

## Enhanced Care for the Severely Ill Obstetric Patient

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<b>Key Documents Owner/Lead:</b>	Dr Hillman	Consultant Obstetrician
<b>Approved by:</b>	Maternity Governance Meeting	
<b>Date of Approval:</b>	30 <sup>th</sup> September 2020	
<b>Date of review:</b>	30 <sup>th</sup> September 2023	

### Key Amendments

Date	Amendments	Approved by
16/06/2020	Policy amended in order to meet the recommendations of the RCoA 2018	

### Introduction

This guideline covers early recognition and the management of severely ill pregnant women and defines the process by which enhanced care is provided in obstetrics and applies to obstetric, Midwifery and anaesthetic staff working within the maternity unit.

Maternal morbidity was included in the confidential enquiry for the first time in 2014 but the prevalence rates for women who require a higher level of monitoring or single organ support in the UK is difficult to quantify and may be as high as 1,200/100,000. For every maternal death, there are nine women who develop severe maternal “near-miss” morbidity. Many of these women will need some degree of critical care.

In August 2018, the Royal College of Anaesthetists released an updated Report ‘Care of the critically ill woman in childbirth; enhanced maternal care’. The document has been produced by a joint working party comprising representatives from: Obstetric Anaesthetists Association (OAA), Royal College of Anaesthetists (RCoA), Royal College of Midwives (RCM), Royal College of Obstetricians and Gynaecologists (RCOG), Intensive Care Society and The Faculty of Intensive Care Medicine. The report identifies the urgent need for teamwork and multidisciplinary training in the early recognition of critical illness.

The report recognises that many of the recommendations from the 2011 NHS Report have not yet been implemented in the UK maternity units, and therefore requests that a nationwide implementation of the recommendations, contained within the 2018 report. The key messages for enhanced care (EMC) in the 2018 report include:

- Working in teams is vital for good outcomes
- Training for enhanced maternal care should be competency based
- Multi-professional education and training is essential
- There is a need for a national early warning system modified for obstetrics (MOEWS)
- Whilst care should be usually take place on the labour ward, transfer to ITU may occasionally be warranted
- Women admitted to general ITU should receive coordinated shared care and daily multi-professional reviews

Enhanced care can be provided within the Delivery Suite with support and advice from the senior obstetrician, anaesthetist and midwifery staff. If this support is not available, then women should be transferred to a dedicated higher dependency or intensive care setting. Patients, who require additional intervention, including support for a single failing organ system, will be transferred to a dedicated higher dependency or intensive care setting.

'Providing equity of critical and maternity care for the critically ill pregnant or postpartum woman' was published by the Royal College of Obstetricians and Gynaecologists (RCOG) in July 2011. It highlighted that women who become critically ill during this time should receive the same standard of care for both their pregnancy related and critical care needs, delivered by professionals with the same level of competences irrespective of whether these are provided in a maternity or general critical care setting.

Key components of the report were:

- Provision of a suitable area and equipment with medical input from anaesthetists and obstetricians, staffed by a team of midwives who have additional training, which equips them with the necessary critical care competences.
- Ensuring that both maternal and critical care aspects of the pathway are delivered equitably, always remembering the goal of keeping mother and baby together unless precluded by a clinical indication.

The level of care women require is based on criteria identified by the department of Health review of Adult Critical Care Services:

<b>Level 0</b>	Patients whose needs can be met through normal ward care in an acute hospital (midwife to midwife)
<b>Level 1</b>	Patients at risk of their condition deteriorating, or those recently relocated from higher levels of care, whose needs can be met on an acute ward with additional advice and support from the critical care team. The patients condition will be assessed using the MEOWS chart/HDU chart
<b>Level 2</b>	Patients requiring more detailed observation or intervention including support for a single failing organ system or post-operative care and those 'stepping down' from higher levels of care.
<b>Level 3</b>	Patients requiring advanced respiratory support alone or basic respiratory support together with support of at least two organ systems. This level includes all complex patients requiring support for multi-organ failure.

A more detailed description of categorising levels of care can be found at **Appendix 1**

**NOTE: Modified early warning obstetric charts called WOW charts (Worcestershire Obstetric Warning) should be used in all obstetric inpatient settings.**

#### **Monitoring of women requiring Enhanced care:**

All observations should be recorded on the Enhanced Care WOW chart. Frequency of observations should be decided on clinical grounds. Any abnormal observation may trigger medical review and assessment. See WOW guideline

#### **Equipment –**

The following equipment should be available for all rooms on delivery suite:

- BP monitors
- Thermometers
- Oxygen saturation monitors
- Oxygen and suction
- Resuscitation equipment

**In addition –**

The following equipment should be available in enhanced maternity care rooms on delivery suite:

- Arterial cannulae and appropriate cables for monitoring an arterial line
- Central lines

**An ECG machine should be available on delivery suite to enable access 24/7**

NB Currently ECG can be arranged via bleep 341

For all higher level high dependency care the patient is admitted to HDU or ITU.

**Responsibilities of different staff groups**

Overall responsibility for the medical care of the woman lies with the senior obstetrician on duty at the time. Multidisciplinary approach is essential for such women.

It is mainly a midwifery responsibility, to undertake routine observation of the mother in accordance with Trust policy and to highlight any deviations from the normal observations to a senior midwife or medical staff.

- Midwife in charge to ensure timely medical review and assessment of the woman.
- Senior duty obstetrician to respond in a timely manner to a request to review an unwell woman.
- Duty anaesthetist; to assist when requested by the obstetric team. The resident anaesthetic team will contact the on-call consultant anaesthetist if clinically indicated.

It is understood that the anaesthetic team will be more familiar with the invasive monitoring which may be required as part of enhanced care. The anaesthetist will be expected to support and guide the midwifery staff in the use of this equipment.

The Critical Care Outreach Team (CCOT) should also be considered as they offer support to midwives & medical staff as required in the care of sick women.

There should be a clearly documented handover of care including summary of current situation and on-going management plan.

**When to involve staff outside of the maternity service**

This will depend on regular assessment of the woman using the observation charts and clinical judgment. In the face of a deteriorating clinical condition appropriate expert opinion should be sought. The obstetrician in charge of the patient's care will contact the relevant specialist colleague and request review.

The response to that request will be a review of the patient together with a recording in the patient's case notes of the outcome of that review. The provision of either high dependency care and/or intensive care can only be delivered in the specialist HDU/ITU departments and not on Delivery Suite. This is an individual patient based clinical decision made after an obstetric and anaesthetic review.

**Criteria for enhanced care provided on Delivery Suite:**

Severe pre-eclampsia to include:

- Patients needing intravenous antihypertensives +/- magnesium sulphate infusion
- Eclampsia
- HELLP syndrome
- Severe renal impairment/dysfunction

Major haemorrhage to include:

- APH, abruption resulting in DIC
- Major PPH> 1500ml, uterine balloon in-situ, B-Lynch suture for atonic uterus
- Sepsis
- Amniotic fluid embolus
- Anaesthetic or medical concerns requiring admission for monitoring
- Intensive monitoring for patients requiring step-down care from critical care units (high dependency or intensive care units)
- Unexplained elevation of the WOW score

Midwives and staff who form part of an Enhanced Care Team should receive specific training. The competency framework for midwives caring for ill and acutely ill women – The Royal College of Midwives in association with the Obstetric Anaesthetists Association can be found at **Appendix 2**

### **Criteria for admission to a high dependency or intensive care setting**

Women whose disease severity exceeds the level of care than can be provided by enhanced care within the obstetric setting should be transferred to the specialist HDU/ITU departments. These include:

- Further deterioration of any of the above criteria
- Failure of one or more organ systems
- Pulmonary oedema
- Aspiration pneumonitis
- Renal failure
- Respiratory distress syndrome

The care of the woman will remain the multidisciplinary responsibility of the consultant intensivist, consultant obstetrician, consultant anaesthetist and the midwife.

### **References:**

Royal College of Anaesthetists. *Care of the critically ill woman in childbirth; enhanced maternal care.*

RCoA 2018

Royal College of Obstetricians and Gynaecologists. *Providing equity of critical and maternal care for the critically ill pregnant or recently pregnant women.* Maternal Critical Care Working Group, 2011

PRactical Obstetric Multi-Professional Training. *Care of the Critically ill Pregnant or Postpartum woman.*

PROMPT 2019

MBRRACE-UK - *Saving Lives, Improving Mothers Care.* 2019

## Appendix 1

<b>Level 0</b>	Level 0 care can be provided across the maternity unit as required
<b>Level 1</b>	Level 1 care can be provided within the Delivery Suite, in the standard delivery rooms / specially allocated rooms, by suitably trained staff, with support and advice from senior obstetricians and anaesthetic staff. Care is recorded on maternity specific "high dependency" charts. Care can also be provided on the postnatal ward if not requiring HDU observations and staffing levels are appropriate.
<b>Level 2</b>	<p>Level 2 care can be provided within designated enhanced care rooms by suitably trained staff (enhanced care team) or within the High Dependency Unit outside of the maternity unit.</p> <p>The decision to admit a woman to the HDU/ITU outside the maternity unit should be made by the Consultant Obstetrician or the Consultant Anaesthetist. The decision and plan of care should be documented clearly in the hospital notes.</p> <p>Examples of women who may have level 2 requirements include:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Massive Obstetric Haemorrhage</li> <li><input type="checkbox"/> Sever Pre-Eclampsia</li> <li><input type="checkbox"/> Cardiac Arrhythmia</li> <li><input type="checkbox"/> Congenital Heart Defect</li> <li><input type="checkbox"/> Severe Respiratory Disease</li> <li><input type="checkbox"/> Diabetic Ketoacidosis</li> <li><input type="checkbox"/> Renal failure associated with HELLP syndrome / persistent oliguria</li> <li><input type="checkbox"/> Women transferred back from ITU if they are being admitted back onto the Delivery Suite</li> <li><input type="checkbox"/> Sepsis</li> </ul> <p>This list is not exhaustive as enhanced maternity care may also be requested by the senior clinician based on clinical need.</p> <p>Women with level 2 requirements who are considered unstable should be notified as early as possible to the Intensive Care Unit including the Consultant on call for ITU – this should be Consultant-to-Consultant. Depending on the underlying condition, Consultants from other specialities may need to be involved (e.g. respiratory, renal, cardiology, haematology etc.) It remains the responsibility of the Consultant Obstetrician to ensure referrals are made. All patients requiring level 2 care should be referred to critical care outreach teams for review.</p>
<b>Level 3</b>	<p><b>Women with level 3 care needs will usually need to be transferred to the Intensive Care Unit</b></p> <p>Examples of women who may have level 3 requirements include:</p> <p>Massive Obstetric Haemorrhage Intermittent positive pressure ventilation required, or continuous positive airways pressure by mask Anuric renal failure Cardiac failure Sickle cell crisis Recurrent seizures Severe hypertension resistant to IV therapy as per Severe Pre-Eclampsia guideline Pulmonary Oedema with oliguria Compromised Myocardial function Sepsis</p> <p>Women with level 3 requirements should be notified as early as possible to the Intensive Care Unit including the Consultant on call for ITU- this should be Consultant-to-Consultant. Depending on the underlying condition, Consultants from other specialities may need to be involved (e.g. respiratory, renal, cardiology, haematology etc.) It remains the responsibility of the Consultant Obstetrician to ensure referrals are made.</p>

## **Appendix 2**

There are three levels of competency required by midwives:

Level 1 **Registration (R)** = competencies required at the point of entry to the midwifery part of the Nursing and Midwifery Council's register.

Level 2 **Core (C)** = competencies required for core midwifery staff employed on a labour ward on a continuous basis.

Level 3 **Enhanced Maternal Care (EMC)** = enhanced specialist skills required by healthcare professionals in an area designated to provide enhanced maternal care.

Midwives must be able to undertake the following competencies in a safe and professional manner within the NMC Code of professional standards of practice and behaviour for nurses and midwives (2015).

### **Respiratory system**

The following competency statements relate to caring for women who require respiratory support, including monitoring, observation, and respiratory care.

Accurately perform and correctly document a thorough respiratory assessment.

Assess and monitor women requiring respiratory support and take appropriate action where required.

Assessment will include:

- Respiratory rate/depth/pattern of respirations **(R)**
- Pulse oximetry **(R)**
- Use of accessory muscles **(R)**
- Sputum **(R)**
- Peak flow **(R)**.

Demonstrate an appropriate response to the observations that you have recorded including:

- Re-positioning the woman **(R)**
- Referral to and working with physiotherapists **(R)**
- Obtaining and processing samples **(R)**
- Assisting with deep breathing and expectoration **(C)**
- Reporting results of ABG sampling from arterial lines to appropriate team member **(C)**
- Offer basic interpretation **(C)**
- Suggest actions following interpretation **(C)**.

### **Oxygen therapy**

Assemble relevant equipment and administer oxygen therapy via:

- A simple face mask **(R)**
- A variable flow O2 delivery system **(R)**
- Nasal cannula **(R)**
- Reservoir mask **(R)**
- Set-up and use humidification methods **(R)**.

### **Pulse oximetry**

Set-up, use, read and interprets pulse oximetry:

- Select appropriate probe site **(R)**
- Set alarms appropriately **(R)**
- Understand limitations of pulse oximetry **(R)**.



Provide appropriate intervention for women experiencing airway problems

- Position **(R)**.
- Head-tilt/chin-lift/jaw-thrust **(R)**.
- Have knowledge of emergency equipment **(R)**.
- Have appropriate airway device **(R)**.
- Demonstrate safe insertion of airway **(R)**.
- Demonstrate bag-valve-mask ventilation two-person technique **(R)**.

### Pharmacology

Safely prepare and administer medications used in respiratory care:

- bronchodilators and steroid inhalers **(R)**
- systemic steroids **(C)**.
- Monitor effects of medication **(R)**.

### Cardiovascular system

The following competency statements relate to monitoring and caring for women who require cardiovascular monitoring and management

Assess and monitor women requiring cardiovascular support.

Accurately perform and correctly document a full cardiovascular assessment including:

- pulse strength/volume/character – manual if irregular **(R)**
- blood pressure, including manual systolic and diastolic with different cuff sizes and lying and standing assessment **(R)**
- temperature **(R)**
- urine output and fluid balance **(R)**
- capillary refill time **(R)**
- skin turgor/elasticity **(R)**
- basic blood results **(R)**.

### Manage fluid (including blood) replacement

- Recognise altered fluid status **(R)**.
- Recognise the need for fluid intervention and therapies including need for blood transfusion **(R)**.
- Recognise the need for fluid restriction **(R)**.
- Administer fluids in accordance with local and national guidelines **(R)**.
- Accurately record fluid balance **(R)**.

### Central venous access

- Safely prepare for and assist with the insertion of a central line **(EMC)**.
- Discuss checking the line position before use in accordance with local policy **(EMC)**.
- Correctly prime a transducer **(EMC)**.
- Correctly attach a transducer to a central line **(EMC)**.
- Correctly zero a transducer **(EMC)**.
- Correctly identify when re-zeroing is required **(EMC)**.
- Correctly set appropriate alarm limits **(EMC)**.
- Apply an appropriate dressing in accordance with local policy **(EMC)**.
- Safely use and change needle-free ports **(EMC)**.
- Safely remove a central line **(EMC)**.

## Arterial line management

- Prepare for and assist in the safe insertion of an arterial line **(EMC)**.
- Correctly prime a transducer **(EMC)**.
- Correctly attach a transducer to an arterial line **(EMC)**.
- Correctly zero a transducer **(EMC)**.
- Correctly identify when re-zeroing is required **(EMC)**.
- Correctly set appropriate alarm limits **(EMC)**.
- Apply an appropriate dressing in accordance with local policy **(EMC)**.
- Safely remove an arterial line **(EMC)**.

## Shock

Recognise and interpret signs and symptoms of:

- cardiovascular shock **(R)**
- hypovolaemic shock **(R)**
- anaphylactic shock **(R)**
- septic shock (including 1st hour care duties) **(R)**.

## Cardiac rhythms

- Correctly check 'emergency' equipment including defibrillator **(R)**.
- Correctly attach the patient to a cardiac monitor **(R)**.
- Correctly identify from the cardiac monitor output:
  - o bradycardia **(R)**
  - o tachycardia **(R)**
  - o ectopic beats **(C)**.

Correctly identify and follow BLS/ILS guidelines where appropriate for the following life threatening dysrhythmias:

- asystole **(C)**
- pulseless electrical activity **(C)**
- ventricular tachycardia **(C)**
- ventricular fibrillation **(C)**.

## Associated pharmacology

Demonstrate knowledge and understanding of prescribed medications used to support the cardiovascular system including:

- anti-hypertensive drugs **(R)**
- magnesium sulphate **(R)**
- safely prepare and administer prescribed medications used to support the cardiovascular system, including:
  - o anti-hypertensive drugs **(C)**
  - o magnesium Sulphate **(C)**.
- titrate medication under supervision to achieve targets set by medical staff (eg MAP, systolic pressure) **(EMC)**.



## Renal system

The following competency statements relate to the safe and effective assessment of renal function, monitoring of fluid balance, and care of women at risk of acute kidney injury:

- determine the monitoring needs for women at risk of deteriorating renal function **(R)**
- demonstrate the ability to accurately measure and record fluid balance and report abnormalities appropriately **(R)**
- identify factors which may affect the assessment of renal function (e.g. blocked catheters and urinary retention) **(R)**
- evaluate the effectiveness of fluid replacement **(R)**
- administer appropriate care to women with a urinary/urinary tract catheter (according to national guidelines and local policy) **(R)**
- utilise locally available equipment:
  - o catheterisation equipment **(R)**
  - o urometers **(R)**.
- identify women who are fluid-depleted **(R)**
- identify women who are fluid-overloaded **(R)**
- review biochemistry results and take appropriate action **(R)**
- monitor and review women's biochemistry and haematology results **(R)**.

## Neurological system

The following competency statements relate to the assessment and management of women who are neurologically compromised.

Identify deterioration in neurological status:

- undertake a neurological assessment using the AVPU scoring system **(R)**
- check blood glucose and take appropriate action **(R)**.

Identify focal deficits such as:

- gag and swallow reflex **(R)**
- pupillary response **(R)**.

Demonstrate an appropriate response to the observations recorded, including:

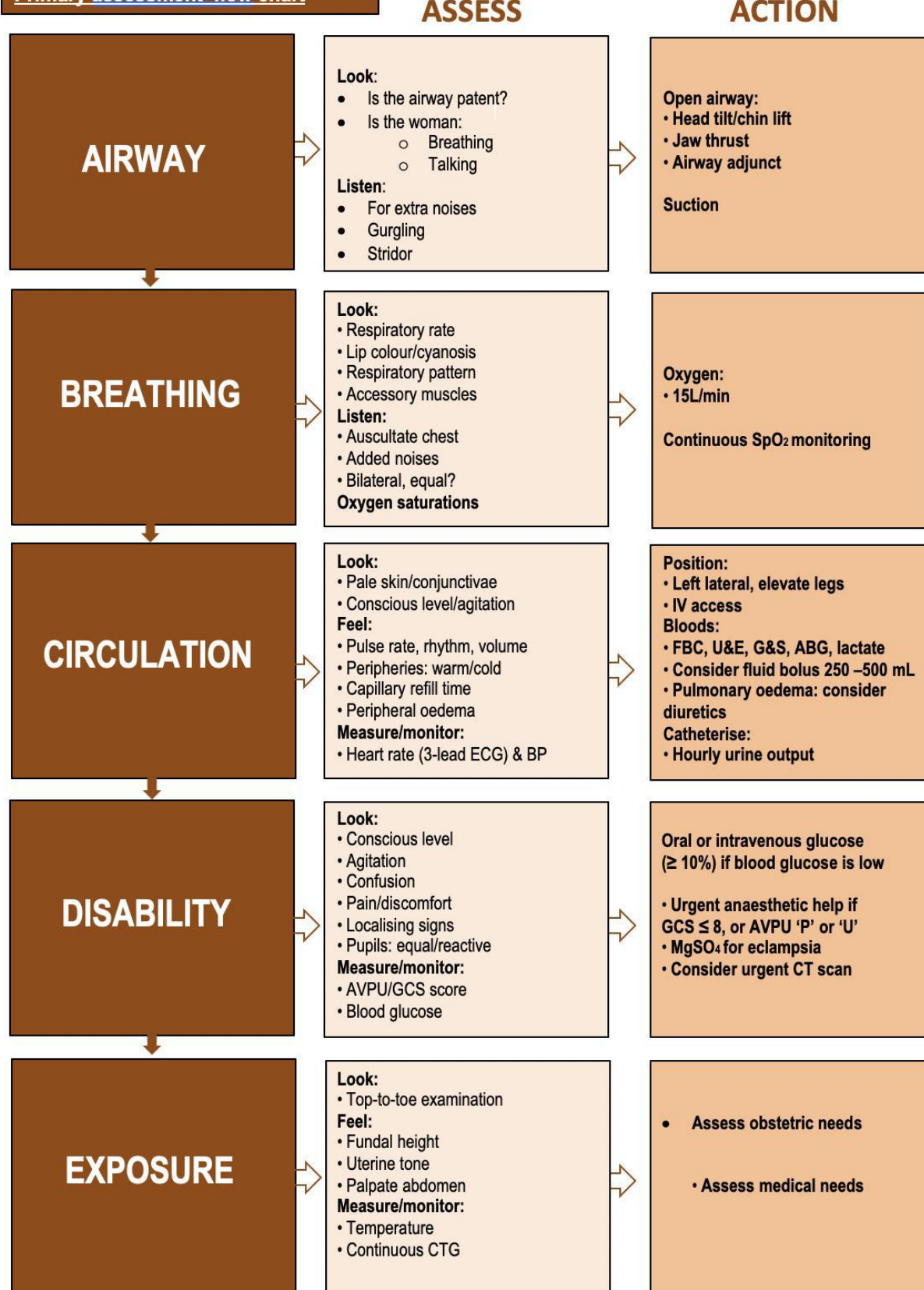
- protecting the airway **(R)**
- placing women in the recovery position **(R)**.

## General

The following competency statements relate to general elements of care required when supporting women in need of enhanced maternal care:

- complete the MEOWS accurately **(R)**
- follow 'track and trigger' system to escalate care **(R)**
- provide accurate documentation of assessment/intervention/evaluation and referrals **(R)**
- contribute to the ongoing management plan **(R)**.

**Primary assessment flow chart**



Adapted from PROMPT / CiPP

## Maternal Critical Care Structured Review

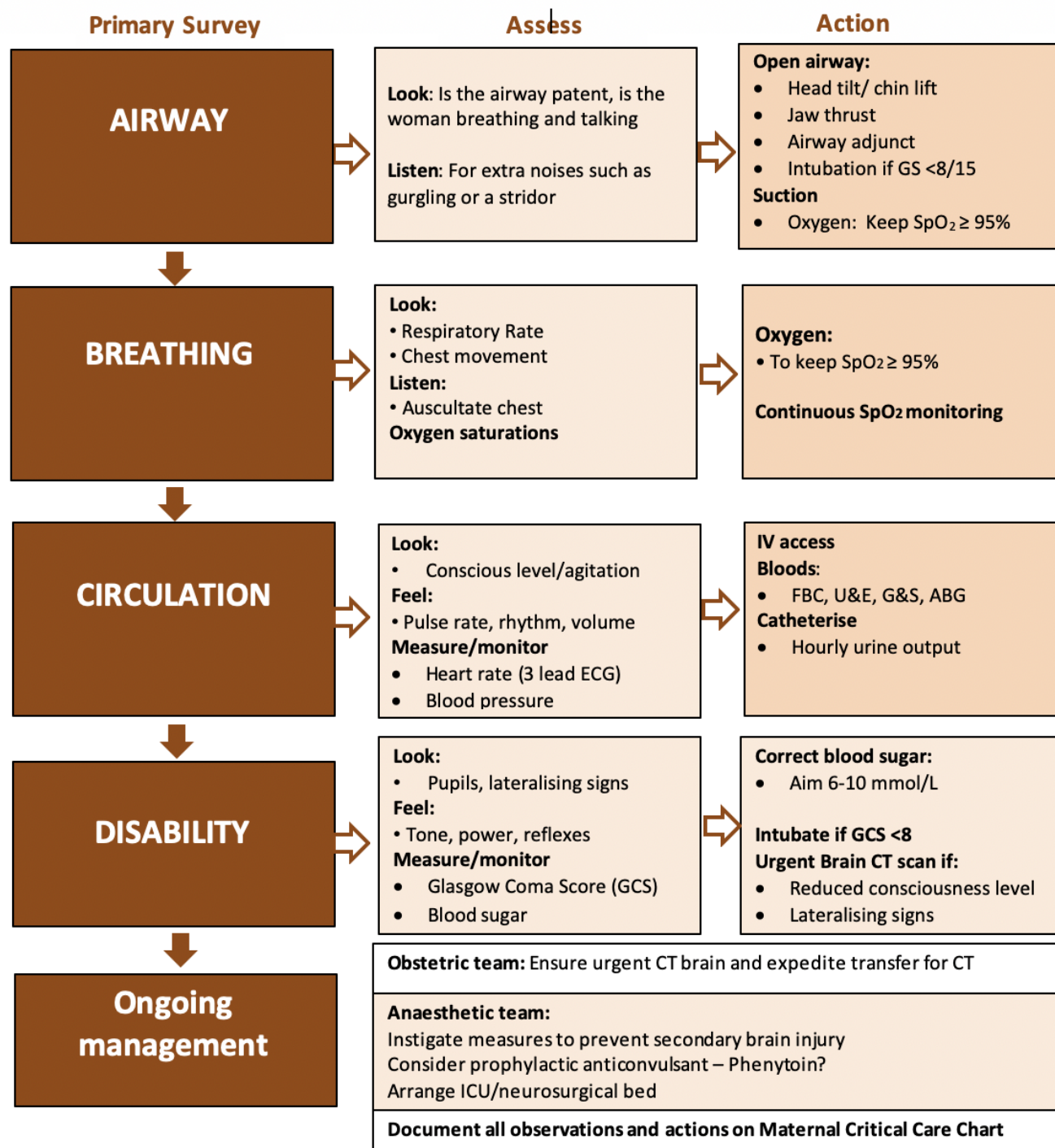
### KEY POINTS

This is designed to be a prompt during the multi professional review of a critically ill pregnant or postpartum woman. This information should be recorded both directly into the woman's notes, handheld or Badgernet, and on the Maternal Critical Care Chart where possible.

	Items to be considered	
A	Airway	
B	Breathing	(Respiratory Rate, SpO <sub>2</sub> , FiO <sub>2</sub> , chest examination findings)
C	Circulation	(Heart rate, BP, capillary refill time, vasopressors)
D	Disability	(level of consciousness, pain, epidural or spinal block)
E	Electrolytes	(Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> levels and eGFR/creatinine)
F	Fluids	Review of fluid balance (input, output, blood loss, drains)
G	GI & Glucose control	(bowel function and gastro- <input type="checkbox"/> protection measures)
H	Haematology	(FBC, clotting profile, VTE prophylaxis)
I	Infection	(temperature, Sepsis Six, inflammatory markers, cultures, antibiotics)
K	Keep records	Document in hand held notes or electronic system
L	Lines	(cannulae, arterial line, central line, urinary catheter, wound drains)
M	Maternal Co-Morbidities	(diabetes, hypertension, asthma, epilepsy)
N	Neonatal considerations	
O	Obstetric	antenatal, intrapartum/postpartum related
P	Pharmacology	(review drug chart)
Q	Questions	
R	Recommendations	
S	Summary / SBAR	

Adapted from PROMPT / CIPP

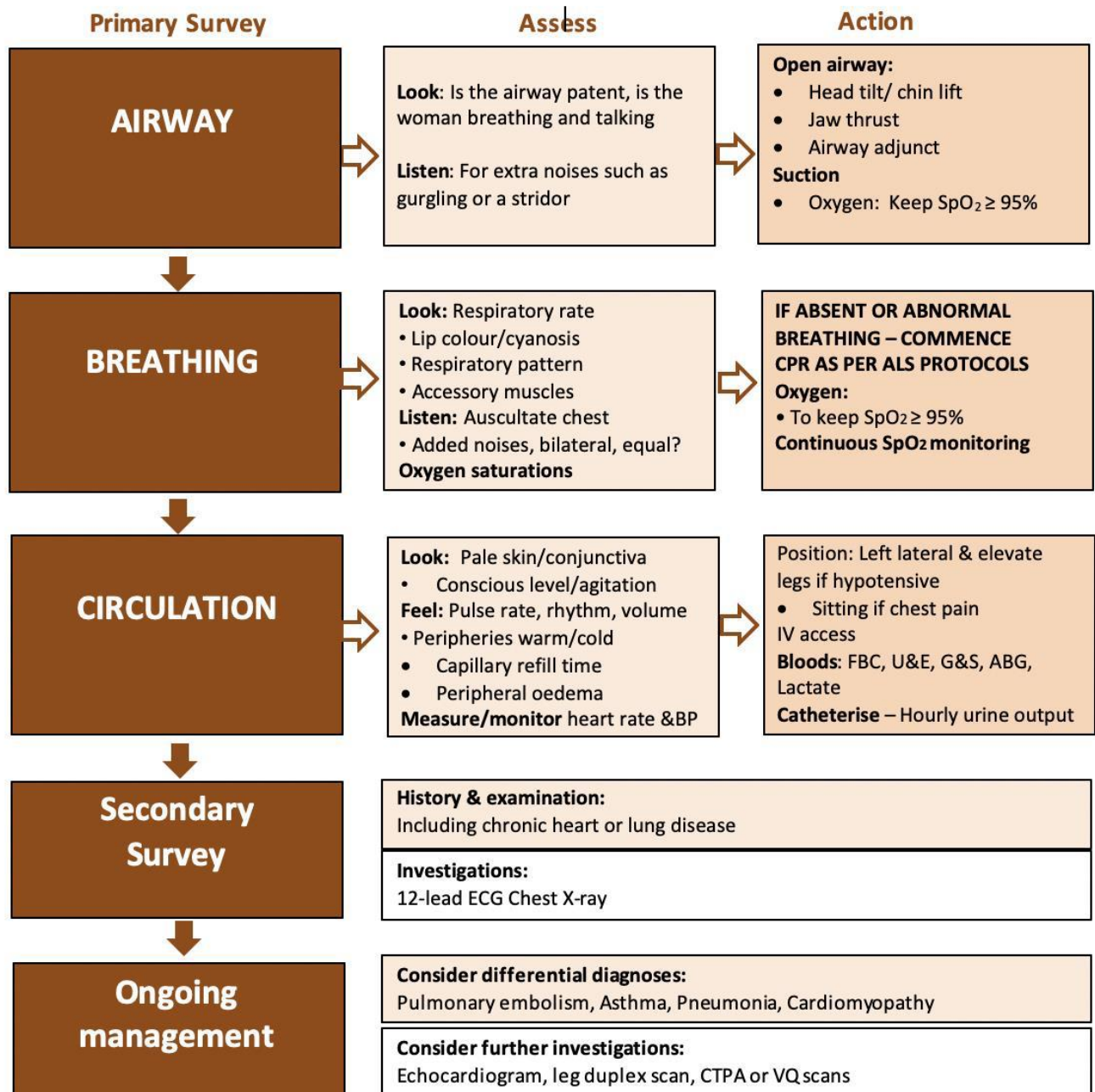
Is this a neurological emergency?	Symptoms	Signs
	<ul style="list-style-type: none"> <li>Headache</li> <li>Altered consciousness level</li> <li>Acute confusion</li> <li>Seizures</li> <li>Limb or facial weakness</li> </ul>	<ul style="list-style-type: none"> <li>Snoring/airway obstruction</li> <li>Altered consciousness level</li> <li>Abnormal neurological signs</li> <li>Seizures</li> <li>Limb or facial weakness</li> </ul>
	<ul style="list-style-type: none"> <li>If unrousable request urgent anaesthetic assistance</li> <li>Urgent CT scan if reduced conscious level or lateralising signs</li> </ul>	



Adapted from PROMPT / CiPP



Is this a cardio-respiratory emergency?	Symptoms	Signs	Cardiac arrest?  Commence CPR
	<ul style="list-style-type: none"> <li>Chest pain</li> <li>Shortness of breath</li> <li>Collapse</li> </ul>	<ul style="list-style-type: none"> <li><b>Tachypnoea</b> (RR&gt;22bpm)</li> <li><b>Tachycardia</b> (&gt;150bpm)</li> <li><b>Bradycardia</b> (&lt;40bpm)</li> <li><b>O<sub>2</sub> saturations</b> (&lt;85% or &lt;92% with oxygen)</li> <li>Hypotension (SBP &lt;90mmHg)</li> <li>Mother unable to speak due to breathlessness</li> </ul>	



Adapted from PROMPT / CiPP

## Suspected Pulmonary Oedema

### DIAGNOSIS—KEY POINTS

#### SOB/tachypnoea:

Can be sudden onset.  
Usually occurs without pyrexia.

#### Cough:

Can be productive of frothy/pink sputum.

#### Hypoxia

#### Fluid balance:

Usually occurs in the context of positive fluid balance, an underlying cardiology diagnosis or pre-eclampsia

#### CXR:

Bilateral patchy infiltrates with pulmonary venous

Structured ABCDE assessment, call for urgent medical review

Baseline observations recorded on Maternal Critical Care Chart

**Initial treatment:**  
Sit upright  
Administer high flow oxygen  
Stop IV fluids  
Consider IV furosemide 40mg

**Investigations:**  
Bedside chest X-ray  
12-lead ECG  
Consider arterial blood gas and bloods (FBC, U&E)  
Urinalysis for proteinuria

From this point onwards, advanced management should be guided by the medical team in collaboration with the senior obstetric team.  
If the woman is ante-partum, there should be an appropriate assessment of fetal well-being

### ADVANCED

Further investigation and management should be guided by medical personnel.

Pulmonary oedema is usually of acute onset and is often easily reversed by offloading fluid through diuretic therapy (e.g. furosemide). Nitrates and opioids are no longer routinely advised.

Other treatments that can be of benefit include high-flow nasal oxygen (e.g. Optiflow, AirVO, NeoFlo, VapoTherm), or CPAP. These provide positive pressure which assist in driving fluid from within alveoli. It may be possible to provide these within an obstetric setting, but if a woman is failing to respond, then critical care referral is advised. Rarely, intubation and ventilation may be necessary to overcome the hypoxic effects of pulmonary oedema.

Pulmonary oedema will rarely occur in healthy women. Its development should prompt the medical team to consider causes, including cardiac failure and severe pre-eclampsia. If an acute cardiac cause is responsible, this may necessitate admission to CCU/ICU for specialist care.

Adapted from PROMPT / CiPP



## Suspected Pulmonary Embolus

### DIAGNOSIS—KEY POINTS

#### Main Symptoms:

Pleuritic chest pain, SOB, possible leg swelling.

#### Main Signs:

Tachypnoea, hypoxia, tachycardia, hypotension, cardiovascular collapse, leg swelling.

#### ECG:

Can show classical S1, Q3, T3 pattern.

#### CXR:

Usually unremarkable

#### Duplex ultrasound:

If clinical signs of DVT

#### CTPA or V/Q scans:

Are definitive investigations

Structured ABCDE assessment, call for urgent medical review

Baseline observations recorded on Maternal Critical Care Chart

**Collapsed/shocked?**

**Administer:**  
High flow oxygen  
Fluids if hypotensive  
Analgesia, e.g. morphine 3-5mg IV  
(titrate until pain free)

Obtain arterial blood gas  
12-lead ECG, chest X-ray & bloods  
(FBC, U&E)  
Consider starting treatment-dose  
Low molecular weight heparin (LMWH)  
pending further investigations  
Duplex USS of legs if signs of DVT  
CTPA or VQ scan if no signs of DVT

**Left lateral**  
High flow oxygen  
IV access & IV fluid bolus  
ALS protocols if cardiac arrest

Urgent consultation and  
multidisciplinary review

Consider urgent echo/CTPA

**Treatment options:**  
IV unfractionated heparin\*  
Thrombolytic therapy  
Surgical thrombectomy

From this point onwards, advanced management should be guided by the medical team in collaboration with the senior obstetric team.  
If the woman is ante-partum, there should be an appropriate assessment of fetal well-being

### ADVANCED

All women presenting with signs and symptoms of an acute PE should have a CXR and ECG.

If there are signs of DVT, duplex ultrasound is the first-line investigation. If this is negative and there is a low level of clinical suspicion, anticoagulation can be discontinued.

If a high level of clinical suspicion remains, or there are no signs of DVT, a CTPA or V/Q scan is recommended. CTPA is preferred if the CXR is abnormal

\* In event of suspected massive PE with shock/maternal collapse, obtain urgent review by a multi professional team. IV unfractionated heparin is the preferred initial treatment:  
Loading Bolus dose of 5000 IU  
Followed by a continuous intravenous infusion

Adapted from PROMPT / CIPP

## Suspected Acute Severe Asthma

### DIAGNOSIS—KEY POINTS

**Main symptoms/signs:**  
Wheeze, SOB, chest tightness, tachypnoea and tachycardia  
**Peak Expiratory Flow Rate (PEFR):**  
Reduced

Structured ABCDE assessment, call for urgent medical review

Baseline observations recorded on Maternal Critical Care Chart

**Administer:**  
High flow oxygen  
Salbutamol 2.5mg nebulised  
Ipratropium 500micrograms nebulised  
Hydrocortisone 200mg IV  
Magnesium 1.2g IV

Obtain arterial blood gas, measure peak flow (PEFR) and consider chest X-ray

From this point onwards, advanced management should be guided by the medical team in collaboration with the senior obstetric team.  
If the woman is ante-partum, there should be an appropriate assessment of fetal well-being

### ADVANCED

If acute severe asthma is suspected, an urgent medical review should be requested and treatment should be commenced. As part of a medical assessment it is helpful to classify the severity of acute asthma:

Severity	PEFR*	Other features
Acute	50-75%	No features of severe asthma
Severe	33-50%	Unable to complete sentences in one breath
Life threatening	<33%	SpO2 <92% /PaO2 .8kPa on air, silent chest, cyanosis, altered conscious level, hypotension, arrhythmias
Near-fatal		Rising PaCO2 / requiring mechanical ventilation

Life threatening or near-fatal asthma both warrant urgent referral to intensive care

*\*Repeat assessment of PEFR is helpful in assessing response to treatment*

Adapted from PROMPT / CiPP



**INPATIENT MATERNAL  
SEPSIS TOOL**

To be applied to all women who are pregnant or up to six weeks postpartum (or after the end of pregnancy if pregnancy did not end in a birth) who have a suspected infection or have clinical observations outside normal limits

<p><b>Staff member completing form:</b>          Date .....          Name .....          Designation .....          Signature .....</p>	<p>Low risk of sepsis. Use standard protocols, consider discharge with safety netting. Consider obstetric needs.</p>															
<p><b>1. Has WOWS triggered?</b> <input type="checkbox"/>          OR does woman look sick? <input type="checkbox"/>          OR is baby tachycardic (<math>\geq 160</math> bpm)? <input type="checkbox"/></p>	<p style="text-align: center;"><b>NO</b></p>															
<p style="text-align: center;"><b>YES</b></p>	<p style="text-align: center;"><b>NO</b></p>															
<p><b>2. Could this be an infection?</b></p> <p>Yes, but source unclear at present <input type="checkbox"/>          Chorioamnionitis/ endometritis <input type="checkbox"/>          Urinary Tract Infection <input type="checkbox"/>          Infected caesarean or perineal wound <input type="checkbox"/>          Influenza, severe sore throat, or pneumonia <input type="checkbox"/>          Abdominal pain or distension <input type="checkbox"/>          Breast abscess/ mastitis <input type="checkbox"/>          Other (specify):..... <input type="checkbox"/></p>	<p style="text-align: center;"><b>NO</b></p>															
<p style="text-align: center;"><b>YES</b></p>	<p style="text-align: center;"><b>YES</b></p>															
<p><b>3. Is ONE maternal Red Flag present?</b></p> <p>Responds only to voice or pain/ unresponsive <input type="checkbox"/>          Systolic B.P <math>\leq 90</math> mmHg (or drop <math>&gt;40</math> from normal) <input type="checkbox"/>          Heart rate <math>&gt; 130</math> per minute <input type="checkbox"/>          Respiratory rate <math>\geq 25</math> per minute <input type="checkbox"/>          Needs oxygen to keep SpO<sub>2</sub> <math>\geq 92\%</math> <input type="checkbox"/>          Non-blanching rash, mottled/ ashen/ cyanotic <input type="checkbox"/>          Not passed urine in last 18 hours <input type="checkbox"/>          Urine output less than 0.5 ml/kg/hr <input type="checkbox"/>          Lactate <math>\geq 2</math> mmol/l <input type="checkbox"/>  <small>(note- lactate may be raised in &amp; immediately after normal labour &amp; delivery)</small></p>	<p style="text-align: center;"><b>NO</b></p>															
<p style="text-align: center;"><b>YES</b></p>	<p style="text-align: center;"><b>YES</b></p>															
<p><b>4. Any Maternal Amber Flag criteria?</b></p> <p>Relatives concerned about mental status <input type="checkbox"/>          Acute deterioration in functional ability <input type="checkbox"/>          Respiratory rate 21-24 OR breathing hard <input type="checkbox"/>          Heart rate 100-130 OR new arrhythmia <input type="checkbox"/>          Systolic B.P 91-100 mmHg <input type="checkbox"/>          Not passed urine in last 12-18 hours <input type="checkbox"/>          Temperature <math>&lt; 36^{\circ}\text{C}</math> or <math>&gt; 38^{\circ}\text{C}</math> <input type="checkbox"/>          Immunosuppressed/ diabetes/ gestational diabetes <input type="checkbox"/>          Has had invasive procedure in last 6 weeks (e.g. CS, forceps delivery, ERPC, cerclage, CVs, miscarriage, termination) <input type="checkbox"/>          Prolonged rupture of membranes <input type="checkbox"/>          Close contact with GAS <input type="checkbox"/>          Bleeding/ wound infection/ vaginal discharge <input type="checkbox"/>          Non-reassuring CTG/ fetal tachycardia <math>&gt;160</math> <input type="checkbox"/></p>																
<p style="text-align: center;"><b>YES</b></p>																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 80%;"></th> <th style="width: 10%;">Time Complete</th> <th style="width: 10%;">Initials</th> </tr> <tr> <td>Send bloods if 2 criteria present, consider if 1</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>Include lactate, FBC, U&amp;Es, CRP, LFTs, clotting</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>Immediate call to ST3+ doctor/ Shift Leader For review within 1hr</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>Time clinician/ Midwife attended</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </table>			Time Complete	Initials	Send bloods if 2 criteria present, consider if 1	<input type="text"/>	<input type="text"/>	Include lactate, FBC, U&Es, CRP, LFTs, clotting	<input type="text"/>	<input type="text"/>	Immediate call to ST3+ doctor/ Shift Leader For review within 1hr	<input type="text"/>	<input type="text"/>	Time clinician/ Midwife attended	<input type="text"/>	<input type="text"/>
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<p><b>Is AKI present? (tick)</b> YES <input type="checkbox"/> NO <input type="checkbox"/></p>																
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<p style="text-align: center;"><b>NO</b></p>																
<p style="text-align: center;"><b>Red Flag Sepsis - Start Sepsis 6 pathway NOW (see overleaf)</b>          This is time critical, immediate action is required.</p>																



## SEPSIS SIX PATHWAY

To be applied to all women who are pregnant or up to six weeks postpartum (or after the end of pregnancy if pregnancy did not end in a birth) who have a suspected infection or have clinical observations outside normal limits

	TIME ZERO	CONSULTANT INFORMED?	INITIALS
Inform Consultant Obstetrician & Obstetric Anaesthetist; OR consider transfer to Obstetric Unit. State patient has <b>Red Flag Sepsis</b>			

Action (complete ALL within 1 hour)			
	TIME COMPLETE	INITIALS	REASON NOT DONE / VARIANCE
<b>1. Administer oxygen</b> Aim to keep saturations > 94%			
<b>2. Take blood cultures</b> At least a peripheral set. Consider e.g. urine, sputum, vaginal swabs, breast milk culture, throat swabs Think source control & timing of delivery of baby-start CTG			
<b>3. Give IV antibiotics</b> According to Trust protocol Consider allergies prior to administration			
<b>4. Give IV fluids</b> If hypotensive/lactate >2mmol/l, 500ml stat (can repeat up to 30ml/kg). Ask doctor regarding fluids if not hypotensive and lactate normal. Ask Anaesthetist regarding fluids if patient has pre-eclampsia			
<b>5. Check serial lactates</b> Corroborate high VBG lactate with arterial sample If lactate >4mmol/l, call Critical Care and recheck after each 10ml/kg challenge			Not applicable- initial lactate <input type="checkbox"/>
<b>6. Measure urine output</b> May require urinary catheter Ensure fluid balance chart commenced & completed hourly			

**If after delivering the Sepsis Six, patient still has:**

- systolic B.P <90 mmHg
- reduced level of consciousness despite resuscitation
- respiratory rate over 25 breaths per minute
- lactate not reducing

**Or if patient is clearly critically ill at any time then call Critical Care Outreach immediately and Contact Obs Consultant Immediately**

**INITIAL ANTIBIOTICS (all IV)**

Antenatal: Cefotaxime 2g QDS + Metronidazole 500mg TDS

Postnatal: Co-amoxiclav Dose 1.2g TDS

If severe infection ADD clindamycin 900mg QDS to above

**SEVERE PENICILLIN ALLERGY** (antenatal and postnatal)

Clindamycin 900mg QDS AND Gentamicin Dose 5mg/kg ideal body weight (3mg/kg if renal dysfunction) OD

**IF FAILURE TO RESPOND CONTACT MICROBIOLOGIST**



Please note that the key documents are not designed to be printed, but to be used on-line. This is to ensure that the correct and most up-to-date version is being used. If, in exceptional circumstances, you need to print a copy, please note that the information will only be valid for 24 hours and should be read in conjunction with the key document supporting information and/or Key Document intranet page, which will provide approval and review information.