported that the NIPs generally only requested support after a careful consideration:

> 'When they come and ask you a question they're sort of asking very sensible very intelligent questions. Either or normally they have in mind what they're going to do and they're just seeking an agreement that that's the way forward.. and easily 90 percent of the time it is entirely sensible or they're sort of say help I don't know what to do, and probably 50% of the time we don't know '(GP. I. 9-13)

The list was managed between them, with the NIPs taking most of what appeared to be minor illness presentations, rather than potentially more complex patients, or those presentations that they felt outside their scope of practice, for example a very elderly patient who had a presenting complaint of 'difficulty sleeping at night'.

The NIPs sent messages to the GP and each other on their computer screens about patients, sometimes asking questions or sometimes saying that they had left a patient in the queue for the other and why.

NIPs were very familiar with minor illness and antibiotic prescribing but were also very aware of the GPs depth of knowledge and experience in primary care. They verbalised this many times throughout the researcher's time there, and were very keen to make it clear that they were not mini doctors. The NIPs said that they could not take on the GP role: they were part of a team. The NIPs managed conditions within their scope of competence and to an extent defined these themselves by choosing conditions from the list of presentations that they felt comfortable to manage. These conditions were mostly minor illness and minor injury presentations

The NIPs sought advice from the GP when cases were more complicated, for example, when patients had co morbidities or allergies. NIPs 1a and 1c were observed asking for advice from the duty GP several times; they always prescribed as advised by the GP, and when asked if they were happy to prescribe as the GP suggested, they said that they were; adding that they could see the rationale behind the prescribing decision.

During interviews, they were also able to describe instances when they would seek advice from the GP:

> 'When someone's probably got a whole load of resistances or sensitivities ermm allergies, if they've got chronic renal failure, AKI(acute kidney injury) that kind of stuff ermm, if their ALTs (alanine aminotransferase, an indication of possible liver damage) bloods or something are abnormal, those kind of things, and I'm thinking that giving them something might be more detrimental for them, rather than good for them, then I probably would go and ask, just check that I'm thinking about the right antibiotic to give' (1c. l. 53-57)

When asked if they were generally happy with the advice given when they sought it, they all said that they were:

> "Yeah definitely yeah" (1c. l. 59)

The NIPs were confident and satisfied with the GP's decisions when they asked advice from any of the doctors in the practice. This was not the experience reported by 1b, when she worked at other GP practices. She had worked in two other GP practices and described some of the prescribing there as "very bad", which was the main reason why she moved on from them. In the other GP practices, she was expected to see the same patients as the GPs. She reported that this was an unrealistic expectation, that she was a nurse practitioner (NP) and not a GP. She described her current practice as being so much better than her previous two. The GPs were very aware of what the NP's role was, how the NP can support the GPs, and how an NP can work as part of a team. In her current practice the NP's role was well established. This practice had piloted the role for some years before employing the NP on a permanent contract; 1a had been involved in that pilot project. 1b described the practice as a welcome change from her previous experiences where she felt prescribing practice was poor:

> 'I feel able to go round and say what am I going to do here? and to get a decent answer and that definitely wasn't the case in previous practices where I'd sometimes come away and feel that I'd got the wrong answer (*laughs*) and then you're stuck aren't you (*Laughs again*)' (1b. l. 178-181)

4.5.4 Learning from each other

In a reversal of roles, it was interesting to note that there were times when the GPs sought advice from the NIPs. In one instance the GP was aware that an antibiotic that covered strep infection was required, she contemplated prescribing Co Amoxiclav but then reconsidered as this is a broad spectrum antibiotic with potentially serious side effects. She sought the advice of the NIP and asked which antibiotic the NIP thought would be suitable. The NIP advised her and she took that

advice. During interviews the NIPs were also able to recount incidents where this role reversal had occurred:

> 'Yeah, yeah, we had a lady with a UTI and one of the GPs came to me and said this lady has allergies to this this and this, she was allergic to Penicillin, allergies to trimethoprim.. Nitrofurantoin, her eGFR was rubbish, and it was like 'what would you give her?' (1c. I. 159-161)

They talked about times when they learned from each other in a very open and non-judgemental way. When asked about support in their role, and whether the GPs ever questioned what they had prescribed or why they had prescribed they said no. Any query was usually because the GP was checking her/his own knowledge and was keen to keep up to date:

> 'Yeah, erm they have done, not in a negative way but just oh, I see you did that with that patient, why did you do that? Is that something, almost like they'd ask me as if they were missing or something they needed to be updated on. Erm and you know really open into looking into things if we've brought something new to them' (1b. I. 185-181)

And there were instances when the NIPs felt able to correct the GPs prescribing and told them that they were not prescribing the correct dose and duration of treatment for a patient with tonsillitis:

> 'I can probably think of a few GPs where the dose is.. I saw someone with a tonsillitis where they had Penicillin 250(mgs) as an adult dose 4 times a day for 7 days, I said well I always give 500mgs and they were like "really, do you !" They say," I've only ever given 250(mgs)". That's a sub therapeutic dose you know, that's a common bread and butter one, so there is that a lot the GPs come and ask us about, the right antibiotic, what should we give this person.. I think they are swayed by what we say to be honest. I think ... I think they respect us as much as we would respect them because this is what we're doing every day..' (1c. I. 150-157)

This acknowledgement of the NIPs' expertise was reflected by the GP when asked what he thought about their antibiotic prescribing:

> 'Probably better than us to be fair, in all honesty I think probably better than us. It's difficult yes, we see the subset of patients who come back to us saying basically we didn't get anything from the nurse practitioner, so we thought we'd try a doctor and actually I think, almost without exception when you look at their decision and their rationale for that decision they're right, they're right and they've probably gone to much greater pains than we do to justify their rightness both in terms of their documentation and in terms of their explanation to patients' (GP.1. 25-30)

The clinic sessions were generally very busy, and the NIPs and GPs worked flat out to get through the list of patients, but the GPs always took time to come and see the patient when asked or were

happy to have the patient sit back in the waiting room for them to call through. The NIPs felt very supported by this behaviour:

> 'yeah I feel really really confident to just ping messages back to GP and say I've got a patient, this is the renal function, BNF says this, I want to do this, what do you suggest and really, you know, good sound answers or they'll come through and have a chat, yeah there's great support really, I mean I can't fault it' (1b. I. 188-191)

The NIPs also asked the GPs' advice when they were concerned about a patient that might require hospital admission or they were unsure of the diagnosis. They were quite explicit when they were unsure and were very comfortable asking advice from the GP. When asked why the NIP had referred a patient with a possible chest infection to the GP she said:

> 'I'm not happy, there's something about him, I'm not sure what's going on …. Apart from wheeze his chest sounds quite bubbly but there's no sacral or ankle oedema' (1c. F)

The GP views the NIPs as generally very competent in managing minor illness:

> 'In the context of antibiotics they are very, very good, more than capable, more than comfortable, and do make their own decisions with no reference to us….. but they will refer people to us when they have someone who is medically complex and challenging' (GP. I. 57 -59)

4.5.5 Peers supporting each other

The NIPs were observed asking advice from each other but only a few times. Advice was sought when they were unsure of a diagnosis, rather than asking advice about what to prescribe. They also asked advice from the other nurses in the practice, such as the practice nurse (PN) who ran the asthma clinics. She was not a prescriber but 1b asked her advice when prescribing a new inhaler for a patient. She sent a message on the computer asking for advice, the PN came into the room and spoke to the patient and asked some questions. 1b prescribed as she advised. There was mutual respect and professional etiquette between the nurses.

When asked at interview, if they were influenced by their peers, they all said 'yes', the interpretation of their response was that they felt supported by their peers, as they had discussions with each other about what they have prescribed with each other:

> 'Yeah I think we do actually cos we all do it slightly, I would say we all do it slightly different, chatting to other people there's things like you've done ..and talking about medicines I would have done one thing and they would have done another I think we're pretty good, most of it is guideline based but dose wise I might sometimes change, I think we all learn from each other as well so yeah, I think we probably do' (1c. I. 28-32)

When asked about peers during interview 1b included GPs in her answer, 1a and 1c only talked about the other NIPs. 1b had worked in several other practices and had worked in this general practice setting for the longest time. She felt that she had as much in common with the GPs as with the other NIPs. Initially this seemed strange as she and the other two NIPs were clear that the GPs were much more experienced and had a greater depth of knowledge than they had. However, in relation to minor illness and antibiotic prescribing they were peers and clearly the NIPs and GPs learned from each other.

4.5.6 Guidelines supporting good prescribing

In the interviews the NIPS said that clinical guidelines influenced their prescribing both local and national. They were able to discuss how they use the guidelines and describe how they used the information within them to decide on the best treatment for patients:

> 'Yeah, I suppose generally I stick to them as much as I can unless I've got a good reason not to….. I'll look at a guideline and say well ok that's fine but that's going to interact with that drug and I don't really want them to stop that so that will influence my prescribing as well' (1b. I. 92-94)

The NIPs knew the contents of the guidelines and did not need to look them up. They described using guidelines as a quick reference but were not critical of the quality of the evidence within them, which they presumed was good:

> 'Yeah I use them as a short way, I know you've got a reference list at the bottom and I might pick a few like the BTS guidelines or SIGN guidelines, I might look at those more in depth if I know they've changed, where that's come from but otherwise I use it as a short summary kind of ... what you treat..what you diagnose that kind of stuff' (1c. I. 69-72)

> 'I suppose I'm just guided by the fact that these are just national guidelines that are accepted at a higher level and sometimes that just has to be enough for me (*laughs*)' (1b. I. 102-103)

Throughout the observed sessions, and in the review of case notes, the NIPs on the whole prescribed antibiotics in line with national and local prescribing guidelines. They prescribed the correct drug, dose and duration of treatment. Where there was any deviation from the guidelines, they were all able to articulate a clear rationale for their decisions. They chose the antibiotic within the guideline that suited the patient best, so it may not have been first line drug indicated; when promoting adherence as discussed below.

The GP recognised that the NIPs were more comfortable working within the guidelines than the GPs and echoed the NIPs assertion that the level of training and experience differed between themselves and the GPs:

> 'I guess you could say that the.. the different way we're trained, the different depth and breadth of experience we have, we're probably slightly better at winging it whereas they're probably more comfortable working in.. with something that's more sort of formulated' GP. I. 13-16)

4.5.7 Adherence to medication.

Improving adherence to the medication regime was a key influence when deciding on the antibiotic and the formulation chosen. For example when trying to improve adherence, the flavour of a suspension was identified as an issue. When prescribing for a child with no penicillin allergy, clarithromycin (a macrolide) was prescribed because it does not have such a bitter taste. This drug was within the guidelines but indicated for use if the patient had an allergy to penicillin:

> 'the amount of times we have parents ring up saying the child won't take the medicine because of the taste you wouldn't believe' (1a. F)

A similar decision was taken by another NIP to prescribe clarithromycin when the patient did not have an allergy to penicillin, this time it was the duration of treatment that was the influence. The course of penicillin is ten days and the course of clarithromycin is seven days. The 17 year old patient had previously been prescribed penicillin for her tonsillitis, the NIP was concerned that she may not completed the course and asked the patient how she had taken the previous course of antibiotics; in particular, had she taken them as prescribed. The NIP was not convinced that the patient had managed to take the tablets four times daily for ten days:

> 'I'm not sure she managed to take that last course for 10 days, this is a simpler regime, I will document that I have tried 'clarithro' to aid concordance' (1b. F)

When asked about the influence of guidelines they also mentioned choosing the appropriate antibiotic within the guideline to aid adherence. This was also noted in the analysis of case notes:

> 'if guidelines say erm this is your first line antibiotics for something and I know that the .. a qds (four times daily) regime, or on an empty stomach might be difficult in a certain situation then I'll go for something that is going to improve concordance and just be a bit easier for the patient' (1b. I. 89-91)

NIPs also considered the patient's experience of taking the antibiotic previously and whether they are going to take the same one again if prescribed. They asked the patient how they had "got on" with the medication the last time they had it and adjusted their prescribing accordingly to aid adherence to the medication:

'The patient might say to me, you know I had that last time and I really didn't like it' (1b.F)

The NIPs did not advise the patient regarding side effects in any of the cases where antibiotics were prescribed. It is good practice to discuss possible side effects with the patient when prescribing any medication. Awareness of side effects can alert the patient what to expect, can highlight dangerous reactions, and when to seek help. This knowledge also helps the patient to manage minor side effects and continue with the medication, thus improving adherence to the regimen. This was not best practice and against RPS 2016 competency framework for all prescribers. When asked why they were not advising, 'time', or more specifically a lack of time was the answer given by all NIPs.

4.5.8 Patient pressure/expectation

Some patients not only brought their own beliefs/expectations to the consultation but also had the expectation of receiving an antibiotic suggested by others. One mum who attended with her daughter had telephoned the surgery for advice about her daughter's ingrowing toenail and was advised by the receptionist at the practice that she should come in and see the duty team as the child might need antibiotics. On this advice the mother had then booked an appointment and came down to the surgery. As it happened the child was prescribed antibiotics but it would have been interesting to see the mother's reaction if they had not been prescribed.

There was some perception by the NIPs that patients expected antibiotics. In one consultation, the NIP could see on the computer that the patient had booked in with a sore throat, she said:

'sore throats is the one when they almost always want antibiotics' (1a. F)

Then when the patient accepted the decision not to prescribe quite happily, she said:

'so sometimes you gear yourself up for a fight and then there isn't one!' (1a. F)

This perception of pressure was more evident with 1a, although there did not appear to be any rationale for this, as no pressure from patients for antibiotics during her consultations, was observed. She had worked longer in the ED than the other NIPs and described herself as a "no nonsense" person. Maybe due to her many experiences with difficult patients in the past she had developed a defensive armour that she wore at all times in preparation for the 'fight', which did not seem to occur.

This perceived pressure, was also discussed by 1b during the interviews, although it would seem that she was talking about her own feelings, about how she felt about not prescribing antibiotics, as well as the perceived pressure from the patients:

> ‘Erm but sometimes I feel that if they've come down, they're not feeling very well at all, they’ve sat out there waiting they feel really, really poorly and I say to them you really don't need an antibiotic, it's really horrible. There is that pressure there, it's almost an unspoken pressure’ (1b. I. 56-59)

The NIPs had worked in this or a similar role for many years and there was some recognition from two of the NIPs, 1b and 1c during interviews, that that there was less pressure from patients than there had been in the past. Although the reason for this easing was unclear, it would appear that the public health initiatives to educate patients about antibiotics have had some effect. It could also be that the NIPs are more confident in relaying this message to patients and are therefore perceived by those patients to be more credible:

> ‘I think it’s decreasing actually, I don’t see that many, I might have one every two-three weeks, maybe bear in mind that we’re seeing…. The majority of our workload is… you know minor illness stuff.. you hear a lot more from patients ‘I know it’s probably a simple cough and you can’t do anything but I just want to check’ (1c. I. 100-103)

> and

> ‘Rarely now do patients say ‘I need an antibiotic’ and they’ll argue with me, if I say I don’t think you need it then most of them will take that ,…. I think with more public information out there patients feel that they don't always need an antibiotic and they'll take that advice... I don't feel as much pressure as I have done in the past to prescribe and I don't know if that’s because I feel more confident in myself or if there is just more understanding in the general public, that they're not always the answer to all ills’ (1b. I. 53-62)

The GP felt that while patients appeared to accept a ‘no antibiotic’ decision during the consultation it did not stop their health seeking behaviour. Parents in particular still wanted their children to be checked by a practitioner:

> ‘You still see a not insignificant number of children that at sort of half past four and they picked them up from school half an hour ago and they say, can you have a look. Whereas I think in an ideal world that the health promotion message would be, actually they're going to be completely fine’ (GP. I. 71-75)

This behaviour was also observed, patients were happy to accept that antibiotics were not required, they reported just wanting to be checked over.

4.5.9 Managing perceived pressure

NIPs managed this perceived pressure by using language to reassure the patient. They often described the illness as ‘viral’ and stated that ‘antibiotics will not help’. They gave patients information and advice on how to manage their symptoms.

During the interviews NIPs were asked if they ever gave in to patient demands and prescribed antibiotics when they really thought they were not required. Their responses were contrary to the observations. 1a appeared to be a confident self-assured practitioner during her consultations with patients. She was clear with the patient when antibiotics were not required, but when asked if she had ever given in to patients, she reported that she did sometimes, and then felt very bad about it. It would appear that on the occasions when she did give a prescription, she was somehow able to rationalise it to herself, because she described situations when she absolutely would not:

> 'Sometimes (*squeals*) I hate to say that, (*she covers her face with her hands*) I do sometimes or if I feel very strongly that they really don't need them I often send them to sit and wait to see the GP' (1a. I. 20-21)

When asked the same question 1c responded in a matter of fact way and showed no regret. She was able to rationalise her decision by educating the patients:

> 'I'll be honest yes I have given in and given prescriptions ……but I will write inside my notes you know, that the patient was not happy does want antibiotics and won't consider a delayed prescription and just see how they go, but I do have an in depth chat with patients of the reasons why it's not the right thing' (1c. I. 92-97)

However, the GP thought that the NIPs were much better at resisting pressure than the GPs:

> 'I think they, they 'give in' in inverted commas in much less than we do.. and I think that's well recognised in the literature that sometimes doctors do, everyone just does, just give in and give antibiotics when the guidelines would say they're not needed' (GP. I. 34-36)

4.5.10 Delayed prescribing

This method of prescribing antibiotics is sometimes used by practitioners so that patients do not have to re attend with the same condition if it worsens, or if the patient may not have easy access to healthcare; for example, if they are travelling or over the weekend. A prescription is given to the patient to be used if required. In the review of case notes, delayed prescribing was used in two cases, both were 'sore throats', and two of the NIPs were observed issuing delayed prescriptions. However, one NIP reported that she did not like to use delayed prescribing, unless absolutely necessary. She said that she would usually prefer to review the patient rather than leaving the responsibility with the patient to decide if their symptoms were worsening. She indicated that she was worried that if their symptoms were worsening, the patient might require more emergency treatment, rather than just starting the antibiotics prescribe. For example, they might require admission to hospital or intravenous antibiotics rather than oral:

'if they're getting worse I want to see them again' (1a. F)

However, during interview she did give an example of when she might use delayed prescribing. A delayed prescription would be provided when the patient was known to the NIP and the patient knew their clinical condition and was very familiar with it. The NIP discussed the example of a patient who gets regular tonsillitis:

'If I see someone who gets tonsillitis regularly but didn't have muck on their tonsils I might give them a delayed prescription, so previous knowledge…yeah' (1a. I. 9-10)

The weekend and the quality of the access to treatment and the out-of-hours service concerned the NIPs. They all said that they were more likely to prescribe antibiotics on a Friday, and this was also a time prior to the weekend when they used delayed prescribing. In conversations during observed sessions NIPs referred to the out-of-hours service as "appalling". They expressed concerns that access to treatment for patients was difficult and the quality and timeliness of the treatment was poor. Patients had to telephone the out-of-hours number and wait for a call back to get an appointment; a procedure which could take many hours, sometimes overnight. The NIPs preferred to treat their own patients as they knew their health history and felt that the patient would benefit from being treated by someone who had access to all their information:

'it's the weekend, that TM (tympanic membrane) was bulging, it's a safety net really' (1a. F)

'Yeah, so towards a Friday afternoon they've got the weekend to kind of get through, I know they've got the out of hours service but it's much better if we can consider treating them, we know the patient best , we know what they're currently on and so maybe a delayed prescription, might use a delayed prescription or if it's a child with like asthma or lower respiratory tract (infection) possibly or bronchitis, I know antibiotics won't help them but if you're questioning whether there some infection there I might consider if it's late in the day giving them antibiotics … yeah definitely' (1c. I. 15-21)

4.5.11 Delayed prescribing used to manage patient pressure

On one observed occasion pressure came from a parent who wanted antibiotics for her child who had a cough, because she was taking part in an athletics' event at the weekend. The mother was very insistent and did not appear to be willing to leave the surgery without them. In this instance the NIP prescribed antibiotics used a delayed prescription to manage the situation, despite having already advised the mum that the child's chest was clear, and that she had a viral illness. The NIP was obviously unhappy with what had happened, after the family left the room, she spun around on her chair and blew out her cheeks:

'Before you ask…because I was blackmailed !!!…I could tell that mum was not going to be happy..' (1c. F)

During her interview she also reported feeling unhappy having to deal with this pressure, although she was open and honest, acknowledging that she did sometimes give in to it. She used the delayed prescription in this instance, as a last resort, as she did not have any other strategies to deal with the extremely insistent mother. She had to move the situation on, and the mother was firmly standing her ground and not moving. On the one hand she acknowledged that the mother wanted the antibiotics, but felt she had a duty to tell her that this would not be the right thing to do. She thought that if she explained that the child did not need antibiotics that the mother would see sense, but after some negotiation she realised that this was not working. She rationalised her actions to some extent by educating the mother and felt that as long as she carried out this education that she was going someway to mitigating her antibiotic prescribing, although she also appreciated the mother's concerns:

'It is difficult … you do sometimes get a bit bullied, patients see no other way, they have the antibiotic, that's the only way they think you can treat them despite that you try to give them reassurance that actually this is a virus and antibiotics wont treat it.. they're concerned that their condition is going to get worse and ermm I feel very responsible, concern and maybe just trying delayed prescriptions pushing the delayed prescriptions as long as you educate the patient why you don't think they should have the antibiotic' (1c. I. 87-92)

4.5.12 Experience as a prescriber in general practice.

The NIPs had a range of years of experience as nurses and time spent working in general practice; it was quite clear they felt that their experience influenced their prescribing. On the whole, this experience enabled them to recognise symptoms and diagnose and treat quickly and effectively. During the observations this experience was also often cited as the reason the NIPs knew what to prescribe, according to the antibiotic guidelines. Seeing a range of similar minor illness presentations reinforced this knowledge:

'I know antibiotic treatment for most common conditions without checking' (1a. F)

'previous experience, I just know' (1c. F)

However, time or lack of, and what they had experienced in practice also influenced them. These experiences seemed to have quite an effect on 1b, a fear of adverse clinical outcomes if she did not prescribe was evident. She described that immediately after her training to undertake the prescribing role, she was much more cautious about her antibiotic prescribing, but bad experiences were now at the forefront of her mind and influenced her decision to prescribe antibiotics:

> ‘Yeah, very much so, and I think ermmm I think I was probably much more aware when I’d finished that, of the potential harms, much more aware ermmm and I was probably much , I prescribed a lot less, whereas after years of being in general practice I can think of a few patients that have got worse very quickly and, and some of them have been very very sick as a result have made me maybe a bit more, swing the other way. Rightly or wrongly’ (1b. I. 118-122)

This anxiety influenced her to prescribe antibiotics when the diagnosis was unclear. When seeing a patient with recurrent chest infections, increasing breathlessness and a cough whose was undergoing investigations for COPD (chronic obstructive pulmonary disease), she prescribed antibiotics. The patient was systemically well, but the NIP reported hearing crackles on his chest. When asked why she had prescribed antibiotics she voiced concern for him, she wanted to cover the possibility that he could have a chest infection and if he also had COPD then he could potentially become quite unwell. This could be seen as unnecessary prescribing of antibiotics, but her concerns and experiences influenced her to prescribe:

> ‘it’s probably more inflammatory….but he still had those crackles’ (1b. F)

When asked if she felt she had a role to play in antibiotic stewardship, she again demonstrated a concern over her antibiotic prescribing, which seems to be driven by the reasons cited previously that she feared poor outcomes for patients:

> ‘I think I need to be .. really sure that the patient needs them and I'm not sure that I always am when I prescribe them I think sometimes I prescribe them, not lightly but generously and I think ....I want, particularly with certain patients if they’re frail and elderly I want to ensure that if there is an infection that it doesn't get worse and they end up in hospital and , and go downhill as a result of my not issuing an antibiotic and I think that definitely influences me’ (1b. 118-122)

This fear was not expressed by the other two NIPs. 1b had been working in general practice longer than the other two NIPs, she was very experienced and knowledgeable, she seemed to take on the experiences of the patients and relate to them, she also made decisions in situations of uncertainty more so that the other NIPs. She was not seen to ask advice from the GPs regarding antibiotic prescribing but managed each presentation independently, sometimes with a follow-up appointment with the GP. She did refer patients with other medical conditions for example, a child with recurrent headaches to the GP when she was unsure of the diagnosis. She was very clear when she was sure that no antibiotics were required. On Friday when delayed prescribing might be an option, she did not use it unless the prognosis for the patient was unclear. For example in a child with? tonsillitis who she saw on a Friday she was asked if she considered delayed prescribing. She was confident in her answer. She said “no”:

> ‘only if I thought they might tip over, she was very well, no fever’ (1b. F)

She managed uncertainty, which the other NIPs appeared reluctant to do, this skill may be seen as an attribute of a GP. Her experience working in general practice, was acknowledged by 1a as a reason why 1b was more willing and comfortable to see some presentations, that the other NIPs avoided. There seemed to be a consensus that she prescribed differently to the others, 1a confirmed this opinion during interview, recognising that 1b had more experience working in GP practice:

> '… I think 2 of us work along the same lines and one doesn't as much because she has a different background knowledge' (1a. I. 43-44)

4.5.13 Emotional engagement

1b appeared to be more influenced, by her own emotions in her tendency to prescribe. She described feeling sorry for patients, empathising with them. She showed a lot of compassion and genuine concern for the patients. She used language such as 'I can see why you are concerned' 'of course you're worried', she apologised to patients for the length of time they had been waiting to be seen, which the other two NIPs did not do.

In the case of a young mum who attended with sinus pain and general congestion who was going on a family holiday to Centreparcs, the following week, she gave a delayed prescription for antibiotics. The NIP had already told the patient that she had a viral illness and advised her on some remedial measures that she might take, so this was potentially confusing for the patient. When the patient left, she was asked why she had prescribed antibiotics after telling the patient she had a viral illness. Her empathy with the patient was evident as she put herself in the position of the young mother and felt sorry for her. She wanted to help her:

> 'I don't know,… maybe something about her being a mum with a small child and feeling under the weather….her sinuses were very tender…..so she doesn't need to seek further help when she is away…I think about all of those things' (1b. F)

Although the other two NIPs were always professional and caring they did not demonstrate such overt emotional engagement with their patients. 1b had insight into this and was aware that this might be a possible influence in her prescribing more antibiotics than the other two NIPs

> ' I think it is just that, and I think I probably prescribe more.., I've no doubt that I prescribe more than the other NPs and I don't know what influences that whether that's me as a person or my experience or something else but yeah certainly it is a weight now on my shoulders and I think it's something I do need to err keep reminding myself really. You can delete that' (1b. I. 94-97)

This difference did not appear to cause any conflict between the NIPs, they all appeared happy with the way they worked and their decision making; there was no overt criticism of each other.

They sought advice from each other; when diagnoses were unclear, they generally agreed with each other that the case was complex and referred on to the GP.

4.5.14 The practice organisation

Ongoing support for development and learning related to prescribing was not explicit, within the practice. NIPs said that there were regular practice meetings but very few where prescribing was discussed, they were unable to recount how many. The NIPs were unaware of the practice prescribing data or their own ePACT data, which could lead to a concern on how they reflect on their practice and learning. They were unaware how to access this data, or if anyone within the practice accessed it. These data would show what drugs they had prescribed and how often, they would also highlight any areas of concern such as any increased or inappropriate antibiotic prescribing as outlined by DH. The GP was also not aware of the practice's or individual practitioners' antibiotic prescribing:

> 'I'm vaguely aware I think as a practice we may be slightly on the higher side to antibiotic prescribing . .We don't as a group sit down and look at it line by line and we don't as a practice sort of we've not specifically looked at antibiotic prescribing and say right this is something we tangibly going to do differently' (GP. I. 94-97)

While the NIPs all seemed to be using current guidelines and prescribing appropriately, at that time, there might be some concern about their future practice, due to the lack of reflection on their antibiotic prescribing. The NIPs knew that a CCG pharmacist visited the practice to support good prescribing but did not know when the pharmacist came and had no interactions with them.

They were all very clear about personal accountability for their actions, and sought out learning opportunities provided by local organisations, such as evening meetings run by hospital consultants who addressed such issues as medical conditions and new treatments. However, these sessions were not prescribing related; prescribing updates were lacking, but it was felt that the situation was improving:

> 'We've pushed for a yearly prescribing update which we're all going on at the end of this..next month' (1c. I. 126)

Both NIPs and the GP were also unaware of the government incentives to reduce the prescribing of broad-spectrum antibiotics in general practice, the NIPs laughed when told that the incentive was money, and they were not at all surprised to learn that the incentive had worked:

> 'Oh no I didn't know that, no, really?..... I can imagine that working quite well (laughs)' (1b. I. 141-143)

The GP thought that it didn't seem ethical and would not pass the 'Daily Mail test':

‘surgery paid to prescribe less antibiotics’ wouldn't sit right’ (GP. I. 102-103)

There appeared to be some disconnect between the confident practitioners, and the friendly supportive practice, and how well the NIPs were actually integrated into the practice as an organisation. However, as a team clinically, they worked very well. The NIPs did not identify this situation a problem. They were not surprised that they were not privy to information about practice incentives or targets, however the GP partner was also not aware of the incentives. NIPs did not seek any information from the practice regarding their prescribing and were not concerned that they were not involved in any organisational aspects of the practice.

The NIPs, GPs and all staff appeared to enjoy respectful friendly professional relationships. The NIPs had a coffee break during their shift as did all staff. This was a time that they sat with reception, administrative staff and the practice nurses and chatted about holidays, family and current topics. The GPs did not routinely sit with the rest of the staff and engage in these discussions, but they did come into the coffee room to make their drink, and sometimes commented on the topic being discussed. The senior partner and one other GP did sit with staff and chat; both doctors were female, and since all the rest of the staff present were also female, they might have felt quite comfortable doing this.

There was always a lot of food in the coffee room, lots of fruit and biscuits and cake. The GPs supplied all the snacks and tea and coffee for staff. On Friday a member of staff made or bought a cake for everyone to share, there was a rota on the wall with all of their names on. During these breaks staff rarely talked about work, usually only to say they had to go back at a certain time because they had a patient waiting.

4.6 Appropriateness

Simple descriptive statistics were used to analyse and present findings from applying the MAI tool to the anonymised case notes, to assess the appropriateness of the NIPs antibiotic prescribing. The tool was applied to 30 case notes, ten from each NIP, retrieved and anonymised as described in Chapter 3, 3.11.3

Table 21 Modified Medication Appropriateness Index (MAI) Case One

Item	Appropriate		Inappropriate	Don't know	N/A	total
Is there an indication for the medication	Indicated (n=28) 93.3%		Not indicated (n=1) 3.3 %	(n=1) 3.3%		30
Is the medication effective for the condition	Effective (n=28) 93.3%		Ineffective (n=1) 3.3 %	(n=1) 3.3%		30
Is the dosage correct	Correct (n=29) 96.6%		Incorrect (n=1) 3.3%			30
Are the directions practical	Practical (n=30) 100%		Impractical (n=0)			30
Are there any clinically significant medication interactions	None apparent (n=30) 100%	Significant and addressed by the prescriber (n=0)	Significant and NOT addressed by the prescriber (n=0)			30
Are there clinically significant medication disease/condition interactions?	None apparent (n=30) 100%	Significant and addressed by the prescriber (n=0)	Significant and NOT addressed by the prescriber (n=0)			30
Is there unnecessary duplication with other medication(s)?	None apparent (n=29) 96.6%		Unnecessary duplication (n=1) 3.3%			30
Is the duration of therapy acceptable?	Acceptable (n=29) 96.6%		Unacceptable (n=1) 3.3%			30
Is the drug first line treatment according to local and National guidelines	First line treatment (n=27) 90%	Not first line treatment but addressed by the prescriber (n=3) 10%	Not first line treatment and NOT addressed by the prescriber (n=0)			30

Findings from the MAI analysis support other findings regarding the appropriateness of the NIPs antibiotic prescribing. The first two items in the MAI tool ask if the medication is indicated and if the chosen antibiotic in normally effective in treating the condition; an outcome that was appropriate in 93.3% of the case notes reviewed. On the whole the prescribed antibiotics were both indicated and effective for the conditions documented in the case notes. In one instance it

was unclear from the documentation whether antibiotics were indicated, this was scored 'don't know' in the table. The patient had suffered trauma to the nail, and it was unclear whether the findings documented were due to the trauma or an infection.

In another, the condition diagnosed was pharyngitis/laryngitis which in the absence of risk factors is a self-resolving condition. In this case the patient was young and generally well and exhibited other viral symptoms, so antibiotics would not be recommended. This was scored "not indicated"

There were no drug/drug, or drug/ disease, interactions. The duration of treatment was appropriate except in one case, where the NIP documented that she was prescribing a course of antibiotics for seven days, but prescribed enough medication for five days only. The guidelines state seven days for duration of treatment, so this was scored 'unacceptable'.

Where one of the NIPs prescribed two antibiotics for a patient it was scored as unnecessary duplication. The antibiotics were prescribed after a discussion with the GP and as advised by the GP; the NIP documented this advice in the patient's case notes.

There were three instances when co-amoxiclav was prescribed. This is a broad-spectrum antibiotic and is one that the all prescribers are encouraged to avoid, due to the increased risk of clostridium difficile. In one instance it was prescribed when it was not first line treatment. The patient had otitis externa, which had developed into a cellulitis and spread to the pinna. This is a serious condition and may have required referral to hospital. It seemed that the NIP prescribed co-amoxiclav to avoid a hospital and she documented that the patient would be reviewed in 24 hours, this could be seen as good practice, and was scored "not first line treatment but addressed by the prescriber". However, co-amoxiclav is indicated for post-operative wound infections and was prescribed appropriately in two cases by for this indication. Co Amoxiclav was also prescribed for this indication during the observed consultations.

There were also two instances where first line treatment was not prescribed but the prescribing was within guidelines, for example Clarithromycin was prescribed for patients without an allergy to Penicillin, which is the first line treatment. This was noted throughout the observations and interviews, as a method of improving adherence, as dosing is less frequent and for a shorter duration. This was scored as 'effective'.

Delayed prescribing was also noted in the review of case notes and was used twice for patients presenting with sore throats.

4.7 Reflexivity

I was really looking forward to the observed sessions. I felt that I would be most comfortable carrying out the observations as this was something that I was very familiar with. As a clinical lead previously, I regularly sat in with staff and observed them and they did the same with me while learning. I had observed these practitioners in their clinical practice previously, however while they were happy with my input in their learning and development at that time, this was different. I was no longer providing guidance and support to them but appearing to sit in quiet judgement. My experience as a university academic helped with this, I often assess prescribing students in practice so to an extent I was able to assume that role, being careful to take everything in and not to make judgements

Although it had been at least seven years since I had worked with the participants in this Case, while observing them, they had a tendency to revert back to the roles we had previously, where we frequently asked each other for advice. They asked my opinion when the patients had left the room: 'what would you have done?' Walshe et al (2011) describe this behaviour as a common occurrence when undertaking non-participant observation as a clinician in the clinical field. The authors advise that strategies should be in place to deal with such situations, such as being up front about what is acceptable. My strategy was not to give my opinion, and I did not give an opinion while the patient was in the room or during the consultation, but it was difficult not to provide positive confirmation of the outcome after the patient had left the room. The urge to once again become their colleague rather than an outsider was overwhelming at times. While this was challenging, it did not impact on the decisions made by the NIP during the consultation. I wrote a note to myself 'Having difficulty not saying what I know'

The semi-structured interviews were a little stilted, due to my lack of experience in this area, previously I had only ever interviewed staff during job interviews or asked questions under examination conditions. My inexperience, meant that I stuck quite closely to the interview guide, potentially creating a power imbalance, where I asked all the questions and restricted the NIPs responses. This may have impacted on the amount and quality of the resulting data. Finlay (2008) describe this research situation as involving a power imbalance, as the researcher has the power to open up or close down responses. However, I experienced this power imbalance in reverse with one participant; she gave very brief responses to my questions and then stopped talking. I was unable to tease anymore out any more information, she had said all she wanted to say, and I lacked the power to manage the situation, mostly through lack of experience. (Brinkman and Kvale 2005) describe this as the power the interviewee. They can say as little or as much as they like, and the quantity of those responses can have a significant impact on the quality of the data.

4.8 Chapter summary for Case One

Overall the three NIPs demonstrated competence and confidence in treating minor illness and prescribed antibiotics appropriately according to local and national guidelines (South Central, Hampshire, Isle of Wight and Portsmouth guidelines for Antibiotic Prescribing in the Community, (SHIP 2014) and PHE (2013). The choice of antibiotic was usually first line according to the guidelines, with the alternative only being prescribed to enhance patient adherence to the medication considering formulation and/or taste. The NIPs were aware of the antibiotic guidelines, and knew the information within them, without having to look them up. Guidelines were also reported to add structure to consultations and aid decision making, so the NIPs were keen to adhere to them. The NIPs were very familiar with common presentations, which ones were likely to be of viral origin, and which bacterial, and therefore may require treatment with antibiotics.

The consultations were completed mostly in accordance with the competency framework for all prescribers (RPS 2016). A full history was taken from all patients, an appropriate physical examination was carried out, patients' records were checked regarding co morbidities, medications past and present, renal and liver function. Patient related factors were key influences including clinical signs and symptoms; co morbidities and age-related factors such as renal function; patient expectation and perceived pressure and promoting adherence to medication regimens. When antibiotics were prescribed, the NIP advised the patient how to take the medication and the importance of completing the course. However, side effects of the medication and management of potential side effects were not discussed in any of the observed consultations. The NIPs worked within their scope of competence, and in most cases chose which patients from the list had presenting complaints that they felt they could manage. This option was not available to them when the GP was very busy with another patient, or out on a call. In these instances, patients were triaged, to ensure they were safe to wait, and referred on to the GP if necessary. The NIPs were also able to do this when the patient's presenting complaint was more complex than they had anticipated. They had a huge respect for the GPs' knowledge and years of experience working in primary care. The GPs also recognised how clinically competent the NIPs were.

There was a good, collaborative working relationship between the NIPs; they supported each other during the duty sessions and there was mutual respect for each other's knowledge. The NIPs had experience in treating minor illness and the GPs had depth and breadth of knowledge across the board. However, the NIPs were not influenced by the GPs in their antibiotic prescribing; at times they corrected the GPs when sub-therapeutic doses, or the wrong duration

of treatments were prescribed. The GPs were very supportive of the NIPs and value them highly, with the GP interviewee considering them to be better at prescribing antibiotics rationally than themselves.

There was some indication that emotional engagement and empathy with the patient may have influenced one of the NIPs antibiotic prescribing. In this case 'doing the right thing' was seen to be making the patient happy, and the NIP feeling that she had done all she could to help the patient, therefore made the NIP feel better. This influence did not result in obvious inappropriate prescribing, but she prescribed antibiotics in uncertainty, which the other NIPs were not seen to do. When they were uncertain, they sought advice or referred the patient to the GP. The NIP in question had more experience of working in general practice than the others, as well as in managing more complex cases. This experience may also have influenced her prescribing. However, at the organisational level the NIPs were GP employees, who knew little about any policies, incentives or structures that were in place to support appropriate prescribing. For example, they did not know how often the pharmacists visited the practice, or how they could access their ePACT data. There were regular clinical practice meetings, but they were rarely related to prescribing; the NIPs were unable to quantify the frequency. Access to continuing professional development opportunities had not been consistent, but this situation was reported to be improving.

Findings from Case One have been presented; data from semi-structured interviews, observational data, and evaluation of case notes using MAI tool. These data collection methods enabled the findings, to accurately reflect the Case being examined, its context, as well as facilitating thick rich description. The NIPs in this Case were not trained into the role within the practice. They were employed by the GP practice when they were already qualified, and experienced nurse practitioners and nurse independent prescribers. Another Case has been identified, with three NIPs who have undertaken training into the role of nurse practitioner/ prescriber in the general practice setting where they work. The same methods will be used in Case two as were employed in Case One in order to explore the original hypothesis, compare themes and build theory.

Chapter 5: Case Two

5.1 Introduction

In this chapter, Case Two will be introduced and research findings presented. The same methods were undertaken as in Case One, Semi-structured interviews, observational data and analysis of case notes. Findings are presented as in the previous chapter. The participant's voices and field notes are used to demonstrate the emergence of themes and initial conclusions. The use of all data sets, supports the analysis, providing the opportunity to interrogate the themes, seeking those where the two Cases are similar and different. This triangulation of the data sets adds to the validity and rigour of the conclusions and increases confidence in the analysis of the influences on and the appropriateness of the NIPs antibiotic prescribing. Data from Interviews are identified by the letter I, and data from fieldnotes are identified by the letter F.

5.2 Introduction to Case Two

Case Two was a GP practice in a small town on the outskirts of a city in the South of England. The practice was housed in premises shared with another GP practice and a pharmacy. There were approximately 15,000 patients registered with the practice. The practice had five GP partners, working a mixture of part-time and full-time hours. It was also a teaching practice in that it offered clinical placements and supervision of medical students and nursing students. Amongst a variety of nursing and administrative staff, the practice employed three NIPs who worked as advanced practitioners who carried out 'on the day' clinic sessions daily and telephone triage on a daily basis. Telephone triage was undertaken to sort out urgent from non-urgent presentations and allocate appointments if necessary, with the most appropriate clinician. One NIP worked full time the other two work part-time, four days a week, and three days a week. Triage and clinic sessions were allocated to NIP depending on their working days and two did a mixture of both. One NIP disliked telephone triage and did not feel comfortable doing it, so was not normally allocated such a duty; the exception being if the other NIPs were on leave or off sick. NIPs did not run chronic disease management clinics, or any other clinics, for example immunisations or smears. Such clinics were carried out by the practice nurses.

Most clinic appointments were made through the practice receptionist, who allocated patients to a GP or the NIP using a rough guide provided for them, which had been agreed by the NIPs and the GPs for example, pregnant women were allocated to the GP list. When asked, the NIPs were unable to say what else was on the list but did just comment that the receptionists frequently did not adhere to it. Other appointments were made through the on- the- day, triage system which a NIP undertook, and patients were allocated an appointment with the duty team. The duty team consisted of one GP and usually one NIP.

In the month preceding the study period, the antibiotic prescribing data for the practice was accessed through a public information site. The overall antibiotic prescribing (number of prescriptions issued) item-based Specific Therapeutic group Age-sex Related Prescribing Unit (STAR-PU) was on the 76th centile, above the national median. STAR-PU is a value calculated to reflect not just the number of patients in a practice but their age and gender as these variables can affect the affect prescribing rates. The number of prescriptions for broad-spectrum antibiotics, which for the most part should only be prescribed after other treatment has failed to avoid drug resistant bacteria developing, was on the 56th centile, similar to the national median. These results are for the practice as a whole, individual prescribing data is not publicly available.

5.3 The participants

All three NIPs employed by the practice consented to participate in the study. Participants are referred to as 2a, 2b and 2c to maintain anonymity. Participant 2a responded to information in the minutes circulated from a local NMP forum, where information was disseminated, to recruit participants to the research study. 2a had undertaken the non-medical prescribing programme at the researcher's university and wanted to help, because of the support he had received while studying. He encouraged the other two NIPs to also take part. Coincidently the researcher had studied for a nurse practitioner degree with participant 2b twelve years earlier. 2c was a business partner in the practice and was not known to the researcher.

2b and 2c were trained into the advanced nurse practitioner role and as NIPs while working in the practice. They undertook the Royal College of Nursing (RCN) BSc nurse practitioner programme during this time and were supported and mentored by GPs from within the practice. 2a came from another GP practice to take up the opportunity to train as an advanced nurse practitioner and prescriber in this practice.

All three participants were undertaking a master's level advanced nurse practitioner programme at the time of the research study and were attending a local university part-time.

Table 22 Participant Demographics Case Two

Participant	Gender	Age	Level of academic achievement	Length of time qualified as nurse	Length of time qualified as NIP	Length of time working in general practice
2a	Male	48yrs	Degree	19yrs	2 1/2yrs	15yrs
2b	Female	46yrs	Degree	18yrs	10yrs	15yrs
2c	Female	47yrs	Degree	25yrs	14yrs	17yrs

Participants were observed for between 9-16 hours, in their roles as 'nurse practitioners' managing on the day presentations, as part of the duty team. During the period of observation, 2c regularly checked the telephone triage queue, in between seeing patients. she made some calls to patients if the queue was long, and there were patients who had been waiting a long time for a call back.

The duty team consisted of one GP and one or two NIPs in the morning sessions 8.30-1pm and one GP and one NIP in the afternoon sessions 2pm-6.30pm daily. The observed sessions took place between May 2017 and August 2018. One of the participants was unwell for a significant amount of time during the research, which prolonged the study period. All participants undertook clinic sessions where they saw on-the-day presentations; two of them also carried out triage duties where they triaged telephone calls from patients in the morning, with the opportunity to bring them in for an afternoon appointment with a GP or NIP. These sessions were not observed, as it was anticipated that few, if any, antibiotics would be prescribed.

5.4 Findings

On arrival, the reception area of the practice was being refurbished, which caused quite a long queue at the reception desk, with patients queuing down a corridor. The practice area was divided in two, with the reception desk in the middle. On one side were the doctors consulting rooms, and on the other, the advanced nurse practitioners, practice nurses and phlebotomists' rooms. The seating areas for patients were also set out on either side of reception designated by which practitioner they had an appointment with. There were very few posters on the walls, and none relating to antibiotics. A television type screen provided general information for patients on the practice website, such as how to make appointments, how to access care out of hours and times of immunisation clinics.

In this Case, on arrival a message was sent by the receptionist to the NIP to say that I had arrived. Sometimes the practice manager who helped at reception at busy times recognised me standing in the queue and waved me through. A poster was positioned at the reception desk to inform patients that a nurse researcher was observing the nurse practitioner on the day, before all observed sessions.

NIPs worked from their own clinic list of patients, with ten-minute appointments, the same duration as the GPs' appointments. The NIPs all had their own consultation rooms with their names on the doors. They did not have to move around and share rooms. Consultation rooms were large with no posters except advice to patients on requesting a chaperone, if they wanted one. 2a kept a variety of guidelines and decision support materials in the room, for easy reference, all had the British National Formulary (BNF) in their rooms. The practice also subscribed to an online decision support system, for the diagnosis and management of clinical scenarios, which the NIPs were able to access on their computers.

Patients were called into the consultation room using an electronic system, which flashed their name up on a screen in the waiting area, but the NIP always walked down the corridor to meet the patient and to remind them that a researcher was sitting in observing the NIP, not the patient. They used phrases such as 'I've got a colleague watching me today'. While observing 2a, two male patients with 'personal" problems', said they would prefer not to have a researcher in the room and their request was honoured. No other patients objected to my presence in the room.

During the observed sessions NIPs were sometimes asked by the practice nurse to come and see a patient, for example when doing wound dressings, if they thought the wound might be infected. These consultations were not observed, as neither the practice nurse, nor patient had been made aware of a researcher's presence. The interactions were always friendly with the practice nurses, and any other staff who came to seek advice; it was noted that the NIPs appeared not to mind. At one point during an afternoon clinic the NIP stopped seeing patients and triaged patients over the telephone, for a short time to help with the backlog of calls.

Due to the size of the consulting room it was quite easy to sit out of the way in a corner and not be obtrusive. As in Case One, a small notepad was used to jot fieldnotes and this activity helped to disengage with the consultation, avoiding eye contact with the patient, and not becoming a part of the consultation. This was an effective approach since one of the practitioners forgot about me and only remembered when she came back into the room at one point and said:

> 'are you alright there, I'm forgetting you're here?' (2b F)

The duty GPs only once, during the period of observation, came to review a patient at the request of the NIP. The GPs consultation rooms were physically located at the other side of the building, but the NIPs were able to send messages on the computer and a few times went to the GP's room to ask advice. On another occasion a GP came and asked the NIP to help him move something from his car into his consulting room, there was friendly banter and he joked, 'It's not a body'

Staff did not have any coffee or lunch breaks together, there was no social space where staff met and interacted. 2c was the link between the NIPs and the GPs and most information came through her. She managed their annual leave, and what modules they did on their MSc programme, organising payment for modules and allocating time off to attend study days.

At the start of the observed period the two female NIPs wore a traditional navy nurse's uniform with a badge identifying them as nurse practitioners, the male NIP wore his own clothes and a badge identifying him as a nurse practitioner. When asked why he was out of uniform he suggested that there had been some discussion on the subject, and it was decided that he looked more professional in a shirt and tie. By the end of data collection, the two female NIPs were also wearing their own clothes instead of a uniform. When asked why they had changed, they responded that before the study period they did not wear a uniform, and just as the study started, they had briefly gone back into uniform, because they found it more convenient to wear a uniform. However, part way through the study they went out of uniform again at patients' requests and after complaints from patients. Patients reported that they felt the uniform created a barrier between themselves and the NIP, and they felt that they were unable to talk as openly. Twelve patients had spontaneously complained via the practice email.

Table 23 35 hours of non-participant observed sessions 25/5/17-1/8/18

Participant	Day and time session	Number. of patients	Potential number for antibiotic prescribing	Number. Antibiotics prescribed
2a	Tuesday 2.30-6pm	14	8	5
2a	Friday 9.30-12.30	9	4	2
2a	Tuesday 2.30-6pm	12	8	3
2a	Monday 2-6pm	14	9	5
2b	Wednesday 9.30-12.30	14	6	5
2b	Wednesday 9.30-12.30	9	5	2
2b	Wednesday 9.30-12.30	8	4	1
2c	Friday 2-6pm	3 (including 10 triage calls)	3	0
2c	Thursday 2-6pm	13	8	3
2c	Tuesday 2-6pm	14	6	2
Total		110	61	28

Table 24 Presenting Complaints Case Two, 111 presentations

Eyes ENT & Lymph	**Respiratory**	**abdominal**	**Musculoskeletal**	**Skin**	**other**	**Mental health**
Ear infection n=15	Cough n=16	UTI n=8	Back pain n=3	Wound/skin infection n=10	Cold/flu n=3	Depression/anxiety n=3
Sore throat n=7	Breathing difficulties n=1	Abdominal pain n=2	Ankle/shoulder/arm pain n=3	Rash n=6	?STI n=3	
Swollen glands n=2	Asthma n=1	Diarrhoea n=1	Bump on head n=1	Lump nipple/breast/chest/back n=4	s/e medication n=1	
Sore mouth n=3		Incontinence n=1	Swollen leg n=1	Chicken pox n=3	Blue toes n=1	
Eye infection n=2		Kidney pain n=1		Lump testicle/ groin n=2		
Swollen glands n=1				Acne n=1		
Reduced hearing n=1				IGTN n=1		
				Thrush n=1		
				Pilonidal sinus n=1		
				Mastitis n=1		
N=31	N=18	N=13	N=8	N=30	N=8	N=3

Table 25 Diagnoses and antibiotics prescribed.

	Soft tissue infection	UTI	Acute exacerbation of COPD	Otitis media	Otitis externa	Acne	conjunctivitis	Epydidimo-orchitis
Amoxicillin				n=2				
Flucloxacillin	n=7							
Clarithromycin	n=1			n=1				
Doxycycline			n=2					n=1
Nitrofurantoin		n=5						
Trimethoprim		n=2						
Fucidin ointment	n=3							
Otomise ear drops					n=2			
Clindamycin						n=1		
Chloramphenicol Eye drops							n=1	

Table 22 lists the range of presentations seen by the NIPs during the study period. The presentations are more than the number of patients as some had two complaints; for example: sore throat and cough. The commonest presentation was cough, with 16 cases, of those only two were treated with antibiotics. The NIPs were frequently observed to tell patients that their condition was likely to be viral and did not need treatment with antibiotics; an example of appropriate treatment and advice. The highest level of antibiotics prescribed were as in Case One for soft tissue infections, with this presentation accounting for 31% of all antibiotics prescribed. Prescribing was suitably low for all other presenting conditions, all other conditions in the table above were treated according to national and local guidelines.

5.5 Influences

Influences on the NIPs antibiotic prescribing, that were observed, and discussed during the semi-structured interviews are set out in themes below.

5.5.1 Clinical factors

Clinical factors were the primary influence reported by all participants, on whether antibiotics were prescribed. The NIPs carried out physical examinations and took observations where appropriate. They were skilled in their assessments and recognising the clinical signs of infection:

> 'the clinical situation' (2c I.17),

> 'first it has to be the patients real need, do they need them' (2a. I. 15)

'what the situation is how they look when they come into the room and if they look sick then that would probably influence to try antibiotics' (2b.I. 17-18)

During the period of observation there were no patients who were significantly unwell or required hospital admission. The NIPs managed a complex group of patients, rather than clinically complex presentations but patients with adverse social conditions and socioeconomic issues that impacted on their ability to cope. For example; issues such as alcohol or drug dependence, lack of family support and poor housing. However, there were a range of other influences on whether they prescribed antibiotics and the choice of antibiotic they prescribed.

5.5.2 Ten-minute appointments

The ten-minute appointment times did not appear to be conducive to good antibiotic prescribing and running late had a negative influence on all participants. All three NIPs reported that not having the time to discuss and negotiate with the patient meant that they prescribed antibiotics more readily, than they would normally do if more time was available. This 'lack of time issue' was a source of frustration for them and they struggled to employ strategies to deal with it:

'10-minute appointments don't support good practice' (2b. F)

'I definitely do not like running late, so I'm, I work differently when I am running late and that might change my ability, sometimes' (2c. I. 30-31)

'I would say yes, sometimes at the end of a, if you're already 45 mins or an hour behind it shouldn't do but I can't say it never does, sometimes you think it would be quicker to give the patient that antibiotic they want, yeah I try to resist, but sometimes it's hard and yes at the end of the shift..' (2a. I. 39-41)

The GP also described time, or lack of it as a pressure, identifying that it takes longer not to prescribe an antibiotic than to prescribe it:

'I'd like to say it wouldn't be the case but potentially, time pressure. You know it takes a lot longer to say no than to say yes. That doesn't mean that you should be influenced by that but I'm sure there's a subconscious influence there' (GP. I. 147-149)

5.5.3 Day of the week.

NIPs also reported that the day of the week was an influence, and Friday would be the day when they reported that they issued a prescription for an antibiotic inappropriately or used delayed prescribing, if they felt that the patient understood when to start taking the medication:

'yes it's a tool I use fairly often'(2a. I. 46)

The NIPs were also worried that the patients would not be able to recognise worsening symptoms and/or when to start the medication. There was also concern about the quality of the out-of-hours service (OOHs). Participants were acutely aware and concerned about the lack of access to good quality care for patients at the weekends, and this problem influenced whether they would prescribe antibiotics or not:

> 'it's seriously overstretched and patients can wait quite a while to speak to someone let alone be seen' (2a. I. 47-48)
>
> 'I do worry about access to OOHs, I tell them to go to A and E if they are worried' (2b. I. 33)
>
> 'I can't say I'm not affected by that....because I am…….we get a lot of patients who come in and say, I can't get through on the OOHs, so I will be more lenient with my prescribing but I will ask them to hold off taking them unless they really have to. ……' (2b. I. 26-28)
>
> 'I feel that as a clinician I don't have a lot of confidence that the patients going to be seen in the time that I would expect would be good practice, whereas historically when it was very locality based I knew that they would ring and be seen in a couple of hours in terms of .. but it's a lot longer process and people don't always get call backs and then they get lost in the system' (2c. I. 49-52)

There was also recognition that a patient's condition could deteriorate if there was a delay in treatment over the weekend:

> 'so, if they've got a plan to fall back on and also for rescue meds for patients with COPD. They are vulnerable patients who even starting the night before can be quite significant in reducing their length of illness' (2a. I. 48-50)
>
> 'It's the "what do you do" on a Friday afternoon when you don't have that access' (GP. I. 141-142)

The NIPs were not observed to prescribe inappropriately, at the end of the day, or week, however they reported doing so quite openly and honestly during the semi-structured interviews.

5.5.4 Guidelines support good practice

Participants were aware of local and national guidelines such as the South Central Antimicrobial Network guide to antibiotic prescribing in the community (SCAN 2018), developed from PHE guidance. NIPs knew the contents of the guidelines, they only looked up the guideline when they knew that there had been recent changes made, or if the patient had an uncommon presentation. One NIP showed an awareness that guidelines had recently changed and checked the latest

information for the treatment of a 4yr old presenting with a urinary tract infection (UTI) (2c F). 2b was able to cite references and authors in the guidelines:

> 'It's got specific things and if you look further down, it's got studies by Paul Little done in primary care, so I can't really challenge that, (*laughs*).. If somebody has already done the research and the research is good who am I to challenge that' (2b F)

Guidelines were also seen as valuable in supporting some broad-spectrum antibiotic prescribing, which might otherwise be criticised:

> 'very useful, particularly if I am using one of the higher risk drugs, ciprofloxacin, co-amoxiclav, sometimes it's useful to justify why you are using a high risk one, you can say actually it meets the criteria, this is why I am going for the high risk drug, it's not just knowing it will work well' (2a. I. 92-94)

The GP felt that the NIPs were much better at following guidelines than the GPs and that suited the way they worked; they were more comfortable with guidelines to support them:

> 'the nurses are very much better at following the protocols and guidelines and everything else, whereas erm us GPs might be a little bit more maverick sometimes' (GP. I. 10-12)

5.5.5 Adherence to medication

The NIPs prescribed within guidelines, but chose antibiotics which they knew tasted better or had a simpler regimen, for example to be taken twice daily rather than four times daily. Adherence to the regimen was a key influence, as the NIPs knew the course had to be completed:

> 'oral Flucloxacillin is particularly expensive so we are told ……and apparently it tastes foul, and its 4 times a day, so we might give clarithromycin and that makes compliance easier, especially if it's a school child getting them to take it twice a day is much easier than trying to get them to take it four times a day, which might involve a dose in the middle of school and transporting the antibiotic backwards and forwards' (2a. I. 172-176)

> 'Amoxicillin is nicely tolerated, they like it because it's banana flavoured but if you've got something like penicillin for tonsillitis, they can't get it in four times a day, I'll go for clarithromycin because it's morning and evening for seven days rather than ten. So yeah I do. It depends on how much I think mum would be able to persevere and what their compliance is like. I don't want them stopping half way through the course really' (2b. I. 162-166)

The elderly were also mentioned as a group that might influence the antibiotic chosen within the guidelines:

> 'And even with the elderly with carers if they have carers going in twice a day then that makes more sense to do it' (2c. I. 150-151)

Where there are several first line choices of antibiotic in the guidelines, for example for a chest infection, 2b chose doxycycline over amoxicillin, as she said that from experience she felt that Doxycycline was more effective:

> 'Sputum results locally seem to indicate that doxycycline is more effective' (2b. F)

NIPs also described using the tools from within the guidelines, such as the fever pain score to support their decision not to prescribe antibiotics with the patient. The guidelines have evidence-based decision support tools within them, such as a point score for symptoms. For example; one point for a fever or cough. The total points indicate the likelihood of the condition requiring treatment with antibiotics:

> 'With tonsillitis I will use the fever pain score and say this, you know normal temperature, with chest infections I'll use the new guidelines and says they've got a normal respiratory rate, no temperature, normal chest clear and say to them this is normal findings, this is why we feel.. and the evidence says that most patients with this don't have an infection, it's all in there. So yeah' (2c. I. 154-158)

> 'Also reassuring them with the likes of the fever pain or Centor scores, using that as a reassurance, I'm not just not giving an antibiotics because I'm under pressure from the Department of Health, there is actually a thought out process, why I'm doing what I'm doing' (2a. I. 113-116)

This approach reassured patients and was frequently observed to back up a no antibiotic prescribing decision made by the NIPs.

5.5.6 Awareness of AMR

NIPS were very aware of their role in protecting antibiotics and educating the patient and during the period of the study, all NIPs signed up online, to become an "*Antibiotic Guardian*" this is a PHE website which contains information on antibiotic stewardship and has resources and toolkits to help the health professional to educate their patients and themselves. NIPs reported that there was a lot of information on the website that they found very useful. In their everyday practice it

was observed that NIPs educated patients about not misusing antibiotics, an activity that they also reported during the interviews:

> 'and more importantly why, when we give an antibiotic they should take it correctly, finish the course, not share them or give them to other people. So we do talk about you know, looking after antibiotics, and also those that might buy them over the counter on holiday when they go out to Spain you can buy a load out there and we say no you can't do that.. I tend to tell patients what it does to them really, I say do you really want a course of antibiotics that will strip all your good flora it probably going to make you feel rotten for a couple of weeks after and really they don't want to get thrush'
> (2c. I. 185-192)

There was also a recognition, that it was not only patients who needed to be educated. As a training practice, the NIPs often had health care professional students sitting in with them, observing, and they had an opportunity to educate them as well:

> 'it is quite common for example I had a medical student with me today, I will have a nursing student tomorrow, that's a fairly regular occurrence, and that's a chance to influence somebody before they qualify' (2a. I. 108-110)

5.5.7 GPs antibiotic prescribing

The NIPs reported that they had good working relationships with the GPs; they felt both supported and valued. The GP reported that one of the reasons he joined the practice was the nurses:

> 'I actually joined this practice partly because we had a strong nursing team, erm and actually because we had one , our lead nurse, was actually a partner in the practice so, I've always felt that there was a strong role for nurses within general practice'
> (GP. I. 2-5)

The NIPS were able to identify one or two GPs, who they thought might prescribe antibiotics inappropriately, they deliberately did not ask their advice, and felt very comfortable going to another GP for advice:

> 'so, I go and talk it out with someone else, colleagues or some of the other GPs who aren't duty and they're more than happy to sit and chat to you about it' (2b. I. 142-143)

The GP felt that the relationship with the NIPs was very good and they supported each other whenever decisions were complex:

> 'What I quite like about it here is, that we've got an open door policy, and nobody minds actually someone saying what do you think, do think this is appropriate and discussing

> which you know, us as doctors do it, the nurses do it to each other and to us, yeah, and likewise I've had conversations the other way where I've been sitting there thinking erm, what's the most appropriate thing we should do here, it's quite nice to have that conversation' (GP. I. 25-30)

Although NIPs reported that they felt supported by the GPs in their prescribing, they reported different experiences when asked if the GP directly influenced their antibiotic prescribing, 2a said:

> 'No, never' (2a. I. 147)

However, 2b reported that early on as a novice prescriber, she did copy the GP's prescribing even though she was knew it was wrong:

> 'I used to go for advice they would say, well just try a little bit of this or try a little bit of that and I don't do that anymore, and I see sometimes on the notes, they'd put, chest clear, Amox (Amoxicillin) and I critique that now, when before I would put chest clear Amox' (2b. I. 130-132)

It's only with experience and exposure to further training that she now feels able to address this behaviour.

> 'It's taken a long time for me to get to that point... erm I feel now that I'm at a point where I can critique the GP's prescribing and if you've just put on there, everything's fine, the chest is clear, so what do you expect the amoxicillin to do?' (2b. I. 127-130)

Similarly, 2c described how experience had brought about a change in her confidence with antibiotic prescribing, compared to when she was a newly qualified prescriber.

> 'certainly, back in my training days I learned to do how *Dr Blank* did it because he was my mentor. But years down the line I've learned that there are other ways, we do it now according to the guidance' (2c. I. 251-253)

One of the NIPs was critical of the GP prescribing antibiotics, when the patient had been assessed by the NIP, and told that they did not need antibiotics. The patient then they sought a second opinion from the GP who prescribed the antibiotics:

> 'I had one particular chap who would not leave the room until he had his antibiotic and so I still didn't prescribe and then he went and saw the doctor and got them. Annoyingly (*laughs*)' (2b. I. 40-42)

This caused frustration and influenced her to prescribe antibiotics in future for those patients. She reported that if the patient was so determined to have them, it saved everyone's time to just prescribe them even against her better judgement:

'well if that's going to happen, I think well I might as well give them to them rather than wasting another doctor's appointment' (2b. I. 44-45)

There was a consensus that there were a few GPs in the practice who did not prescribe appropriately, in that they regularly prescribed broad spectrum antibiotics when they were not indicated. 2a and 2c reported that they were happy to challenge the GPs prescribing:

'Oh yes there's a couple in particular (laughs) where its, yeah, it's quite an open thing challenging their over -reliance, particularly drugs like cipro, yeah' (2a. I. 160-161)

However, 2b found this difficult and felt that it didn't go down well. She was reluctant to do it:

'(*Blows out*) goes down like a lead balloon (*Laughs*) yeah.. I don't do it often but I do think about it ..(*laughs again*)' (2b. I. 136-137)

5.5.8 Pressure from patients.

During the period of observation there was only one consultation where the patient appeared to want antibiotics and, although they did not ask directly, seemed disappointed not to have been prescribed them. Her child had chicken pox and a slight temperature but was very well otherwise. She had come to the UK quite recently from an eastern European country. 2c reported that patients from countries where antibiotics are more available are more demanding and reluctant to take advice only. She admitted that it was a battle that she didn't always win:

'sometimes I give in' (2c F)

However patient pressure was reported more frequently in the interviews. 2a who has been qualified as a prescriber for a shorter period of time than the other NIPs, reported that he is pressured to prescribe antibiotics regularly, usually by parents of ill children:

'Oh yes, yeah it's a regular thing, probably its more so with parents of young children, sore throats would probably be the highest where people really do expect or are hoping for antibiotics because they see it as a way to get better quicker, particularly if the child is losing time at school or has exams coming up' (2a. I. 27-30)

2b reported that older patients with chest infections were the most predominant:

' I find that I see a lot of patients who say, I get this every year and I have to have antibiotics' (2b. I. 37)

Two participants reported that they assumed more demand from patients for antibiotics, and that with experience, now found that most patients just wanted reassurance, and to feel that their concerns had been addressed:

> ‘I have noticed that sometimes they just want advice, and not the antibiotics, that I thought they wanted’ (2b. I. 52-53)
>
> ‘I think sometimes, maybe it was us maybe we thought the patient wanted it all the time and we weren’t actually focusing on what actually did they want’ (2c.I. 99-100)
>
> ‘I think patients are actually really understanding it, certainly I can get through a whole clinic not prescribing antibiotics without that pressure, that used to be’ (2c. I.97-98)

Experience also made 2b and 2c more confident practitioners, and this confidence reassured patients. Their confidence was seen repeatedly during the observations, they were very clear in their decision making and discussed it with the patient, giving a clear rationale why antibiotics were not required. The NIPs had the skill of appearing to involve the patient in shared decision making when they had already decided that the patient did not need a prescription for antibiotics:

> ‘most of the time you sit there and you’re thinking it through and thinking does this patient need an antibiotic or is this likely to be viral and then you try and explain that rationale out and often when you do that with confidence, I’m probably much better at it in the last few years than I was in previous years. I just sort of go through the evidence and make the decision with them, even though I’ve made it at the back of my mind’ (2c. I. 21-25)

All participants reported that discussing the rationale around their decision not to prescribe antibiotics and pointing out the potential nasty side effects enabled them to manage patient expectations. The NIPs referred to the side effects of antibiotics, only when backing up a no prescribing decision. When doing this they told the patients that antibiotics would make them feel more unwell and used words to phrases such as ‘they will make you feel grotty’, or ‘you’ll get an upset tummy’. There was only one observed occasion when the NIP discussed a potential side effect with the patient. When doxycyline was prescribed, 2b advised the patient to stay out of the sun due to the possibility of a photosensitivity reaction. However, one NIP was more mindful that there were a variety of factors that influenced patients concerns about not being prescribed antibiotics. She explored why patients thought they needed antibiotics, what was really worrying them:

> ‘So I tend to, when they are indignant, ask about other worries and say what have you got planned next week, what are you worried about if you didn’t get an antibiotic, and try to engage more in their conversation and their life and then they think she’s interested that I’ve got this concert next Monday to go to ..and then we sort of negotiate, and I say that’s absolutely fine and realistically it’s Wednesday today, how about we say on Friday if you’re not getting much better you’ll ring me and I’ll see you as an extra and we’ll sort this out.. it’s just sort of giving them the confidence that there is an alternative to getting a script today’ (2c. I. 283-290)

The NIP referred to her role as a business partner in the practice and why it was important to her to ensure patient's leave the consultation happy, as she might be left to deal with a complaint. She reported that she was 'breaking the rules' somewhat in how she did this. Patients usually must telephone on the day and be triaged over the telephone, before being offered an appointment. However, the flexibility of being able to give the patient an appointment if needed, was very effective and ensured that patents felt looked after and were happy:

> 'I'm sure it drives my colleagues mad, they say stop giving them what they want, but I just trying to make sure that they go out happy .. it's easier, now I'm older and wiser it's easier to please people and not argue with them' (2c. I. 292-295)

The GP also focused on ensuring the patient left the consultation feeling content with the reasons why antibiotics were not prescribed:

> 'I suppose there's a continuous, not a battle, well yes it is. Part of your consultation you know people come in, I'm ill, i think i need antibiotics and you've got to somehow think I agree and treat them or not agree and then work out a way that they're happy with that treatment' (GP. I. 110-113)

All Participants reported feeling deflated and cross, when they had been pressured to prescribe against their better judgement but were able to rationalise it. They were able to put it into context and move on, it was not an ongoing worry for them:

> 'I feel hacked off that they haven't listened to my advice and they've gone with their own health beliefs, and they've thought no this is what I need and this is what I want, even though I've said everything will settle down, you might end up feeling grotty, you might end up with the trots for want of a better word, you know, they still want it.. and I'm just thinking.. aww...defeated, but I'm thinking, I'm not here to argue with people or have a stand up row with people' (2b. I. 170-175)

> 'you type it up and you feel so cross with yourself because you know that's not the way you would do it if you were in exam conditions you wouldn't have practised like that, but you've just let yourself down because of all those factors, and it could just be you just really needed a wee, and you are thinking I just need to get this one done now (*laughs*) and its all the wrong reasons why we make those decisions, but it's honest reasons' (2c. I. 110-115)

5.5.9 Prescribing In uncertainty

During the observed sessions 2a did not prescribe when he was uncertain, he referred patients to the GP. On the other hand, 2b and 2c managed their consultations more independently. There were a few instances where they were uncertain of the diagnosis but felt that antibiotics were indicated. In these cases, the patients were not very unwell, but the NIPs were concerned enough to prescribe antibiotics. Antibiotics were prescribed so to see if they would be effective, with instructions to return if they were not or if symptoms worsened. The NIPs prescribed in order to exclude infection rather than because they had a diagnosis of infection. This behaviour is evidence of a balanced judgement and can only be deemed good or bad when the outcome is seen, and the patient is followed up. In the case of a woman with abdominal pain, a history of kidney disease and regular urine infections, antibiotics were prescribed for a urinary tract infection despite a negative dipstick. The patient had only one fully functioning kidney, which influenced the decision:

> 'just in case …not sure what was going on, maybe not good prescribing, sorry about that' (2b. F)

In the case of a patient with hard swollen submandibular gland, the NIP was unable to make a diagnosis but felt that infection might be the cause, and prescribed antibiotics:

> 'Not sure what exactly is going on there' (2c. F)

5.5.10 Diagnostic skills

2a was observed prescribing antibiotics for a patient who had been treated with antibiotics for otitis media, the symptoms, of pain and fever had resolved but the patient could not hear properly. The NIP gave a delayed prescription for antibiotics for the patient to take if symptoms did not resolve in a few days or worsened. The NIP seemed unaware that this was normal finding, and it would take time for the inflammation to reduce and for the debris to drain from the patient's ear. There were also two patients seen by 2b who returned, as their condition was not improving, they had been misdiagnosed by 2a as having cellulitis, a soft tissue infection and were prescribed antibiotics. 2b subsequently diagnosed that the patients had varicose eczema, a condition for which antibiotics are not required, and advised alternate appropriate treatment. 2a had the least prescribing experience of the three NIPs and had mentorship and monthly tutorials with a GP to support him in the role.

5.5.11 Fear of litigation

NIPs were aware of the risk of litigation and felt that justifying their decision making and documenting it would go some way to mitigate the risk:

> 'I'm very well aware of the need to…everything I do I have to imagine I am justifying it to a higher authority and just be prepared that whatever I do I'm going to have to explain it, so yes, I wouldn't say fear, I'm certainly strongly mindful of it yeah' (2a. I. 55-57)

> 'Yeah, yeah I do especially kids, I must admit I'm probably more lenient with children, but yeah on the flip side of that I was speaking to a student nurse yesterday, if you don't prescribe and they become unwell then it's your fault and if you do prescribe and it's not necessary and they have an allergic reaction, it's your fault, you've got to make such a fine line decision whether, you know, because they're not without their side effects' (2b. I. 56-60)

Experience has altered 2c's perception of risk and she has rationalised that outcomes cannot always be predicted. What matters is that the patient is assessed properly, and that during that consultation the best is done for the patient, and they were safe at that time. 2c had experienced a complaint as the patient, she saw went on to develop worsening symptoms, and her good documentation enabled her to see how she had managed the consultation well:

> 'recording really well, I tend to have very good notes, ermm they're a bit nursey, they tell a story, but I just find that will help me if I'm faced to, and it did with the PE one because I wrote bits about this girl had lost an amount of weight and social things and that meant that the moment that happened I could remember that consultation straight away so I think its safeguarding, remembering one patient in a thousand, when you're asked that' (2c .I. 88-92)

5.5.12 Pharmacist support

The pharmacist who worked three days a week in the practice was seen to be a huge support in helping the NIPs to prescribe appropriately. NIPs reported that they frequently sought advice from him, or from the local hospital microbiologist, when they had a query about what antibiotic to prescribe. They would take this option rather than ask the GPs:

> 'Yeah, yeah, it is .. it's made a massive difference him being there' (2b. I. 116)

> 'Looking at interactions it can be very difficult if you come up against a pharmacology quandary to actually work it out, you can message him and, he will say yes that is an interaction, avoid it or actually you're ok it's not harmful' (2a. I. 78-80)

At the end of the study period the pharmacist had left, but the practice hoped to employ another one soon, as they recognised the contribution that he had made.

5.5.13 Continuing professional development

There were no staff meetings where antibiotics or any prescribing issues were discussed. The NIPs had regular CPD regarding their prescribing though quarterly CCG prescribing forums. 2a had one-to-one monthly tutorials with a GP as part of their support into their developing nurse practitioner role.

The forums were described as very useful, using prescribing scenarios to discuss complexities and best treatment and disseminating up-to-date information and changes to guidelines. It was also recognised that this situation was not always the case and that this level of education and support is a relatively recent development. The NIPs commented on how valuable the forums were as a means of forming an identity, as a group who supported each other:

> 'In the last 4-5 years we are much better at that than we probably were. I think we went through a, especially as a nurse practitioner, the first ones, we were left thinking, well who supports me now and we were a bit of an oddity without this team around us whereas now there are so many NIPs that you have your own networks like GPs have their networks. So, I think it's much better than it was' (2c. I. 232-236)

5.5.14 The practice organisation

NIPs described how the practice operated during the winter to try to manage patient expectations of having antibiotics for viral illness such as coughs and colds. The local medicines management team came in last year and had a stand where they gave out leaflets and talked to patients and answered their questions. The NIPs reflected that it had worked very well and considered that it would be good to do it again. The event supported good antibiotic prescribing practice:

> 'I think we might do that again erm this year, try and see if he'll come in or maybe do it ourselves, put the leaflets out and print out the ones where you give them a prescription of advice for example your cough will last 3-5 days, this will do this or that, this is what we think you've got, these are the worsening symptoms well see you for that. If they go away with something they feel that they've got something' (2c. I. 199-203)

During the period of observation 2c frequently discussed strategies that might improve the quality of the NIPs antibiotic prescribing, such as looking closely at EPACT data and developing a

mechanism of feedback for the NIPs. There was also a recognition that at practice level there needed to be more input into supporting good prescribing:

> 'At the moment we have clinical meetings but they don't tend to be educational, there isn't any discussion about what we're doing and how are we with that and I think we need to be doing more of that '(2c. I. 239-241)

At practice level the GP was aware of the level of antibiotics prescribing and how they compared locally and nationally, and felt the comparison was favourable. The GP reported that he had previously looked at the NIPs' ePACT data in relation to antibiotic prescribing and it has caused him no concern.

> 'were pretty balanced across the patch, the nurse practitioners have a higher rate of prescribing of antibiotics but that's because, they're seeing the minor illnesses, so there's nothing surprising in that. The majority of the stuff that they're prescribing is what you'd expect them to be prescribing. There's nothing weird and wonderful' (GP I. 66-70)

5.6 Appropriateness

Simple descriptive statistics were used to analyse and present findings from applying the MAI tool to the anonymised case notes, to assess the appropriateness of the NIPs antibiotic prescribing. The tool was applied to 30 case notes, ten from each NIP, retrieved and anonymised as described in Chapter 3, 3.11.3

Table 26 Modified Medication Appropriateness Index (MAI) Case Two

Item	Appropriate		Inappropriate	Don't know	N/A	total
Is there an indication for the medication	Indicated (n=28) 93.3%		Not indicated (n=1) 3.3%	(n=1) 3.3%		30
Is the medication effective for the condition	Effective (n=100) %		Ineffective (n=0) %	(n=0)		30
Is the dosage correct	Correct (n=29) 96.6 %		Incorrect (n=1) % 3.3%			30
Are the directions practical	Practical (n=30) % 100%		Impractical (n=0)			30
Are there any clinically significant medication interactions	None apparent (n=30) 100%	Significant and addressed by the prescriber (n=0)	Significant and NOT addressed by the prescriber (n=0)			30
Are there clinically significant medication disease/condition interactions?	None apparent (n=30) 100%	Significant and addressed by the prescriber (n=0)	Significant and NOT addressed by the prescriber (n=0)			30
Is there unnecessary duplication with other medication(s)?	None apparent (n=30) 100%		Unnecessary duplication (n=0)			30
Is the duration of therapy acceptable?	Acceptable (n=29) 96.6%		Unacceptable (n=1) 3.3%			30
Is the drug first line treatment according to local and National guidelines	First line treatment (n=30)	Not first line treatment but addressed by the prescriber (n=0)	Not first line treatment and NOT addressed by the prescriber (n=0)			30

The analysis of case notes using the modified MAI indicated that as other data suggested, the NIPs' antibiotic prescribing was overall appropriate and in line with current guidelines (SCAN 2018). 93.3%of antibiotics prescribed were indicated and effective for the condition they were prescribed for.

There was one consultation where the patent was treated for a chest infection, when the chest was documented as 'clear' this documentation would indicate that treatment with antibiotics was not appropriate and so was scored as such. In another case the documentation was not clear, the

patient presentation was, exacerbation of asthma, it was not clear from the documentation why antibiotics were prescribed. In this case a 'don't know' was scored.

The dosage was scored as 'incorrect' in a case where doxycycline was prescribed appropriately, but the prescription stated 100mgs tablets to be taken twice daily, no length of treatment was indicated and only 8 tablets were prescribed. This patient was prescribed medication for four days only, which is an inappropriate duration of treatment. This was an error that the pharmacist should pick up when dispensing the medication.

5.7 Reflexivity

It might be assumed that it would be easier to be subjective throughout the research process in this Case, as I did not feel any collegiality with the NIPs. However, there were other challenges, as I did not have the same relationship as with the NIPs in Case One, I had to develop a rapport with the NIPs, which McConnell-Henry et al (2009) describe as important in developing open and honest relationship with participants. Relationship building took some time and I did feel that the NIPs initially were on their best behaviour, they were more formal with me and there was less general chatting than with the NIPs in Case One. I tried to be as relaxed as possible with them and did my best to create a non-judgemental environment (Hillier and Vears 2015) Two of the NIPs treated me as a peer, they did not ask advice and did not justify their decisions. However, the NIP who was a former student did ask my advice on occasion, when the patient had left the room, and once during a consultation. The NIP turned to me and said that I had taught him about the examination he was undertaking on the patient and asked me in front of the patient what the findings meant as he could not remember. I felt that I had to answer as the patient was looking at me for a response. In my role as non-participant observer I had previously stated that I would not take part in the consultations but being pragmatic it made no difference to the outcome of the consultation or the treatment, and I told him the answer.

The NIPs carried out their consultations and clinical examinations, in a slightly different way than I would have done. Initially this was slightly disconcerting, and I felt uncomfortable, but I quickly realised that they were not 'wrong' in what they did, just different, and outcomes for patients were similar in both Cases. For example, when examining ill children, I expected the NIPs to undress them, and examine them thoroughly, even if there was an obvious diagnosis. I felt that some of the examinations were brief and similar to how a GP would carry them out, rather than a nurse. Hillier and Vears (2016) describe the tendency to be over critical in areas where the researcher has expertise. I recognised that I was judging the practitioners in Case Two against my own clinical practice. I made this note

'Briefer examinations, I wanted him to look in that baby's ears'

Through reflexivity I recognised what I was doing. The consultation model some of the NIPs used was not familiar, but I was able to put that aside and report findings honestly. Writing field notes and thinking and discussing with supervisors enabled me to identify potential biases, thereby adding to the rigour of the research (Fisher 2011).
I felt the power imbalance was less than in Case One. They were much more peers rather than participants, as we did not have a previous clinical relationship as I had with the NIPs in Case One. They were however still concerned that I was watching what they did, and they wanted to be seen to be prescribing appropriately. My presence had an influence on them, as they demonstrated a heightened awareness of their responsibilities when prescribing antibiotics, as well as undertaking activities to ensure that they were up to date.

5.8 Chapter Summary for Case Two

NIPs prescribed within guidelines and on the whole appropriately, although there were two instances on reviewing the patient case notes using the MAI tool that an antibiotic was prescribed questionably. According to the notes the patient did not appear to be systemically unwell, or fit the criteria for an antibiotic i.e., the condition was likely to have been of viral origin.

There was evidence that GPs influenced prescribers' antibiotic prescribing when they were novices, but as they gained experience and further training, they were able to identify poor prescribing practice and they now all worked well within the prescribing guidelines. They had an awareness of the possibility of litigation, but it did not overly concern them.

During the period of observation one of the NIPs was a less experienced practitioner, than the others and there were two instances when a condition was misdiagnosed, and antibiotics were prescribed inappropriately. However, there was ongoing training and support in the practice for that NIP. The NIPs reported that they prescribed inappropriately at times due to time pressure and patient pressure or concerns about the patient managing the system for accessing treatment, especially at the weekend. Although this was not observed.

NIPs were very aware of the need to prescribe antibiotics appropriately and in line with guidelines and were unhappy when they did not. However, they also took the pragmatic view that such prescribing was not always possible. They were all able to describe circumstances when they were pressured to prescribe either due to patient pressure or time factors. Experience also helped them to recognise that not all patients wanted antibiotics, and their perception that they did, was

incorrect. NIPs were aware of guidelines and prescribed within them, choosing the antibiotic best suited to the patient to improve adherence. Guidelines were seen to be evidenced based and were a valuable resource.

NIPs regularly attended NMP forms and other CPD activities. They were also completing master's level modules at University and they felt that their educational programme helped to keep them up to date and encouraged some critical thinking about their practice. The pharmacist was an additional asset for the NIPs and his support was very welcome. The NIPs felt that their prescribing was being monitored, and that any problems would be identified, and acted upon, either by the pharmacist or the nurse partner in the practice.

The development and expansion of the advanced practitioner/prescriber role over the years was seen as valuable. The development of NMP forums and CPD events were identified as key to keeping up to date. The NIPs no longer only had the GP for support and advice, they now had colleagues who are up to date and were a valuable resource for each other. NIPs recognised that the GPs probably do not have as many updates or as much ongoing training as they do. GPs did not directly influence what antibiotics the NIPs prescribed. If NIPs had already decided to prescribe antibiotics, but had some concerns about which one, maybe due to allergies or the patient's co morbidities, they sought advice from the hospital microbiologist or the pharmacist.

NIPs were observed to be aware of the importance of their antibiotic prescribing and the increasing problem with antimicrobial resistance and signed up to become "*antibiotic guardians"* during the study period. The study heightened their concern about their own antibiotic prescribing and the practice's antibiotic prescribing as a whole.

Findings from Case Two have been presented in this chapter; data was obtained through semi-structured interviews, observational data, and analysis of case notes using the MAI tool. These data collection methods enabled the findings to accurately reflect both the Case and the context. In the following chapter cross case synthesis will identify the shared and distinct findings from each Case.

Chapter 6: Cross Case synthesis

6.1 Introduction

This study has explored the appropriateness of and the influences on, NIPs antibiotic prescribing in general practice. In the previous two chapters, the Cases were described, findings were presented and discussed and the influences on and appropriateness of the NIPs antibiotic prescribing was explored.

In this chapter the findings from both Cases are synthesised and main themes are presented and compared in depth, in order to illuminate, and understand the phenomenon of nurse independent prescribers' antibiotic prescribing in this particular context, general practice.

This is the first study to examine how the context in which the NIP was prescribing might support appropriate antibiotic prescribing or may influence their antibiotic prescribing. The different organisational structures of two GP practices are presented below, followed by a synthesis of the research findings

6.2 The organisation

6.2.1 The practice set up

In Case One the practice was welcoming and friendly; all the staff (receptionists, administrative staff, nurses and GPs) had coffee and lunch breaks together. The practice manager took charge of the practice as a whole, organising contracts of employment, leave, and rotas for all practice staff including the NIPs. She was the first person the researcher was introduced to in the practice and appeared to be the person giving consent for the study to be undertaken. It was also the practice manager who asked me to sign a confidentiality agreement. Consent was actually given by the GP partners and participants, prior to the start date of the study. The NIPs were employees, and GP meetings took place in the practice without the NIPs involvement. It was noted that neither did the NIPs attend the practice nurse meetings. The NIPs had no access to a pharmacist and did not know when the pharmacist visited the practice. They did not ask for access to their ePACT data and were not sure how they would access that information. In this practice the NIPs wore a traditional navy nursing uniform and used GP consultation rooms for their clinic sessions.

In Case Two, the practice was also welcoming, and the staff were friendly. The practice manager had been appointed by the NIP business partner and took less of a lead in the practice than in Case One, having no direct involvement with the NIPs. The NIP business partner took on some of the duties of the practice manager, as outlined in Case One. She arranged leave and study days, and cover when staff were off sick. She recruited new practice staff, both administrative and clinical, and attended business meetings with the partners. The business partner NIP acted as the liaison between the other NIPs, by disseminating information, this role ensured that the NIPs' voices was represented in most aspects of the practice. The lead GP attended CCG medicines management meetings and, when appropriate, provided feedback to the staff. In this Case, NIPs did not wear a uniform, and had their own consultation rooms with their names on the door.

6.2.2 Practice antibiotic prescribing

Case One practice level prescribing data indicated that they were on the higher centile nationally for both overall antibiotic prescribing and prescribing of broad spectrum antibiotics, which should be avoided. Case Two practice level antibiotic prescribing was on the median centile. Prescribing data for individual practitioners is not publicly available. In Case One the GP was not aware of practice prescribing data. He was unaware of the practice antibiotic prescribing in relation to local or national figures, although he had a sense that they might be higher than others, which was actually correct. He also did not know that there were government incentives to reduce antibiotic prescribing in general practice. The NIPs in Case One were also vague about their own antibiotic prescribing; they were unclear whether it was appropriate or in line with national standards, and they were unconcerned about their lack of knowledge on the subject.

Although there was no specific monitoring of NIP's prescribing in either Case, the GP in Case Two had some knowledge of both the practice prescribing rates and where they sat nationally. The antibiotic prescribing in this Case was similar to the national median. The GP had also previously reviewed the NIPs antibiotic prescribing, which he deemed to be appropriate for the type of patients and presentations that the NIPs treated. The NIP business partner in Case Two, was aware of the incentives for practices to prescribe antibiotics appropriately; and was the only participant interviewed in both Cases who was aware of that information

The two Cases' engagement with government incentives and awareness of national and local antibiotic prescribing rates differed, but the NIPs lack of knowledge about their own antibiotic prescribing was similar in each Case. Despite these differences and similarities, the NIPs prescribed within guidelines and prescribed antibiotic appropriately. The overall practice prescribing rates did not influence the NIPs antibiotic prescribing.

6.2.3 Practice population

The practice population in each Case, were from different socioeconomic groups. In Case Two which was described by the CQC as an area of high deprivation, the patients' circumstances led to more complex consultations. While the presenting complaint may not have been complex, the patients frequently had ongoing socioeconomic and mental health problems, which impacted on their ability to manage their condition and to adhere to their medication regimens. This issue was evident during the period of observation in Case Two, patients presented with a physical complaint, but once in the consultation room brought up other, either physical, social or mental health issues, which made the consultation time longer and more complex.

However, the presentations in Case One, were more clinically complex, with some requiring admission to hospital; for example: patients presenting with chest pain, and shortness of breath. For this reason, the NIPs appeared to seek diagnostic support from the GPs, more often than in Case two. The triage system operated in Case two may have filtered these patients out to the emergency department, rather than allocating an appointment with the duty team.

Despite the differing complexities experienced by the NIPs, they managed consultation very well and supported patients both physically and mentally, while also prescribing antibiotics appropriately.

6.2.4 The Practices' staff

In both Cases there was respect between the NIPs and GPs for each-others' professional knowledge and experience. There was friendly interaction between the nursing, medical and administrative staff in both cases. When practice nurses or district nurses asked NIPs to review patients, or asked advice, this was never seen as an unwelcome addition to their workload. When discussing the practice nurses in case one the NIPs praised them. There was much more social interaction between staff in Case One, due to them having coffee and lunch breaks together. The physical layout of the case one practice, with the duty team NIPs and GPs in adjoining rooms, facilitated interaction between the team members. In case study two the consultation rooms of the duty team were at different sides of the building: GPs on one side and NIPs on the other. However, this arrangement did not appear to have any impact on the NIPs' clinical practice.

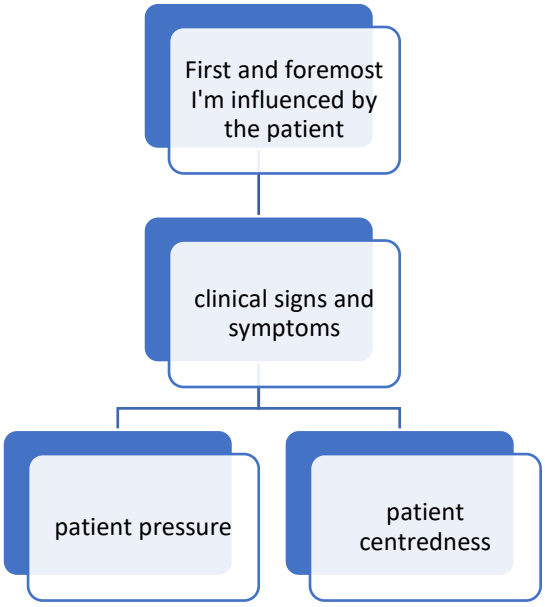
6.2.5 Summary

Despite the differences highlighted in the two Cases discussed above, the NIPs maintained their own competence and were noted to have prescribed appropriately. The organisation and features

of the general practice settings, however disparate, do not appear to have influenced how the NIPs actually prescribed antibiotics. In both Cases the NIPs were observed to prescribe antibiotics appropriately. This finding was supported by the evaluation of case notes using the validated MAI tool.

6.3 Influences

The factors that influenced NIPS antibiotic prescribing, are illustrated below, under three main themes. The first major theme is the patient, using the quotes from the participants as a metaphor 'First and foremost I'm influenced by the patient'. The second theme is time, using the metaphor 'it takes longer to say no than to say yes'. The third theme is how the NIPs see their role in antibiotic stewardship and the strategies that support good antibiotic prescribing 'it's a weight now on my shoulders'. Noblit and Hare (1988) suggest metaphors as a method of combining data in meta-ethnography.



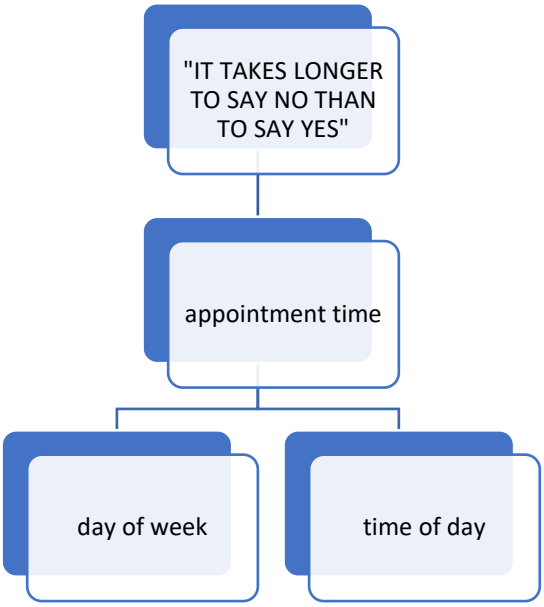
The patients were the primary concern in both Cases. Clinical factors were the main influence; for example: clinical signs of infection, immunosuppression and co morbidities. NIPs were very concerned that when they prescribed antibiotics, the patient's ability to adhere to the medication regimen was enhanced. NIPs adapted their prescribing to overcome this concern by choosing to prescribe antibiotics from within the guidelines. They prescribed formulations which were more palatable, and where dosing schedules were more convenient for schoolchildren and the elderly, and the duration of treatment was shorter than the alternative antibiotic.

6.3.1 Patient pressure to prescribe antibiotics

However, some 'patient factors' influenced antibiotic prescribing in a negative way. Patient pressure was reported across both cases, albeit on the decrease, while some NIPs reported experiencing more pressure from patients than others did. Experience managing that pressure was seen to be an important asset. Also, it was felt that trust in the practitioner made patients more open to their decisions, and with experience NIPs were more confident in negotiating acceptance of their decision with the patient. NIPs were seen to manage patient expectations for antibiotics through negotiation and shared decision making. Delayed prescribing was used in some cases to manage patient pressure

6.3.2 Patient centeredness, resulting in different prescribing outcomes

All NIPs took a holistic approach to managing their patients, listening to their concerns, and taking into account lifestyle factors during the consultations, however, there was one NIP in each Case, who took a very patient centred approach to antibiotic prescribing. The two NIPs took this approach, which went beyond holism. They wanted to ensure that patients felt satisfied with the outcome of the consultation, that they had been listened to and there was a safety net in place for that patient. Rather than saying, 'come back if you have any concerns', which all the NIPs did, they went out of their way to help the patients access the service again, if they had any concerns, by booking review appointments for them or arranging a telephone call. In Case Two It was difficult for patients to get another appointment at the practice, as there is a process of calling on the day; then the call is then triaged before an appointment is allocated. When access to treatment might be further restricted such as at the weekend, the NIPs managed their concern by issuing a delayed prescription.



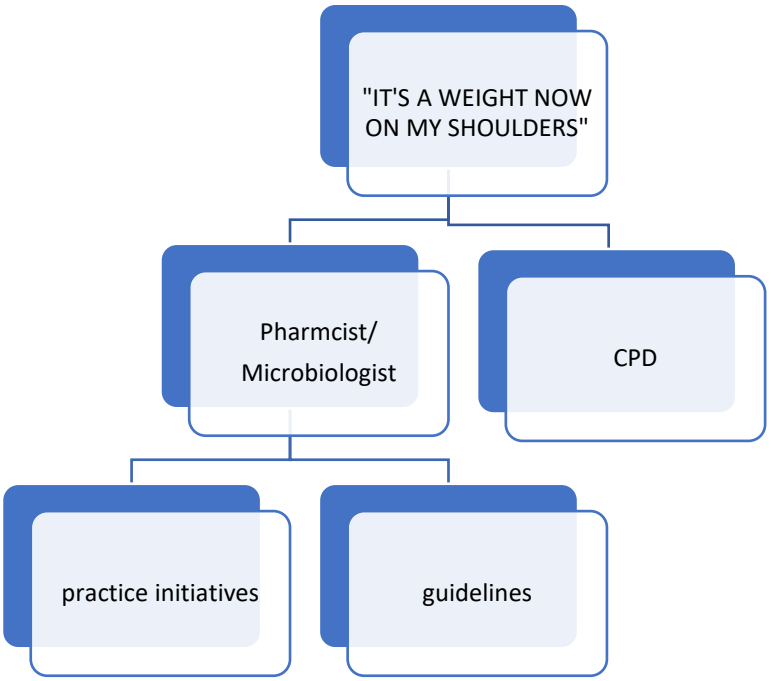
6.3.3 Appointment times not long enough

Time was an influencing factor in both cases, but much more so in Case Two. The NIPs in Case One did not have set appointment times, they worked from a list of patients, some of whom had been waiting for a long time, and there was noticeable pressure to get through that list. However, the ability to have flexibility in the length of consultation was very beneficial to the NIPs. If the NIP had a patient who was very unwell, or possibly needed admission to hospital, and took a long time to manage, other members of the duty team saw the waiting patients. This back up support meant that the NIPs were able to take set coffee and lunch breaks, and very rarely had to forgo their breaks to catch up. In Case Two, the NIPs had 10-minute appointment times and used breaks to catch up as they were regularly running behind time.

This time issues or more accurately lack of time, would appear to be a key influence in Case two, where NIPs reported that they prescribed antibiotics inappropriately much more frequently than in Case one, due to time factors. Late in the afternoon was also reported to be a time when NIPs prescribed inappropriately, in order to finish the clinic on time. Another critical time period was on a Friday afternoon, before the weekend, when access to treatment for patients was limited. NIPs in Case One, reported Friday afternoon as a time when they might prescribe antibiotics inappropriately due to concerns regarding the poor quality of the OOHs service.

6.3.4 Avoiding the problems with the OOHs service

A major concern for the NIPs in both Cases was the OOHs service at the weekend, when NIPs were aware that access to the service was difficult and patients often had to wait a long time to be seen. This influenced the NIPs' decisions to prescribe antibiotics for those patients who, according to the guidelines, did not need antibiotics at the time they were assessed by the NIP, but who might become more unwell over the weekend. NIPs described the OOHs service as 'Appalling' (F)



NIPs were aware of their role in antibacterial stewardship and the need to prescribe antibiotics appropriately, for some it was very concerning. In Case two, the NIPs awareness of their role in antibiotic stewardship was heightened by the researcher's presence. The development of government initiatives around antibiotic guardianship, were explored, the NIPs joined up to the initiative, and were keen to demonstrate their engagement with the battle against increasing levels of AMR.

6.3.5 Wanting to do better

The NIPs in Case Two said that they wanted to do better, and the business partner NIP discussed strategies to improve their antibiotic prescribing. Support from a pharmacist and a microbiologist was much appreciated for helping the NIPs to decide which antibiotic was most appropriate for the patient, in instances when there were concerns regarding allergies, intolerances, and interactions.

In Case Two the practice worked alongside the CCG medicines management team in the winter period, to put up a stand against antibiotics for cold and flu, highlighting that the antibiotics were not necessary or appropriate; the stand was manned by a pharmacist who gave out leaflets and answered patients' questions. NIPs reported this initiative as very effective in reducing pressure from patients to prescribe antibiotics during the winter period. However, they also felt it was an initiative that should be ongoing.

6.3.6 Continuing Professional Development, access and support

In Case Two the three NIPs developed confidence in prescribing through ongoing development and CPD opportunities, this enabled them to move away from the influences of the GP who supported them through the prescribing programme and when they were novice prescribers. This professional support enabled them to move away from the influences of the GP who mentored them through the prescribing programme and when they were novice prescribers. The development of NMP forums and the increasing numbers of nurses taking on the advanced practitioner role, meant that there were more opportunities than previously to obtain this peer support in their local area. The NMP forums frequently include teaching sessions from pharmacists

This support was more evident in Case Two, although this study was undertaken some time after Case One. In Case One the NIPs independently undertook educational activities in the evening, but they were not prescribing related. It might be assumed that the NIPs in Case One now have similar support mechanisms to those that were evident in case two.

6.3.7 Guidelines, underpinning practice

Guidelines were seen as a support mechanism, both in making the right choice of antibiotic for the patient's condition and also as a support when a NIP decides not to prescribe. NIPs referred to the criteria in the decision-making tools within the guidelines and discussed with the patient how

their symptoms and signs did or did not meet that criteria. Not meeting the criteria indicates that an antibiotic is not required, and this process appeared to help reassure patients.

NIPs rarely prescribed outside the guidelines and were able to justify when they did. They wrote the rationale for their decision in the patient notes, so that it was clear and unambiguous, should the decision come under any scrutiny. NIPs in both Cases wanted to do the right thing by prescribing appropriately and within guidelines. Therefore, they were deflated and upset when they felt that they had prescribed inappropriately for whatever reason.

6.4 Chapter summary

The original hypothesis when undertaking this research study was that GPs would influence the NIPs antibiotic prescribing. However, while when novice prescribers this was the case, as they developed experience and with further training and updates, NIPs become much more independent from, and less dependent on, the GPs. NIPs recognised that the GPs have much more training and experience than they had, so they asked for the GP's advice much more commonly when the diagnosis was unclear, rather than for specific advice regarding which antibiotic to prescribe. This behaviour was more evident in Case Two, where NIPs also asked for advice, although from a pharmacist or microbiologist rather than the GP, regarding antibiotic prescribing. In Case One the NIPs did not have access to the same level of support from pharmacists or microbiologists and relied on the GPs for advice when dealing with such issues as which antibiotic to prescribe when there were problems with allergies, drug/drug and drug/disease interaction.

Time pressures were the most notable difference between the two Cases. In Case Two NIPs worked with ten-minute appointments, their consultations regularly ran over time and so they were obliged to make up that time in their breaks. Consultations in Case Two were more rushed and slightly more chaotic due to patients presenting with multiple issues, in one ten-minute appointment. This pressure impacted on the antibiotic prescribing of the NIPs in this Case. As a result of this pressure they reported prescribing antibiotics inappropriately more frequently than in Case One, although this was not observed. The day of the week was an influence in both cases due to concerns regarding the OOH service

In both Cases NIPs were seen to prescribe antibiotics appropriately for the most part. There were a few occasions where prescribing was not appropriate, in the review of documentation using the

MAI tool in just one of the 60 consultations across both Cases, antibiotic prescribing was deemed to be 'completely inappropriate'.

The NIPs honestly and openly discussed times when their antibiotic prescribing may not have been appropriate and were able to identify the reasons for that and what would help them going forward. Longer appointment times was the main issue identified that could support better antibiotic prescribing.

The one negative finding in this study was that the side effects of medications prescribed were not discussed with the patients; an issue noted in all but one of the total observed consultations across both cases. This significant omission could have an impact on whether the patient adhered to the medication regimen. Simple instructions regarding possible minor side effects, how to manage them, and providing encouragement to continue with the treatment, would have been beneficial to the patients. It could also be lifesaving if the reaction was severe.

Despite differences in practice culture, both sets of NIPs were able to maintain high standards of antibiotic prescribing. and knowledge of the GPs regarding antibiotic prescribing rates within the practice and nationally appeared to have little effect on the NIPs antibiotic prescribing. The NIPs in Case One had much less support from within the practice regarding their antibiotic prescribing, this situation was partly their own choice, although antibiotic prescribing was guideline driven and NIPs knew the contents of the guidelines without looking them up. With experience, the NIPs became more knowledgeable and sought information from other sources.

This chapter has summarised and synthesised the findings from each Case. In the next chapter findings will be compared with the literature and theories applied to the findings in order to further explore and understand the data.

Chapter 7: Discussion

7.1 Introduction

The reason for undertaking this case study research, was to understand the appropriateness of and the influences on NIPs antibiotic prescribing in general practice settings in the UK. Context was key to the inquiry, whether the context of general practice and the GPs as employers and mentors had an impact on the prescribing behaviour of the NIPs in those practices. NIPs antibiotic prescribing in general practice is an under researched area as identified by the limited literature review in chapter two. This chapter includes a discussion of the main findings of the appropriateness of and influences upon the NIPs antibiotic prescribing in relation to other research. To aid explanations, also included is a discussion on theories of patient centeredness, communities of practice and expertise, in relation to this study. Limitations of the study and reflections will also be discussed, concluding with implications for practice and potential future research.

The findings from both qualitative and quantitative data are that the NIPs in both cases were on the whole prescribing appropriately and effectively. The influences on the NIPs antibiotic prescribing were multi-dimensional, relating to; the individual patients and working practices. Whatever the influences the NIPs in this study worked hard to do the right things; to continue to develop knowledge and competence and to prescribe antibiotics appropriately. The context in which they prescribed i.e. the general practice setting, with GPs in a variety of roles, employer, mentor and in some cases peer, influenced the NIPs antibiotic prescribing to a limited extent. The influence of the GP on the NIPs antibiotic prescribing was most evident when the NIPs were student and novice prescribers, however the influence diminished as NIPs gained experience and confidence in their role as a prescriber in general practice. The one overarching influence that the NIPs found most difficult to overcome was time.

7.2 Findings and patterns within the literature

The limited literature to date is comprised of studies that include NIPs prescribing medication in a variety of settings and is not exclusive to NIPs in general practice settings, or to antibiotic prescribing. Where possible the studies discussed below that relate to NIPs antibiotic prescribing have been elicited to confirm or refute findings from this study. The key findings are discussed in themes.

7.3 Appropriateness

Findings regarding the appropriateness of NIPs antibiotic prescribing support previous findings from research into NIPs prescribing medication across a range of conditions by concluding that prescribing is, on the whole, safe and appropriate (Latter et al 2012; Black and Dawood 2014 and Hart 2013). Ness et al (2015), in their retrospective analysis of NIPs prescribing data across Scotland, were careful not to say that antibiotic prescribing was appropriate, but quality indicators such as adherence to guidelines would suggest that it was. Overall NIPs in this current case study adhered to guidelines and prescribed appropriately; however, there were times when the NIPs reported that other influences had an impact on the appropriateness of their prescribing. This revelation strongly suggested that some patients may have been prescribed antibiotics when they did not need them. This prescribing behaviour was reported by the NIPs rather than actually observed by the researcher; their openness and honesty is highly commendable and much appreciated. This case study is the first to undertake observation to assess the appropriateness of antibiotic prescribing and to triangulate findings with the evaluation of patient case notes using a validated research tool.

7.4 Influences

7.4.1 Time is everything

Time was reported to be a major influence on the NIPs antibiotic prescribing in Case Two and to a lesser extent in case one. This influence has been reported in the OOHs' service (Williams et al 2018) and also in primary care (Horwood et al 2016; Courtney et al 2017). Consultation time differed across both cases; the NIPs in Case One were not constrained by fixed appointment times. However, in case two the NIPs had fixed 10-minute appointments, as did the GPs in the practice. Similarly, in Williams et al (2018) some of the participants had fixed appointments and other did not. Those who did not have restricted appointment times reported that they were very aware of how lucky they were, and how this had an impact on their prescribing, enabling them to spend longer with patients and negotiate a 'no prescribing' decision with them. In case two of this current study, the NIPs reported prescribing antibiotics inappropriately at times due a variety of time related factors. These factors included; the constraints of time, consultation time, time of the day and day of the week, although this inappropriate prescribing was not observed. In both cases the day of the week, was the time most reported to be a concern for the NIPs. The OOHs' service over the weekend was seen to be; fragmented, difficult to access, taking too long to respond to patients and not having knowledge of the patient. For these reasons, NIPs reported

that Friday afternoon was the time when they were most likely to prescribe antibiotics against their better judgement (Philp and Winfield 2010; Maddox 2011; Rowbotham et al 2012; Horwood et al 2016; McIntosh 2017; Williams et al 2018).

Time was the one influence that NIPs found most difficult to mitigate against, they were able to manage other potential influences on their prescribing behaviour by using their communicating and negotiating skills. Those who worked in the Case Two practice, with its with ten-minute appointments, reported the short appointment times (specifically the lack of sufficient time), as having the potential to increase levels of inappropriate antibiotic prescribing. The NIPs reported that if patients were difficult or demanding that it was quicker to 'give in' against their better judgement, due to clinics running behind. A particularly difficult time for 'giving in' was at the end of the day, when the surgery was closing and they needed to finish their list of appointments.

Concerns regarding the length of consultations in primary care are not new or exclusive to NIPs, concerns have been raised by GPs and patients for decades. In 1991 Wilson reported that patients and GPs thought that in some part the length of the consultation impacted on the quality of care provided, and that longer consultation were more likely to result in higher quality care. In a more recent survey, 24% of GPs in England agreed that all appointments should be longer than 10 minutes with 68% of respondents agreeing that longer appointments were required for certain patient groups (BMA 2015).

A systematic review in 2002 found that GPs who had longer appointment times prescriber fewer medications and were more likely to provide lifestyle and health promotion advice (Wilson and Child 2002). However, in their conclusion the authors were unable to conclude that the consultations length itself was the most important aspect of the study. They suggested that there were other variables which might have an influence on the outcome such as practitioner competence and confidence and personal attributes. Wilson carried out another systematic review in 2016 and found similarly, that there was not enough evidence to adjust the length of GP consultations (Wilson et al 2016)

Several studies have reported found that longer consultations offer better quality care for patients with chronic conditions and result in higher patient enablement scores, the ability of the patient to understand and manage their condition (Campbell et al 2001; Howie et al 1999). However, Jenkins et al (2002) argue that longer consultations do not mean better consultations as each patient has differing expectations and good outcomes can be achieved in a short time provided the patient was listened to and their concerns addressed.

Grey and Orton (2017) describe consultation length in general practice as a significantly under-researched area which can have serious consequences and the authors discuss how previous studies produced conflicting results as discussed above. The current research indicates that one size does not fit all, and some consultations need to be longer to meet the complex needs of the patient but not all. In this study some consultations were shorter than others and this enabled to NIPs to catch up to an extent, but the number of consultations which exceeded 10 minutes outweighed the shorter consultations and this added stress to their workload.

Freeman et al (2002) describe how when longer consultations are required, they need to be realistically scheduled to ensure that GPs are not stressed by time pressure, which is one of the most common environmental psychological stressors. Zakey (1993) describes how time stress in complex decision-making situations such as in medicine has a negative effect and can led to longer time estimates and in these stressful situations decision making deteriorates and the potential for errors and bias escalates (Goldberger and Breznitz 1999; Holsti and George 1975). It is the perception of this time pressure whether real or not which impacts on the level of psychological stress and quality of decision making (Klapproth 2008; Rattat et al 2018)

Studies have identified that there is a difficulty in recreating time pressure artificially in experiments, however there is agreement that time pressure increases stress (Maule et al 2000).This perception of time caused psychological stress to the NIPs and impacted on their decision making, it was at these times that they admitted to making poor decisions.

7.4.2 The patients.

Clinical factors identified by observation, such as a fever or feeling 'unwell', together with focal signs (crackling chest sounds, enlarged nodes and pus on tonsils) were the most important influences that the NIPs reported. These factors were observed, as a full clinical examination was undertaken in all cases where one was required. (Philp and Winfield 2010; Maddox 2011; Horwood 2016; Courtney et al 2019). However, over and above these influences there were some more nuanced issues within clinical factors, issues such as; co- morbidities, renal and liver function, drug interactions, drug/disease interactions, allergies and immunosuppression. As discussed in the chapters four and five, these influences would be seen as clinically relevant, and should be taken into account by all clinicians prescribing any medication for any patient.

Patient and family pressure have both been reported as influences in previous research, (Rowbotham et al 2012; Maddox 2011; Philp and Winfield 2010). Most NIPs in this study felt that although still an issue, this pressure was decreasing, as did some participants in more recent studies, (Horwood et al 2016; Williams et al 2018). Delayed prescribing was used as a mechanism

to manage this patient pressure (Rowbotham et al 2012, Maddox 2011 and Horwood et al 2016). It would appear from this finding, that the public health campaigns may have been effective to a certain extent, in educating patients and mitigating their expectation of prescriptions for antibiotics.

7.4.3 Guidelines

In this study, guidelines supported good antibiotic prescribing (Maddox 2011; Courtney et al 2019). NIPs used guidelines to discuss and negotiate with the patient, and to justify their decision to not prescribe antibiotics (Maddox 2011). Guidelines were used to manage perceived patient pressure to prescribe in a variety of ways; some NIPs used the guidelines to support their decision and told the patient that they were unable to prescribe as it would be outside the guidelines, while others were observed to resist patient pressure using negotiation and discussion. For most NIPs, the concern to do the right thing was upmost in their minds, which meant adhering to the guidelines. The NIPs in this research felt both accountable and responsible for their actions and prescribing decisions. Guidelines were used as decision support, particularly to ensure that any prescribing decision that was queried could be fully justified. For example, when prescribing a broad-spectrum antibiotic, which might be viewed as inappropriate, they documented “as per guideline” to indicate that they were aware that prescribing such an antibiotic might come under some scrutiny. The NIPs were mindful of the possibility of litigation and that they might be required to justify their decision to prescribe antibiotics (Maddox 2011; Mcintosh 2017; Williams et al 2018). Overall, NIPs were keen to prescribe safely and appropriately and to be seen to be doing so (Courtney et al 2019).

7.5 Patient centredness

For two of the NIPs, the concern to do the right thing meant something slightly different. Apart from prescribing antibiotics appropriately, it also meant making sure the patient left the consultation feeling content with the outcome, whatever that was. What was initially identified as emotional engagement was actually a patient-centred approach, as proposed by Stewart et al (2003). The authors advocated this approach to enhance patient care and achieve mutual goals between the patient and clinician. In this case study, strategies were employed by the NIPs to ensure that the patient was treated as an individual with their concerns being both listened to and actually met; maybe not with a prescription but with caring language and general empathy. For some patients obtaining a prescription validated their illness; giving them permission to take time off work, as well as allowing them to undertake the sick role (Misslebrook 2001). For such reasons the pressure from some patients for a NIP to issue a prescription for antibiotics can

become excessive. When the NIPs did not feel that a prescription for an antibiotic was appropriate, the NIPs discussed what the patient's concerns were, any lifestyle or work-related issues, and any social responsibilities the patient might have. Whilst all NIPs took such issues into account and used shared decision making to negotiate with the patient, two of the NIPs went further to ensure that the patient was happy with a 'no antibiotics' prescribing decision. Access to appointments for those two NIPs' patients was often perceived as difficult, so instead of using phrases such as 'comeback if you have any concerns', or 'you know where we are if you need us', they facilitated access to follow ups such as; making a review appointment, or agreeing to telephone the patient to see how they were, and delayed prescribing was also employed as a reassurance. NIPs have previously self-reported that they used patient centred strategies to manage patients' expectation for an antibiotic (Courtney et al 2017). Navigating the system to get another appointment is difficult for some patients; in this study the NIPs were observed managing that concern for the patient.

Stewart et al (2003) argue that a consultation takes no longer using this approach, and when combined with evidenced based prescribing, the best outcomes for patients can be achieved. Their patient centred clinical methods model has six components; these components were seen to be undertaken by the NIPs without any knowledge of the work by Stewart et al (2003)

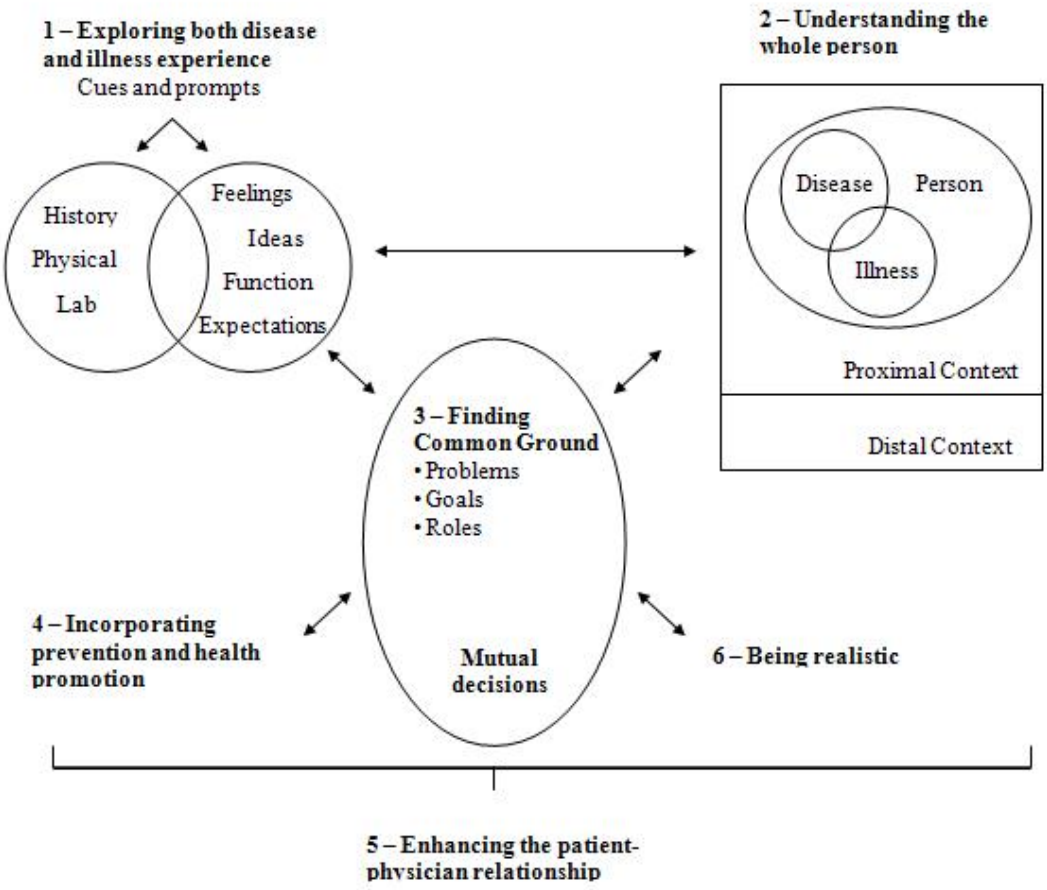


Figure 2 The patient centred clinical method: six interactive components (Stewart et al 2003)

However, the idea of a patient centred approach is not new to the 21st century, Foucault (1973 p107) describes the quote below from 1807 as the 'unbounded extent of the clinical domain'

> "Unravel the principle and cause of an illness through the confusion and obscurity of the symptoms; know its nature, its forms, its complications; distinguish at first glance all its characteristics and differences; by means of a prompt and delicate analysis separate it from all that is foreign to it; foresee what beneficial or detrimental events might occur in the course of its duration; use the favourable moments that nature provides to effect a solution; calculate the forces of life and the activity of the organs; augment or diminish their energy as required; determine precisely when you should act and when it would be better to wait; decide confidently between several methods of treatment all of which offer advantages and inconveniences; choose the one whose effects seem most rapid, most agreeable, and most certain of success; benefit from experience; seize your opportunities; calculate your chances and your risks; make yourself master of your patients and their affections; assuage their pains; calm their anxieties; anticipate their needs; bear with their whims; make the most of their characters and command their will, not as a cruel tyrant reigns over his slaves, but as a kind father who watches over the destiny of his children"
>
> (C.-L.Dumas, Éloge de Henri Fouquet (Montpellier, 1807), quoted by A.Girbal,,Essai sur l'esprit de la clinique médicale de Montpellier (Montpellier, 1858, p. 18).

The NIPs included all six patient centred components proposed by Stewart et al (2003) during their observed consultations.

7.5.1 Exploring the disease and illness

While taking a good history of the illness, and undertaking physical examinations and investigations, the NIPs also explored the impact of the illness on the patient. They asked questions such as, whether the patient able to attend work or school, were they able to eat, drink and sleep, had they ever had this illness before? The if the answer was 'yes' in order to gauge expectations, the NIPs asked the patient how it was treated previously. The NIPs considered all of this information when making their decision on whether to prescribe antibiotics. This balance of objective data, together with the signs, symptoms, clinical observations and subjective data, such as how the patient experienced the illness, ensured a patient-centred approach.

7.5.2 Understanding the whole person

The NIPs explored socioeconomic factors, and family issues, they showed concern for those who had responsibilities, such as young children. The NIPs wanted to reduce the impact of the illness on the patients' family and their daily lives. In case one the NIP discussed how she thought about all of those things when undertaking a consultation, and this concern impacted on how she supported the patient to continue with their family life by going on holiday. The NIP issued a delayed prescription which reassured the patient, thus enabling her to go on her family holiday without having to worry about how she would access treatment, while she was away. By doing so the NIP maintained antibiotic stewardship and the patient left the consultation feeling reassured and satisfied with the outcome.

7.5.3 Finding common ground

The NIPs were frequently observed to discuss the presenting illness with the patient, often highlighting the clinical significance of some symptoms over others, with explanations. They also explored which aspects of the illness were most troublesome for the patient; for example, a cough at night. This approach created a space for discussion; for example, when a patient said that it was keeping their partner awake. Although clinically the cough was not significant enough to require antibiotic treatment, it was impacting not only the patient but also their family; potentially leaving everyone tired and unhappy. By discussing both aspects of the symptom, that is: the clinical significance as well as the personal experience, the NIPs were able to engage with the patients' concerns, offer advice and come to shared decision making on the way forward. The

NIPs agreed with their patients on when would be a reasonable time for the symptoms to resolve, as well as when and how to seek further advice, alongside how a patient might self-manage the symptoms and reduce their impact on others. Together the NIP and patient agreed an outcome that was satisfactory for both parties.

7.5.4 Incorporating prevention and health promotion

During consultations the NIPs gave health style advice, mostly in relation to self-management of the presenting complaint. Where appropriate, they advised patients regarding their smoking in addition to positively reinforcing healthy lifestyles. The NIPs were aware of potential risks and complications for the patient regarding any pre-existing condition they might have, such immunosuppression, which could make the patient more vulnerable to infection. The NIPs discussed their concerns with patients and advised how they might manage to live their life with just a few restrictions, such as avoiding events involving school aged children, or visiting unwell friends or family. They demonstrated an awareness of AMR and their role in antibiotic stewardship, demonstrating their professional commitment by becoming '*antibiotic guardians'*

7.5.5 Enhancing the patient doctor relationship

In GP practice the patients are fortunate enough to be able to see the same practitioner regularly, if they need to, so there is the potential for practitioners to build up a good relationship with their patients. In case two one of the NIPs reported that trust is built over time, and when the NIP has a good relationship with the patient, that patient will accept the advice given and decisions made by the NIP. Non-judgemental language was observed throughout the consultations, but some language demonstrated more compassion than others. One NIP used very compassionate language, which seemed to reassure patients that they were correct to seek advice about their illness. Comments such as, 'oh yes the baby is very hot, I can see why you were concerned', reassured parents that they were being listening to and their concerns were being taken seriously. This empathetic behaviour enhanced the relationship between the NIP and patients, resulting in patients trusting her; in this case the NIP went on to examine the child and then explained the significance of the symptoms; that they indicated a viral rather than a bacterial infection. The parents were accepting of that judgement as all of their concerns had been addressed.

7.5.6 Being realistic

Time, and the lack of it, was an issue for the NIPs. However, a benefit of the general practice setting is that patients can be given a follow up appointment, so although all issues may not be

able to be resolved in one consultation, a reasonable follow up can be negotiated. The NIPs addressed the most important points in the time available and made appointments for a follow up. Some patients may well have had an infection that required antibiotics, but they presented too early to assess the significance of their symptoms. In such a scenario, rather than trying to predict the progression of the illness, the NIPs reviewed the patients, either with an appointment or via a telephone call. Patients were very happy with this process; they felt reassured and the NIP did not prescribe antibiotics inappropriately

Doctors report that they treat patients as individuals, and that their patients are usually not representative of the participants in the research studies which underpin the guidelines. For this reason they can justify that they prescribe for the patient who is in front of them at the time, rather than follow guidelines (Wood et al 2007; Charani et al 2013). There has also been criticism of guidelines and the evidence-based medicine movement in general, as the supporting evidence cited often omits the most important outcome, the patients' health experience (Sturmberg 2019). While doctors may propose that they are treating the patient as an individual, it would appear that they mean individual clinical presentations, rather than individual people. Doctors have been accused of concentrating on the biomedical aspects of the patient presentation and ignoring other factors. Foucault asserted that doctors are 'doctor-oriented', not 'patient-oriented' (Misslebrook 2013) However, the NIPs in this study managed to take a patient- oriented approach, addressing each patient's illness and concerns while still prescribing within the guidelines. The NIPs combined the best of nursing and medical worlds; their traditional nursing skills of care and compassion and additional medical skills and knowledge, which together brought added value to the consultation. They took a patient-centred approach in order to provide the best outcome for the patient; prescribing antibiotics inappropriately was avoided whenever possible and every effort was made to ensure the patient was happy with the outcome of the consultation.

7.5.7 Patient centred care and AMR

It could be argued that this patient centred approach creates a tension between following the prescribing guidelines and reducing the increase of AMR and giving the patient what they want and adding to the incidence of AMR. However, that assertion fails to recognise the complexities and realities of clinical practice. The use of guidelines and evidence-based medical decisions are now accepted as the norm in clinical practice, it is almost assumed that all decisions will made using be evidence from research studies (Robert and Weaver 2015). However, there has been some movement away from applying clinical scientific evidence such as those found in guidelines to individual patients, towards understanding the real-life complexities of clinical practice and

individual patient needs (Miles 2009). Evidence-based practice (EBP) has been criticised by some as disease driven and not patient centred (Bensing 2000). The proponents of the EBP movement appear to champion a more reductionist approach to treating all patients with a given condition in the same way, which is in conflict with Patient Centred Care (PCC). Miles (2009) argues that patient considerations cannot be secondary or peripheral to healthcare discussions and that the lived experience of the patient needs to be considered.

The gap between evidence-based guidelines and PCC has been described by some as worlds apart, however it is suggested that good communication skills can bridge that gap (Bensing 2000). PCC does not mean giving the patient what they want at all costs. The skilled practitioner can engage with the patient to ensure that they leave the consultation satisfied, this may mean that the patient has not got the antibiotics they thought they needed, but they have been listened to and their concerns addressed and there is a plan going forward.

Stewart et al (2003 p266) describe the following communication and professional skills to improve patient satisfaction

'a warm and caring demeanor

The patient's assessment of clinical competence

A balanced communication of both psychosocial and biomedical concerns

Continuity of the relationship

The facilitation of the patient's expressions of their expectations'

A systematic review by Coxeter et al (2015) found that engaging the patient in shared decision making is a key aspect of PCC and addresses the potential tension and risk of increasing antibiotic prescribing inappropriately. The authors found that using this approach can actually reduce the prescribing of antibiotics in primary care. Engaging in PCC and shared decision making which is core to safe and appropriate prescribing should enable practitioners to negotiate the outcome of prescribing decisions and therefore reduce the incidence of AMR. There is a risk that those new to the role or who are inexperienced may lack these negotiating skills and succumb to patient demand, therefore when training practitioners in the prescribing role communication and negotiation skills are key.

7.6 Communities of practice

Gabbay and LeMay (2004) describe the importance of communities of practice in the general practice setting as a source of support and guidance for colleagues, and in order to maintain an evidenced based healthcare approach. The NIPs in Case Two were part of a community of practice, while studying for the prescribing qualification. Lave and Wenger (1991) describe this state as situated learning, comprising of two parts; communities of practice, and 'legitimate peripheral participation'. The authors propose that to learn the student must become part of the activity, and learning must take place through interactions with others and participation in that activity. There are a number of variations on how a community of practice (CoP) looks; Wenger et al (2002) purport that there are three basic elements that all should contain.

1) A domain of knowledge, which defines a set of issues

2) A community of people who care about the domain

3) And a shared practice that they are developing to be effective in their domain

In Case Two, the student NIP and the GP were part of the learning process. The student had the theoretical knowledge taught at university and learned how to apply it in practice through observing the GP, through supervision of their practice, and by picking up hints and tips and expert knowledge. The learning was constructed around the context of the practice, the patient, and the division of power between the medical teacher and the nurse as a student prescriber. The theory suggests that the student, and as a novice prescriber, is subservient and will not challenge the established way of doing things; but also, their peripheral status allows them to learn and make mistakes. The clinical setting is where students bridge the theory-practice gap, as well as bring and then apply theoretical classroom based learning in the real world. It is in this latter location where learners acquire skills of clinical reasoning and evidence-based practice under the apprenticeship of experienced mentors (Meagher-Stewart et al 2012) who, in this case, were the GPs. The main concern that drove this study was that the inherent hierarchy of medicine to nursing would have a negative impact on the community and the learning (Monrouxe 2010), a point outlined in chapter one; therefore the NIPs antibiotic prescribing would be influenced by such a medical model. It has been suggested that although some nurses are now taking on a more medically oriented role, they are inherently socialised in their profession to lack confidence, as the traditional medical role of 'cure' conflicts with the traditional nursing role of 'care' (Niezen and Mathijssen 2014). Weiss et al (2016) describe the GP in general practice as "king", and the NIPs in this case study research demonstrated that they were submissive to this medical dominance to the extent that initially they had copied the GPs antibiotic prescribing habits, even

when the NIPs knew that it was inappropriate. However, this influence was limited to the early stages of prescribing and did not continue as the NIPs gained professional experience and confidence as well as expertise in antibiotic prescribing.

At the time of the study NIP students were trained in their area of practice by a medical mentor who had the responsibility of signing the student off as being a 'safe and competent' prescriber. The student could pass all the theoretical aspects of the programme at the university but without the medical mentor signing her / him off, they would not be able to qualify as a prescriber and therefore would not have the qualification annotated on the NMC register. For students in general practice the mentor would most commonly be a GP from within the same practice. In this study the participants in Case One were not trained as prescribers in the general practice they were now working in. They came to their present general practice, having already completed the prescribing qualification in other clinical areas, such as a hospital's emergency department and walk-in centres. However, in CaseTwo the NIPs were trained as prescribers in the general practice in which they were still working. This variation in the two cases provided the opportunity to explore how NIPs who had been trained in general practice by GP mentors, might prescribe antibiotics compared to NIPs who had not been so prepared. As previously stated in Chapter One, GPs' antibiotic prescribing practice has been described as poor (Tonkin-Crine et al 2011). This research explored the possibility that the NIPs were influenced by this poor prescribing, and in case two there was some evidence that the NIP was influenced by the GPs prescribing. NIPs described how, as novice prescribers, they copied what the GP wrote in the patients' notes; recording that there was 'no sign of infection', yet then went on to prescribe an antibiotic.

While the NIPs were part of this CoP as students and novice prescribers, they moved on professionally and became experienced and somewhat independent of the community. However, the NIPs still maintained the community ethos of aiming to do what is best for the patient, supporting, asking advice and seeking knowledge from each other. Lave and Wenger (1991) describe how, in some CoPs, the 'masters' restrict the activities of the students, so that they do not develop skills beyond those that the master has. However, that situation did not apply here; in the CoP, in relation to antibiotic prescribing for minor illness, the students became the masters.

In both cases NIPs asked for GP support and advice regarding challenges of diagnosis and management of other complex conditions. They worked well together as a team with NIPs describing the GPs as supportive and having an extensive knowledge base upon which they could draw. GPs also recognised the skills of the NIPs and felt that in the area of minor illness and antibiotic prescribing the NIPs had superior and more up to date knowledge than the GPs. All NIPs were clear that they did not have the knowledge, experience and training that GPs had, and could

not act as, or pretend to be, the GPs' substitutes. However, antibiotic prescribing was an area that the NIPs excelled in and they were proud of that (Maddox 2011; Rowbotham et al 2012; Williams et al 2018; Courtney et al 2019).

7.6.1 Professional identity within a CoP

NIPs in both cases described how they were no longer part of the nursing team, they were not invited to any of the practice nurse meetings; similarly, they were not part of the medical team nor did they have any organisational influence. The one exception out of the six participant NIPs was in case two; she was also a business partner in the practice. The NIPs could be described as being in a place of professional ambiguity and / or experiencing a loss of social identity (Weiss et al 2016). Weiss et al (2016 p156) in their study on the social identity of nurses and pharmacist prescribers working in general practice describe their situation as 'no man's land'. The NIPs described themselves as not belonging to the nursing team and also not being part of the GP organisation. NIPs in that study reported how they were not included in GP meetings or non-prescribing nurse meetings; they 'just came into work and got on with their job'. This finding was reflected in this current case study. The NIPs were very much excluded from the other professional groups' activities; they appeared not to belong in either the medical or nursing categories. This ambiguity was further strengthened by those in Case Two not wearing a nurse's uniform. Weiss et al (2016) suggested the uniform was part of a nurse's professional identity; therefore, the change from uniform to non- uniform may be perceived as shifting the power balance, by moving away from their own nursing profession towards GPs. However, with or without their uniforms they were not allowed to integrate into that group. This is an ongoing situation for NIPs in general practice and throughout the NHS. As nursing roles have expanded, the traditional "core" work of the nurse has changed, and with that change has come a loss of professional identity (Borthwick et al 2009). In case two, patients complained via email to the practice when the NIPs went back to wearing a traditional nursing uniform, after a time out of uniform. When asked, the NIPs were unable to articulate why this might be an issue for the patients.

The nursing profession has a public image and it would appear that this role does not always fit with the traditional view of what nurses and nursing are supposed to look like. The NIPs were assessing, diagnosing and prescribing, but by doing so in a nurses' traditional uniform were viewed negatively by their patients (Chulach and Gagnon 2015). The patients experienced the nurse behaving in a way that is in conflict with the traditional caring image, which both patients and nurses themselves describe as important to the professional role of the nurse (ten Hoeve et al 2015) These NIPs, alongside lacking professional identity, were also losing their identity with the

public, who had an image of a nurse that they wanted to be upheld. The concept of this grey area between traditional nursing and medicine was originally described by Bhabha (1994) as the 'third space' where a hybrid identity evolves. Advanced nursing practice and inherently, nurse prescribing, remain in this 'space' with little recognition of the problems that it presents for either the practitioners (Anderson 2017) or the public (Rushforth 2015). As previously discussed in chapter one, the argument for the regulation of the role of advanced nurse practitioner is beyond the scope of this thesis. However, it is reasonable to suggest the NIPs' role is central to the advanced nursing practice role, and this finding supports the body of evidence that the role is different from what the public perceive traditional nursing to be. The absence of protected title and regulation of the role in general practice, could result in clinical governance risk (Maier 2016); alongside the loss of identity for the practitioner there is the potential for confusion and possible risk to the public. Despite these challenges, the NIPs in both cases appeared to maintain their own prescribing and professional integrity; they worked within their scope of practice and competence. They sought learning and development opportunities from a variety of sources and found support from other NIPs at NMP forums. This positive finding would indicate that the NIPs will keep up to date and will continue to prescribe antibiotics appropriately.

7.7 Expertise

NIPs in this Case study demonstrated expertise in managing minor illness presentation and for the most part in their antibiotic prescribing. The NIPs also thought that their experience was a factor in how patients reacted to a no antibiotic prescribing decision. If the NIPs were confident in their decision-making and the patient could see that, there was less resistance from that patient. Overall expertise in managing a consultation, assessment and diagnosis, meeting patient expectations and alleviating patients' concerns were all demonstrated by the NIPs. However, prescribing medication is a complex process, not only involving assessment and diagnosis but taking into account interactions with other co-morbidities the patient may have and any medications the patient is currently taking or treatments they are currently receiving. Practitioners move through levels from novice to expert (Dreyfus 2004) and the NIPs in this study were at various stages of that journey. Some of the NIPs were keen to adhere to the guidelines to such an extent that although they tried to ensure that patients were happy, they did not seem overly concerned if they were not. It appears that for some NIPs concerns about accountability, and therefore adherence to guidelines drove that behaviour, rather than any reluctance to learn and develop their professional skills.

Dreyfus and Dreyfus (1980) describe rules-based practice as competent, where the practitioner is fearful of making mistakes and this cautious behaviour inhibits their journey towards expertise.

Emotional involvement at this stage, as well as taking responsibility for actions and then reflecting upon them allows progress towards expertise (Winch 2010). However, although Nicolini et al (2016 propose that if practitioners are unwilling carry out this reflective practice, they remain at the competent stage, Bereiter and Scardamalia (1993) suggest that experienced competent non experts work well with routine problems and adhere to guidelines to support them. One could argue that such a routine is all that is required of the NIPs; a perspective that certainly supports the GPs' assertions that the NIPs work well with protocols and guidelines; much better than do the GPs. While all NIPs demonstrated expertise in managing minor illness presentations two of them went further and demonstrated expertise in managing complexities that were existing outside of minor illness presentations. Expertise was developed in in managing complex conditions by some of the NIPs, while others chose to work in a more restricted way, to manage the minor illness presentations and to pass on other more complex cases to the GP.

In the nursing literature, time is described as the antecedent of expertise and that time in the practice area results in the development of expertise (Hutchinson et al 2016). This perspective fits with Benner (1983) who maintains that nurses can gain knowledge and skills with experience and through experiential learning, so they know 'how' without ever learning the theory aspect of 'that'. However, this view is at odds with Winch (2010), who argues that knowing 'that' before being allowed to practice a skill and to be able to make knowledgeable judgements, is key in professional education. However, that experience and the time spent in practice does not necessarily equate with the development of expertise (Bereiter and Scardamalia 1993). Offredy (2008) also suggested that although the application of intuitive knowledge may have value in nursing, it is not sufficient for nurse prescribing, as the latter role requires acquiring and then implementing the advanced skills of assessment and diagnosis, which are traditionally part of a medical, not a nursing role. Time in general practice and managing a wide range of clinical presentations, exposed the NIPs to both positive and negative experiences that jointly enhanced their knowledge and skills.

Dreyfus and Dreyfus (1980) argue that expertise is not the end of the trajectory from novice to expert, as expert practitioners are constantly developing and critically reflecting on their skills and knowledge. The NIPs did this by seeking out opportunities to expand their knowledge, and to keep up to date. In Case Two NIPs attended prescribing forums and sought expert advice from microbiologists and pharmacists. Although this situation was not seen in relation to antibiotic prescribing, in Case One, due to a lack of opportunities, the NIPs attended other learning opportunities related to diagnosis and management of a variety of conditions at education events, in the evening, in their own time. If there had been NMP forums and any prescribing educational events available at that time, it could be assumed that they would have attended

them. Despite becoming experts, there was one characteristic of expertise that in Case Two the NIPs could not achieve, and that is the ability to slow down when a clinical presentation is complex. Experts recognise complexity, where non-experts do not, so such experts consciously slow down their thought processes in order to make safe and effective decisions (Moulton et al 2007). The NIPs were not afforded the time to do this and additionally Bereiter and Scardamalia (1993) suggest that stress and burn-out can result in experts behaving like non-experts. 'Expertise' is not a constant state, which might explain when NIPs reported prescribing inappropriately due to lack-of-time pressures. However, as experts they were able to reflect on that situation, and it was something that concerned them.

Abazour et al (2018) in their systematic review of the expertise development of pharmacist and nurse independent prescribers in the UK, concluded that this development is influenced by several complex factors, which include intrinsic abilities, skills and clinical reasoning and extrinsic factors such as social context, where the learning and prescribing skills are developed. The review included studies which reported on the competence of the prescribers and contained mainly self-reported data; with authors warning of the inherent egocentric bias of self-reported data. Expertise developed in the context in which prescribing takes place is essential and such experiential learning is key to developing expertise. Abazour et al (2018) discuss context in the learning phase rather than the when the practitioner is actually prescribing, and whether the context has a positive and / or negative effect on prescribing competence as was explored in this study. This research study explored whether context supports appropriate antibiotic prescribing, rather than whether context and the organisational culture support NIPs to undertake the role of prescriber. The studies in included in the review by Abazour et al (2018) address the latter aspect.

The NIPs developed their own way of learning and developing knowledge about antibiotic prescribing. The GP was no longer their sole source of information. NMP forums had been developed and were regularly attended by the NIPs. In these forums, NIPs gained up to date information addressing issues such as changes in guidelines and local sensitivities to antibiotics and which were the best antibiotics to prescribe for a condition. The NIPs in case two continued to learn through study at university undertaking a master's level degree. They moved away from viewing the GP as the expert regarding antibiotic prescribing decisions and chose to ask advice from other experts such as a pharmacist and a microbiologist. Guidelines, clinical acumen and professional accountability supported good antibiotic prescribing.

7.8 Methodology: strengths and limitations of the study

This study highlights the strengths of case study design, underpinned by a pragmatic interpretivist approach. The combination of both a pragmatic and interpretivist approach has worked well in this research study, with quantitative data supporting qualitative findings. Undertaking three methods; observation, semi-structured interviews, and evaluation of case notes, and drawing on the principles of ethnography, allowed for a thick rich description of the phenomena being explored to be presented. As previously discussed in chapter three, case study methodology does not purport to produce findings that represent a whole population, but through detailed accounts of the findings they might be considered to be transferable to NIPs in the same area of practice. The findings from this study related to the NIPs safe and appropriate prescribing reflect those reported in previously published studies which adds to their validity and transferability. Although case study findings are not dependent on sample size, this study might have been strengthened further by recruiting more cases; however, due to the researcher only being able to undertake the investigation part time, combined with a lack of funding this development of scale was not feasible. But, since the finding from the two disparate cases were so similar it might be expected that further cases would also be comparable, and therefore undertaking the two cases was sufficient.

There was more time for conversation and discussions on treatment options and decisions made with the NIPs in Case One, due to the way the duty team worked, by selecting patients from a list, without fixed appointment times. This opportunity resulted in more field notes to refer to and the findings reported from Case One are richer for that. However, the increased data from Case One also led to the richness of the overall data in this study. There was also a time lag between the two cases, due to the part time nature of the research. The length of time between undertaking the research in each case might mean that the NIPs in Case One now have access to NMP forums and specialists for support and that the findings reported are no longer an accurate representation of the situation currently.

Recruitment to the study was challenging and resulted in participants who were known to the researcher responding to the email sent out by the NMP leads. Silverman (2010) describes the recruitment challenge as common in qualitative research studies, and acquaintances are often participants. Naivety as a researcher led to underestimating the difficulty of recruiting participants who were willing to be observed in clinical practice. A review of all the studies undertaken should have highlighted that perhaps there was a reason why observation as a method had not previously been included in the body of research reviewed. The problem with recruiting a second case was discussed with participants in Case One, and they tried to recruit other practices where

they had friends who might be willing to take part. It has been noted that fear of being judged can be a hindrance to recruitment in observational studies (Gray 2009). The NIPs in the other practices reported that they did not want to be observed; so it is not unreasonable to assume the fear that their prescribing practice would be judged may have been the reason for their decision not to volunteer. Observation was the unique aspect of this study, so flexibility in offering participants the choice to be observed or not was ruled out.

Two participants, one from each case, initially made contact and expressed a desire to take part in the study. This incidence could be considered to be an example of self-selection bias, as the people who put themselves forward to take part in a study may not be representative of the population being explored (Collier and Mahoney 1996). However, that is not the primary aim of case study research. The other NIPs in each case were recruited by the first participants to consent and could not be described as self-selected; in fact some were a little reluctant to take part. The NIP business partner in Case Two encouraged the third NIP to take part, and in Case One the initial contact encouraged the others two NIPs to take part. The cause of the difficulties in recruitment of participants to take part in this study appeared to be the inclusion of observed practice. This reluctance would explain the lack of observational methods in this research area, which is also the reason why this study is unique.

In observational studies there is always the risk of participants modifying their behaviour due to the "Hawthorne effect"; a point discussed in some detail in chapter three. The presence of the researcher may modify or influence the behaviour of those being observed or in some way trigger introspection and doubt. (Mays and Pope 1995) In Case Two the participants became reflective about their antibiotic prescribing and verbalised that they wanted to improve. This change in behaviour may have been due to the fact that the NIPs in Case Two were on the MSc ANP pathway. Critical analysis and reflection were things they were aware of and open to, rather than the presence of an observer. It is inevitable that any additional presence will affect how participants behave, particularly if the presence is a researcher who previously knew some of them. Fetterman (2010) suggest that the use of other methods, such as those carried out in this case study, can overcome problems caused by the 'Hawthorne effect'.

7.9 Contribution to knowledge

This is the first study to undertake direct non-participant observation combined with semi-structured interviews and evaluation of patient case notes to explore NIPs antibiotic prescribing in the context of general practice in the UK. The key finding that NIPs are cautious and appropriate prescribers echoes with previous research studies on NIPs prescribing more generally across a

range of medication and settings. However, this is the first study to identify that time is the biggest influence on NIPs antibiotic prescribing. Few if any behavioural change interventions are required to ensure that they are always prescribing antibiotics appropriately.

This study has found that as novice prescribers the NIPs were influenced by the GPs' antibiotic prescribing behaviours. Given the comments raised by NIPs in this study and the previous research that has shown that GPs do not always prescribe antibiotics appropriately (Tonkin-Crine et al 2011), this initially raises concerns. However, it was also shown that as the NIPS gained prescribing experience the impact of this negative influence diminished.

The increasing numbers of NIPs prescribing antibiotics appropriately general practice, is likely to be contributing to the overall reduction in inappropriate antibiotic prescribing in primary care, outlined in the ESPAUR report (PHE 2019). Although their contribution to this improvement is not recognised within the report.

7.10 Implications for practice

7.10.1 NIPs contributing to the reduction in antibiotic prescribing in general practice

NIPs are an experienced workforce capable of supervising and supporting those new to general practice and the management of minor illness presentations. The findings from the ESPAUR report (PHE 2019) that there has been a slight reduction in both the overall amount of antibiotics prescribed and number of broad-spectrum antibiotics prescribed in primary care, may be attributed to the increasing in numbers of NIPs prescribing antibiotics in general practice. The findings from this research study would suggest that NIPs are prescribing appropriately and within guidelines. such appropriate prescribing would inevitably reduce the total number of antibiotics and the number of inappropriate broad-spectrum antibiotics, that are being prescribed.

7.10.2 General practice workforce development

The GP workforce has declined due to an ageing population and increasing workloads, the number of telephone contacts and face to face consultations in general practice has risen exponentially. This increasing burden has led to burn out with some GPs taking early retirement or reducing their hours to manage work/life balance (Baird et al 2016). In 2016 there was a plan: *the General practice forward view,* to increase GP numbers by 5000 in 2020 (NHS England), by 2018 the plan had failed to address the shortfall, with fewer GPs in practice than in 2016 (BMA

2018). There is also a reduction in the nursing workforce caused by workload pressures and the removal of the NHS bursary for nursing students as well as high attrition rates (Beech et al 2019). One in eight nursing posts is vacant (NHS Improvement 2018) and with fewer student nurses in the system; there is a now a limit on how much of GP workload can be taken on by the nursing workforce. Consequently, other health care professions are now being trained to take up the role of 'advanced practitioner' such as pharmacists, and paramedics. These professionals are now taking on some of the role previously carried out by nurses in general practice. While this increase in skill mix is welcomed by GPs there is a concern that rather than alleviating their workload, supervision and the potential replication of work due to inexperienced staff referring patients to them, will actually increase their workload in the short term (Nelson et al 2018). Findings from this study would indicate that NIPs would be able to supervise these practitioners, at least in the area of management of minor illness and recognising complexity and appropriate referral. However, the NIPs also require support in developing their skills in managing more complex presentations and in order to do so will require input from the GPs, which will also be a challenge in the short term.

This study would indicate that NIPs will be good role models for other professions coming into general practice, they are likely to be an invaluable source of information and guidance. It also supports the UK government's agenda for increasing and upskilling workforce in primary care due to the decrease in the number of working medical practitioners.

7.10.3 Supporting good antibiotic prescribing

NIPs are aware of their ongoing responsibility towards antimicrobial resistance and supporting them to prescribe antibiotics appropriately is pivotal going forward. To support good antibiotic prescribing by NIPs in the general practice setting, it appears that time is the one factor that would make the greatest difference. Longer appointment times for NIPs' patients or 'blocked' appointments to let them catch up would be a great benefit. These arrangements may not fit well with the problem of increasing numbers of patients accessing general practice. However, good consultations in which there is time to share decision making and reassure patients that antibiotics are not necessary for their condition, could potentially reduce the number of patients presenting or re-presenting with the same condition. Going forward patients might have the confidence to self-manage their symptoms rather than seek an appointment. This opportunity to educate and support patients will not only impact on presentations to the practice but to wider society. For example, parents can be reassured that children are not unwell, that they can attend school, the parent does not need to worry about taking time off work or the follow-on implications.

7.10.4 Improvements to the OOHs provision

The issue of combating the NIPs' concerns about access and care provision in the OOHs service is more challenging. A seven- day service by GP practices offering on the day appointments for minor illness conditions would overcome this. With increasing numbers of allied health professionals now contributing to the general practice workforce, it may be possible to rotate staff to work weekends. It might also encourage those practitioners who are unable to work weekdays, possibly due to childcare issues, to continue to develop and maintain their skills in a supported environment. In 2015 the conservative government manifesto pledged that by 2020 a seven- day NHS service including both acute and general practice settings, would be available. By 2017 NHS England reported that 23.6% of practices offered this full seven- day service, although it appears that this is not individual practices but rather a collaboration of community providers offering the service (McKenna 2017).

Many clinical areas in both primary and secondary care have extended to provide a seven- day service with great success, improving access and seamless care for patients (NHS Improvement 2016). All general practices should offer a seven- day service for those patients requiring on-the-day appointments. Extension of this seven-day service provision would support good antibiotic prescribing by NIPs, and by implication, the emerging NMP workforce. Their patients would have improved access to care and be consulting with practitioners who have access to their medical records in a timely manner. This extension to the working week would reassure the NIPs and mitigate their fears and the pressure to prescribe antibiotics on a Friday afternoon. Longer appointment times would also support the NIPs in their efforts to achieve their goal of appropriate antibiotic prescribing.

7.10.5 The new NMC standards

The findings from this study also supports the changes to the NMC standards for nurse and midwife prescribing (NMC 2019). The previous DMP role has been split into two new roles; a practice supervisor and a practice assessor. Previously the DMP role had to be undertaken by a medical practitioner but the new roles can now be undertaken by experienced non- medical prescribers, such as NIPs. The change in the NMC standards means that prescribing students can be signed off as safe and competent in prescribing practice by a NIP. The findings from this study on the appropriateness of NIPs prescribing and the observation of their clinical skills of assessment and diagnosis and prescribing to guidelines, indicate that they would be perfectly capable of undertaking this role.

7.11 Implications for Education

7.11.1 The GP's influence

This study found that the GPs influenced the NIPs at the time when those NIPs were students and novice prescribers. Although the NMC now states that experienced NMPs can supervise and assess NIP students, in some practices there may not be an experienced NMP, and the student will continue to have GPs as their medical supervisors and assessors. Any problems should be identified early on and if required educationalists should offer more support to those students in general practice who have a GP supervisor and assessor, perhaps by creating a non-judgemental time for discussions on any problems they may be experiencing. With increasing knowledge and confidence, the findings suggest that the GP's influence will decline, and at the same time the NIPs will continue to develop their own expertise.

7.11.2 Continuing professional development

The NIPs felt that in the GP workplace they occupied another space, somewhere between the nursing team and the GPs, their hybrid role lead to some feeling isolated and not part of either profession. The is in part due to the slow educational development of the ANP role in this country which has no one clear definition and lacks standardisation and regulation (Rushforth and Brook 2011; Thompson et al 2019). The incidental finding that patients preferred that the NIPs did not wear traditional nurses' uniforms together with the lack of integration with their medical colleagues and the move away from their nursing colleagues has added to the participants feeling of being in 'no-man's land' (Weiss et al 2009). A core capabilities framework for advanced clinical practice (Nurses) working in general practice/ Primary Care in England has been developed by HEE (HEE 2020) and states that the ANP must be able to 'critically assess and address their own learning needs' P33. Within the reality of a small GP practice with possibly limited funding one could question whether this is achievable. Within the document there is no recommendation for nationalised support and development of this group of practitioners. So, the concern is ongoing. These findings are echoed in Evans et al (2020) in their evaluation of ANP roles in the UK, practitioners in the study reported that ongoing CPD was patchy and that they lacked a formal support network, one participant reported that they ran the risk of 'falling through the cracks' (Evans et al 2020 p9). The study suggests that there is a need for a system wide approach for ANP education and development and the need to recognise those practising at this level as a distinct group of health professionals.

While the NIPs in this study were trying their best to maintain CPD activities and keep up to date there is a risk that as a profession they are being left behind with no standardised career development or CPD activities to keep their knowledge and skills up to date (Thompson et al 2019). With the growing global concern of AMR this group of practitioners should be recognised as critical in the drive to reduce antibiotic prescribing and as such national programmes of education should be delivered.

7.12 Reflection on the research process

This section is written as a reflection on my PhD journey, as Woolgar (1998) proposes that reflection is a collection of thoughts around processes and accuracy of accounts. Throughout this PhD I have undertaken reflexivity to explore how my own assumptions, beliefs and lack of research experience has had an impact on each aspect of the research process. Ruby (1980 p154) states that *'being reflexive in doing research is part of being honest and ethically mature in research practice'* and therefore it brings credibility to the research.

Gold (1969 p211) discussed the role of "participant as observer" in ethnographic fieldwork as having an inherent risk when researching with people where there is a relationship; as in this study. So, although familiarity may be useful initially in gaining trust and developing rapport, conversely there is a risk of 'going native' where the researcher becomes so involved with the group, that the researcher may lose their objectivity and become unable to report findings accurately, if at all. However, being aware of the potential risk of becoming overly intimate with participants, and by being transparent about it through reflexivity, which is threaded throughout this study, adds to the trustworthiness of the report findings (Shaw 2010).

The skills that I brought to the research process from my clinical background and clinical knowledge, enhanced the use of the pragmatic interpretivist approach. The practical skills of accepting that the data collection would be a complex process and knowing what was achievable and practicable in the time frame, rather than ideal (Long et al 2018), helped me to remain flexible. One example of such flexibility was when I had to change my recruitment strategy due to lack of progress when attempting to access general practices directly. It also helped me to deal with disappointment such as when I visited the site only to find that the participant was off sick, doing home visits or running telephone triage instead of having their clinic session. This pragmatic approach combined well with interpretivism, the ability to interpret the findings and to understand the phenomenon in its unique context. Once again, my clinical background and ability to engage with, and understand the world of the participants aided my interpretation of the

finding, we shared a common language which assisted accurate reporting. Critics of this approach suggest that the researcher will be influenced when interpreting the findings by their own health beliefs and bias (Cresswell 2009) Through reflexivity throughout and by using a variety of research methods, and triangulation of data sets, for the reasons outlined above the pragmatic interpretivist approach was appropriate for this research study.

During the process of undertaking this study I certainly developed research knowledge and skills such as interviewing techniques, analysing data and managing large data sets, that will help with future teaching and supervision of students. Undertaking the research has also highlighted a tenacity that I was unaware that I had, which proved to be the cornerstone of this journey.

7.12.1 Recommendations for future research

Further research on NIPs prescribing in a variety of settings across a range of medication should be undertaken, with an emphasis on whether the setting i.e. the context is an influence. An ethnographic study where the researcher is immersed in the practice for a longer period of time might elicit further nuances on influences, which the NIPs reported but were not observed.

Future research on NMPs should also include other allied professionals who are new to general practice and the NMP role and how the experienced NIPs might now influence those practitioners

An incidental finding from this study was the lack of role identity of NIPs/advanced practitioners. Further research might explore role identity and how this ambiguity impacts on the NIP and the patients, as it appears to be an area of confusion and concern for patients.

7.13 Chapter summary and final conclusions

This study set out to explore the appropriateness of, and influences on NIPs antibiotic prescribing in general practice. Case study methodology was undertaken, 200 consultations were observed over 74 hours of practice, six semi-structured interviews were undertaken, and 60 historical case noted were evaluated. On the basis of the findings reported. It appears that interventions are not required to ensure that their antibiotic prescribing is safe and appropriate. Increased time allowed for consultations, and an improvement in the quality of OOHs care are the two most important issues that need to be addressed. The findings highlight that NIPs are good role models for other health professions joining the general practice workforce and their appropriate antibiotic prescribing is having an impact on the overall reduction in antibiotic prescribing in general practice.

This study has highlighted the expertise of NIPs in assessing diagnosing and prescribing antibiotics appropriately in minor illness presentations. However other more complex presentations where the NIP was unsure or felt it would take too long for them to deal with, were passed to the GP. Supporting the NIPs to develop their skills beyond management of minor illness to more complex presentations, would require time, and more input from the GPs. While this might not seem an attractive proposition to the struggling GP workforce, it would in time reduce their workload and improve access to care for patients. This benefit is particularly important due to the reduction in the GP workforce and the need to develop highly skilled practitioners

Sitting neither within the nursing team or the medical team, the NIPs are increasingly a profession apart. The advanced nurse practitioner role requires regulation and a professional identity that the public can understand and recognise.

The NIPs in this study fulfilled the ambitions of Barbara Bates who was a pioneer in pushing for advanced skills in nursing starting with history taking and physical assessment as the first skills required when taking on a medical role.

> 'By expanding into medicine, you will need – more than ever before – to increase your consciousness of what nursing is all about… our patients need the knowledge and skills of both medicine and nursing. By combining these you have the opportunity to practice not only at the highest level of medicine but also in the highest traditions of nursing' (Bates 1974 p136-139).

Appendix A Sponsorship letter

University of
Southampton

Professor S Latter,
Health Sciences
University of Southampton

Date: 16th October 2015

Dear Professor Latter,

Professional Indemnity and Clinical Trials Insurance

Project Title: How clinically appropriate is and what are the influences on antibiotic prescribing by NIPs working in general practice settings?

ERGO Ref: 15805

Participant Type	**Number of participants**	**Participant age group**
Healthy Volunteers	12	Adult

Thank you for submitting the completed questionnaire and attached papers.

Having taken note of the information provided, I can confirm that this project will be covered under the terms and conditions of the above policy, subject to written informed consent being obtained from the participating volunteers or their parent, guardian, next of kin as appropriate.

If there are any changes to the above details, please advise us as failure to do so may invalidate the insurance.

Mrs Jenny King
Senior Insurance Services Assistant

Tel: 023 8059 2417
email: jsk1n08@soton.ac.uk
Finance Department, University of Southampton, Highfield Campus, Southampton SO17 1BJ U.K.
Tel: +44(0)23 8059 5000 Fax: +44(0)23 8059 2195 www.southampton.ac.uk

Appendix B R&D Wessex CRN

NHS
National Institute for Health Research

Clinical Research Network
Wessex

Wessex Primary Care Research Support Service

Unit 7
Berrywood Business Village
Tollbar Way
Hedge End
Southampton
SO30 2UN
T: 01489 77 11 17
E:studysupport.cnwessex@nihr.ac.uk

Ref: AJ

Mrs Francine O'Malley
University of Southampton
Building 45/2016
Southampton
SO17 1BJ

Dear Francine O'Malley

Study Title: NIP antibiotic prescribing in general practice settings

Letter of access for research

The information supplied about your role in research within the NIHR Clinical Research Network Wessex area has been reviewed and you do not require an honorary research contract. We are satisfied that such pre-engagement checks as we consider necessary have been carried out.

You may present this assurance to an independent contractor within CRN: Wessex[1] when negotiating access to conduct research. This assurance is effective from **04/03/2016** and ends on **31/01/2017** unless terminated earlier in accordance with the clauses below.

Guidance for Independent Contractors receiving this Letter of HR Assurance

The subject of this assurance is considered to be a legal visitor to your premises. The subject is not entitled to any form of payment or access to other benefits provided by you to employees and this letter does not give rise to any other relationship between the subject and you, in particular that of an employee.

While undertaking research through your premises, the subject will remain accountable to their employer **University of Southampton** but they are required to follow your reasonable instructions or those given on your behalf in relation to the terms of access.

Where any third party claim is made, whether or not legal proceedings are issued, arising out of or in connection with your right of access, the subject is required to co-operate fully with your investigations in connection with any such claim and to give all such assistance as may reasonably be required regarding the conduct of any legal proceedings.

The subject must act in accordance with your policies and procedures, which you should make available upon request, and with the Research Governance Framework.
The subject is required to co-operate with you in discharging your duties under the Health and Safety at Work etc Act 1974 and other health and safety legislation and to take reasonable care for the health

NHS
National Institute for Health Research

Francine O'Malley
University Of Southampton
Highfield Campus
Southampton
SO17 1BJ

Clinical Research Network
Wessex
Unit 7
Berrywood Business Village
Tollbar Way
Hedge End
Southampton
SO30 2UN

Tel: 01489 77 11 11
Email: studysupport5.crnwessex@nihr.ac.uk
Web: www.crn.nihr.ac.uk/wessex

06 February 2017
Ref:

Dear Francine

Re: IRAS ID:
Study Title:

Letter of access for research

The information supplied about your role in research within the NIHR Clinical Research Network Wessex area has been reviewed and you do not require an honorary research contract. We are satisfied that such pre-engagement checks as we consider necessary have been carried out.

You may present this assurance to an independent contractor within CRN: Wessex[1] when negotiating access to conduct research. This assurance is effective from **06.02.17** and will continue to be valid until your contract of employment has ended, unless terminated earlier in accordance with the clauses below. If your current contract is extended you will not be required to reapply, however you may be asked by hosting Independent Contractors to show proof of employment along with this letter.

Guidance for Independent Contractors receiving this Letter of HR Assurance

The subject of this assurance is considered to be a legal visitor to your premises. The subject is not entitled to any form of payment or access to other benefits provided by you to employees and this letter does not give rise to any other relationship between the subject and you, in particular that of an employee.

While undertaking research through your premises, the subject will remain accountable to their employer **University Hospitals Southampton** but they are required to follow your reasonable instructions or those given on your behalf in relation to the terms of access.

Where any third party claim is made, whether or not legal proceedings are issued, arising out of or in connection with your right of access, the subject is required to co-operate fully with your investigations in connection with any such claim and to give all such assistance as may reasonably be required regarding the conduct of any legal proceedings.

The subject must act in accordance with your policies and procedures, which you should make available upon request, and with the Research Governance Framework.

The subject is required to co-operate with you in discharging your duties under the Health and Safety at Work etc Act 1974 and other health and safety legislation and to take reasonable care for the health

and safety of themselves and others while on your premises. Although not a contract holder, the subject must observe the same standards of care and propriety in dealing with patients, staff, visitors, equipment and premises as is expected of a contract holder and must act appropriately, responsibly and professionally at all times.

If the subject has a physical or mental health condition or disability which may affect their research role and which might require special adjustments to their role, if they have not already done so, they must notify you and their employer prior to commencing their research role with you.

The subject of this assurance is required to ensure that all information regarding patients or staff remains secure and *strictly confidential* at all times. They must ensure that they understand and comply with the requirements of the NHS Confidentiality Code of Practice (http://www.dh.gov.uk/assetRoot/04/06/92/54/04069254.pdf) and the Data Protection Act 1998. Furthermore they should be aware that under the Act, unauthorised disclosure of information is an offence and such disclosures may lead to prosecution.

As an Independent Contractor you will not indemnify the subject against any liability incurred as a result of any breach of confidentiality or breach of the Data Protection Act 1998. Any breach of the Data Protection Act 1998 may result in legal action against them and/or their substantive employer.

The subject should ensure that, where they are issued with an identity or security card, a bleep number, email or library account, keys or protective clothing, these are returned upon termination of this arrangement. They should also ensure that while on the premises they wear their ID badge at all times, or are able to prove their identity if challenged. As an Independent Contractor you accept no responsibility for damage to or loss of personal property.

You may terminate the subject's access at any time. We would suggest that this should be either by giving seven days' written notice to the subject or immediately without any notice if they are in breach of any of the terms or conditions described in this letter or if they commit any act that you reasonably consider to amount to serious misconduct or to be disruptive and/or prejudicial to your interests and/or business or if they are convicted of any criminal offence. The subject must not undertake regulated activity if they are barred from such work. If the subject is barred from working with adults or children you may immediately terminate their access. Their employer should immediately withdraw them from undertaking this or any other regulated activity and they MUST stop undertaking any regulated activity immediately.

The subject's substantive employer is responsible for their conduct during this research project and may in the circumstances described above instigate disciplinary action against them.

If the subjects circumstances change in relation to their health, criminal record, professional registration or suitability to work with adults or children, or any other aspect that may impact on their suitability to conduct research, or their role in research changes, they must inform their substantive employer through its normal procedures. They must also inform you.

Yours sincerely

April Coates
Administrator
Study Support Service

C.C. Study Manager (if applicable)
HR Department of the Substantive Employer

Appendix C Participant information sheet NIPs

UNIVERSITY OF Southampton

Participant Information Sheet

Study Title: How clinically appropriate is and what are the influences on antibiotic prescribing by nurse independent prescribers working in general practice settings?
Researcher: Francine O'Malley **Ethics number**: 15805
Please read this information carefully before deciding to take part in this research. If you are happy to participate you will be asked to sign a consent form.
What is the research about?
I am a lecturer in the non- medical prescribing programme at the University of Southampton and I am undertaking this research as part of my PhD. I am looking at the influences on and the appropriateness of nurse independent prescribing (NIP) of antibiotics due to the increasing global problem of antimicrobial resistance (AMR)

What will happen to me if I take part?
You will be asked to take part in an audio recorded interview initially. I would then like to observe your consultations in clinics where you are likely to be prescribing antibiotics. Informal conversational interviews will take place at the end of each session to clarify any issues that may arise and to give you the opportunity to verbalise some of your thought processes in making the decision to prescribe antibiotics or not. These will also be audio recorded and transcribed.
It is anticipated that three to four clinic sessions would be observed.
Informal conversational interviews will be carried out at the end of data collection after you have had the period of observation and discussions and therefore you will have had some time to reflect on your initial perceptions of the influences on your prescribing. These will also be audio recorded and transcribed
I will also evaluate documentation from anonymised patient records for the three months prior to the observed sessions.

Are there any benefits in my taking part?
There may be no direct benefit to you, however this study will add to the research on the quality of nurse independent prescribing and their important role in antimicrobial stewardship

Are there any risks involved?
There are no risks, however if in the unlikely event that any unsafe or unethical behaviour is observed as an NMC registrant I will be obliged to inform your employer and potentially the Nursing and Midwifery council (NMC)

Will my participation be confidential?
In accordance with the Data Protection Act (1998) all identifiable information will be removed from transcripts.
Interview data will be stored on a password protected computer. Any hard copy data will be kept in locked storage.
University of Southampton data protection policy will be adhered to.

What happens if I change my mind?

You have the right to withdraw at any time.

What happens if something goes wrong?
Please contact the Research Governance Manager at the University of Southampton
Address: University of Southampton, Building 37, Highfield, Southampton, SO17 1BJ
Tel: +44 (0)23 8059 5058 **Fax:** +44 (0)23 8059 5781
Email: rgoinfo@soton.ac.uk

Where can I get more information?
If you want to know more please contact me F.O'Malley@soton.ac.uk or on telephone number 02380597627

Version three

Appendix D **Consent form NIPs and GPs**

CONSENT FORM

Study title: How clinically appropriate is and what are the influences on antibiotic prescribing by NIPs working in general practice settings?

Researcher name: Francine O'Malley
Ethics reference: 15805

Please initial the box if you agree with the statement(s):

I have read and understood the information sheet (08/06/16 /version three of the participant information sheet) and have had ☐

I agree to take part in this research project and agree for my data ☐

I understand my participation is voluntary and I may withdraw at ☐

I agree to take part in audio recorded and transcribed interviews and observation of practice. I also understand that the information I provide will be made anonymous. ☐

Data Protection
I understand that information collected about me during my participation in this study will be stored on a password protected computer and that this information will only be used for the purpose of this study. All files containing any personal data will be made anonymous.

_____	_____	_____
Name of Participant	Date	Signature

_____	_____	_____
Name of Researcher	Date	Signature

Version one

Appendix E Interview schedule NIPs

Interview Schedule NIPs

Thank you for agreeing to take part in this interview. Can I remind you that the interview will be audio recorded so that I do not miss any information you give. If any of the questions make you feel uncomfortable or you do not want to answer them please feel free to decline. Are you happy for the interview to continue?

How long have you been qualified as a nurse?

How long have you been qualified as a NIP?

How long have you worked in general practice?

What do you think influences your antibiotic prescribing?

(Prompt with themes already known from lit review: clinical factors, patient pressure, guidelines, time of day/week, cost, peers, and accountability/fear litigation)

Do you use guidelines to support your prescribing?

What do you think of the local/national guidelines?

What do you think about the quality of the evidence within the guidelines?

Are you aware of the problem of AMR?

What do you think your role is in antibiotic stewardship?

Are you aware of any local or national drivers or incentives to limit the prescribing of antibiotics?

Do you attend CPD events, how do you keep up to date?

Do the GPs influence your antibiotic prescribing?

Do you feel supported in your prescribing by the GPs?

Version two

Appendix F Participant information sheet GPs

Participant Information Sheet GP

Study Title: How clinically appropriate is and what are the influences on antibiotic prescribing by nurse independent prescribers working in general practice settings?

Researcher: Francine O'Malley **Ethics number**:15805

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 am a lecturer in the non- medical prescribing programme at the University of Southampton and I am undertaking this research as part of my PhD. I am looking at the influences on and the appropriateness of nurse independent prescribing (NIP) of antibiotics in general practice settings due to the increasing global problem of antimicrobial resistance (AMR). NIPs working in general practice are a discrete group who work closely with, and are employed by GPs and there may be the potential for this relationship to influence the NIPs prescribing.

Why have I been asked to participate?

You are a GP who has several NIPs working in your practice and your views and experiences of the NIPs antibiotic prescribing will be valuable to the study

What will happen to me if I take part?

You will be asked to take part in one audio-recorded semi-structured interview lasting approximately one hour maximum. The audio recording will ensure accurate transcription of the interview. The interview will be transcribed, and the recording will be deleted.

Are there any benefits in my taking part?

There may be no direct benefit to you however this study will add to the research on what is known about NIPs, the quality of their prescribing and their important role in antimicrobial stewardship

Are there any risks involved?

There are no risks.

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 members of the research team 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 will be removed from transcripts. Interview data will be transcribed and the recording deleted. The transcript will be stored on a password protected computer. Any hard copy data will be kept in locked storage. University of Southampton data protection policy will be adhered to.

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 contact the researcher by email to arrange a time for the interview to take place

What happens if I change my mind?

You have the right to change your mind and withdraw at any time up until data analysis without giving a reason and without your participant rights being affected. 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 results will be written up and included in thesis submitted for a PhD. They may be published in the future.

What happens if something goes wrong?

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. 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).

Where can I get more information?

If you want to know more please contact me F.O'Malley@soton.ac.uk or on telephone number 02380597627

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 10yrs after the study has finished after which time any link between you and your information will be removed. Your data will be pseudonymised by using a code applied by the researcher, no one else in the research team will have access to this information. Thank you for taking the time to read this information sheet and considering taking part in the research.

Version four

Appendix G Interview schedule GPs

Interview schedule GPs

Thank you for agreeing to take part in this interview. Can I remind you that the interview will be audio recorded so that I do not miss any information you give. If any of the questions make you feel uncomfortable or you do not want to answer them please feel free to decline. Are you happy for the interview to continue?

What do you think influences your antibiotic prescribing?

(Prompt with themes already known from research literature: patient pressure, concerns about worsening condition)

What do you think of your NIPs?

(and NIPs in general)

What support do you give them?

Do you provide training or updates or CPD events?

Are you aware of any local or national drivers or incentives to limit the prescribing of antibiotics?

What do you think about the local/national antibiotic guidelines?

What do you think about the quality of the evidence within the guidelines?

What do you think about the problem of AMR?

Do you think that you influence your NIPs prescribing?

Version two

Appendix H Poster for patients

UNIVERSITY OF Southampton

RESEARCH PROJECT

This Health Centre is taking part in research looking at Nurse prescribing in primary care.

If you have an appointment with the Nurse Practitioner there may be a researcher in the room during your consultation watching the nurse.

If you would like her to leave, please tell the receptionist or the nurse. This will not in any way affect the care you receive.

Researcher: Francine O'Malley, University of Southampton.

V1

Appendix I Transcribed fieldnotes

Case 1. Semi-rural practice

14/9/16. Participant 1a Wednesday 2-6pm.

GP and NIP take from computerised list of patients requiring on the day treatment. Those with ongoing problems are advised to make a routine appointment with the GP. There was some negotiation with the GP about the patients on the list and who should take what, for example the GP jokingly said that the NIP should see the patient with a gynae problem as he wasn't comfortable seeing that presentation, " that's one for you I think ". There was friendly interaction between them.

I was introduced to the practice manager who was warm and friendly, she asked me to sign a confidentiality agreement and said that she hoped I enjoyed my time in the practice.

Also introduced to duty GP who shook my hand and said hello smiled but didn't speak to me any further.

Appointment times are generally 10 mins but there was flexibility in that, so there was no time pressure on the NIP that I was observing which meant that I could ask her questions in between patients. The number of patients seen by each practitioner is available to view on the computerised system by the GPs and Nurse practitioners, the NIP said that there was no indication that any action had ever been taken if someone seemed to be seeing fewer patients than others.

Small consultation room, I sat behind NIP beside the sink. No posters on walls about antibiotics or any medicines or illnesses. Just posters about asking for a chaperone if wanted one about health and safety and a framed picture of GP and his family on the wall.

Poster about my presence in the room and the research study was displayed at reception.

NIP collected patients from the waiting room and reminded them that there was someone else in the room observing, She introduced me as 'Francine from the university'. No patients objected to my presence, several said hello to me as they came into the room, some ignored me.

1st patient was 50 year old woman with fungal ear infection (results from swab taken) who although symptoms were resolving reported pain when applying the spray to her ear. Had been advised to come in and have it checked as ? secondary infection. NIP checked no further infection but some inflammation seen at entrance to ear canal, advised re application treatment. Patient happy with advice.

2nd patient had ongoing fungal skin infection for several years, had not resolved with recent treatment given by GP. Advised to make routine appointment with GP who specialised in skin conditions since ongoing problem. NIP not happy to prescribe further treatment at this point. Made no apology for this. Patient was agitated, said how was he going to wait for 2-3 weeks for a routine appointment when the itch was driving him mad. Prescribed antihistamine for itch. Patient happy with this.

3rd patient 68 yr old with shoulder pain following fall yesterday, small graze on leg. Examined by NIP advised musculoskeletal pain and to take analgesia which patient had been previously prescribed by GP and had at home (Naproxen). Patient has severe eczema and infected eczema on Rt thumb for which the GP had prescribed Co Amoxiclav after several other failed attempts at treatment. While the NIP was out of the room finding a dressing for the graze on her leg, she asked me what I was researching I answered that I was looking at the NIP and abx prescribing, she said that was interesting because her vicar had asked her if she should be taking all these antibiotics.

4th patient 12 year old girl accompanied by mother, hx of dizziness on standing for 4-5 days. Had seen the GP recently with history of very heavy periods. Sitting and standing BP checked by NIP who thought she might need some bloods taken, went out of the room and checked with GP. Came back and made appointment for patient to have bloods taken and review appointment with the Gp.

5th patient. 78yr old man with on going knee pain following several attempts to reconstruct knee after failed knee replacement surgery. Wanted more analgesia. Prescribed by NIP as requested and appointment made with GP for review and possible referral onto consultant again.

6th patient 12yr old girl accompanied by mum. Hx IGTN treated with abx previously. Lt great toe inflamed and painful, very short nail. Mum said that she rang surgery for advice, and was advised to come in by receptionist because the child might need antibiotics. Child is systemically well. Examined by NIP who stated that she was going to prescribe antibiotics and also advised some self care, soaking foot in salt water. Mum stated that child did not like taking medicines, unable to take tablets. NIP asked if child could take paracetamol tablets, mum said only if they are crushed

down. Said that the last time the GP had prescribed medicine to be taken twice daily which they could just about cope with but there was no way she could take it 4 times daily. Said "we have to sit at the table with her and build up to it" NIP looked back in the patient record and saw that she had been prescribed amoxicillin suspension to be taken twice daily instead of three times daily which is the appropriate dose. NIP could find no rationale for this. NIP prescribed Clarithromycin suspension bd. Appropriate dose and course of treatment as per guidelines. No side effects discussed advised mum to read the PIL.

I asked the NIP why she had prescribed clarithromycin since patient had no hx penicillin allergy and first line treatment is Flucloxacillin. Said that she knew that patients disliked the taste of Flucloxacillin and frequently parents rang the surgery to report that their children refused to take it. 'The amount of times we have parents ring up saying the child won't take the medicine because of the taste you wouldn't believe 'Also similar problem with Pen V. Clarithromycin can be prescribed BD. NIP reported that she prescribed the abx which could be taken BD and avoided the one that tasted horrible so the child was much more likely to take the medication and the problem would resolve. Asked if she ever considered cost of treatment for example the difference between capsules and suspensions. She said 'No, what's the point in prescribing something that they aren't going to take'. It was more important to prescribe something that the patient would take, rather than what was cheaper. Child and mum happy with treatment.

7th patient. 45yrs old woman whose presenting complaint was recorded on the computer as 'unable to get out of bed for 4 days'. A neighbour had brought her to the surgery. Patient looked very unwell reported that she had a cough was breathless, unable to lie down as couldn't breathe, had pain Rt side chest, felt hot and cold, couldn't stay awake. Relevant hx: IDDM RA on Methotrexate, smoker. Reported that she hadn't taken any meds for past 4 days except paracetamol but had checked her BS which was 12mmols/L. Said not eating but drinking lots of water. Obs T 38, p100 sat 93-95%, respiratory rate and BP not taken. NIP auscultated chest and reported widespread rhonchi and crackles Rt posterior base. Voiced her concern to patient in a very gentle tone that due to her underlying medical conditions she may need admission to hospital. Went out of the room to discuss with GP. Returned with GP who asked patient about her breathlessness, how bad it was. Listened to her chest for quite a long time, rechecked sats.

He advised patient that she needed antibiotics, told NIP to prescribe Co Amoxiclav 625mgs. Told patient to take 2 that evening and 1 three times daily afterwards. Asked if she had someone at home, patient said her son was at home, told her that her son needed to look after her. Safety netted re worsening symptoms, call 111 tonight or return to surgery tomorrow. For review in 48 hrs.

Asked NIP what she thought about that choice of antibiotic since it wasn't first line treatment for CAP according to local guidelines , said that she agreed due to patients medical history of IDDM and medication methotrexate which is an immunosuppressant.

8th Patient 24yr old with hx abdominal pain and diarrhoea, not worsening had been referred to consultant but missed appointment and wanted to be referred again. Examined by NIP (abdo exam, urine dipstick and pregnancy test) found nothing acute. Advised to see GP re referral for ongoing problem.

9th patient 60 yr old male with 1 day hx of swelling to Rt lower leg from above knee to ankle. Systemically well, came from work. No observations taken.

Rt leg more pink than Lt leg. Some healing scratches around lower leg. No other injury or trauma. No pain calf. Examined by NIP who ruled out DVT. Measured calves and compared, palpated calf. She prescribed Flucloxacillin 500mgs for 7 days which is appropriate according to local and national guidelines, advised re worsening symptoms and when to return. No advice re side effects medication.

Current BNF and BNFc on the shelf and local abx guidelines dated 2014. Not referred to at any time by NIP. When asked if she used decision support said that she did use CKS (an online tool) if she wanted to look something up. Rarely looked at the BNF unless case was unusual, knew abx treatment for most common conditions without checking.

Checked current medication for all patients and asked re allergies.

Appendix J Example lumper coding combining interview and observation data

GPs

Prescribed as advised by GP for woman with CAP, asked if she agreed with his decision to prescribe Co Amoxiclav, she said yes because patient had serious underlying medical problems. 1a *NIP taking advice from GP*

Asked GP advice re man with 56yr old man with unresolved UTI. Symptoms much improved but not fully resolved after 1 week Nitrofurantoin. Urine sample results from lab show sensitivity to Nitrofurantoin and Temocillin, NIP had never heard of Temocillin, asked GP advice who said to prescribe Nitrofurantoin for another week. I asked what NIP thought of that decision, she said that she was happy with that 'it's worth trying another week of Nitro'1c *NIP taking advice from GP*

Yes immensely yes. Definitely, not necessarily so much for the run of the mill stuff…… When someone's probably got a whole load of resistances or sensitivities ermm allergies if they've got chronic renal failure AKI that kind of stuff ermm if their ALTs bloods or something are abnormal those kind of things and I'm thinking that giving them something might be more detrimental for them rather than good for them then I probably would go and ask just check that I'm thinking about the right antibiotic to give. 1c *seeks advice when case more complicated*

*86 yr old woman with 2 week hx swelling and inflammation face, slight fever, glands in neck up. Several lesions on nose that appeared herpetic to NIP, asked second opion from other NIP, she was also unsure re diagnosis and treatment. Duty doctor came in to see patient , thought infection ? erysipelas but not classic picture, knew that she needed to cover strep because it was on the face, she said that there was something in the back of her mind telling her that was important. She suggested Co Amoxiclav and then quickly corrected herself and said that they shouldn't be doing that. NIP suggested Clarithromycin 500mgs bd for a week and GP agreed. Patient had many co morbidities and reduced renal function NIP checked all of this before issuing prescription. (patient reviewed after 48hrs and condition much improved) 1c *GP asking advice about which abx to prescribe from NIP*

Some GPs probably do because they'll say ermm, I can probably think of a few GPs where the dose is.. I saw someone with a tonsillitis where they had Penicillin 250 as an adult dose 4 times a day for 7 days, I said well I always give 500mgs and they were like "really do you !" They say," I've

only ever given 250". That's a subtherapeutic dose you know, that's a common bread and butter one, so there is that a lot the GPs come and ask us about, the right abx, what should we give this person.. I think they are swayed by what we say to be honest. I think 1c *GPs learning from NIPs*

Yeah... yeah they do. Ermm so if I've seen a patient and it's a full consultation which is what most of the patients I see are, then I'll make a decision on what I need to do and that's that but if I've gone to someone and asked a bit of advice on a patient ermmm then I will, if they've said give this and do that then that's what I'll do I'll prescribe those abx and take that advice." 1b *respect for GP knowledge and experience*

Yeah, yeah, we had a lady with a UTI and one of the GPs came to me and said this lady has allergies to this this and this, she was allergic to Penicillin, allergies to Trimethoprim.. Nitrofurantoin, her eGFR was rubbish, and it was like 'what would you give her?' …… , I think they respect us as much as we would respect them because this is what we're doing every day.. 1c *Respect for NIPs knowledge*

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