The Royal College of Pathologists
Pathology: the science behind the cure

National Medical Examiner's Good Practice Series No. 19

Sepsis

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Contents

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About the National Medical Examiner's Good Practice Series

Medical examiners are senior doctors providing independent scrutiny of non-coronial deaths in England and Wales, with the role now a statutory requirement since 9 September 2024.

While there is extensive guidance available on a wide range of topics for NHS and public sector staff, the National Medical Examiner's Good Practice Series highlights how medical examiners and medical examiner officers can better meet the needs of local communities and work more effectively with colleagues and partners.

The Good Practice Series is a topical collection of focused summary documents, designed to be easily read and digested by busy front-line staff, with links to further reading, guidance and support.

Introduction

Sepsis is one of the leading causes of death in the UK but is frequently underreported on death certificates and other mortality statistics.

Simple but timely interventions have been shown to significantly reduce mortality from sepsis, and very long delays are associated with increased mortality in those with septic shock. Despite this, sepsis often goes unrecognised in unwell and vulnerable patients and these interventions are often omitted, potentially leading to preventable deaths.

This paper concentrates on how the medical examiner system can improve reporting of deaths caused by sepsis or deaths where it was a contributing factor, through ensuring the completeness and accuracy of death certificates. Scrutiny can assist learning for clinical governance and mortality processes, escalate the concerns of the bereaved and identify cases that require referral to the coroner.

This paper does not attempt to explore or provide extensive detail of sepsis pathophysiology or evidence for treatment, as information about these are widely published. Links are included to helpful sources for further reading.

Recommendations for medical examiners

Medical examiners and officers should:

- in cases where sepsis contributed to death, ensure this is recorded accurately on the Medical Certificate Cause of Death (MCCD)
- consider whether the possibility of sepsis was considered in a timely manner, or whether diagnosis was delayed; if there was a failure to respond to patient and family concern, appropriate referrals to clinical governance should be considered to ensure that learning points are identified and actioned
- explore whether sepsis was assessed and recognised appropriately for the patient group and the clinical setting
- identify whether the patient had appropriate sepsis management, including investigations and antibiotics/treatment, such as the relevant Sepsis 6 bundle[1] or equivalent. Interventions should have been implemented in a timely way, especially administration of appropriate antibiotics in line with the organisation's sepsis policy
- consider whether the source of infection was identified and controlled in a timely way; for example, whether there were delays in radiological investigations to identify source and surgical or interventional radiology procedures to release pus.

[1] UK Sepsis Trust. *Clinical tools*. Available at: https://sepsistrust.org/healthcare-professionals/clinical-tools/

Context

One analysis suggests an annual figure of approximately 245,000 episodes of sepsis in adults in the UK each year, with 48,000 people dying as a result. This indicates sepsis claims more lives than breast, bowel or prostate cancers.[2]

According to the World Health Organization, data published in 2020 shows that there were 48.9 million cases and 11 million sepsis-related deaths worldwide, representing 20% of all global deaths.[3]

The Office of National Statistics (ONS) data suggests there are around 22,000–24,000 sepsis deaths per year in England and Wales. The ONS generally reports on underlying causes of death and sepsis is frequently a contributor in the final deterioration and death of patients with chronic conditions such as dementia, cancer, advanced old age and chronic lower respiratory diseases.

Deaths that may have been prevented can result from a failure to recognise and treat sepsis in a timely manner.

What is sepsis?

Professional narrative definition of sepsis

Sepsis is characterised by a life-threatening organ dysfunction due to a dysregulated host response to infection.

Definition of septic shock

Septic shock is a subset of sepsis where particularly profound circulatory, cellular and metabolic abnormalities substantially increase mortality.

Recognising sepsis

Sepsis can affect anyone who has an infection, an injury, a disease or illness – all these can progress to sepsis, but some people are more vulnerable such as the elderly,

[2] UK Sepsis Trust. *11 million deaths globally every year among 49 million cases*. Available at: https://sepsistrust.org/about-sepsis/references-sources/
[3] World Health Organization. *Sepsis*. Available at: https://www.who.int/news-room/fact-sheets/detail/sepsis

pregnant women, neonates, hospitalised patients, people who are immunosuppressed and those with chronic medical conditions.[3]

Clinicians should always consider, 'Could this be sepsis?', when presented with an unwell person with a possible infection, with or without a high temperature. According to the British Medical Journal, 'The key to improving outcomes is early recognition including proper interpretation of NEWS2 scores and prompt treatment, as appropriate, of patients with suspected or confirmed infection who are deteriorating and at risk of organ dysfunction. By the time the diagnosis becomes obvious, with multiple abnormal physiological parameters, risk of mortality is very high'.[4]

Organisations have produced several tools designed to aid clinical staff in community and hospital settings based on the Academy of Royal Medical Colleges (AoMRC) and NICE sepsis guidance. Many use clinical tools from the UK Sepsis Trust, which include risk stratification and identification of those who will benefit most from early and focused intervention. Different tools exist for high-risk groups, including pregnant women and children.

Sepsis management and issues

Patients identified as having a high chance of sepsis or at particular risk of deterioration should have care centred around high-impact interventions in an evidence-based care bundle. The AoMRC has published guidance on antimicrobial treatment of sepsis. The UK Sepsis Trust's clinical tools are tailored to the needs of different clinical settings and patient groups. These were updated in 2024 and accurately reflect the recommendations in the NICE guideline on sepsis.

The timing of interventions can be critical in determining the outcome for individual patients. It is, therefore, appropriate for medical examiners to consider the care of a deceased patient before death, whether warning signs were identified and whether the sepsis pathway, if appropriate, was followed. It will be imperative to understand whether the Sepsis 6 bundle (or equivalent sepsis management) appropriate to the clinical setting and for the patient was implemented in a timely way, especially early administration of

[4] British Medical Journal. *Sepsis in adults*. Available at: https://bestpractice.bmj.com/topics/en-gb/3000098

appropriate antibiotics in line with national guidance and the local healthcare provider's antibiotic policy.

If it appears that identification of sepsis and management were less than optimal, medical examiners should support learning and improvement by identifying concerns and escalating these, where appropriate. A judgement will need to be made, as in other cases, about when referrals for cases record reviews and other established clinical governance processes are appropriate. Coroner notification is required when Notification of Deaths Guidance 2019 criteria are present.

Sepsis features too often in tragic accounts of deaths of patients which, in other circumstances, may have been avoided. Martha Mills was a 13-year-old who died from sepsis following a cycling accident that caused an injury to her pancreas in 2021. In 2023, a coroner ruled that Martha would probably have survived had she been moved to intensive care earlier.

In response to this and other cases related to the management of deterioration, the Secretary of State for Health and Social Care and NHS England committed to implement Martha's Rule to ensure that patients, families, carers and staff will have round-the-clock access to a rapid review from a separate care team if they are worried about a person's condition. In 2024, 143 hospital sites began testing and implementing Martha's Rule, with hundreds of calls leading to improvements in patient care. Implementation is undoubtedly saving lives, emphasising how important it is for clinicians to listen to patients and respond to clinical concern, rather than just relying on standard physiological signs of deterioration. The 3 components are:

1. patients will be asked, at least daily, about how they are feeling and if they are getting better or worse, and this information will be acted on in a structured way
2. all staff will be able, at any time, to ask for a review from a different team if they are concerned that a patient is deteriorating and they are not being responded to
3. this escalation route will also always be available to patients themselves, their families and carers and advertised across the hospital.

Martha's Rule is part of the wider NHS Patient Safety Strategy, which is saving thousands of lives and millions of pounds through evidence-based approaches to improving safety.

A similar patient and family-initiated approach, to be named Call 4 Concern, is being adopted in Wales to enable the patient or their family to call for immediate help and advice if they are worried about instances of deteriorating health.[5]

Medical Certificates of Cause of Death

It is generally recognised that deaths from sepsis are under-reported on the MCCD, leading to inaccuracies in public health data. A 2015 report, *Just Say Sepsis*, by the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) found that, where patients with sepsis had died, it was only recorded on the death certificate in 40% of cases.[6]

MCCDs should include sepsis if there is clear evidence of organ dysfunction in an organ unrelated to the primary site of infection, e.g. hypoxia in a patient with severe cellulitis. Examples of new organ dysfunction include hypoxia, derangement of coagulation, derangement of liver function, derangement of renal function, hypotension and reduced level of consciousness. Sepsis should be qualified on the certificate with the source, if known or suspected to the best of knowledge and belief (e.g. 1(a) Sepsis 1(b) Pneumonia) or alternatively if the source is not clear, 'sepsis of unknown aetiology'. Terms such as 'multi-organ failure' do not add to the certificate or assist public health research, and describe a manner or mode of death rather than a cause of death.

However, there is also a risk that sepsis may be included in the MCCD when it was not present, as in some cases clinicians can conflate infection with sepsis. It is important that the MCCD content is as accurate as possible, recognising that clinical opinion and judgement may vary. For sepsis to be recorded, there should be evidence of acute organ dysfunction occurring as a consequence of the underlying infection.

The term septicaemia has not been used or recommended for use in adult medicine since the first international consensus definitions of sepsis were published in 1992,[7] and it is not

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[5] Welsh Government. *Adopting a patient and family-initiated escalation approach (WHC/2024/040)*. Available at: https://www.gov.wales/adopting-patient-and-family-initiated-escalation-approach-whc2024040-html
[6] NCEPOD. *Sepsis: Just Say Sepsis!*. Available at: https://www.ncepod.org.uk/2015sepsis.html
[7] Bone RC, Balk RA, Cerra FB, Dellinger RP, Fein AM, Knaus WA. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. The ACCP/SCCM Consensus Conference Committee. American College of Chest Physicians/Society of Critical Care Medicine. *Chest* 1992;101:1644–1655. https://pubmed.ncbi.nlm.nih.gov/1303622/

recommended for use in an MCCD. Where sepsis is defined as above, current correct terminology relating to the obsolete term ‘septicaemia’ includes bacteraemia, viraemia and fungaemia.

Medical examiners may find information in the good practice paper addressing antimicrobial resistance helpful in deciding how causes of death should be recorded.

Conclusions

Medical examiners cannot change the care a patient received before death, but their role is to review the circumstances. By considering the possibility of sepsis and identifying learning from cases where sepsis could have been managed better, they can help the NHS improve care for future patients and may prevent avoidable deaths.

Recommendations for choice of antimicrobial therapy or local policies is outside the scope of medical examiners but, as they come from a wide variety of clinical specialties, they have an opportunity to improve understanding and consistency by identifying issues. Please see the Good Practice Series paper on *Recording antimicrobial resistance on the Medical Certificate of Cause of Death* for more details.

Further information can be found in the *Find out more* section of this paper.

Find out more

- Academy of Royal Medical Colleges: Statement on the initial antimicrobial treatment of sepsis.
- British Medical Journal: Sepsis in adults - Symptoms, diagnosis and treatment.
- The Lancet: Sharp rise in sepsis deaths in the UK.
- NCEPOD: Sepsis: Just Say Sepsis!
- NHS England:
  - Martha's Rule
  - NHS announces 143 hospitals to roll out 'Martha's Rule' in next step in major patient safety initiative
  - NHS Long Term Plan to reduce toll of 'hidden killer' sepsis.
- National Medical Examiner's Good Practice Series: Recording antimicrobial resistance on the Medical Certificate of Cause of Death.
- NICE guidance: Suspected sepsis: recognition, diagnosis and early management
- The UK Sepsis Trust:
  - Clinical tools
  - References & sources
  - The sepsis manual.
- Welsh Government:
  - Adopting a patient and family-initiated escalation approach
  - Spotting sepsis in children, awareness leaflet
  - Standardising the management of acute deterioration
  - Timelines and responsibilities for Early Warning Scores (EWS).
- World Health Organisation: Sepsis.

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