NT Health

Guideline

Due for review: 09/08/2028

Adult Acute Care Sepsis Recognition and Management

Contents

Applicability

This guideline applies to:

- Northern Territory (NT) Hospitals/Acute Care Services

NORTHERN TERRITORY GOVERNMENT

This guideline must be used for the following:

- Adults 18 years old and over

SEE SEPARATE DOCUMENT: ACUTE CARE ADULT SEPSIS PATHWAY (two versions: Central Australia/Barkly Regions and Top End/East Arnhem/Big Rivers Regions) for easy reference to sepsis recognition, management and empiric antibiotic recommendations.

Guideline statement

This guideline provides additional information to:

- Provide guidance for best practice for sepsis recognition and management,
- Where sepsis is suspected, empower staff to escalate care to clinicians experienced in recognising and managing sepsis,
- Engage senior medical staff in sepsis recognition and management of patients,
- Support the provision of education and information to patient and carers.

Recommendations in this guideline are not intended to replace a clinician's good clinical judgement when presented with a patient with unique characteristics, and is not intended to set a standard for clinical care.

The guideline should be used in conjunction with the NT Observation Chart or Modified Early Warning System (MEWS) and NT Health Adult Sepsis Pathway for Acute Care facilities.

Policy suite

This guideline forms part of the following national ACSQHC Sepsis Clinical Care Standard suite for this topic. Related documents are also listed below:

- Clinical Documentation Policy
- Physiological Deterioration Patient Recognition and Management NT Health Policy
- Use of Observation Charts in Recognising and Responding to Clinical Deterioration Procedure
- Adult Primary Health Care Sepsis Recognition and Management NT Health Guideline
- Melioidosis Guideline
- Paediatric Acute Care Sepsis Recognition and Management NT Health Guideline
- Paediatric Primary Health Care Sepsis Recognition and Management NT Health Guideline
- TEHS Adult Febrile Neutropenia Guideline
- Observations and Modified Early Warning Score (MEWS) ASH Procedure
- *Noradrenaline ASH Guideline [archived on 11/09/2024]*
- Noradrenaline RDH PRH ED Guideline
- Sepsis and Septic Shock RDH ICU Medical Guideline
- Febrile Neutropenia Initial Management ASH Pathway
- Acute Care Adult TER/EAR/BRR Sepsis Pathway Form
- Acute Care Adult CAR/BR Sepsis Pathway Form
- Acute Care Paediatric TER/EAR/BRR Sepsis Pathway Form
- Acute Care Paediatric CAR/BR Sepsis Pathway Form

- Primary Health Care Adult Sepsis Pathway NT Health Form
- Primary Health Care Paediatric Sepsis Pathway NT Health Form

Standards

- Sepsis Clinical Care Standard
- Antimicrobial Stewardship Clinical Care Standard

Guideline details

Introduction

The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3):

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

Septic shock is a subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities are profound enough to substantially increase mortality. Patients with septic shock can be clinically identified by a vasopressor requirement to maintain a mean arterial pressure (MAP) of 65mmHg or greater and serum lactate level greater than 2mmol/L (>18mg/dL) despite adequate fluid resuscitation.

Sepsis is a time-critical medical emergency that arises when the body has a dysregulated response to an infection. This results in damage to the body's own tissues and organs, which can lead to septic shock and organ failure. Sepsis can be triggered by infections caused by bacteria, viruses, fungi, and parasites. Bacterial infections are the most common triggers.

Early recognition of sepsis is crucial to treating patients before their condition worsens and becomes fatal. Literature suggests sepsis improvement tools such as screening and management programs can significantly decrease the time to recognise and manage sepsis, resulting in better survival rates.

In the NT, sepsis is five times more common compared to other Australian temperate climates, and is commonly seen in Aboriginal and Torres Strait Islander populations. The common themes of sepsis related deaths in the NT includes: patients of a young age, fit build, and delayed sepsis recognition, diagnosis and administration of appropriate antibiotics.

Partnering with consumers

The patient and/or caregiver should be involved in all the clinical decision-making and the care planning process. Care planning should involve discussions regarding the future healthcare that may be required post acute care including information on how to access services post-discharge.

The patient and/or caregiver should be provided with sepsis consumer resources and relevant clinical information regarding the treatment they have had or may receive (refer to the staff intranet or internet sites to access local electronic resources). Goals of care and prognosis should be discussed and their wishes should be incorporated into the treatment and end-of-life care planning as appropriate.

Sepsis recognition

Lack of recognition prevents timely therapy. Sepsis screening is associated with earlier treatment.

Early recognition and prompt treatment of sepsis through a formalised screening effort is necessary to reduce mortality risk. Sepsis is not a specific illness but rather a syndrome that can be recognised by a constellation of clinical signs and symptoms in a patient with suspected infection. There is no gold standard diagnostic test that exists to identify sepsis.

Sepsis may not be obvious in every patient, it may be non-specific and subtle. Patients may exhibit different physiological abnormalities, therefore a diagnosis should be based on clinical judgment and may be supported by relevant investigations. It is important to pay attention to patient risk factors and increase your suspicion of sepsis in these patients. Concerns expressed by the patient and/or caregivers, particularly changes to their mental status, are also an important consideration in clinical assessment.

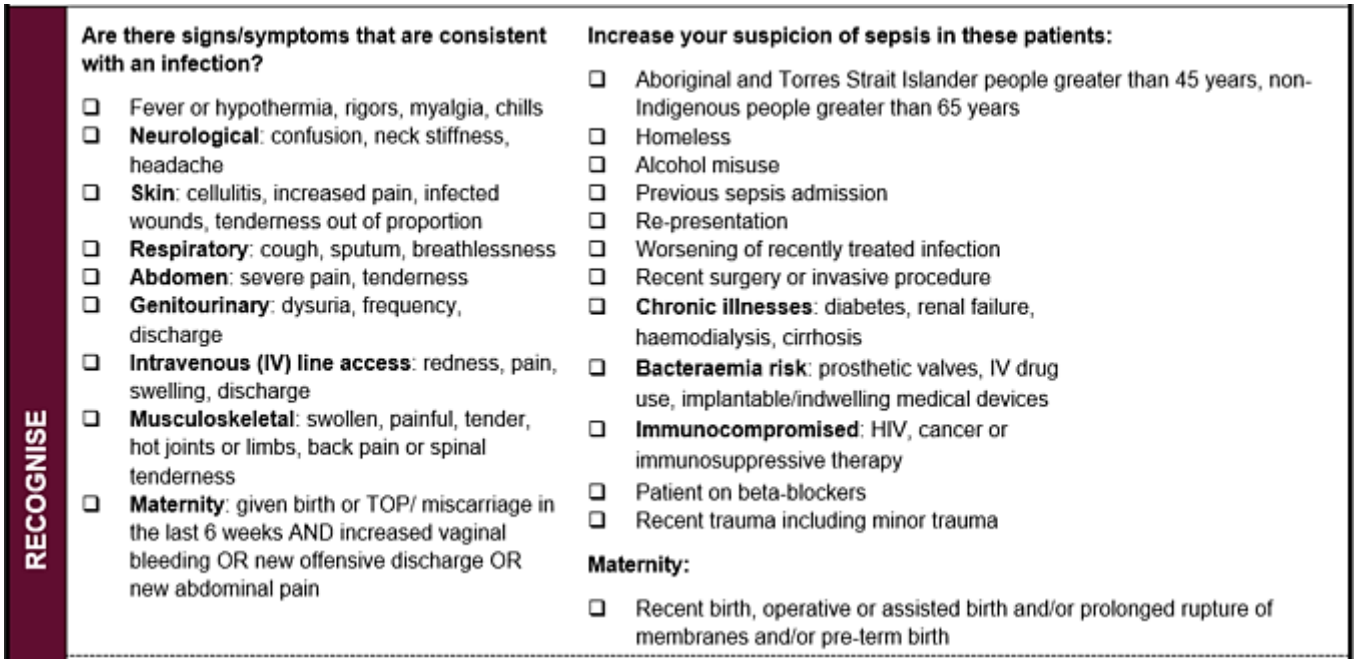
In the Top End, sepsis can occur due to melioidosis, especially in the wet season. Consider melioidosis in all patients presenting with sepsis or septic shock. Please refer to the Melioidosis Guideline for diagnosis and management of melioidosis.

Could it be sepsis?

Screening for Sepsis should occur in all patients who have signs or symptoms of infection.

Figure 1 outlines the features to assist in recognition of signs and symptoms of infection. If a patient meets these features it does not indicate definitive sepsis or septic shock diagnosis, but should be considered if a patient has symptoms or signs of an infection, combined with risk factors, abnormal vitals or other signs of compensated shock (new altered mental state, lactate level greater than 2mmol/L) or markers of a severe infection (petechiae suggestive of meningococcal infections and unexplained severe strong pain to suggest necrotising fasciitis, septic joints, acute abdominal sepsis). The pathway empowers clinicians to escalate to senior medical officer(s) to determine the cause of clinical deterioration on a background of suspected infection.

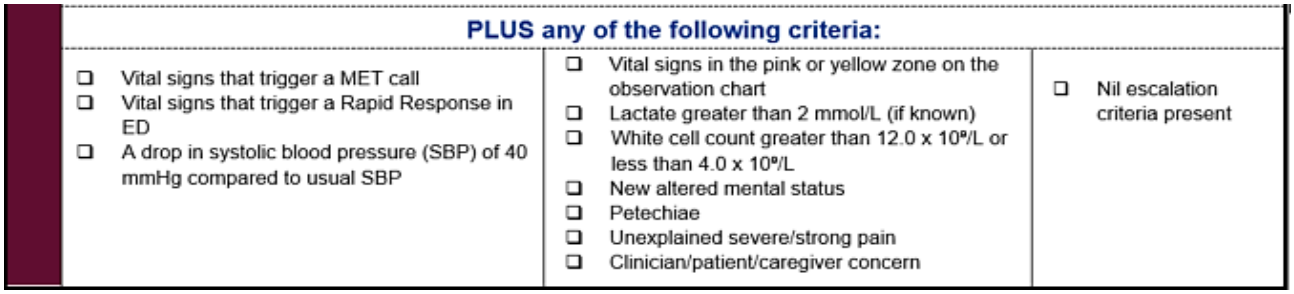
Figure 1: Signs and symptoms of infection



Signs that may suggest septic shock and rapid deterioration

Warm, flushed skin may be present in the early phases of sepsis. As sepsis progresses to shock, the skin may become cool due to redirection of blood flow to core organs. Additional signs of hypoperfusion include tachycardia, altered consciousness, restlessness, and oliguria or anuria.

Figure 2: Physiological indicators of septic shock and sepsis



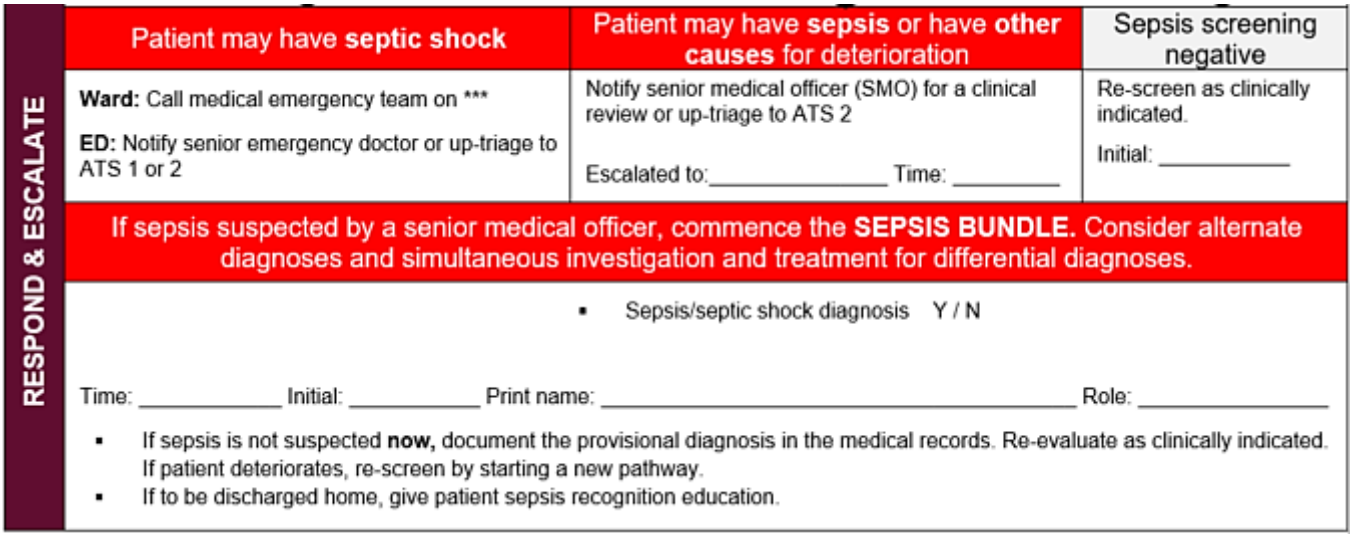
Sepsis response and escalation

Early response to suspected sepsis or septic shock through appropriate escalation to a medical emergency team or senior medical officer is crucial to ensure early initiation of appropriate treatment. The following response and escalation process should occur when patients meet the warning signs of deterioration.

In emergency departments, triage nurses are to use clinical judgement to escalate suspected sepsis by assigning appropriate ATS categories. When there are any concerns, it is a requirement to call for senior medical advice.

If sepsis screening is negative i.e. no escalation criteria is present, re-screen as clinically indicated by starting a new pathway.

Figure 3: Sepsis response and escalation



Sepsis management

Commence sepsis resuscitation bundle

"The culture is one of assuming least injury/illness rather than actively excluding the greatest illness/injury, this is particularly dangerous in a high morbidity cross cultural environment." Dr Didier Palmer, Executive Director RDPH.

Clinical judgement is required to balance the risk of over treatment/investigation. It may be more appropriate to collect targeted cultures and investigations within 2 to 3 hours for those patients with vague presentations and who not meet the screening criteria for septic shock or sepsis.

Initial sepsis management consists of undertaking 6 key actions within 60 minutes in the sepsis bundle, including assessment of airway, breathing and circulation as per advanced life support (ALS) principles. This pathway supports the initiation of treatment **as soon as possible** after recognition or strong suspicion within 60 minutes for both sepsis and septic shock. Evidence suggests that a delay in the first dose of antibiotics beyond 60 minutes of presentation has been associated with increased in-hospital mortality. For patients with febrile neutropenia and features of sepsis or septic shock, it is recommended to initate antibiotics **within 30 minutes** of sepsis recognition. Please refer to your local guideline and pathway for Febrile Neutropenia management if applicable (TEHS Adult Febrile Neutropenia Guideline or ASH Febrile Neutropenia Initial Management Pathway).

Table 1: Sepsis management: Sepsis resuscitation bundle

Actions	Details
1. Supplemental oxygen therapy if needed	• Target saturations 94% and above (88 to 92% for chronic obstructive pulmonary disease).
2. Establish intravenous (IV) access	• If IV access is unsuccessful after two attempts, consider intraosseous (IO) or central venous catheter (CVC). Do not delay antibiotics.

3. Collect blood cultures and lactate.
Other cultures and investigations as clinically indicated.
Aim to collect cultures prior to antibiotics
	• Collect two sets of blood cultures. Each set must collected from a separate site. If concern about central venous access device bloodstream infection refer to "Central Venous Access Device Blood Sample Collection NT Procedure".
	• Blood cultures should be obtained prior to initiating antimicrobial therapy. At times the risk/benefit ratio favours rapid administration of antimicrobials if it is not logistically possible to obtain a full set of cultures promptly.
	• Lactate can be obtained from venous blood gas, point of care testing, or in a fluoride EDTA tube. Lactate is a useful marker of the severity of sepsis and sepsis is more likely to be present if lactate is greater than 2 mmol/L.
	• Other investigations can include:
	  ○ Blood tests: blood glucose level, FBC, CRP, LFT, coagulation studies (PT, APTT), UEC.
	  ○ Other cultures as clinically indicated: sputum, urine (and urinalysis) and wound cultures, joint aspirates, melioid rectal and throat swabs.
	  ○ Other cultures/investigations may include lumbar puncture or abdominal paracentesis (ascetic tap), if indicated. CXR and other radiology as clinically indicated.

4. Administer intravenous (IV) antibiotics (consider possible source)	• Antibiotic regimen is located in the Adult Acute Care Sepsis Pathway pages 3 to 6. • If source unknown, use sepsis/septic shock without clear focus (undifferentiated) antibiotic regimen. • If source known, use empirical antibiotic regimen. • Nursing staff should be informed of urgent need to administer antibiotics and they should be administered in order of shortest to longest administration time as per the Australian Injectable Drugs Handbook. • If an abscess, septic arthritis or necrotising fasciitis is suspected, consult senior surgical doctor urgently for advice and/or review. Note necrotising fasciitis is a surgical emergency.

Actions	Details
5. Assess fluid and consider fluid resuscitation	• If SBP less than 100 mmHg or lactate greater than 2 mmol/L commence 250 to 500 mL 0.9% sodium chloride or Hartmann's (up to 30 mL/kg). Assess after each bolus for signs of fluid overload. • Fluid rate and end points must be titrated to meet patients physiological reserve. • Assess and document baseline physiological reserve (baseline eGFR, exercise tolerance, ejection fraction) • Consider inotropes early in consultation with SMO +/-intensive care physician. • Weight. • Review current medications and consider withholding anti-hypertensive and/or diuretic medications and restart when patient is hemodynamically stable. • If no clinical response, notify a senior doctor as vasopressors and/or intensive care unit (ICU) admission may be required. **If vasopressors required,** consider noradrenaline 0.02 microg/kg/min and titrate accordingly (maximum rate 2 microg/kg/min. Refer to Noradrenaline RDH PRH ED Guideline or *Noradrenaline ASH Guideline [archived on 11/09/2024]*. Alternatively consider Metaraminol.
6. Monitor signs of deterioration and urine output	• Patients with sepsis or septic shock should be closely monitored due to high risk of clinical deterioration. • For the first 2 hours, consider monitoring vital signs every 30 minutes and urine output every 60 minutes, until clinically stable from a medical perspective. • If warranted, consider IDC insertion.

Figure 4: Sepsis bundle

(next page)

SEPSIS BUNDLE: 6 KEY ACTIONS IN 60 MINUTES*
*If patient at risk of febrile neutropenia with septic shock, administer antibiotics within 30 minutes.

Ensure management plan aligns with patient's goals of care.
If there are any clinically indicated variations in care to the pathway, document this in the patient record.

RESUSCITATE

1. Consider oxygen therapy Maintain SpO_2 94% and above (aim 88-92% for moderate/severe COPD).	▪ SpO_2 maintained	Y / N
2. Establish intravenous (IV) access If unsuccessful, obtain access with intraosseous (IO) or central venous catheter.	▪ Access established	Y / N
3. Collect blood cultures (2 sets) prior to antibiotics (where possible) and a venous blood gas (with lactate) Other blood tests: FBC, UEC, LFTs, CRP, blood glucose and coagulation studies. Other investigations as indicated: CXR, urinalysis, urine culture, sputum culture, joint aspirates, cryptococcal Ag, wound and melioid swabs.	▪ Blood cultures collected ▪ Lactate collected Lactate level: _____ mmol/L	Y / N Y / N
4. Administer IV antibiotics (check allergies) If source unknown, use sepsis/septic shock without clear focus regimen (p.3). If source known, use empirical regimen (p.3 to 6). Ensure nursing staff administer antibiotics immediately. **If surgical source suspected, consult the relevant surgical team.**	▪ 1st antimicrobial commenced ▪ 2nd antimicrobial commenced	Y / N Y / N
5. Assess fluid state and consider fluid resuscitation If SBP less than 100mmHg or lactate greater than 2mmol/L give 250 to 500 mL fluid bolus (0.9% sodium chloride or Hartmann's) up to 30mL/kg. Fluid rates, end points and additional boluses must be titrated to meet patient's physiological reserve. Assess and document baseline physiological reserve (baseline eGFR, exercise tolerance, ejection fraction). Consider inotropes early in consultation with SMO +/- intensive care physician.	▪ Fluids administered ▪ Inotropes required	Y / N Y / N
6. Monitor signs of deterioration and urine output For the first 2 hours, monitor vital signs every 30 minutes and urine output every 60 minutes. If warranted, insert IDC.	▪ Fluid balance commenced ▪ IDC required	Y / N Y / N

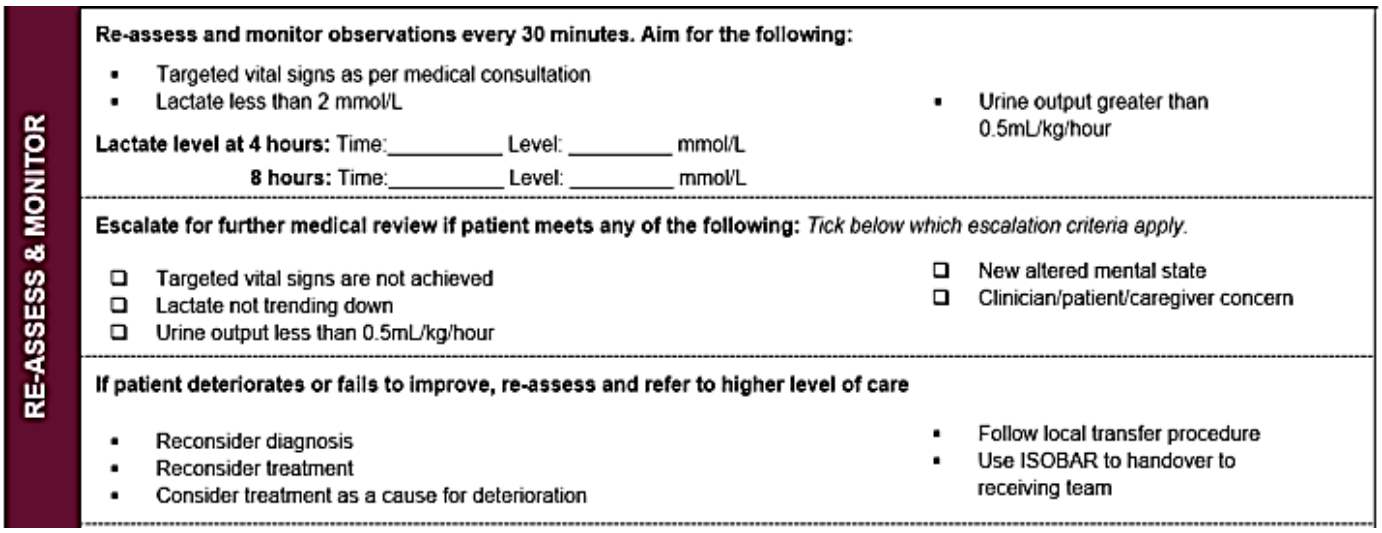
Bundle completed. Time: _____ Initial: _____ Print name: _____ Role: _____

Re-assess and monitor

Close and more frequent monitoring of observations is recommended for patients with suspected or confirmed sepsis due to high risk of clinical deterioration. This is in accordance with the observation chart/MEWS actions in recognising and responding to clinical deterioration.

Medical officers may request targeted vital signs based on the individual context and this should be clearly documented in the medical records in accordance with the observation chart in recognising and responding to clinical deterioration procedure.

Figure 5: Re-assess and monitor



Medical review of patients that deteriorate despite initial treatment:

- Identification of the cause of the infection is vital to determine if surgical input is required.
- Reconsider the diagnosis to confirm the cause for deterioration (non-septic cause for presentation)
- Is patient on correct treatment?
- Is treatment a cause of deterioration? (medication reaction, under/over fluid resuscitation)
- Ensure appropriate antibiotic regimen for source control.
- Discuss with senior medical officer and/or other specialists such as infectious disease, ICU physicians or surgeons as appropriate.

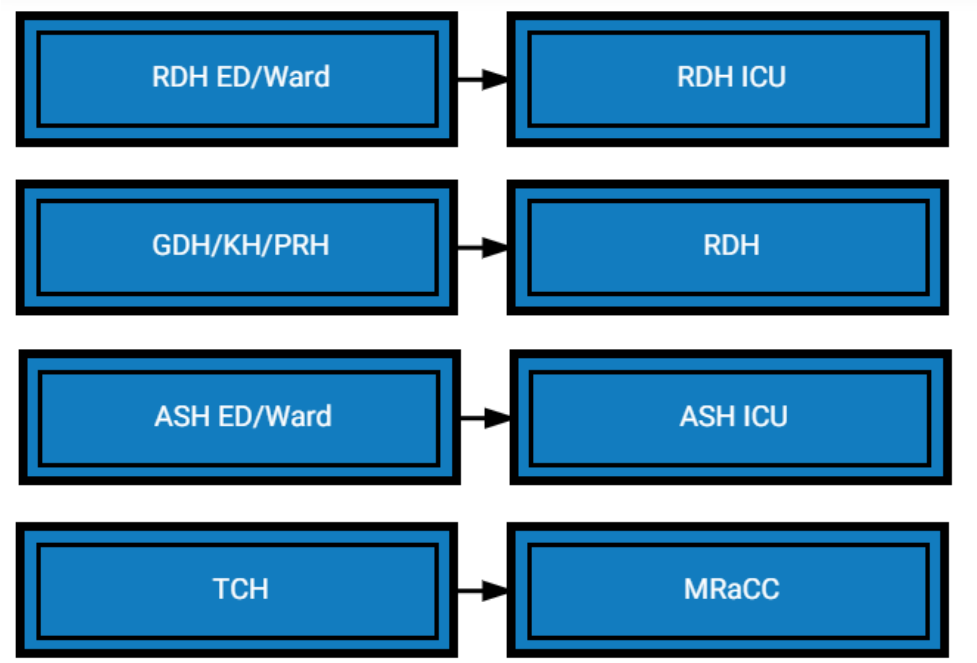
Referral to a higher level of care

Patients diagnosed with sepsis or septic shock are at a high risk of deterioriation in the first 24 to 48 hours. Monitor and escalate care early. Appropriate nursing staff ratios and skills to closely monitor an at risk patient is important.

Patients located at a regional hospital: Palmerston Regional Hospital (PRH), Gove District Hospital (GDH), Katherine Hospital (KH) and Tennant Creek Hospital (TCH), should be transferred to the Royal Darwin Hospital (RDH) or Alice Springs Hospital (ASH) after consultation with all relevant stakeholders.

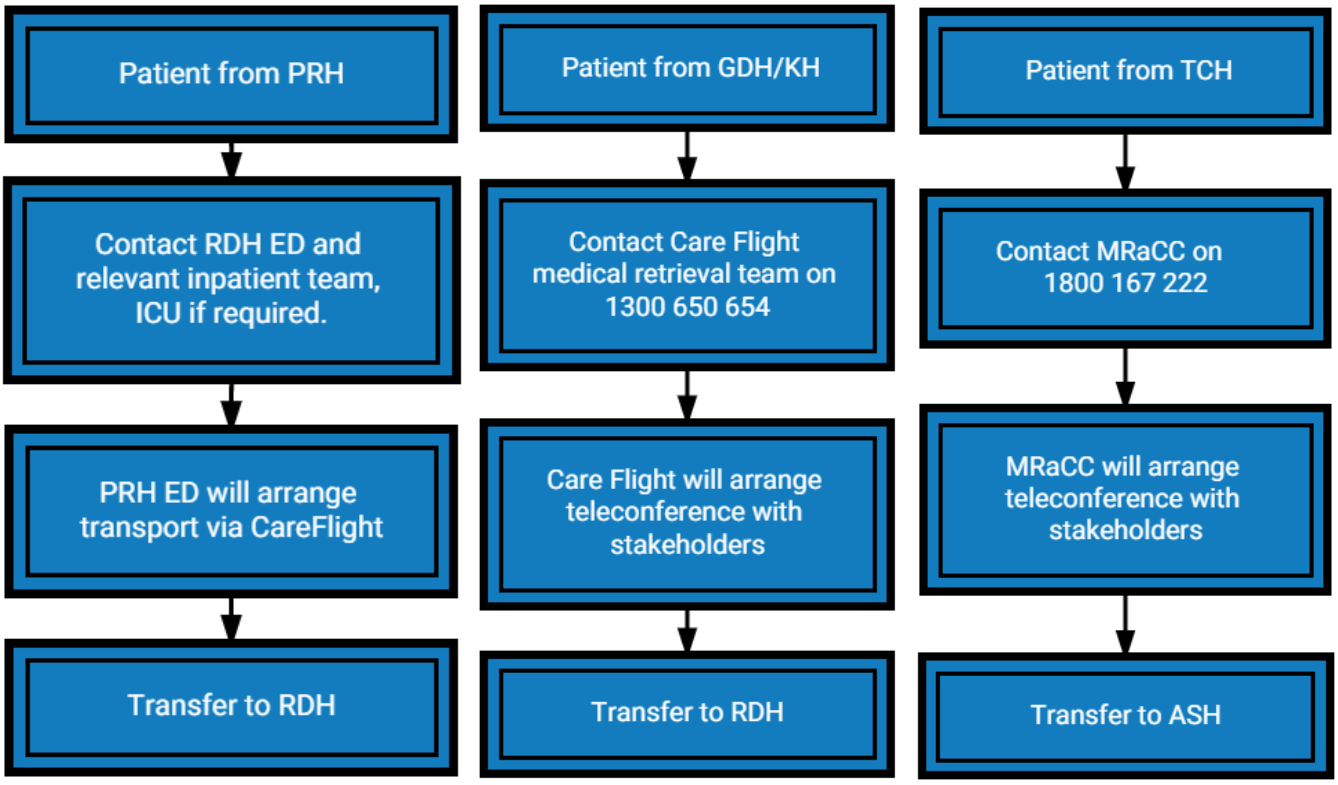
ISOBAR or ISBAR and sepsis pathway should be used to communicate critical information upon handover to ensure the right information is provided to the receiving team to continue to provide care for the patient.

Figure 6: Referral to a higher level of care



- Follow local transfer procedure
- Discuss management plan with patient and/or caregiver
- Use ISOBAR/ISBAR to handover to receiving team

Figure 7: Process of referral to a higher level of care for regional hospitals



Ongoing management plan

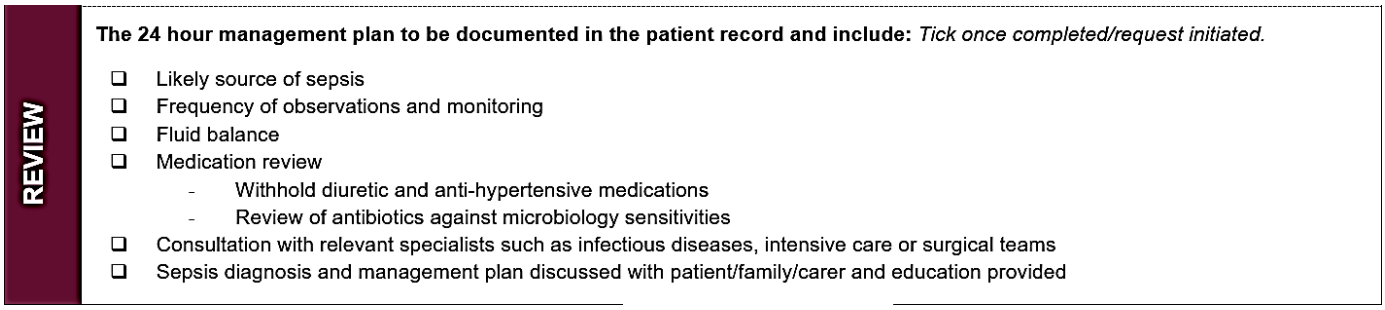
The components of ongoing care of patients with sepsis will vary depending on the source of infection as well as the severity of a patient's illness, underlying illnesses and/or immunosuppression.

Critical information and management plan should be clearly documented in the patient's medical records to ensure communication of the management plan to clinicians involved in the ongoing care of the patient. Refer to Clinical Documentation Policy that outlines the requirements for clinical documentation. The management plan should be communicated at handover and to the senior doctor, nurse team leader and the patient and/or caregiver.

In addition to regular documentation, documentation in relation to sepsis should include:

- Likely source of infection
- Any further investigation plans
- Frequency of observations and monitoring (minimum 4 hourly)
- Fluid balance
- Medications that are withheld such as anti-hypertensive and/or diuretic medications
- Antibiotic regimen based on microbiology sensitivities
- Consultation with relevant specialists e.g. infectious diseases or intensive care teams, and multidisciplinary team e.g. AMS and/or ward pharmacists, allied health, interpreters and/or Aboriginal Liaison Officer as required.

Figure 8 : Ongoing management plan



Care planning for discharge from acute care

Sepsis can have long-lasting effects including altered immunological, physiological, psychological and cognitive functioning. Discuss the cognitive and psychological effects that may occur after diagnosis and treatment for sepsis, including fatigue and anxiety. Ensure follow-up requirements have been discussed with the patient and carers, including the need for rehabilitation, and ensure follow up is reflected in the electronic health record/booking system.

Discharge documentation provided to patient, carers and usual doctor must include;

- A formal diagnosis of sepsis
- A referral to the usual primary care provider with a plan for any follow-up requirements
- Details of the senior clinician or care coordinator where appropriate.
- Contact details for follow up requirements such as Allied Health, Outpatients or Community Clinic, emotional and social wellbeing support.

Education requirements

Each service shall have its own dedicated sepsis teaching program that includes sepsis pathway awareness in all:

- medical and nursing orientation and/or induction packages, and
- regular dedicated competency-based sessions throughout the year which includes sepsis simulation.

Completion of the sepsis e-module via MyLearning is recommended prior to attending face-to-face courses, e.g. Recognition and Response to the Deteriorating Patient, CARE, DETECT.

Monitoring

NT Health quarterly sepsis dashboard (outcome measure) reports and six monthly (process measure) auditing is used to monitor the effectiveness of sepsis pathways in detecting sepsis. A benchmark of 80% compliance is the minimum required for sepsis process measures. Each region is responsible for their own monitoring via Business Intelligence system and/or auditing, reporting and related quality improvements. Monitoring will have oversight by the NT Health Standard 8 Committee

Accessibility

Sepsis pathways are available via Darwin Stores with a specific HR code:

- Acute care adult – CA/BR – HR543d-02/23
- Acute care adult – TE/EA/BR – HR543-02/23

Refer to the staff intranet sepsis site for further information about ordering sepsis pathways and viewing samples of same.

Roles and responsibility

Sepsis patients must have an overarching lead Consultant responsible for their care. When multiple teams are involved, communication between teams must be at Consultant level.

AMS teams are responsible for keeping sepsis pathway antibiotic recommendations up to date. A formal review shall be undertaken every six months.

Definitions

Term	Definition
ACSQHC	Australian Commission on Safety and Quality in Health Care.
AMS	Antimicrobial Stewardship – the ongoing effort by a health service organisation to optimise antimicrobial use among patients 'to improve patient outcomes, ensure cost-effective therapy and reduce adverse sequalae of antimicrobial use, including antimicrobial resistance.
ATS	Australasian Triage Scale – A clinical tool used in emergency departments to establish the maximum waiting time for medical assessment and treatment of a patient.
CARE	Central Australia Remote Emergency course.
DETECT	Detecting deterioration, Evaluation, Treatment, Escalation, and Communicating in Teams – a simulation course that is specifically designed to assist clinical staff to confidently identify and manage deteriorating patients.

Term	Definition
ICU	Intensive Care Unit – Provides the critical care and life support for acutely ill and injured patients.
MEWS	Modified Early Warning Score – used to evaluate the patient's physiological state baxsed on six vital parameters; heart rate, blood pressure, respiratory rate, core body temperature, mental status, and urine output.
MRaCC	Medical Retrieval and Consultation Centre.

Document History

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National Safety and Quality Health Service standards

National Safety and Quality Health Service standards							
Clinical Governance	Partnering with Consumers	Preventing and Controlling Healthcare Associated Infection	Medication Safety	Comprehensive Care	Communicating for Safety	Blood Management	Recognising & Responding to Acute Deterioration
☒	☒	☐	☐	☒	☒	☐	☒