National Clinical Guideline No. 6: Sepsis Management

Dr Vida Hamilton MB FCARCSI JFICMI
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

Background

- 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’

Response

- 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

Confounders

- 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

Evidenced based

- 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

Sepsis 6 in the 1st hour

Give 3	Take 3
1.OXYGEN	1. CULTURES
2. FLUIDS	2.BLOODS
3. ANTIMICROBIALS	3. URINE OUTPUT

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

Strategy

- 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

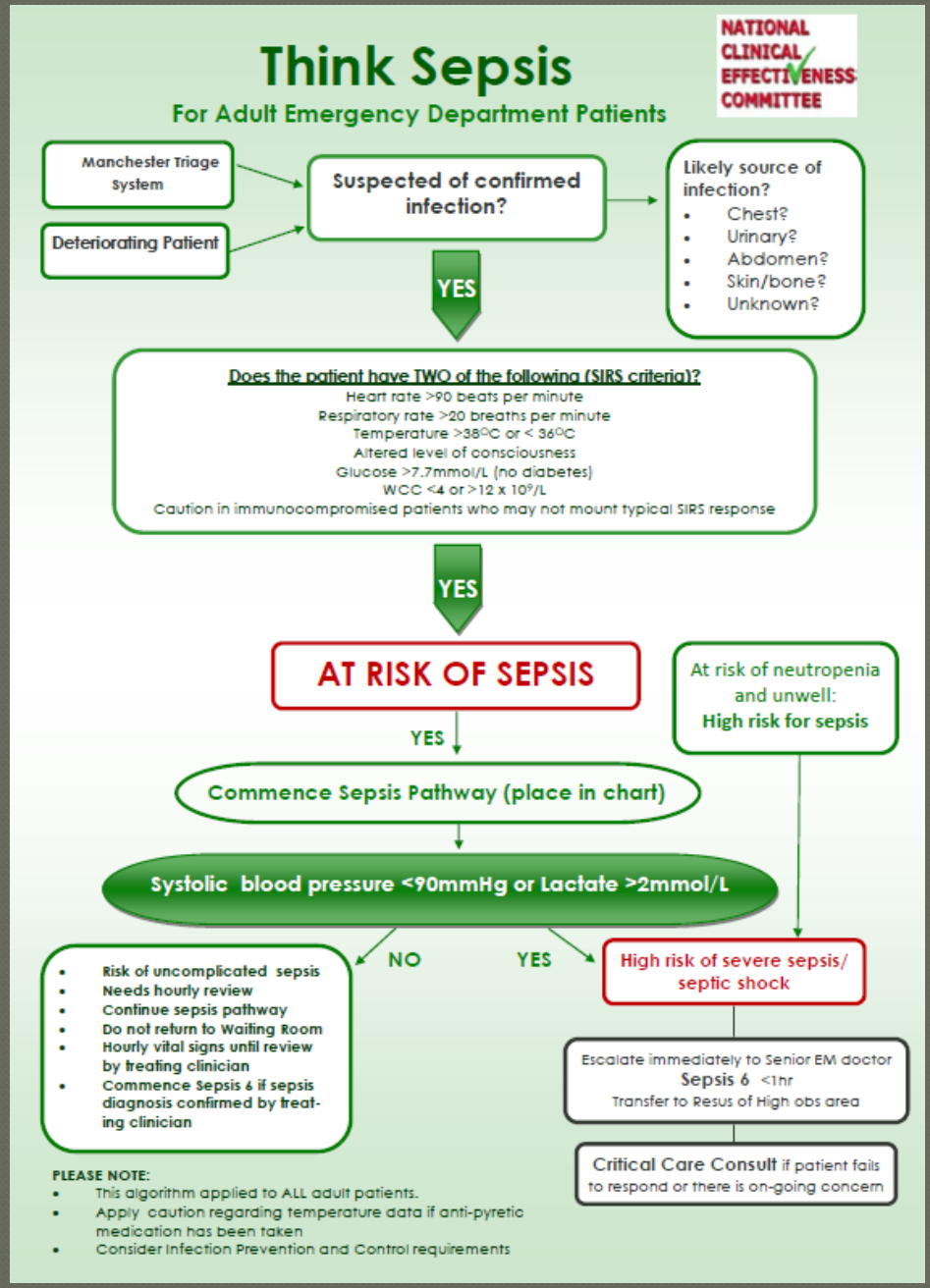
- Compliance
  - Local
    - Sample charts with blood cultures sent
    - Random review of all ED presentations
    - Compliance with Sepsis 6 for all Level 2 & 3 admissions with clinician feedback
  - National
    - HIPE / NOCA
- Mortality rates
  - LOS
  - National ICU audit

Outcome objectives

- 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
NATIONAL CLINICAL EFFECTIVENESS COMMITTEE
Manchester Triage System
Deteriorating Patient
Suspected of confirmed infection?
Likely source of infection?
Chest?
Urinary?
Abdomen?
Skin/bone?
Unknown?
YES
Does the patient have TWO of the following (SIRS criteria)?
Heart rate >90 beats per minute
Respiratory rate >20 breaths per minute
Temperature >38°C or < 36°C
Altered level of consciousness
Glucose >7.7mmol/L (no diabetes)
WCC <4 or >12 x 10⁹/L
Caution in immunocompromised patients who may not mount typical SIRS response
YES
AT RISK OF SEPSIS
At risk of neutropenia and unwell:
High risk for sepsis
YES
Commence Sepsis Pathway (place in chart)
Systolic blood pressure <90mmHg or Lactate >2mmol/L
NO
YES
Risk of uncomplicated sepsis
Needs hourly review
Continue sepsis pathway
Do not return to Waiting Room
Hourly vital signs until review by treating clinician
Commence Sepsis 6 if sepsis diagnosis confirmed by treating clinician
High risk of severe sepsis/ septic shock
Escalate immediately to Senior EM doctor
Sepsis 6 <1hr
Transfer to Resus of High obs area
Critical Care Consult if patient fails to respond or there is on-going concern
PLEASE NOTE:
This algorithm applied to ALL adult patients.
Apply caution regarding temperature data if anti-pyretic medication has been taken
Consider Infection Prevention and Control requirements

Emergency Department Sepsis Pathway

ADULT PATIENTS — There is separate sepsis criteria for women in pregnancy

EMERGENCY MEDICINE

CLINICIAN TO COMPLETE THIS SECTION

Date: Time Started:

Clinician's Name:

Clinician's Signature:

MCRN/NMBI PIN:

Patient label here

INFECTION SUSPECTED +

- ☐ Patient unwell and at risk of Neutropenia

OR any *2 or more modified* Systemic Inflammatory Response Syndrome (SIRS) criteria present

- ☐ Respiratory rate > 20 (bpm) / Hypoxia
- ☐ Heart rate > 90 (bpm)
- ☐ WCC < 4 or > 12 x 10^9/L
- ☐ Temperature <36 or >38.3 (°C)
- ☐ Acutely altered mental status
- ☐ Bedside glucose >7.7mmol/L *(in the absence of diabetes mellitus)*

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)

☐ **YES. THIS IS SEPSIS** Time Sepsis Six Regimen must be completed *within 1 hour*

SEPSIS SIX – aim to complete *within 1 hour*

TAKE 3

1. ☐ **Blood cultures** before giving antimicrobial
   Do not delay antibiotic administration >1 hour if blood cultures are difficult to obtain. Send samples from potentially infected sites eg. sputum, urine, wounds, IVC/CVC. Consider source control.
2. ☐ **Lactate and FBC**
3. ☐ **Urine output measurement**

GIVE 3

4. ☐ O_2 (94-98% SpO_2 or 88-92% in Chronic Lung Disease patients)
5. ☐ **IV fluid resuscitation**
   (500ml bolus - give up to 30ml/kg) & reassess
   (target systolic BP>100/MAP>65)
   Monitor response to IV fluids and titrate to effect
6. ☐ **IV antimicrobials** according to local guidelines
   Time Given:

Laboratory tests/Investigations must be requested as 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 or Systolic BP more than 40 below patient's normal
- ☐ New need for oxygen to achieve saturation > 90%
- ☐ Lactate > 2 mmol/L (following administration of fluid bolus)
- ☐ Urine output < 0.5ml/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
- ☐ PTR > 1.5 or aPTT > 60s
- ☐ Platelets < 100 x 10^9/L

Any organ dysfunction: THIS IS SEVERE SEPSIS

Registrar or Consultant to review immediately.
Reassess frequently in *1st hour.*
Consider other *investigations and management*

(ALWAYS USE CLINICAL JUDGEMENT)

Look for signs of septic shock

(following administration of fluid bolus)

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

If either present: THIS IS SEPTIC SHOCK
Critical care consult required

- ☐ Consider transfer to a higher level of care
- ☐ Critical care consult requested

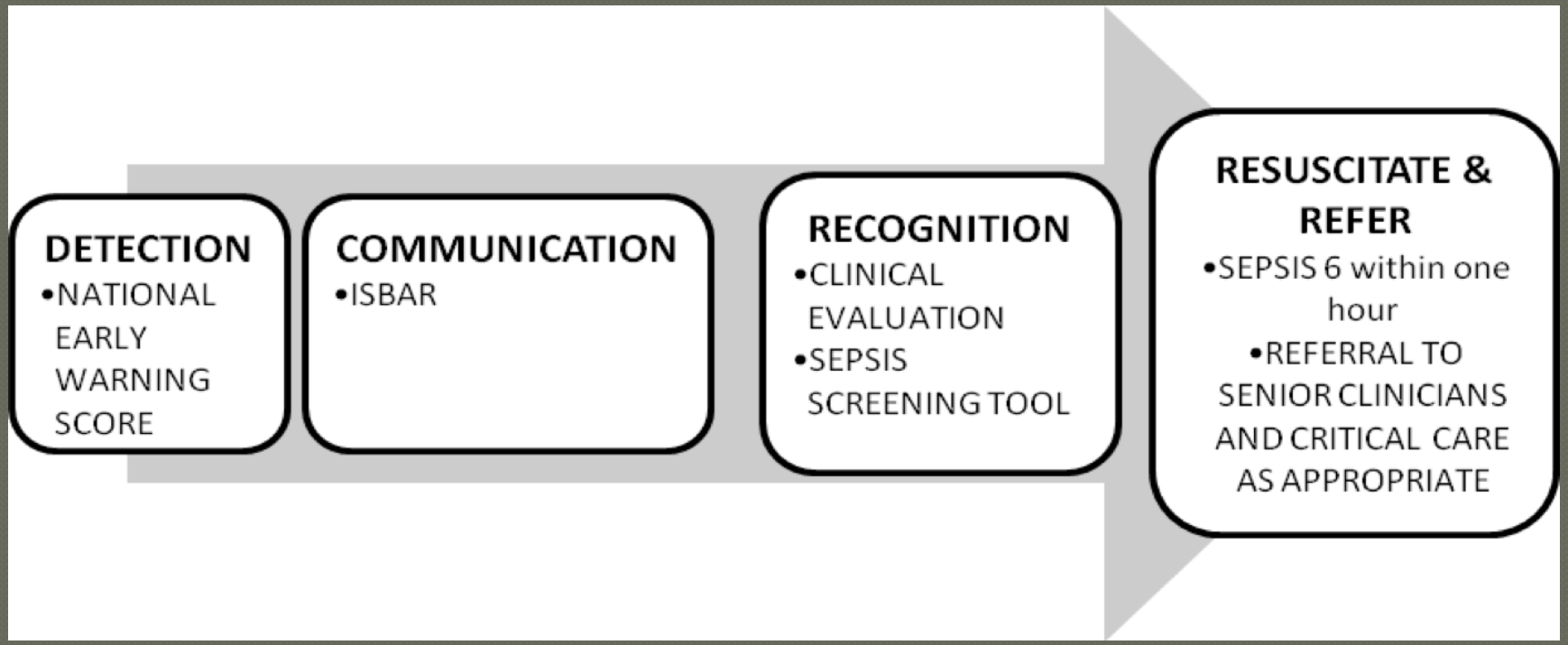
A critical care review may be requested at any point during this assessment, but is required for patients with Septic Shock. In a hospital with no critical care unit, a critical care consult must be made and transfer to a higher level of care considered, if appropriate, following the consult.

Doctor's Name: MCRN:

Doctor's Signature: Date:

File this document in patient notes - Document management plan. Time Completed:

Version 2 March 2015


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)

ADULT PATIENTS

There is separate sepsis criteria for women in pregnancy

Complete this form and apply if the National Early Warning Score (NEWS) is ≥ 4 (5 on supplementary O_2), and infection suspected

CLINICIAN TO COMPLETE THIS SECTION

NEWS:

Name of Doctor contacted:

Date: Time:

Clinician's Name:

Clinician's Signature:

MCRN/NMBI PIN:

Patient label here

Doctor must review *within 30 mins* (use ISBAR). 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)
- ☐ WCC < 4 or > 12 x 10^9/L
- ☐ Temperature <36 or >38.3 (°C)
- ☐ Acutely altered mental status
- ☐ Bedside glucose >7.7mmol/L *(in the absence of diabetes mellitus)*

OR ☐ Patient unwell and at risk of Neutropenia

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)

☐ **NO** Following a history and examination, and in the absence of suspected infection, staff may proceed with using the NEWS protocol

☐ **YES. THIS IS SEPSIS** Time Zero: Sepsis Six Regimen must be completed *within 1 hour*

Has a decision been made NOT to escalate care (excluding further treatment)? ☐ **NO** proceed ☐ **YES** do not proceed

TAKE 3

SEPSIS SIX – aim to complete *within 1 hour*

GIVE 3

1. ☐ **Blood cultures** before giving antibotics
   Do not delay antibiotic administration >1 hour if blood cultures are difficult to obtain. Send samples from potentially infected sites eg. sputum, urine, wounds, IVC/CVC. Consider source control.
2. ☐ **Lactate and FBC**
3. ☐ **Urine output measurement**
4. ☐ **O_2** (94-98% SpO_2 or 88-92% in COPD patients)
5. ☐ **IV fluid resuscitation**
   (500ml bolus - give up to 30ml/kg) & reassess (target systolic BP>90/MAP>65)
   Monitor response to IV fluids and titrate to effect
6. ☐ **IV antimicrobials** according to local guidelines
   Time given:

Laboratory tests must be requested as 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 or Systolic BP more than 40 below patient's normal
- ☐ New need for oxygen to achieve saturation > 90%
- ☐ Lactate > 2 mmol/L (following administration of fluid bolus)
- ☐ Urine output < 0.5ml/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
- ☐ PTR > 1.5 or aPTT > 60s
- ☐ Platelets < 100 x 10^9/L

Any organ dysfunction: THIS IS SEVERE SEPSIS

Registrar or Consultant to review immediately.
Reassess frequently in *1st hour.*
Consider other *investigations and management*

Look for signs of septic shock

(following administration of fluid bolus)

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

If either present: THIS IS SEPTIC SHOCK
Critical care consult required

- ☐ Consultant referral
- ☐ Consider transfer to a higher level of care
- ☐ Critical care consult requested
  A critical care review may be requested at any point during this assessment, but is required for patients with Septic Shock. In a hospital with no critical care unit, a critical care consult must be made and transfer to a higher level of care considered, if appropriate, following the consult.

Pathway Modification

Not all patients meeting modified SIRS criteria have sepsis, OR there may be additional problems requiring different management (current Congestive Cardiac Failure (CCF), Diabetic Ketoacidosis (DKA), Myocardial Infarction (MI), Gastro-Instinal (GI) Bleed etc) OR patient may be receiving chemotherapy OR be palliated.

File this document in patient notes - Document management plan.

Doctor's Name: Doctor's Signature: MCRN: Date: Time:

Acknowledgements

- Christina Doyle, Sepsis PM
- Ann McCabe, Julie-Ann Kelly, patient representatives
- Grainne Cosgrove, Mary O'Riordan, Cathy McMahon, guideline development group
- HIPE, NOCA
- F Fitzpatrick and the Sepsis Steering Committee
- Kathleen MacLellan and NCEC
- Aine Carroll and Aveen Murray, Clinical Strategy and Programmes
- The Rory Staunton Foundation
- N Kissoon, Global Sepsis Alliance
- Ron Daniels UK Sepsis Trust
- The Surviving Sepsis Campaign

Contact us

- www.hse.ie/sepsis
- vida.hamilton@hse.ie
- Christina.doyle1@hse.ie