National Clinical Guideline No. 6: Sepsis Management

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National Clinical Lead Sepsis
Implementation aim

- To ensure that every patient with sepsis is given the best available opportunity to survive
- Recognition, Resuscitation, Referral
- Education and Audit
In response to the report on the Investigation of Incident 50278

‘mandatory induction and continuous education of staff on the recognition, monitoring and management of infection, sepsis, severe sepsis and septic shock’
Minister requested the setting up of the National Sepsis Steering Committee by Dr Aine O’Carroll in the Clinical Strategy and Programmes division, July 2013

Developed National Clinical Guideline No. 6: Sepsis Management

Published Nov 2014

2015 Implementation year

2016 Reporting starts
Definition

- Dysregulated immune response to infection leading to organ dysfunction, failure and death.
- Diagnosed by the presence of infection leading to a systemic inflammatory response.
Natural History

- Inflammatory response
- Tissue hypo-perfusion
- Organ dysfunction
- Organ failure
- Death
Micro-organism virulence
Inoculation dose
Host factors
  • Co-morbidities
  • Genetics
Medical response
  • With the best available therapy 1 in 5 with septic shock will die
Inflammatory Response

Variables:

- **General**
  - T, HR, RR, WCC, BSL, Mental status

- **Inflammatory**
  - CRP, PCT

- **Organ dysfunction**
  - SpO2, UOP, Cr, Bili, Platelets, Coag, Ileus

- **Tissue hypo-perfusion**
  - Capillary refill, Lactate

- **Haemodynamic instability**
Sepsis 6
• One hour bundle for all patients with sepsis

Adapting the surviving sepsis campaign guidelines
• For patients with severe sepsis and septic shock

With this approach
• An extra 1 in 5 with septic shock will survive
<table>
<thead>
<tr>
<th>Give 3</th>
<th>Take 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. OXYGEN</td>
<td>1. CULTURES</td>
</tr>
<tr>
<td>2. FLUIDS</td>
<td>2. BLOODS</td>
</tr>
<tr>
<td>3. ANTIMICROBIALS</td>
<td>3. URINE OUTPUT</td>
</tr>
</tbody>
</table>
Risk stratify

- Sepsis
- Severe sepsis
- Septic shock

- And escalate accordingly
- Assess requirement for source control and response to therapy
Resources

- National Sepsis Steering Committee
  - Chair Dr Fidelma Fitzpatrick

- National Sepsis Team
  - National Clinical Lead
  - Project Manager

- Hospital Group Sepsis ADONs
  - Service plan 2015

- Funding for poc lactate devices
Guideline
• Published Nov 2014
• NICE accredited May 2015

Education
• Undergraduate
• Postgraduate

Implementation
• Hospital sepsis committees
• Hospital based education
• Pathway rollout

Audit
Proximate objectives

- Pathway development
  - Adult
  - Paediatrics
  - Maternity
  - Pre-hospital
- Awareness
  - Site visits
  - National Sepsis summits
- Hospital based implementation
  - Sepsis committees
  - Roll-out
Mid-term objectives

- Education
  - Medical Schools
  - Nursing
  - Intern training programme
  - Postgraduate bodies

- Medical Council
  - Mandatory

- HIQA
  - Standards

- Community awareness
Audit

Compliance

• Local
  • Sample charts with blood cultures sent
  • Random review of all ED presentations
  • Compliance with Sepsis 6 for all Level 2 & 3 admissions with clinician feedback

• National
  • HIPE / NOCA

Mortality rates

• LOS
• National ICU audit
Primary outcome:
- Reduce mortality from sepsis by 20%

Secondary outcome:
- Reduce progression
- Reduce LOS
- Reduce chronic health burden
Summary

- Mechanism:
  - Time dependent pathways
  - Multi-disciplinary participation
  - Use existing resources in evidence-based fashion
  - Strong in-hospital leadership
  - Commitment to audit
    - ‘If you don’t measure it, you can’t change it’
Think Sepsis
For Adult Emergency Department Patients

Suspected of confirmed infection?
- YES
- Likely source of infection?
  - Chest
  - Urinary
  - Abdomen
  - Skin/bone
  - Unknown

Does the patient have TWO of the following (SIRS criteria)?
- Temperature >38°C or <36°C
- Respiratory rate >20 breaths per minute
- Systolic blood pressure <90mmHg or lactate >2mmol/L
- Altered level of consciousness
- Glucose >7.7mmol/L (or diabetic)

- YES
- AT RISK OF SEPSIS
- Commence Sepsis Pathway (place in chart)
  - Systolic blood pressure <90mmHg or Lactate >2mmol/L

- NO
  - Risk of uncomplicated sepsis
  - Needs hourly review
  - Continue sepsis pathway
  - Do not return to waiting room
  - Hourly vital signs until review
  - Complain of sepsis if sepsis diagnosed by reviewing clinician

- YES
  - High risk of severe sepsis/septic shock
    - Admit immediately to senior EM doctor
    - Sepsis & care
    - Transfer to ICU of High dependency

Critical Care Consult if patient fails to respond or there is ongoing concern

Please note:
- This algorithm applies to all adult patients
- Apply caution regarding temperature data if antipyretic medication has been taken
- Consider infection prevention and control requirements
Emergency Department Sepsis Pathway

ADULT PATIENTS

CLINICIAN TO COMPLETE THIS SECTION

Date: [ ]
Clinician's Name: [ ]
Clinician's Signature: [ ]
MCN/NUR PRN: [ ]

INFECTION SUSPECTED +

- Patient unwell and at risk of Nectopias
- OR any 2 or more modified Systemic Inflammatory Response Syndrome (SIRS) criteria present
  - Respiratory rate > 20 BPM
  - Oxygen saturation < 94%
  - Temperature > 38°C
  - Specific gravity > 1.025
  - Acutely altered mental status
- Temperature < 36°C
- Bradycardia > 90 BPM
- In the absence of diarrhoea

Note: Some groups of patients, such as elderly, may not meet the modified SIRS criteria, even though infection is suspected. Where this occurs check for signs of organ dysfunction and raised markers such as C-reactive protein (CRP).

YES. THIS IS SEPSIS

[ ]
Time: [ ]
Sepsis Six Regimen must be completed within 1 hour

TAKE &

1. Blood cultures before giving antibiotics
2. Do not delay antibiotic administration
3. Fever is a common feature of infections. Consider antibiotics even if cultures are negative.
4. Lactate and BNP
5. Urine output measurement

Laboratory tests/investigations must be requested as an EMERGENCY and aim to have results available and acted on within the hour.

SEPSIS SIX – aim to complete within 1 hour

GIVE &

1. IV antibiotics
2. IV fluid resuscitation
3. Other antibiotics
4. IV fluid resuscitation
5. IV antibiotics

Laboratory tests/investigations must be requested as an EMERGENCY and aim to have results available and acted on within the hour.

Look for signs of organ dysfunction:

- Systolic BP < 90 or Mean Arterial Pressure < 65
- Oxygen saturation < 90%
- Lactate > 2 mEq/L
- Urine output < 0.5 mL/kg for 2 hours
- Altered mental status
- Glucose > 3.7 mmol/L
- Creatinine > 177 micromol/L
- Urea > 34 mmol/L
- PIP > 1.5 of APFI > 68
- Panel: CRP > 100 or NA

Any organ dysfunction: THIS IS SEVERE SEPSIS

Registrar or Consultant to review immediately

Reassess frequency in 1 hour.

Consider other investigations and management

(AWAYS USE CLINICAL JUDGEMENT)

Look for signs of septic shock

- Critical care consultation required
- Consider transfer to a higher level of care
- Severe sepsis consult
- CRP > 100 or NA
- If either present: THIS IS SEPTIC SHOCK

- Lactate > 4 mmol/L
- Hypotension (Systolic BP < 90 or MAP < 60)
- Respiratory rate > 20 BPM
- Oxygen saturation < 94%

If either present: CRITICAL CARE CONSULTATION REQUIRED

CRITICAL CARE CONSULTATION REQUIRED

Doctor's Name: [ ]
Doctor's Signature: [ ]
Date: [ ]
Time: [ ]
DETECTION
- NATIONAL EARLY WARNING SCORE

COMMUNICATION
- ISBAR

RECOGNITION
- CLINICAL EVALUATION
- SEPSIS SCREENING TOOL

RESUSCITATE & REFER
- SEPSIS 6 within one hour
- REFERRAL TO SENIOR CLINICIANS AND CRITICAL CARE AS APPROPRIATE
# Sepsis Screening Form

** ALWAYS USE CLINICAL JUDGEMENT **

Complete this form and apply if the National Early Warning Score (NEWS) is ≥ 4 (is on supplementary O₂), and infection suspected

<table>
<thead>
<tr>
<th>CLINICIAN TO COMPLETE THIS SECTION</th>
<th>Patient label here</th>
</tr>
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<tbody>
<tr>
<td>NEWS:</td>
<td>CLINICIAN’S NAME:</td>
</tr>
<tr>
<td>Name of Doctor contacted:</td>
<td>CLINICIAN’S SIGNATURE:</td>
</tr>
<tr>
<td>MACRONURVE Pf:</td>
<td></td>
</tr>
</tbody>
</table>

**Doctor must review within 10 min (see table: DOCTOR TO COMPLETE REMAINDER OF THIS DOCUMENT AS APPROPRIATE)**

### INFECTION SUSPECTED

- **Are any 2 or more modified Systemic Inflammatory Response Syndrome (SIRS) criteria present?**
  - Respiratory rate > 20 bpm
  - Heart rate > 90 bpm

- **OR**
  - Patient counsel and at risk of Hyperglycaemia

- **Note:** Some groups of patients, such as older people, may not meet the modified SIRS criteria, even though infection is suspected.

- **Where this occurs check for signs of organ dysfunction and raised biomarkers such as C reactive protein (CRP).**

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<th>Time Zero:</th>
<th>Sepsis Six Regimen must be completed within 1 hour</th>
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| Has a decision been made NOT to escalate care (excluding further treatment)? | NO | YES

### TAKE 3

1. **Blood culture before giving antibiotics:**
   - Do not delay antibiotic administration > 3 hours.
   - Collect samples from potentially infected sites (eg, gunshot, laceration, urinary, wound, AV/VC, Consider source control)

2. **Lactate and I&BC**

3. **Value output measurement**

- **Laboratory tests must be requested as EMERGENCY and aim to have results available and acted on within the hour**

### SEPSIS SIX — aim to complete within 1 hour

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### Look for signs of organ dysfunction:

- Systolic BP < 90 or Mean Arterial Pressure < 65 or Systolic BP more than 40 below patient’s normal
- Need for oxygen to achieve saturation > 90%
- Lactate > 2 mmol/L (following administration of fluid bolus)
- Value output < 92 ml/kg for 2 hours despite adequate fluid resuscitation.
- Acutely altered mental status
- Glucose > 7.7 mmol/L (in the absence of diabetes)
- Creatinine > 177 micromol/L
- Bilirubin > 34 micromol/L
- PTT > 1.5 or APTT > 40s
- Platelets < 100 x 10^9/L.

**Any organ dysfunction: THIS IS SEVERE SEPSIS**

Register or Consultant to review immediately. Resources frequently in 1st hour.

Consider other treatment and management plan.

### Look for signs of septic shock:

- Lactate > 4 mmol/L.
- Hypotension (Systolic BP < 90 or MAP < 65).

**If either present: THIS IS SEPTIC SHOCK**

Critical care consultation required.

- Consultant referral
- Consider transfer to a higher level of care
- Critical care consultation required.

A critical care review may be required at any stage during this assessment, but is critical for patients with septic shock in a hospital with an critical care unit. A critical care consultant must be made and transferred to a higher level of care considered. Inappropriate, follow the consult.

### Pathway Modification

Not all patients meeting modified SIRS criteria have sepsis. There may be additional problems requiring different management: Infection, Coagulopathy, Cardiac failure (CHF), Fluid overload (rescue of hypovolaemic shock), Atrial fibrillation, Myocardial infarction (MI), Kidney failure (renal failure) or other patient may be requiring chemotherapy (on call) to be published.

<table>
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<th>Date</th>
<th>Time</th>
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**Doctor’s Name:**

**Doctor’s Signature:**

**NEWS:**

**MACRONURVE Pf:**

**Other information or notes:**

**Document management plan:**

File this document in patient notes / document management plan.
Acknowledgements

- Christina Doyle, Sepsis PM
- Ann McCabe, Julie-Ann Kelly, patient representatives
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- N Kissoon, Global Sepsis Alliance
- Ron Daniels UK Sepsis Trust
- The Surviving Sepsis Campaign
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