

Maternity Early Warning System



Factsheet for clinicians – sepsis

When a woman's deterioration triggers a maternity early warning system (MEWS) escalation, you should consider sepsis as a differential diagnosis. Sepsis progresses rapidly so you need to investigate it, treat it and refer it for expert management early and aggressively.

Sepsis is a leading cause of death among hospitalised patients in the developed world.¹ Up to 15,000 Australians and New Zealanders are admitted to intensive care with sepsis each year.² As many as one-third of patients who have a rapid response call while in hospital have sepsis.³ In addition, when the rapid response team reviews patients, sepsis is the most common reason for admitting them to intensive care.⁴

Obstetric sepsis is the second most common cause of direct maternal death in New Zealand, behind only amniotic fluid embolism.⁵ Non-obstetric sepsis is a leading cause of indirect maternal death. Sepsis is also a very common cause of severe acute maternal morbidity leading to admission to an intensive care unit or high-dependency unit; it was the reason for 14 percent of the notifications of these units to the Maternal Morbidity Working Group case review process between 1 September 2016 and 31 August 2017.⁶

Recognising sepsis may be challenging early on as the symptoms may be subtle and can mimic those of many other possible conditions; the normal physiological changes in pregnancy may conceal early signs of sepsis.^{7,8,9} Because the uteroplacental circulation is not autoregulated, however, maternal sepsis resulting in circulatory insufficiency may lead to compromised fetal perfusion, so the fetus is a useful early marker of maternal wellbeing.¹⁰ Given its prevalence, significant associated risks and sometimes rapid progression of sepsis in the maternity population, you need to have a high level of suspicion about it so that you consider it early when acute deterioration occurs.

As the evidence base grows, some elements of sepsis definitions and management continue to be debated.^{11,12,13} However, the literature generally agrees that early recognition and response are crucial to successfully reducing harm from sepsis.^{14,15,16}

Recognition

In its recently published guidelines¹⁷ for investigating and managing sepsis in pregnancy, the Society of Obstetric Medicine of Australia and New Zealand (SOMANZ) recommends an obstetrically modified qSOFA (quick Sequential (sepsis-related) Organ Failure Assessment score) tool to screen clinically for sepsis. This tool uses fast respiratory rate, low systolic blood pressure and altered level of consciousness to identify women with suspected infection who are at a greater risk for a poor outcome. If the qSOFA is positive, you should undertake a more extensive omqSOFA (obstetrically modified qSOFA) assessment. See Appendix 1 for omqSOFA and omSOFA scoring.





Response

The Maternal Morbidity Working Group has produced sepsis guidance, including the 'sepsis 6 + 2' tool.¹⁸ Your hospital may have developed sepsis guidelines specifically for local use. If you respond to acutely deteriorating women in maternity, make sure you know what your responsibilities are in managing women with suspected sepsis. See Table 1 on the next page for recommended capabilities for sepsis management. Note these are indicative only; your hospital will need to localise them to support optimal care for the women receiving its services.

Further guidance

- **Surviving Sepsis Campaign guidelines:** Rhodes A, Evans L, Alhazzani W, et al. 2017. Surviving Sepsis Campaign: international guidelines for management of sepsis and septic shock 2016 (Sepsis-3): *Critical Care Medicine* 45(3). URL: www.sccm.org/Research/Guidelines/Guidelines/Surviving-Sepsis-Campaign-Guidelines
An update in response to Sepsis-3: www.survivingsepsis.org/Guidelines/Pages/default.aspx (accessed 11 February 2019).
- **A clinical guidelines synopsis:** Howell MD, Davis AM. 2017. Management of sepsis and septic shock. *Journal of the American Medical Association* 317(8): 847–8. DOI: [10.1001/jama.2017.0131](https://doi.org/10.1001/jama.2017.0131) (accessed 11 February 2019).
- **The National Institute for Health and Care Excellence (United Kingdom) risk stratification:** NICE. 2016. Sepsis: recognition, diagnosis and early management. URL: www.nice.org.uk/guidance/ng51/chapter/recommendations#stratifying-risk-of-severe-illness-or-death-from-sepsis (accessed 11 February 2019).
- **SOMANZ guidelines:** Bowyer L, Robinson H, Barrett H, et al. 2017. SOMANZ guidelines for the investigation and management of sepsis in pregnancy. *Australian and New Zealand Journal of Obstetrics and Gynaecology* 57(5): 540–51. DOI: <https://doi.org/10.1111/ajo.12646> (accessed 11 February 2019).

Table 1: Recommended capabilities for sepsis management

Escalating response to acute deterioration – sepsis			
 <p>Recogniser Eg, bedside midwife, nurse, lead maternity carer</p>	 <p>Primary responder Eg, lead maternity carer, senior house officer, registrar</p>	 <p>Secondary responder Eg, senior midwife/nurse, registrar</p>	 <p>Tertiary responder Eg, on-call obstetric team and/or rapid response team, charge midwife, nurse practitioner, consultant obstetrician/ intensivist/ anaesthetist</p>
Capabilities for sepsis recognition, investigation and treatment			
<ul style="list-style-type: none"> Accurately measure and document vital signs and early warning scores. Recognise and understand the significance of vital sign derangement and signs of altered tissue perfusion (eg, pallor, altered mental state). Escalate care using structured communication tools. Provide emergency resuscitative care while waiting for help (eg, oxygen administration, basic life support). Understand the urgency of treatment and begin appropriate investigations and treatment as ordered (eg, blood tests, intravenous antibiotic and bolus fluid administration). Monitor and escalate care further as required. 	<p>As for recogniser and:</p> <ul style="list-style-type: none"> undertake initial assessment, discuss findings and proposed plan of care with a senior clinician understand the urgency of involving senior specialist staff in the management of suspected sepsis and refer accordingly communicate and document agreed plan of care be familiar with local and international sepsis management guidelines. Begin assessment, investigation and treatment as required be familiar with local antibiotic guidelines and able to prescribe initial broad spectrum treatment. 	<p>As for primary responder and:</p> <ul style="list-style-type: none"> provide advanced clinical assessment and determine differential diagnosis discuss the clinical situation, treatment options and goals of care with woman and her family and whānau. Make shared decisions about appropriate treatment (referral to palliative care may be appropriate if medical intervention and treatment are limited) assess potential source of infection and consider source control options (eg, referral for surgery) communicate and document a detailed plan for ongoing management, including monitoring requirements and plan for follow-up refer for ongoing care as required (eg, to intensive care). 	<p>As for secondary responder and:</p> <ul style="list-style-type: none"> provide life-sustaining treatment as indicated (eg, advanced respiratory support, vasopressors) ensure appropriate monitoring, investigations and treatments are being provided refer for definitive care as required. facilitate safe transfer of care as required (eg, retrieval to other hospital or transfer to intensive care).

Appendix 1: omqSOFA and omSOFA

Table 1: Obstetrically modified qSOFA score

Parameter	Score	
	0	1
Systolic blood pressure	≥90 mmHg	<90 mmHg
Respiratory rate	Less than 25 breaths/minute	25 breaths/minute or greater
Altered mentation	Alert	Not alert

mmHg = millimetres of mercury; qSOFA = quick Sequential (sepsis-related) Organ Failure Assessment score

Table 2: Obstetrically modified SOFA score

System parameter	Score		
	0	1	2
<i>Respiration</i>			
PaO ₂ /FIO ₂	≥400	300 to 400	<300
<i>Coagulation</i>			
Platelets, x10 ⁶ /L	≥150	100–150	<100
<i>Liver</i>			
Bilirubin (μmol/L)	≥20	20–32	>32
<i>Cardiovascular</i>			
Mean arterial pressure (mmHg)	≥70	<70	Vasopressors required
<i>Central nervous system</i>	Alert	Rousable by voice	Rousable by pain
<i>Renal</i>			
Creatinine (μmol/L)	≥90	90–120	>120

FIO₂ = fraction of inspired oxygen (expressed as a decimal); PaO₂ = partial pressure of oxygen (in mmHg); SOFA = Sequential (sepsis-related) Organ Failure Assessment score

Tables adapted from Bowyer L, Robinson H, Barrett H, et al. 2017. SOMANZ guidelines for the investigation and management of sepsis in pregnancy. ANZJOG 57(5): 540–551. <https://doi.org/10.1111/ajo.12646>

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- 13 Singer M, Deutschman CS, Seymour C, et al. 2016. The third international consensus definitions for sepsis and septic shock (sepsis-3). *Journal of the American Medical Association* 315: 801–10.
- 14 Torsvik M, Gustad L, Mehl A, et al. 2016. Early identification of sepsis in hospital inpatients by ward nurses increases 30-day survival. *Critical Care* 20: 244.
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