Mid Essex Hospital Services NHS
NHS Trust

MANAGEMENT OF AMNIOTIC FLUID EMBOLISM	CLINICAL GUIDELINES Register No: 07039 Status: Public

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Policy to be followed by (target staff)	**Midwives, Obstetricians, Anaesthetists**
Distribution Method	Intranet & Website. Notified on Staff Focus
Related Trust Policies (to be read in conjunction with)	04071 Standard Infection Prevention 04072 Hand Hygiene 06036 Guideline for Maternity Record Keeping 09062 Mandatory training policy for Maternity Services 04247Resuscitation in pregnancy 09095 Management of the severely ill pregnant patient 04234Management of postpartum haemaorrhage 04232 Guideline for the provision of high dependency care and arrangements for the safe and timely transfer to intensive care 07024 Emergency transport of bloods and specimens in the event of a major obstetric haemorrhage 07074 Guideline for neonatal resuscitation 04252 Peripartum collapse

Document Review History:

Version No	Authored/Reviewed by	Active Date
1.0	Nina Smethurst	July 2003
2.0	Judy Evans	June 2007
3.0	Judy Evans	January 2008
4.0	Sarah Moon	June 2011
5.0	Sam Brayshaw, Consultant Anaesthetist	1st May 2014
6.0	Sam Brayshaw, Consultant Anaesthetist	11 July 2017

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1.0 Purpose

1.1 The purpose is to ensure that maternity staff are aware of how to identify and to manage amniotic fluid embolism.

1.2 Provision should be made for up to ten high dependency cases and one intensive care admission per 1,000 deliveries. Failure to recognise the severely ill patient leads to a delay in giving appropriate treatment and has been identified as a major contributing factor in over 60% of all maternal deaths in the UK.

2.0 Equality and Diversity

2.1 Mid Essex Hospital Services NHS Trust is committed to the provision of a service that is fair, accessible and meets the needs of all individuals.

3.0 Definition

3.1 Amniotic fluid embolism is a rare but potentially catastrophic condition. The aetiology is uncertain but is thought to occur in response to amniotic fluid containing vernix and other solids entering the maternal circulation.

3.2 The body responds in two phases:

- Pulmonary vasospasm causing respiratory and cardiovascular collapse
- The development of coagulopathy (DIC) and haemorrhage. Amniotic embolism may occur during labour; 70% or during caesarean section; 19% or post delivery; 11%. Although the incidence is rare, mortality and morbidity are high.

4.0 Diagnosis

4.1 Diagnosis is difficult and may be a matter of exclusion but could be recognised by:

- The onset of severe shock
- Dyspnoea
- Tachycardia
- Cyanosis
- Profuse haemorrhage
- Seizures

4.2 A mast cell tryptase test should be undertaken when diagnosis is suspected; in conjunction with additional blood tests to include clotting and fibrinogen.

5.0 Complications

5.1 Complication following the diagnosis of an amniotic fluid embolism may include:

- Disseminated intravascular coagulation (DIC)
- Multi organ failure
- Death

6.0 Management of Amniotic Fluid Embolism (AFE)

In the event of a patient being diagnosed with AFE:

6.1 Call a **CODE RED.**
(Refer to Appendix A)

6.2 Management is supportive and should follow an ABC approach:

- **AIRWAY:** check the airway is open, apply 100% oxygen, consider intubation if the patient is unconscious

- **BREATHING:** check the patient is breathing and oxygen is being given, if intubated ventilate with 100% oxygen

- **CIRCULATION:** check for a pulse, insert 2 large bore venflons (16G or above) take blood for cross match, FBC, U&E, LFTs & clotting screen. Administer rapid IV fluids such as hartmans in an initial bolus of 20ml/kg. Administer further fluids, blood and blood products as required. Administer inotropes as required.

6.3 If the patient is antenatal put her in a full left lateral position and consider early delivery of the baby.

6.4 Apply full monitoring to the patient: ECG, blood pressure, pulse oximetry, urinary catheter. Other monitoring to consider: oesophageal Doppler or lidco, arterial line, central line, echocardiogram.

6.5 Anticipate the need for intensive care and have early liaison with the intensive care team.

6.6 Anticipate on-going coagulopathy. Involve the consultant haematologist. Consider giving blood, FFP, fibrinogen platelets and tranexamic acid.

6.7 If there is severe pulmonary hypertension consider use of pulmonary vasodilators such as nitric oxide and nebulised prostacycline.

6.8 Document events contemporaneously in the patient's healthcare records

7.0 Fetal Considerations and Management

7.1 In some instances, and of course most favorable for the fetus, AFE does not occur until after delivery. When AFE occurs before or during delivery, however, the fetus is in grave danger from the onset because of the maternal cardiopulmonary crisis.

7.2 Continuous monitoring should remain in progress.

7.3 Ensure that the patient is positioned in the left lateral position.

7.4 As soon as the mother's condition is stabilized, delivery of the viable infant should be expedited.

7.5 Alert the paediatric team and call a **Code Blue** if birth is imminent.
(Refer to the 'Guideline for neonatal resuscitation'; register number 07074)
(Refer to Appendix A)

7.6 If resuscitation of the mother is futile, an immediate Grade 1 emergency caesarean delivery may be necessary to save the infant. The sooner after maternal cardiopulmonary arrest that the fetus is delivered, the more favorable is the fetal outcome.
(Refer to the guideline for 'Peripartum Collapse'; register number 04252)

8.0 Transfer to Intensive Therapy Unit (ITU)

8.1 In severe cases, transfer of the patient to ITU may be necessary. When this situation arises, the appropriate guideline should be followed
(Refer to the 'Guideline for the provision of high dependency care and arrangements for the safe and timely transfer to intensive care'; register number 04232) and 'Resuscitation in Pregnancy'; register number 04247)

9.0 Staffing and Training

9.1 All midwifery and obstetric staff must attend yearly mandatory training which includes skills and drills training, maternal resuscitation and early recognition of the ill patient.
(Refer to 'Mandatory training policy for Maternity Services (incorporating training needs Analysis)'; register number 09062)

9.2 All midwifery and obstetric staff are to ensure that their knowledge and skills are up-to-date in order to complete their portfolio for appraisal.

10.0 Professional Midwifery Advocates

10.1 Professional Midwifery Advocates provide a mechanism of support and guidance to women and midwives. Professional Midwifery Advocates are experienced practising midwives who have undertaken further education in order to supervise midwifery services and to advise and support midwives and women in their care choices.

11.0 Infection Prevention

11.1 All staff should follow Trust guidelines on infection control by ensuring that they effectively 'decontaminate their hands' before and after each procedure.

11.2 All staff should ensure that they follow Trust guidelines on infection prevention. All invasive devices must be inserted and cared for using High Impact Intervention guidelines to reduce the risk of infection and deliver safe care. This care should be recorded in the Saving Lives High Impact Intervention Monitoring Tool Paperwork (Medical Devices).

12.0 Audit and Monitoring

12.1 Completed adult resuscitation checklists will be collected and archived on a monthly basis to assess overall compliance each month.

12.2 Audit of compliance with this guideline will be considered on an annual audit basis in accordance with the Clinical Audit Strategy and Policy (register number 08076), the Corporate Clinical Audit and Quality Improvement Project Plan and the Maternity annual audit work plan; to encompass national and local audit and clinical governance identifying key harm themes. The Women's and Children's Clinical Audit Group will identify a lead for the audit.

12.3 The findings of the audit will be reported to and approved by the Multi-disciplinary Risk Management Group (MRMG) and an action plan with named leads and timescales will be developed to address any identified deficiencies. Performance against the action plan will be monitored by this group at subsequent meetings.

12.4 The audit report will be reported to the monthly Directorate Governance Meeting (DGM) and significant concerns relating to compliance will be entered on the local Risk Assurance Framework.

12.5 Key findings and learning points from the audit will be submitted to the Patient Safety Group within the integrated learning report.

12.6 Key findings and learning points will be disseminated to relevant staff.

13.0 Guideline Management

13.1 As an integral part of the knowledge, skills framework, staff are appraised annually to ensure competency in computer skills and the ability to access the current approved guidelines via the Trust's intranet site.

13.2 Quarterly memos are sent to line managers to disseminate to their staff the most currently approved guidelines available via the intranet and clinical guideline folders, located in each designated clinical area.

13.3 Guideline monitors have been nominated to each clinical area to ensure a system whereby obsolete guidelines are archived and newly approved guidelines are now downloaded from the intranet and filed appropriately in the guideline folders. 'Spot checks' are performed on all clinical guidelines quarterly.

13.4 Quarterly Clinical Practices group meetings are held to discuss 'guidelines'. During this meeting the practice development midwife can highlight any areas for future training needs will be met using methods such as 'workshops' or to be included in future 'skills and drills' mandatory training sessions.

14.0 Communication

14.1 A quarterly 'maternity newsletter' is issued to all staff to highlight key changes in clinical practice to include a list of newly approved guidelines for staff to acknowledge and familiarise themselves with and practice accordingly. Midwives that are on maternity leave or 'bank' staff have letters sent to their home address to

update them on current clinical changes.

14.2 Approved guidelines are published monthly in the Trust's Staff Focus that is sent via email to all staff.

14.3 Approved guidelines will be disseminated to appropriate staff quarterly via email.

14.4 Regular memos are posted on the guideline and audit notice boards in each clinical area to notify staff of the latest revised guidelines and how to access guidelines via the intranet or clinical guideline folders.

15.0 References

CNST Maternity Clinical Risk Management Standards (2010/11) Version 1, Standard 2, Criterion 9; High dependency care.

Johanson R et al managing Obsteric Emergencies and Trauma 2003 RCOG Press
Marsh S et al 2002 Clinical Protocols in Labour London Parthenon

Cordingly JJ & Rubin AP (2000). A survey of Facilities for High Risk Women in Consultant Obstetric Units. Journal of Obstetric Anaesthesia 6: 156-160

Mid Essex Hospital Services NHS Trust
Women's and Children's Directorate

There are two types of emergencies (code RED and code BLUE) that require urgent 'crash call' responses using the new 4444 emergency call number.

Initiating an emergency

6 Co-ordinator/senior staff member to initiate code
7 Dial 4444
8 Specify code **RED** or code **BLUE** (see below criteria)
9 Give location to switchboard (e.g. A4, Maternity – Delivery Suite or Postnatal Ward)

Code RED for obstetric emergencies

- Grade 1 caesarean section
- Major/ massive haemorrhage
- Maternal fitting
- Cord prolapse

Code RED switchboard will fast bleep the following:

- Labour ward co-ordinator (#6555 2017)
- On call obstetric registrar
- On call obstetric SHO
- On call anaesthetist
- On call anaesthetic assistant
- On call paediatric registrar
- On call paediatric SHO
- Theatre scrub team

Code BLUE for collapsed baby

Code BLUE switchboard will fast bleep the following:

- Labour ward co-ordinator (#6555 2017)
- On call paediatric registrar
- On call paediatric SHO
- Advanced neonatal nurse practitioner (Mon – Fri, 08:00 – 21:00 only)
- Resus officer (will only attend if available)

****** In the event of a cardiac arrest you will still need to dial 2222******

Amended: April 2014