RCGP | Royal College of General Practitioners

Sepsis: guidance for GPs
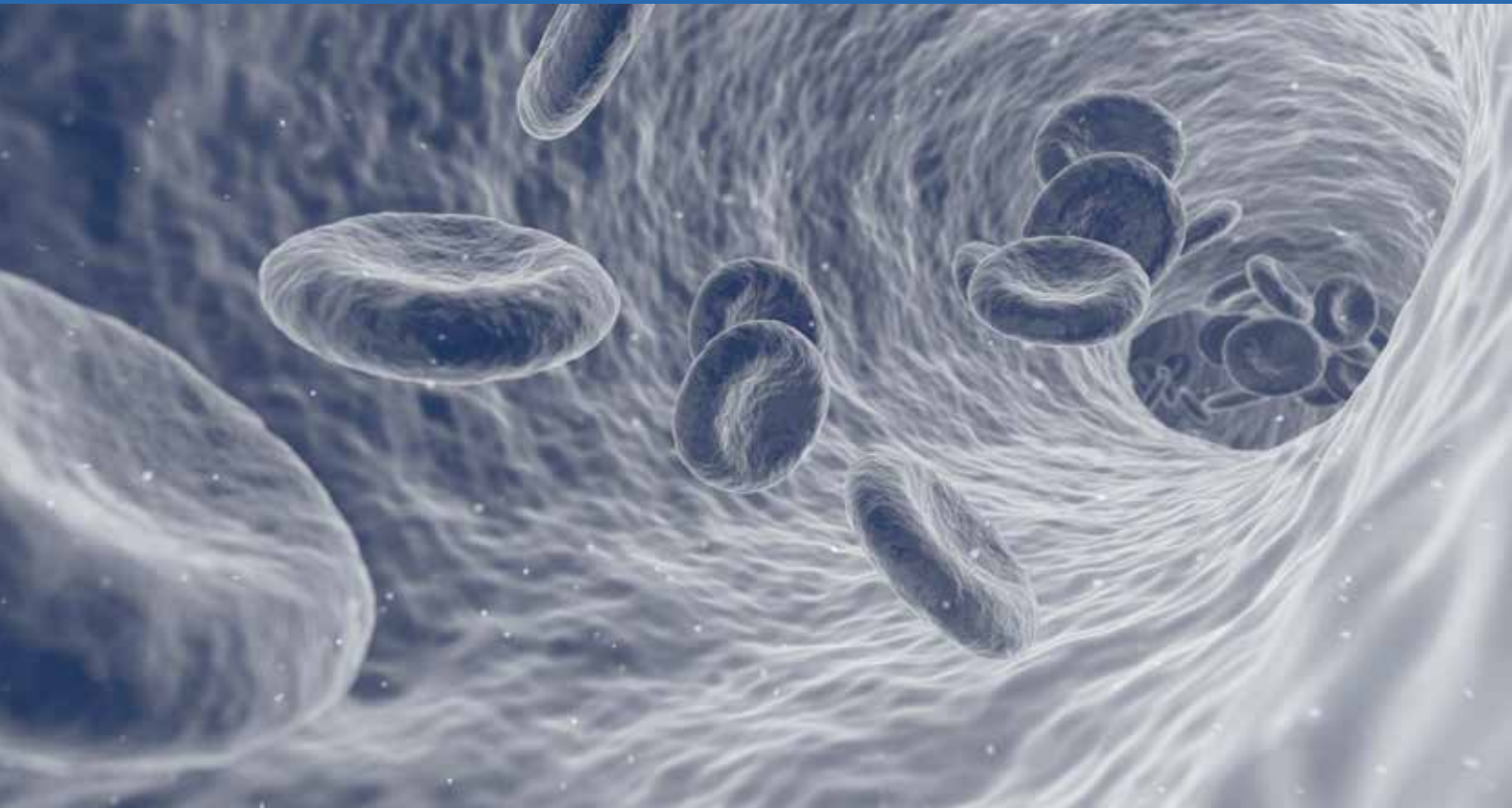
Contents

Introduction

This document is produced as part of the Health Education England/ Royal College of General Practitioners clinical priority project for sepsis. It is intended for use by GPs, trainees and other general practice clinicians. It can be used as a piece of self-directed or facilitated group learning package and is suited to small group discussions rather than lectures to larger groups.

This booklet consists of an introduction to sepsis and structured case studies for group discussion.

These aim to both educate delegates and stimulate discussion as to how best practice can be achieved. When downloaded online, the facilitator is encouraged to add images and notes to the slides to suit their particular regions, audience and knowledge-base.

Educational Goals

The goals of this package are based upon the aims of the HEE/RCGP sepsis clinical priority: changed attitudes and changed behaviours.

It is clear that sepsis is not a problem confined to hospitals even though much of the early work in improving outcomes has focused upon better recognition and early management within hospital systems. At its various access points, general practice has a significant role to play in identifying suspected sepsis at an early stage and to promptly escalate care where appropriate.

There has been a change in attitude from accepting that sepsis is often hard to detect, to one where it is actively being assessed whenever infection is being considered as a cause for significant illness or deterioration. It is also important to recognise that GPs play a part in creating a system of care that is sepsis aware and that system includes patients, their family members, carers, reception staff and other health workers.

The behaviour changes should include the consistent use and recording of physiology as part of the assessment of infection and the deteriorating patient. This assessment should include the three elements most predictive of sepsis, namely: respiratory rate, blood pressure/perfusion and cognition. The method selected for doing this in primary care is still open to challenge due to a lack of general practice or primary care evidence, but within hospital and the ambulance service, the National Early Warning Score 2017 (NEWS2) is becoming the standard way for doing this.

The use of a standard message to communicate a concern regarding potential sepsis is seen as beneficial both between patients and general practice and general practice and the hospital and ambulance services. This should include the phrases "Suspected Sepsis" and a physiological assessment such as NEWS and the call to the ambulance service should be made using the 999 service.

The use of meaningful safety netting with regard to what deterioration would look like for a patient with infection should be used and backed up with appropriate support leaflets or materials. The advice for the patient to return if they get worse or if he/she is concerned is viewed as vague and uninformative.

What is sepsis?

Sepsis:

Sepsis is defined as "life-threatening organ dysfunction caused by a dysregulated host response to an infection".[1]

Septic shock:

Sepsis with persistent hypotension despite fluid correction and inotropes.

Septic shock has a mortality of 7.6% for every hour that antibiotic therapy is delayed.[2]

Sepsis is the common pathway for deterioration in almost all life-threatening infection. The first question when managing deterioration in the presence of suspected infection should be "Is sepsis present?" not "Where is the primary infection?".

1. Singer M, Deutschman CS, Seymour CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). Jama 2016; 315(8): 801-10.
2. Kumar A, Roberts D, Wood KE, et al. Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock. Critical care medicine 2006; 34(6): 1589-96.

The GP's Challenge

123,000

cases annually in England in 2014.

37,000

deaths in that period.

70-80%

of cases are derived from primary care chest (40%) and urinary tract (25%) sources.

43,000

cases of sepsis out of 360,000,000 consultations.

Sepsis is difficult to spot: good GPs "miss it".

With best practice implemented, it is estimated that as many as 10,000 deaths annually may be preventable (NHS England[3]).

3. NHS England Cross Systems Sepsis Prevention Programme Board. Improving outcomes for patients with sepsis: A cross-system action plan,. In: NHS England, editor. London: NHS England, 2015.

Action Points

Identifying sepsis can be challenging and clinical judgement should be supported and augmented by physiological assessment (NICE Quality Standards 2017[4]).

In adults National Early Warning Score[5] and NICE Guidelines[6] offer some values for abnormal physiology. In children there is no standardised Paediatric Early Warning Score (PEWS), but NICE offers some values as a guide. Raised respiratory rate, lowered blood pressure or perfusion and altered cognition have greater predictive value than pulse, oximetry and temperature (International Sepsis Guidelines 2016). Respiratory rate, blood pressure and altered cognition are amongst the least well recorded values by GPs when assessing patients with sepsis (NCEPOD Sepsis Report 2015[7]).

Sepsis, and particularly septic shock, should be treated as a time-critical medical emergency.

Communicate concern to ambulance service and colleagues, using the words: "SUSPECTED SEPSIS", and offer the outcome of your physiological assessment or NEWS Score.

In patients where sepsis is not suspected but infection is thought to be present, meaningful safety netting should be used and supported with appropriate materials.

Creating sepsis aware communities and practices has the GP at the centre educating patients, relatives, carers and staff to ensure that potential sepsis is considered and addressed in a timely and appropriate manner.

Consider creating a Practice/ Service Sepsis Lead to facilitate implementation of the above.

4. National Institute for Health and Care Excellence. Sepsis: Quality Standard 161. NICE; 2017.
5. Royal College of Physicians. National Early Warning Score (NEWS) 2: Standardising the assessment of acute-illness severity in the NHS. In: RCP, editor. London: RCP; 2017.
6. National Institute for Health and Care Excellence. Sepsis: recognition , diagnosis and early management. NICE; 2016.
7. NCEPOD. Just Say Sepsis. In: National Confidential Enquiry into Patient Outcomes and Death, editor. London: NCEPOD; 2015.

Top Ten Tips for Sepsis Leads

1 Be a senior member of the practice team (either clinical or non-clinical).

2 Undertake other roles related to infection prevention control and antimicrobial stewardship as appropriate.

3 Ensure that all members of staff in the practice under take sepsis learning appropriate to their role.

4 Ensure that appropriate sepsis and infection control messages are visible in the practice.

5 Support and monitor the use of physiology in the assessment of patients with infection and in the communication of concern to hospital and ambulance services.

6 Promote the use of safety netting leaflets for patients within the practice.

7 Promote the appropriate vaccination of staff and patients – particularly vulnerable groups – against in influenza and other relevant infections.

8 Promote and audit antimicrobial prescribing to safeguard against resistance and adverse effects from unrequired medication.

9 Develop systems to capture and review sepsis cases within the practice population.

10 Lead practice response to any outcomes from such review processes that are undertaken either within the practice or locality.

National Early Warning Score 2017

There are two changes from the 2012 score:

- Patients with chronic hypoxia are addressed by the inclusion of a second oxygen saturation scale for those whose normal oximetry is 92% or less.

- Confusion of new onset is added to the assessment of consciousness.

Physiological parameter	Score						
	3	2	1	0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO$_2$ Scale 1 (%)	≤91	92–93	94–95	≥96			
SpO$_2$ Scale 2 (%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

Frequently Asked Questions

Q: How do we manage the competing messages of antimicrobial stewardship and sepsis?

A: Antimicrobial stewardship is essential if we are to have effective antibiotics to manage severe life-threatening infection. There is evidence that suggests that taking an antibiotic increases the likelihood of developing a subsequent infection that requires the use of an antibiotic within the following three months.

Q: NEWS hasn't been validated in general practice so should it be used?

A: The use of NEWS isn't advocated as a replacement for clinical judgement, but physiological assessment must be undertaken when considering sepsis and/or the deteriorating patient. NEWS offers a template for doing this and may be considered as a potential adjunct to the assessment process. It also offers a useful shared language for communicating concern between clinical services and clinicians.

Q: How do we use physiology to assess children?

A: That physiology has a role to play in assessing children is widely agreed but there is no single system for doing so. Each system chooses different values or criteria or age groups. It is worth being familiar with a set of normal ranges for age groups and to use them as a guide in your clinical assessment but not as a replacement for clinical judgement.

It may be that abnormal respiratory rate, cognition and perfusion are more significant than other physiology.

Q: What is the best Paediatric Early Warning System to use?

A: Unlike for adults, there is no agreed national system though work is ongoing to try and create one. See the previous answer for alternative methods to use.

Q: What is the best way to transport my patient to hospital when I suspect sepsis?

A: This will vary according to your location and situation so there is no hard and fast rule, but if they are in septic shock then this is a time-critical emergency with mortality increasing by nearly 8% every hour that resuscitation and antibiotics are delayed. An ambulance is likely to be the preferred option in such circumstances.

Q: How should I train my staff about sepsis?

A: Ideally all staff in a sepsis aware practice will have had some education about sepsis alongside other Red Flag events such as chest pain or stroke (FAST). As materials are developed for this group, links will be made available on the RCGP sepsis toolkit (http://www.rcgp.org.uk/clinical-and-research/resources/toolkits/sepsis-toolkit.aspx)

Evidence Base for Primary Care

No evidence about the effectiveness of Adult Early Warning Scores (NEWS2).

No evidence about the sensitivity of NICE guidance values.

No evidence for PEWS or similar.

No evidence about when GPs or community get it right.

Cat C evidence when GPs / Community get it wrong.

NICE Quality Standards

People with suspected sepsis are assessed using a structured set of observations to stratify risk of severe illness or death.

But not everyone presents to primary care with infection.

People with suspected sepsis who have been stratified as at low risk of severe illness or death are given information about symptoms to monitor and how to access medical care.

This could be anyone with infection, but what information and how?

What tells us that someone is unwell?

Most of us feel that we can quickly spot when someone is really unwell: "You know it when you see it" was often the training we received with little thought as to what we were seeing.

If we understand what it is that triggers that sense that something is wrong, maybe we can spot it earlier and better document it when it is absent.

Physiology to record and help assessment:

- Respiratory rate
- Blood pressure/capillary refill
- Pulse rate
- Oximetry
- Temperature
- Cognition/social interaction changes

How to assess physiology:

- International guidelines recommend a combination of respiratory rate, cognition and blood pressure.
- NICE have high risk values, signs or symptoms.
- National Early Warning Scores use a weighted combination of a basket of physiological variables.
- Hospitals and ambulance services have standardised on NEWS2, none are validated in primary care.

Improving Outcomes

CHANGING ATTITUDE

Outcome isn't just down to luck.
It improves with better recognition
and organisation.

Sepsis is a problem for the whole
health community.
GPs have a significant part to play.

Recognising that life-threatening
infection (sepsis) may be present
is the key element.
Detecting the source of the infection
is secondary to getting care right.

CHANGING BEHAVIOUR

Use physiology and NEWS as
an adjunct to your assessment
of patients.
Assess respiratory rate, perfusion
and cognition.

Communicate effectively
with colleagues: dial 999.
Suspected Sepsis, NEWS = 8.

Use effective safety netting.
NOT "come back if it gets worse".

Creating a Sepsis Aware Community

1 Patients and parents aware of sepsis, particularly those at high risk. Nursing and care homes who can assess and communicate concern.

2 Getting access to clinicians swiftly when parents / patients raise concern.

3 Receptionists switched on to what doesn't sound right and empowered to raise concern.

Summary

1 Use physiology in your recording and assessment of the person unwell with infection.

2 Use a common language.

3 Use shared assessment tools and strategy.

4 Be clear on how to escalate care and to whom.

5 Communicate appropriately with ambulance and secondary care.

6 Safety net effectively with patients.

Case studies for group discussions

Case studies:
Objectives

This section consists of two structured, case-based discussions highlighting the challenges, strategies and limited evidence for improving sepsis care within primary care.

It should take about 1 hour to review and discuss the cases.

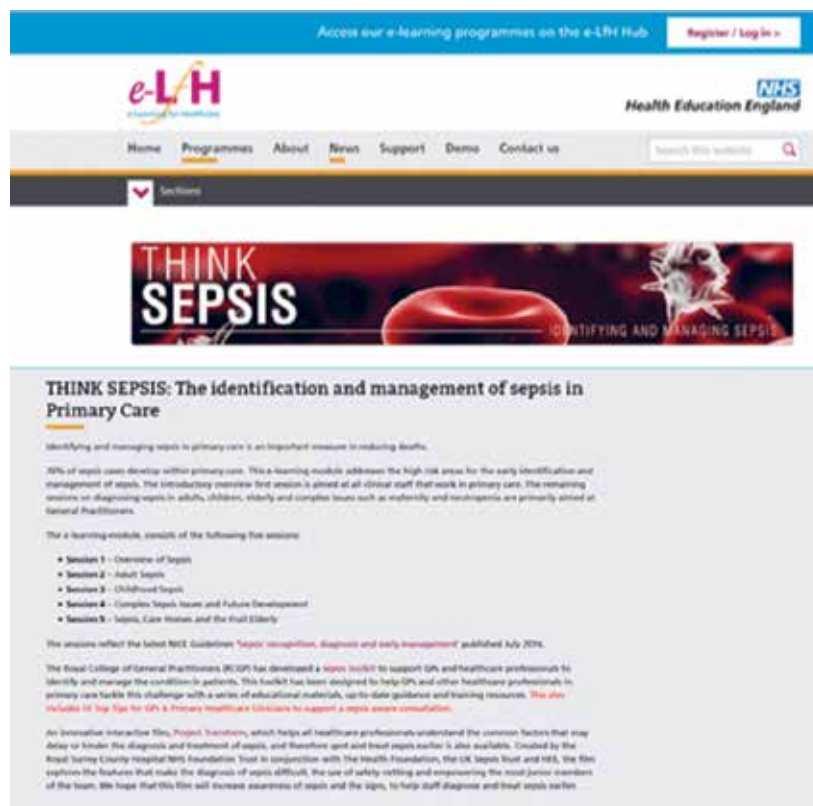The package is intended to complement the E-learning for Healthcare Sepsis suite of learning resources: https://www.e-lfh.org.uk/programmes/sepsis/

Case studies:
Pre-learning

Whilst not essential, clinicians may wish to consider the following as pre-learning:

1 E-learning for Healthcare Sepsis in Primary Care modules 1-3, https://www.e-lfh.org.uk/programmes/sepsis/

- Overview of sepsis
- Adult sepsis
- Childhood sepsis

2 NICE Sepsis Quality Statements QS161

https://www.nice.org.uk/guidance/qs161/chapter/Quality-statements

CASE 1:
Mr and Mrs Brown

Mrs Brown has called the surgery.

She is concerned about her husband who has stayed in bed today and is shivery.

He has treatment for high blood pressure and an enlarged prostate but is normally fit and active.

She is not clear what is wrong with him and does not feel he is well enough to make it to the surgery.

The role of the receptionist

Q: How would this request be managed within your service?

Q: Are there any red flags or questions that might be asked?

Q: Is there more that might be asked to influence the decision as to when to visit?

The Visit

1 When you visit Mr Brown, he struggles to give the history himself. You determine that he has been feverish for a day and has some discomfort passing urine.

2 What would help you determine if this is possible sepsis or a simple urinary tract infection?

The Unwell Patient

1 You determine that Mr Brown does have the signs to raise concern about sepsis:

- he is uncharacteristically muddled and he has a mild tachypnoea (respiratory rate 22).
- His temperature is only mildly elevated at 38.1 and he has a pulse rate of 104.

2 What further actions might you take to determine how promptly Mr Brown needs to receive treatment?

Communication

1 Mr Brown's oximetry and blood pressure are 96% and 110/ 60.

2 Mr Brown normally runs a BP of approximately 140/80.

3 He feels pretty awful and you decide to organise an ambulance to get him to hospital.

4 Describe the message you wish to give the ambulance service and why.

Mr Brown's NEWS Score

The ambulance service decide to take Mr Brown to the Emergency Department and determine that it will take them about 18 minutes to arrive. Is there anything you might wish to do?

Physiological parameter	3	2	1	0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO₂ Scale 1 (%)	≤91	92–93	94–95	≥96			
SpO₂ Scale 2 (%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

To see this process in action and its impact for patient care, watch this West of England AHSN Video: https://vimeo.com/208284106

CASE 2:
Bill

You are working in an urgent care centre on a Friday evening. Bill is fourteen and his mother describes a 2-day history of fever, fatigue, generalised aching and decreased appetite.

What would help you determine if this is possible sepsis or a simple infection?

The assessment

1 Bill is cooperative but shows little interest in giving you a history or the examination.

2 Mum provides most of the history and suggests that he is really quite unwell in her opinion, and that his reaction is uncharacteristic. You find no obvious cause of the infection but note a mild pharyngitis.

3 You conclude the this is the start of an illness and likely to improve without the need for antibiotics.

4 Mum is happy with this approach and asks how she would recognise that Bill is deteriorating.

Bill's Examination findings	
Temperature	38.7
Respiratory Rate	20
Oximetry	98%
Pulse	108
No clear source of infection identified on examination	

Could this be sepsis?

1 10 hours later Mum returns increasingly concerned: Bill has been drowsy, is feeling really unwell and has vomited a couple of times.

2 She notes that he appears to be breathing faster than before which was listed as a concern in the safety netting leaflet, she asks if this could be sepsis?

3 Is there anything else you might ask Mum about?

Second Consultation

1 At the second consultation you are equally concerned by the change in the recorded presentations.

2 What are the features of concern and what do you think?

Bill's Examination findings	First presentation	Second presentation
Temperature	38.7	35.8
Respiratory Rate	20	26
Oximetry	98%	94%
Pulse	108	132

No clear source of infection or rash, 2cm bruise on abdomen

The Admission

1 You decide to admit Bill via the Emergency Department which is co-located with the Urgent Care centre.

---

2 You ask the same question of the staff there: *"Could this be sepsis?"*

The Catch Up

1 At the end of the shift you learn that in A&E Bill became markedly hypotensive and developed a widespread purpuric rash.

2 After 10 days, including an ITU stay, Bill is discharged without apparent problems.

The Sepsis Aware System

1 This case demonstrates how a sepsis aware system combined and collaborated to identify a sepsis case when the presentation was non-specific.

2 What are the features of a sepsis aware system?

3 How sepsis aware is the system in which you work?

Quality Improvement

Availability of aide memoires for paediatric physiology.

Number of patients sick with infection who have oximetry / respiratory rate recorded.

Number of patients sick with infection who receive something to support their safety netting.

Number of clinicians who have undertaken additional electronic learning in assessing the sick child.

Structured case reviews of children admitted.

Resources and further reading

Resources

On Line Learning:

E-learning for Health https://www.e-lfh.org.uk/ programmes/sepsis/

RCGP Sepsis Toolkit

http://www.rcgp.org.uk/clinical-and-research/resources/ toolkits/sepsis-toolkit.aspx

Further reading

Singer M, Deutschman CS, Seymour CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). Jama 2016; 315(8): 801-10.

- National Institute for Health and Care Excellence. Sepsis Quality Standard qs161. NICE; 2017.

Kumar A, Roberts D, Wood KE, et al. Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock. Critical care medicine 2006; 34(6): 1589-96.

- Royal College of Physicians. National Early Warning Score (NEWS) 2: Standardising the assessment of acute-illness severity in the NHS. In: RCP, editor. London: RCP; 2017.

- Shaw J, Fothergill RT, Clark S, Moore F. Can the prehospital National Early Warning Score identify patients most at risk from subsequent deterioration? Emergency medicine journal : EMJ 2017.

- Silcock DJ, Corfield AR, Gowens PA, Rooney KD. Validation of the National Early Warning Score in the prehospital setting. Resuscitation 2015; 89: 31-5.

- NCEPOD. Just Say Sepsis. In: National Confidential Enquiry into Patient Outcomes and Death, editor. London: NCEPOD; 2015.

- National Institute for Health and Care Excellence. Sepsis: recognition , diagnosis and early management. NICE; 2016.

The Royal College of General Practitioners is a network of over 52,000 family doctors working to improve care for patients. We work to encourage and maintain the highest standards of general medical practice and act as the voice of GPs on education, training, research and clinical standards.