**Recognising and responding to the early signs of sepsis.**

Emeritus Professor Alan Glasper, from the University of Southampton, discusses a new publication from NICE which gives guidance on the recognition and management of the early sings of sepsis in vulnerable patients.

**Introduction**

In July 2016 and after an exhaustive review of the literature and the research underpinning it NICE (The National Institute for Health and Care Excellence) <https://www.nice.org.uk/>

published a new guideline entitled Sepsis: recognition, diagnosis and early management. <https://www.nice.org.uk/guidance/ng51>

The new NICE guideline comes in the wake of a series of high profile deaths from undiagnosed sepsis but especially among children. In 2014 one year old William Mead died of septicaemia and at the subsequent inquest into his death the role of the family doctor and the out of hours services were criticised as was the functioning of the 111 call handler who was unable to recognise that the child was developing systemic sepsis precipitated as later revealed, by an underlying chest infection

<http://www.bbc.co.uk/news/uk-england-cornwall-36795922>

Similarly baby Charlie Jermyn died of sepsis in May 2015 aged only 30 hours, and at the inquest into his death the coroner was critical of the series of catastrophic failures in care delivered by the midwives who likewise failed to recognise the emerging signs of sepsis <http://www.bbc.co.uk/news/uk-england-cornwall-35558924>

**Background**

Severe sepsis is known to cause the deaths of at least 37,000 people annually in the UK.(Daniels et el 2011).With this number of deaths attributed to sepsis every year it is not surprising that infection and fear of infection continue to haunt members of all societies. Such fears are justified and indeed the whole history of mankind is littered with accounts of epidemics and pandemics, biblical plagues and pestilences, some of which have caused levels of mortality of immense proportions which make man’s futile efforts to cause self-harm through wars child’s play in comparison. Perhaps the most feared infection was that attributed to the Black Death in the 14th century. Caused by the bacterium Yersinia Pestis, Zeigler (2013) describes how this plague was responsible for the deaths of almost a third of the European population. In contemporary society hospital acquired infection has likewise caused fear among patients in hospital almost akin to the situation described by Semellweis in the early years of 19th century Vienna. Here some mothers opted to have their babies in the gutters of the streets rather than in the nearby lying in hospital where hospital acquired puerperal sepsis was commonplace. This was because doctors went straight from the autopsy room to the wards where they delivered babies without washing their hands. Boyce (199) describes how Semellweis introduced the simple measure of asking doctors to wash their hands in chlorinated lime solution before delivering babies which led to significant reductions in mortality.

In contemporary health care in England, the regulator for health and social care, the Care quality Commission (CQC) puts significant effort into collecting data from hospitals that infection control meets their stringent standards. This includes an assessment of cleanliness and hygiene and an assessment of how reliable the systems are to protect patients and prevent them from acquiring health care associated infections. As part of these in depth hospital inspections the CQC specialist advisors who are themselves experienced health care professionals seek assurances from the health care staff that they interview during the process of hospital inspection, that comprehensive risk assessments are carried out on service users in line with national guidance .In this context the CQC specialist advisors will seek to identify how health care professionals such as nurses take steps to recognise and respond appropriately to changing risk among patient groups including having the skill set to recognise deteriorating health and the ability to put measures in place to initiate emergency interventions. Hence evidence of the use of early warning tools such as Paediatric Early Warning Scores (PEWS) or New-born Early waring Scores (NEWS) will be collected and their use ascertained from scrutiny of the patient record. New born early warning assessment tools for example have been shown to be helpful in delivering effective optimum care to babies at potential risk of deterioration (Roland et al 2010).

Furthermore the use of care bundles or algorithms such as SepsisSix which have been designed to reduce patient mortality from sepsis has been shown to improve patient outcomes (Daniels et al 2011). Researchers such as Gao et al (2005) have shown that successful sepsis algorithm implementation is predicated on staff training to ensure their effective use in optimizing the management of severely ill patients.

In addition to the use of Sepsis 6 ,nurses have been using clinical assessment tools such as PEWS for a number of years as they are principally designed to detect signs of deterioration, in this case of a sick child. In such situations nurses have developed confidence in these tools as they can alert carers to the early signs of impending collapse and furthermore predict which children are likely to deteriorate and require more intensive care facilities. Additionally many nurses now use the SBAR framework (i.e. Situation, Background, Assessment, and Recommendation) which facilitates precise communication between members of the multi-disciplinary care team about the appropriate management of deteriorating sick patients. Importantly as an adjunct to the use of early warning tools it is important for any nurse to think outside of the box and listen and respond to the almost extrasensory perceptions of parents and carers who can uncannily see the early signs of deterioration before anyone else. This was shown to be true in the tragic case of William Mead whose mother desperately sought help and where subsequent to his death better recognition of sepsis by health care staff was advocated <http://www.bbc.co.uk/news/health-35407340>

**The New NICE guideline**

Despite the routine use by many health care professionals of these measures of patient acuity where deterioration can be detected early and appropriate interventions delivered in a timely fashion, too many cases of fatal sepsis are occurring throughout the NHS. This has prompted NICE to publish its own guideline for health care workers to better detect and mange sepsis in vulnerable patients.

The new guideline is designed for health care workers to enable them to more easily recognise and manage sepsis in all patient groups including children in acute hospital settings and within primary care .It is beyond the scope of this paper to give anything more than a simple précis of this complex NICE guideline which has many algorithm sub divisions but primarily seeks to help nurses and others identify service users with suspected sepsis ranging from children under 5 years of age through to adults in all clinical settings.

The guideline identifies a number of risk factors associated with sepsis and these include among others the very young and in contrast the very old, people who have suppressed immunity as in cancer treatment, people who are recovering from recent surgical interventions, people with breached skin conditions, people with indwelling catheters or intravenous lines and post-partum women.

**Undertaking a face to face assessment of people at risk and stratifying the risk of severe illness or death from sepsis**

The new NICE guideline recommends that any patient at risk of developing sepsis should be comprehensively physiologically assessed by health care staff. This assessment includes ascertaining such parameters as temperature, blood pressure and level of consciousness among others. In young children other parameters such as oxygen saturation levels and capillary refill time are mandatory. Other aspects such as examining patients for urinary functioning (in babies this means the checking of nappies), skin mottling, cyanosis, and examining the skin for breach of integrity such as rashes are also part of the NICE reconditions. Importantly the guideline gives health care professionals a range of risk stratification tool for adults, children and young people aged 12 years and over with suspected sepsis, children aged 5 to 11 and children under 5 with suspected sepsis. This allows nurses and others to use the person's history and physical examination results to grade the risk of severe illness or death from sepsis using criteria based on age

<https://www.nice.org.uk/guidance/ng51/chapter/recommendations#stratifying-risk-of-severe-illness-or-death-from-sepsis>

**The management of sepsis**

The new NICE guideline gives details of the management of sepsis in both acute and community settings, but only acute hospital management will be considered here. The NICE guideline gives specific management guidelines for differing age groups who have suspected sepsis and meet high risk criteria. Nurses should consider as appropriate the use of assessment tools such as the Glasgow coma scale or the AVPU (alert ,voice ,pain ,unresponsive ) scale .In suspected sepsis situations an immediate review by a senior clinician and the monitoring of people who meet any high risk criteria continuously, or a minimum of once every 30 minutes depending on the clinical setting. In addition to a range of pathological blood tests the NICE guideline also recommends the giving of intravenous fluid bolus without delay in certain patient groups. The NICE guidance recommends that consultant attendance in person should be requested in any patient presenting with high risk criteria and suspected of developing or experiencing sepsis if that patient fails to respond within 1 hour after the administration of antibiotics or intravenous fluid resuscitation procedures. The guideline recommends a range of differing antibiotics and intravenous resuscitation fluids for each of the specific age groups including neonates. The guideline also recommends a range of oxygen administration strategies ranging from achieving oxygen saturation levels of 94 -98% for adults, through to administering oxygen to sick children whose saturations fall below 91%

Although the NICE guidance recommends that health care professionals identify the source of the sepsis in infected patients , it also gives a range of caveats such as avoiding the performance of a lumbar puncture when contraindications are present as in raised intracranial pressure or in cases where there are fluctuating levels of consciousness as measured using the Glasgow coma scale

**Training and education**

Clearly the new NICE sepsis guideline which covers all patient age groups is a complex and detailed document designed to save lives. It will be incumbent upon nurses to read and digest this information for the benefit of those they deliver care to. However NICE recognise that hospital continuing education departments and practice education facilitators will need to embed within their training and development plans strategies to ensure that all staff including students are enabled to access training which will allow them to identify and manage patients at risk of developing sepsis. Furthermore all nurses involved with triage or early management of patients such as site practitioners should be given regular clinical updating on the assessment and management of sepsis including being enabled to access local protocols and escalation pathways. NICE guidelines are essential reading for all registrants!

**Key points**

* In July 2016 theNational Institute for Health and Care Excellence)
* published a new guideline entitled Sepsis: recognition, diagnosis and early management.
* This new NICE guideline comes in the wake of a series of high profile deaths from undiagnosed sepsis but especially among children.
* It is known that use of care bundles or algorithms such as SepsisSix can improve sepsis patient outcomes.
* The NICE guideline gives specific management guidelines for differing age groups who have suspected sepsis and meet high risk criteria

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