MATERNITY UNIT

GUIDELINE: Amniotic fluid embolism

AUTHOR: Obstetrician & Midwifery Educator & Quality

SCOPE: All midwives and obstetricians working in the maternity unit

PURPOSE: To provide guidance on the management of amniotic fluid embolism in order to improve the chances of maternal and fetal survival.

DEFINITIONS: Amniotic fluid embolism is a rare but catastrophic emergency in which amniotic fluid, and other debris, enters the pregnant woman's blood stream via the placental bed of the uterus and causes an allergic reaction.

GUIDELINE
Hauora Tairawhiti has adopted the **PMMRC 'Amniotic Fluid Embolism (AFE) Management** – see below).

Amniotic Fluid Embolism (AFE)

Definition
Amniotic Fluid Embolism (AFE) is a rare but catastrophic obstetric emergency in which amniotic fluid, and other debris, enter the pregnant woman's blood stream via the placental bed of the uterus and cause an allergic reaction. The incidence of AFE is in the order of 1 in 16,000 to 1 in 55,000 pregnancies. AFE was equal to hemorrhage as the most common cause of maternal death in the most recently published PMMR report (2015).

The clinical diagnosis is based on the presentation with cardiovascular collapse or coagulopathy in the absence of other potential explanation. Women with mild cases of AFE usually recover without sequelae, but the overall fatality rate with severe AFE is high and case fatality rates of 13% to 30% are reported in recent studies. Neurological damage may occur in some survivors. Perinatal outcome is good in infants born to women who develop AFE following delivery but the perinatal mortality rate is high (154 in 1,000) if AFE develops prior to delivery.

Risk factors
Two studies from North America have reported increased rates of AFE with maternal age >35 years, caesarean section, instrumental delivery, preeclampsia, placenta praevia and placental abruption. Medical induction of labour was found to be a risk factor but the majority of women who develop AFE have no identifiable underlying risk factors. Although the most frequently cited risk factors for AFE appear to be cesarean delivery, instrumental vaginal delivery, placental abnormalities (praevia, abruption, accreta), and preeclampsia/eclampsia [23,24], no clinical or demographic risk factor is sufficiently predictable of AFE to alter

standard obstetric practice or conclude that AFE would not have occurred in a particular patient in the absence of that risk factor

Signs and symptoms

AFE usually presents during labour or around delivery, although cases have also been reported in first and second trimester abortion and as late as 48 hours postpartum and following amniocentesis or abdominal/uterine trauma.

Premonitory symptoms have been described and include breathlessness, chest pain, feeling cold, light headedness', restlessness, distress, panic, nausea and vomiting, pins and needles. Pain is not usually a feature.

Early symptoms include a sudden onset of dyspnoea and hypotension which is frequently followed by cardiovascular collapse and respiratory arrest. In 10-20% of cases these events are preceded by seizure-like activity. In women who survive this initial phase, coagulopathy frequently follows. In 10-15% of patients coagulopathy is the presenting manifestation.

Clinical management

The goal of treatment is to correct hypoxaemia and hypotension so that ischaemic consequences are prevented. Current treatment consists of aggressive oxygenation, treatment of circulatory collapse and counteracting coagulopathy while ruling out other diagnoses. Prompt delivery may prevent fetal asphyxia and improve fetal outcome when AFE occurs prior to delivery, as well as play a key part in maternal resuscitation. The woman will require transferring to ICU once stable.

CALL for HELP – 777 and request crash team plus anaesthetist, theatre team, obstetrician & paediatrician. Ensure you have the crash trolley in the room.

<u>Circulatory collapse</u>

1. Oxygen should be given at high concentrations of at least 10-15L/min and unconscious patients should be immediately intubated and ventilated.
2. Intravascular access should be obtained.
3. Treat hypotension with crystalloid and blood products. Avoid excess fluid administration.
4. Vasopressors should be used to improve ventricular function, inotropes also have a place.
5. Other therapies include inhaled nitric oxide for pulmonary hypertension.
6. Perimortem c-section should be considered within 5 minutes of collapse if fetus undelivered to aid in maternal resuscitation. Preparations for emergent perimortem c-section should be initiated simultaneously with initiation of CPR.

<u>Coagulopathy and major obstetric haemorrhage</u>

Development of coagulopathy and major obstetric haemorrhage should be anticipated.
In the event of bleeding, the **massive transfusion protocol** should be activated.

1) Baseline bloods should be taken to assess the presence and degree of coagulopathy and a group and antibody screen taken to allow blood for transfusion.

Baseline bloods required:
i) Blood for group and antibody screen/ crossmatch (pink tube)
ii) FBC in edta tube (purple top)
iii) Coagulopathy screen in citrate tube (blue top).

2) Management of coagulopathy
Disseminated intravascular coagulation with rapid consumption of blood clotting proteins especially fibrinogen and also platelets is very common and develops very rapidly in AFE compared to other causes of major haemorrhage.

Aggressive pre-emptive replacement of blood and blood products should take place according to the Massive Transfusion Protocol under the direction of the obstetrician and anaesthetist.

3) Haemorrhage should be aggressively managed with uterotonic agents, uterine tamponade and examination to exclude co-existent genital tract trauma that may exacerbate blood loss. Early administration of tranexamic acid recommended, for example at the time the MTP is activated. Severe ongoing uterine bleeding that does not respond to first line measures requires rapid recourse to more invasive techniques such as bracing suture (B-Lynch suture), uterine artery ligation, peripartum hysterectomy.

Recombinant activated Factor 7 has been used in management of severe obstetric haemorrhage that is unresponsive to standard treatment and is available from Hauora Tairawhiti blood bank. Options for second line treatment will be dependent on the expertise and resources available locally.

<u>Post cardiac arrest management</u>

1) Fluids, vasopressors, and inotropes with the goal to maintain mean arterial blood pressure of 65 mmHg.
2) Fever may worsen ischemia-reperfusion injury to the brain and should be aggressively treated.
3) HyPERoxia will also worsen ischemia-reperfusion injury. Administration of 100% oxygen after survival of cardiac arrest should be avoided.
4) Inspired fraction of oxygen should be weaned to maintain a pulse oximetry value of 94-98%.
5) Transfer to a tertiary care may be required once the patient is stable.

<u>References</u>

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ASSOCIATED DOCUMENTS

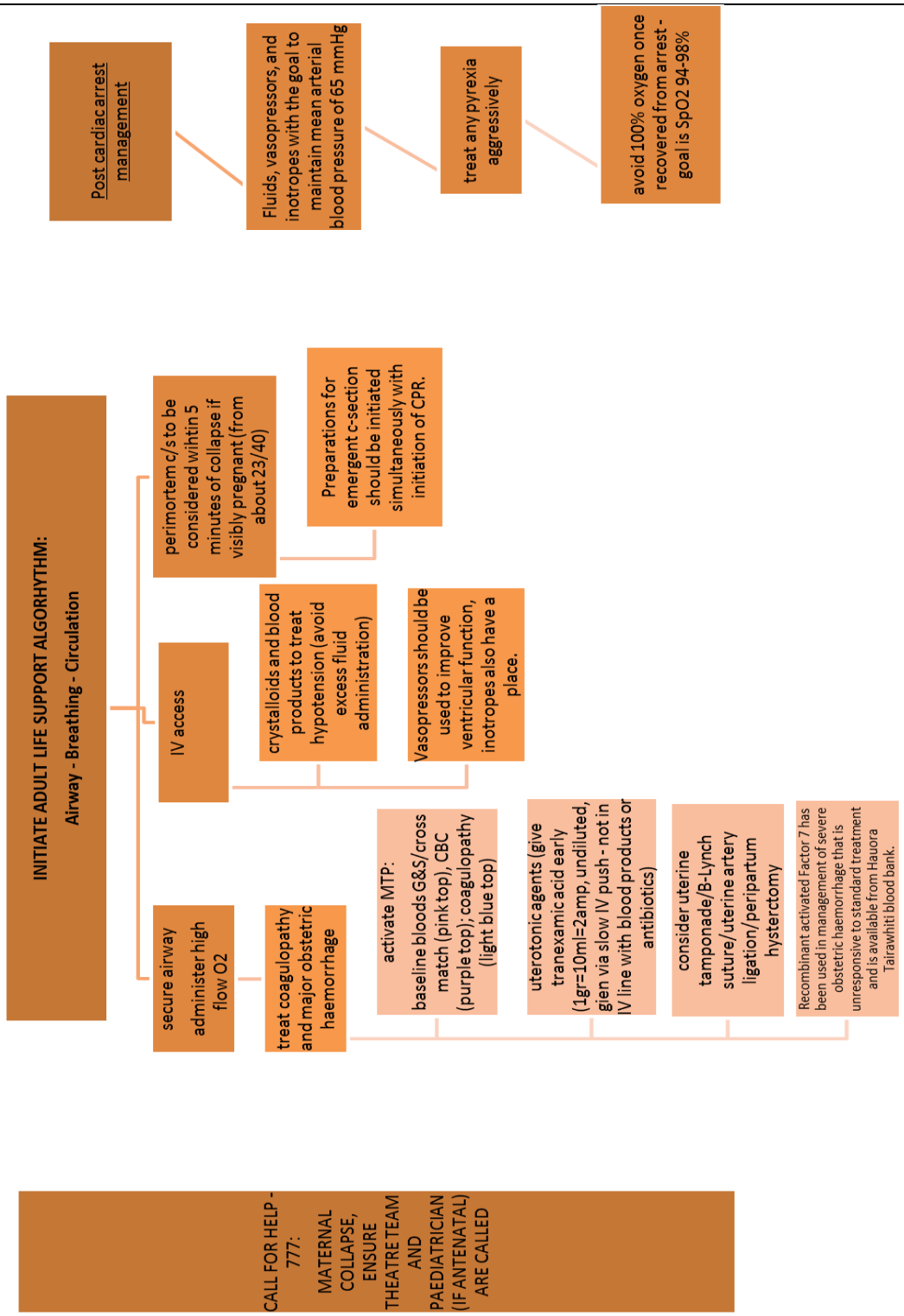
Hauora Tairawhiti Resuscitation policy
Hauora Tairawhiti Rapid Massive Transfusion Protocol

Authorised by (HOD Obstetrics)

Authorised by (Clinical Care Manager Women, Child and Youth)

Date of Approval: November 2019

Next Review Date: **November 2022**


CALL FOR HELP - 777: MATERNAL COLLAPSE, ENSURE THEATRE TEAM AND PAEDIATRICIAN (IF ANTENATAL) ARE CALLED
INITIATE ADULT LIFE SUPPORT ALGORHYTHM: Airway - Breathing - Circulation
secure airway administer high flow O2
IV access
perimortem c/s to be considered wihtin 5 minutes of collapse if visibly pregnant (from about 23/40)
Preparations for emergent c-section should be initiated simultaneously with initiation of CPR.
crystalloids and blood products to treat hypotension (avoid excess fluid administration)
Vasopressors should be used to improve ventricular function, inotropes also have a place.
treat coagulopathy and major obstetric haemorrhage
activate MTP: baseline bloods G&S/cross match (pink top), CBC (purple top); coagulopathy (light blue top)
uterotonic agents (give tranexamic acid early (1gr=10ml=2amp, undiluted, given via slow IV push - not in IV line with blood products or antibiotics)
consider uterine tamponade/B-Lynch suture/uterine artery ligation/peripartum hysterctomy
Recombinant activated Factor 7 has been used in management of severe obstetric haemorrhage that is unresponsive to standard treatment and is available from Hauora Tairawhiti blood bank.
Post cardiac arrest management
Fluids, vasopressors, and inotropes with the goal to maintain mean arterial blood pressure of 65 mmHg
treat any pyrexia aggressively
avoid 100% oxygen once recovered from arrest - goal is SpO2 94-98%