Sepsis is often insidious in onset and should never be underestimated. Women may appear deceptively well before suddenly collapsing often with little or no warning (CMACE 2011). Maternal mortality from infection is currently about 18/100,000 deliveries.

It may occur during pregnancy, following surgical interventions or as puerperal sepsis. Severe sepsis has a mortality rate of 20-40% which rises to 60% if septic shock develops.

**DEFINITIONS**

**SIRS (Systemic Inflammatory Response Syndrome)**
Patients with 2 or more of the following criteria

- Temperature $\geq 38^\circ$C or $<36^\circ$C
- Heart rate $> 100$ beats per minute
- Respiration $> 20$/min
- Leukocyte count $>16,000/mm^3$, $<6,000/mm^3$ or $>10\%$ immature cells

**SEPSIS**

SIRS plus a documented infection site. (i.e. positive cultures for organisms from that site). Blood cultures do **not** need to be positive.

**SEVERE SEPSIS**

Sepsis associated with organ dysfunction, hypoperfusion abnormalities or hypotension. Hypoperfusion abnormalities **include**, but are **not limited to**:

- Lactic acidosis
- Oliguria
- Or an acute alteration in mental status

**SEPTIC SHOCK**

Sepsis induced hypotension despite fluid resuscitation PLUS hypoperfusion abnormalities.

Mortality increases with increase in number of SIRS symptoms and in severity of the disease.

Potential complications of sepsis include ARDS, DIC, acute renal failure, liver failure, CNS dysfunction, cardiac failure and death.

**Reference:**
Centre for Maternal and Child Enquiries (CMACE) Saving Mothers’ Lives March 2011

Dr Pauline Lynch     Dr Pamela Johnston
January 2013 Review January 2015
Risk Factors for Maternal Sepsis:
- Obesity
- C-Section/Midcavity forceps
- Prolonged SROM
- Pyrexia in Labour
- Retained products of conception
- Impaired glucose tolerance
- Immunosuppression
- Anaemia
- Vaginal discharge
- History of pelvic infection
- History of Group B streptococcal infection
- Invasive intrauterine procedures

Signs & symptoms of infection (Complete sepsis Screening Tool)

History
- Diarrhoea +/-vomiting
- Severe lower abdominal pain/severe “after pains” requiring frequent analgesia
- Sore throat
- Productive cough
- Urinary symptoms
- Vaginal discharge/ wound pain and redness

Signs
- Pyrexia > 38 ºC ± Rigors
- Hypothermia < 36 ºC
- Persistent Tachycardia > 100 bpm
- Persistent Tachypnoea > 20 breaths/min
- Abnormal CTG or absent fetal heart
- Rash (generalised streptococcal maculopapular rash)
- Purulent discharge of wound, breasts or perineum
- Uterine tenderness

Investigations
- WCC < 6 or >16
- Blood glucose > 7.7mmol in absence of diabetes
- Coagulation disturbance
- CRP > 100

Antenatal Investigation
- Take T, P, BP and Respiratory Rate, record on Maternity Early Warning Score Chart
- FBC, CRP, U+E’s, LFT’s glucose, lactate, G&S, consider ABGs
- Blood Cultures if pyrexia >38 ºC
- Throat swab
- MSSU and HVS

Postnatal Investigation – as above plus
- Examine perineum if c/o pain or persistence of pain (significant perineal trauma examine daily until healing satisfactory)
- Examine breast for signs of mastitis/abscess
- Swabs taken from, perineal/abdominal wound or breasts
- Ultrasound scan to check for retained products of conception/Pelvic collection

ENSURE SAMPLES TRANSPORTED PROMPTLY AS URGENT by porter

Treatment - DO NOT WAIT FOR MICROBIOLOGY RESULTS
- Start systemic broad spectrum IV antibiotics immediately
- Clindamycin is antibiotic of choice for Group A Strep
- Sepsis - Co-Amoxiclav 1.2g tds + Metronidazole 500mg tds
  (If penicillin allergic: Clindamycin 900mg tds + Gentamicin (see obstetric gentamicin policy))
- Severe Sepsis - Piperacillin/Tazobactam 4.5g qds + Clindamycin 1.2g qds
  (If penicillin allergic: Clindamycin 1.2g qds + Gentamicin (see obstetric gentamicin policy))
- Septic Shock - Piperacillin/Tazobactam 4.5g qds + Clindamycin 1.2g qds + Gentamicin
  (If penicillin allergic: Clindamycin 1.2g qds + Gentamicin (see obstetric gentamicin policy))

DISCUSS ALL PATIENTS WITH SEVERE SEPSIS OR SEPTIC SHOCK WITH MICROBIOLOGY
All patients with CRP>200 to be reviewed by ST6/7 or Consultant
Paracetamol for analgesia (avoid NSAIDs) and if pyrexial (T>38°C) after blood cultures
On discharge ensure follow-up until CRP <50
MANAGEMENT OF SEVERE SEPSIS

IMMEDIATE STABILISATION OF THE PATIENT
by Anaesthetist and Obstetrician & complete Sepsis Tool

A:
- Establish airway patency, apply 15 l/ min O₂ via reservoir mask

B:
- Check respiratory rate. Document all recordings on Early Warning Scoring Chart.
- Attach SpO₂ monitoring
- Consider assisted ventilation if required
- Check ABG’s including lactate. Serum lactate will identify patients with hypoperfusion but without hypotension.

C:
- Check pulse rate
- Peripheral perfusion (capillary refill time <2 seconds) and warmth of extremities
- Check urine output and fluid balance status
- Check BP. *(Remember sepsis can produce significant vasodilatation and patients may be profoundly hypotensive but with warm peripheries)*
- Establish intravenous access with 2x large bore cannulae
- Send blood for FBC, U+E’s, Coagulation, LFT’s, CRP, G&S, blood cultures x 2 pairs at least.
- Fluid bolus 500 ml Hartmann’s solution over 5 minutes and reassess
- Repeat fluid (?colloid) bolus as necessary. If hypotension persists despite adequate filling/ 2 litres of fluid, contact ITU for advice regarding further management.
- Check temperature

D:
- Check pupils equal and reactive
- Check BM
- Assess AVPU score (Alert, Responds to Voice, Responds to Pain, Unresponsive). If P or U, place in recovery position and call for help.

- *In severe sepsis, invasive arterial and venous monitoring may be necessary.*
- *Aim for a CVP of 10-14mmHg, Mean arterial pressure >65mmHg, urine output >0.5ml/kg/hr*

SOURCE IDENTIFICATION
- Top to Toe examination to assess for source of infection
- Collect and culture bacteriological samples e.g. urine culture & micro, sputum, wound swab, CSF, HVS etc and transport by porter
- Consider source control if obvious source of infection e.g. drainage of abscess, evacuation of retained products etc. *Do not wait for this before giving antibiotics.*

ANTIBIOTIC THERAPY
Start broad spectrum empirical therapy as soon as samples are withdrawn, and in all cases WHICH MUST BE WITHIN 1 HOUR OF RECOGNITION OF SEPSIS. Do not delay antibiotics if IV access leads to delay in blood cultures. Rationalise antibiotics when sensitivities are known.

INVOLVE INTENSIVE CARE UNIT early in the management of severe sepsis and septic shock. ICU care should begin with diagnosis and not wait for transfer to ICU as there may be a delay in arranging an available bed.
PLEASE ALSO SEE

SEPSIS TOOL V8

CAN BE FOUND IN DOCSTORE AND ON WOMEN & CHILD HEALTH WEBSITE