Maternal Collapse Guideline

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Summary of document:
The aim of this document is to:
Identify and correctly manage maternal collapse

Scope:
This guidance applies to all health care professions proving care for women during pregnancy.
The guidance uses the term “woman” (pronouns she or her) to describe individuals whose sex assigned at birth was female, whether they identify as female, male or non-

binary. It is important to acknowledge it is not only people who identify as women for whom it is necessary to access women's health and reproductive services. Therefore, this should include people who do not identify themselves as women but who are pregnant or have recently given birth. Obstetric and midwifery services and delivery of care must therefore be appropriate, inclusive and sensitive to the needs of those individuals whose gender identity does not align with the sex that they were assigned at birth.

To be read in conjunction with:

Prompt (Practical Obstetric Multi-Professional Training) Course manual (2017)

1090. In the Event of a Maternal Death Policy [opens in new tab]

1242. All Wales Guideline for Maternity Transfers from Community and Freestanding Midwifery Units
https://www.rcog.org.uk/globalassets/documents/guidelines/gtg_56.pdf [opens in new tab]

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Keywords
Maternal Collapse

Glossary of terms

MEWs	Maternity Early Warning score
ALS	advanced life support
BLS	Basic life support

Key points:
Please summarise key points of the document

Contents

Scope

This guidance applies to all health care professions proving care for women during pregnancy.

Aim

The aim of this document is to:
Identify and correctly manage maternal collapse.

Objectives

The aim of this document will be achieved by the following objectives:

- Summarise and standardise practice with regard to maternal collapse and initiate basic life support in a timely and correct manner.

1. Introduction

Maternal collapse is defined as an acute event in the woman involving the cardiorespiratory systems and/or brain, resulting in a reduced or absent conscious level and potentially Cardiac Arrest/ death at any stage in pregnancy and up to six weeks after birth.
Maternal collapse is a rare but life-threatening event with a wide range of underlying causes. The outcome, primarily for the mother but also the fetus, depends on prompt and effective resuscitation.
If the collapse happens in pregnancy the fetus will be affected by the maternal compromise,
Maternal resuscitation is the primary aim.

2. Presentation

Presentation in Maternal collapse may range from an isolated and temporary drop in blood pressure resulting in a simple faint to cardiac arrest and death.

Use of the Maternity Early Warning score (MEWS) chart can identify early warning of deterioration and becoming critically ill. In some cases, maternal collapse occurs with no prior warning although there may be some existing factors that make this more likely.

Antenatal care for those women with significant medical conditions that are at risk of maternal collapse should include multidisciplinary team input in pregnancy with a pregnancy and birth management plan in place.

Any of the vital observations in table 1 below should trigger an immediate emergency response.

Table 1.	Observations that Trigger an emergency response
Airway	• Obstructed or noisy
Breathing	• Respiratory rate less than 5 or more than 35 breaths/minute
Circulation	• Pulse rate less than 40 or more than 140 beats/minute • Systolic blood pressure less than 80 or more than 180mmhg
Neurology	• Sudden decrease in level of consciousness • Unresponsive or responsive to painful stimuli only • Seizures

3.0 Classification of possible causes of maternal collapse in systematic way.

Classification of possible causes of Maternal Collapse in a Systematic way:	
Head	Eclampsia, epilepsy, cerebrovascular accident, vasovagal response
Heart	Myocardial infarction, arrhythmias, peripartum cardiomyopathy, congenital heart disease, dissection of thoracic aorta
Hypoxia	Asthma, pulmonary embolism, pulmonary oedema, anaphylaxis
Haemorrhage	Abruption, uterine atony, genital tract trauma, uterine rupture, uterine inversion, ruptured aortic aneurysm.
Whole body and Hazards	Hypoglycaemia, amniotic fluid embolism, septicaemia, trauma, complications of anaesthesia

3.1. Most common reversible causes of collapse/ Arrest

The most common reversible causes of collapse/ cardiac arrest can be remembered using the *aide memoire* employed by the Resuscitation Council (UK) categories of the 4 **T**'s and the 4 **H**'s, with the addition of Eclampsia and Intracranial Haemorrhage for pregnant women (RCOG 2019)

Reversible cause		Cause in pregnancy
4H's	Hypovolaemia	Bleeding (obstetric/other; may be concealed) or relative hypovolaemia of dense spinal block, septic or neurogenic block
	Hypoxia	Pregnant women can become hypoxic more quickly. Cardiac events – peripartum cardiomyopathy, myocardial infarction, aortic dissection, large vessel aneurysms
	Hypo/hyperkalaemia and Hyponatraemia	Hypo and hyperkalaemia are no more likely. Hyponatraemia may be caused by oxytocin use
	Hypothermia	No more likely
4T's	Thromboembolism	Amniotic fluid embolus, pulmonary embolus, air embolus, myocardial infarction
	Toxicity	Local anaesthetic, magnesium, other
	Tension pneumothorax	Following trauma/suicide attempts
	Tamponade	Following trauma/suicide attempts
Eclampsia and pre-eclampsia		Includes intracranial haemorrhage

- Although consideration should be given to the cause of the collapse throughout the resuscitation process, this should never delay the initiation or continuation of resuscitation. The immediate resuscitative management of all conditions is the same for any woman who collapses before, during, or after labour.

4.0 Initial Management of Maternal Collapse

- Follow Basic Life Support Algorithm:/Maternal Collapse Algorithm
- Assess responsiveness of woman by gently shaking her and asking if she is alright – if no response seek immediate help.
- **Pull emergency buzzer, dial 2222 in hospital setting,** (see section 7.0 for community setting)

State Obstetric Emergency and Adult Cardiac Arrest Team for Maternal collapse. State location.
If neonatal team are required call 2222 and request Neonatal Emergency.

- Turn woman onto her back and ask an assistant to manually displace the uterus to the left using one or two hands to reduce aortocaval obstruction. A 30-degree tilt can be used if a woman is on a firm surface that can be tilted (e.g. an operating table).
- Open the airway using head tilt and chin lift manoeuvres.
- Assess breathing for up to 10 seconds at arm's length by observation and hand flat on chest.

Agonal gasps (isolated or infrequent gasping in the absence of other breathing in an unconscious person) occur commonly in the first few minutes after a cardiac

arrest; they are an indication for starting CPR immediately and should not be confused with normal breathing.

- While assessing breathing, observe for other signs of life, such as colour and movement.
- If there are no signs of life, commence basic life support using Maternal Collapse Algorithm (Appendix A) until help arrives (to provide advanced life support/ ALS) or the woman shows signs of life.

- If the woman has signs of life, place her in recovery position and give high-flow oxygen via a reservoir mask. Obtain IV access, take blood samples (FBC, clotting, U&E's, glucose, LFT's, G&S) and give IV fluids.

- Establish monitoring of vital signs with ECG, respirations, pulse, BP and pulse oximetry.

- Perform a primary obstetric survey.

4.1 Primary Obstetric Survey

This initial assessment should produce a working assessment and should enable treatment of the cause of the collapse to commence. Perform obstetric survey in logical manner starting at head and working down.

Primary Obstetric Survey:	
Head	How responsive is woman? Is she alert, responsive to: voice, painful stimuli or unresponsive (AVPU)?
Heart	Capillary refill? Pulse and rhythm? Blood pressure? Is there a murmur?
Chest	Good bilateral air entry? Respiratory rate? Oxygen saturation? What do breathe sounds like? Trachea central? Complaining of chest pain
Abdomen	Acute abdomen (rebound and guarding)? Tenderness (uterine or non-uterine)? Is the fetus alive? Is there a need for a laparotomy to expedite birth?
Vagina	Is there bleeding? What is stage of labour? Is there an inverted uterus
Legs	Evidence of deep vein thrombosis (DVT)?

4.2 Decisions on continuing treatment

After Primary survey cause and treatment required may be evident e.g. eclampsia or haemorrhage. If it is not evident only a few key decisions are necessary.

1	Is fluid resuscitation a priority or is it contraindicated? If in doubt, fluid is usually beneficial. The exception is when the woman has, or is at great risk of, pulmonary oedema, as may happen in severe pre-eclampsia or renal failure.
2	Is a laparotomy required for diagnosis or treatment? Is there evidence of an acute abdominal event? Does the fetus need birth to aid resuscitation?
3	Is sepsis likely and are antibiotics therefore a priority?
4	Is intensive care needed to provide airway, respiratory or circulatory support?

4.3 Secondary Obstetric Survey

When the woman has been stabilised, a secondary obstetric survey should be performed.

Further Management is dependent upon the cause of the collapse.

Secondary Obstetric Survey	
History	Revisit the history of the collapse and the previous history of the woman. Read the notes and ask the partner or relatives
Examine	Repeat the examination from 'top to toe'
Investigate	Take arterial blood gases, troponins, blood glucose, lactate, blood cultures, ECG, chest x-ray, ultrasound of the abdomen and HVS
Monitor	Continue monitoring of ECG, respirations, pulse, blood pressure and pulse oximetry. Consider arterial and central venous pressure lines to aid monitoring.
Pause & think further	Consider further investigations such as CT/MRI scans and echocardiography. Ask relevant experts for their opinions

5. Maternal Cardiac Arrest

If there are no signs of life, commence basic life support/ Maternal Collapse algorithm (Appendix A) until help arrives to provide advanced life support (ALS) (see appendix C) or the woman shows signs of life.

Please Note: With severe collapse and no cardiac output in a pregnant woman more than twenty weeks gestation a perimortem caesarean birth should be considered if resuscitation is not successful in four minutes and performed within five minutes to aid maternal resuscitation. This is a senior obstetric decision.

- Adult life support techniques must be maintained during the birth.

Below 20 weeks of gestation urgent birth is not indicated as maternal cardiac output is unlikely to be compromised by the gravid uterus.

6. Post Resuscitation

- Following birth if the resuscitation is successful the woman will be transferred to theatre to complete the operation and for stabilisation.

- Assessment and resuscitation of the infant will be managed by the neonatal team.

- The ongoing management of the maternal collapse will require close collaboration within the multi-disciplinary team and will be dependent upon the cause of the collapse following the relevant guideline.

- The woman will be nursed in the environment most appropriate for her condition i.e. HDU on the Labour Ward, ITU, ICU or a specialist tertiary unit.

- In the unfortunate event of a maternal demise please follow the guideline for the Local Management of a Maternal Death

7. Maternal Collapse in the Community Setting

- Assess responsiveness of woman by gently shaking her and asking if she is alright – if no response seek immediate help
- The Midwife should phone 999 or give instructions to someone else to phone 999 for an ambulance: Request a Paramedic and state ““Maternal collapse. It is an obstetric emergency and requires an immediate emergency transfer to nearest hospital with attached obstetric led unit.”
- If second person present, ring 999 and ask location and code of local Automated External Defibrillator (AED) send someone else (if possible) to fetch it (if safe to do so)
- Turn woman on her back if no respiratory effort.

- Open the airway using head tilt and chin lift manoeuvres.
- If woman is pregnant and there is a third person present manually displace the uterus to the left using one or two hands to reduce aortocaval obstruction.
- Assess breathing for up to 10 seconds (at arm's length, by observation and hand flat on chest).
  Agonal gasps (isolated or infrequent gasping in the absence of other breathing in an unconscious person) occur commonly in the first few minutes after a cardiac arrest; they are an indication for starting CPR immediately and should not be confused with normal breathing.
- While assessing breathing, observe for other signs of life, such as colour and movement.
- If there are no signs of life, commence basic life support (using Community Algorithm for BLS Appendix B) until help arrives (to provide advanced life support) or the woman shows signs of life.
- In community setting if there is a lone trained healthcare attendant perform continuous Cardiac compressions. If a second trained health care attendant is available, then ventilation with bag valve mask should be attempted (ideally two-person technique). If third person present, then manual uterus displacement should be attempted.
- If the woman has signs of life, place her in left lateral or recovery position.
  Assess ABCDE* Recognise and treat:
  - Oxygen
  - Monitor vital signs with respirations, pulse, BP, Oxygen saturation (if available)
  - IV access to be obtained if possible.

Obstetric unit to be informed of situation.

8. Documentation

Accurate and contemporary documentation is essential in all cases of maternal collapse, whether or not resuscitation is successful, from all staff groups involved in care birth.

• The Health Board resuscitation proforma which is kept on the resuscitation trolley must be completed for all cases. (If collapse in community setting, please contact Resuscitation department by phone or by email to inform and provide details).

• Datix Incident Reporting form must be completed.

9. Communication

- A scribe should be allocated to ensure that all events are recorded as contemporaneously as possible.
- The mother and her family must be debriefed following the event.

- The mother and the family should be informed that an investigation into the incident will be undertaken and that their views on events will be sought.
- Debrief and support of staff. Consider wellbeing support.

Auditable Standards

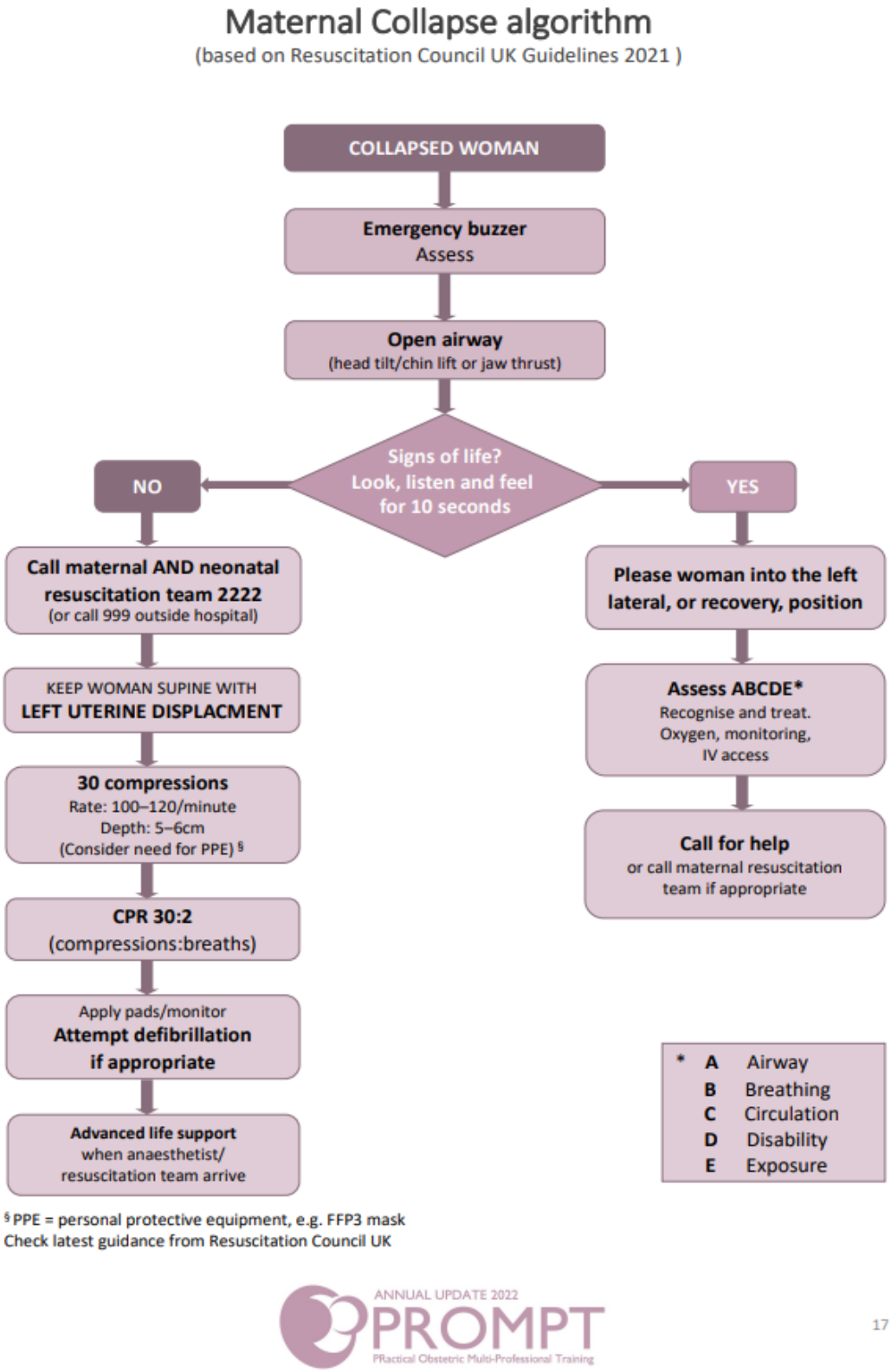
References

Maternal Collapse in Pregnancy and Puerperium Green Top Guideline 56. RCOG, 2019.https://www.rcog.org.uk/globalassets/documents/guidelines/gtg_56.pdf - opens in new tab

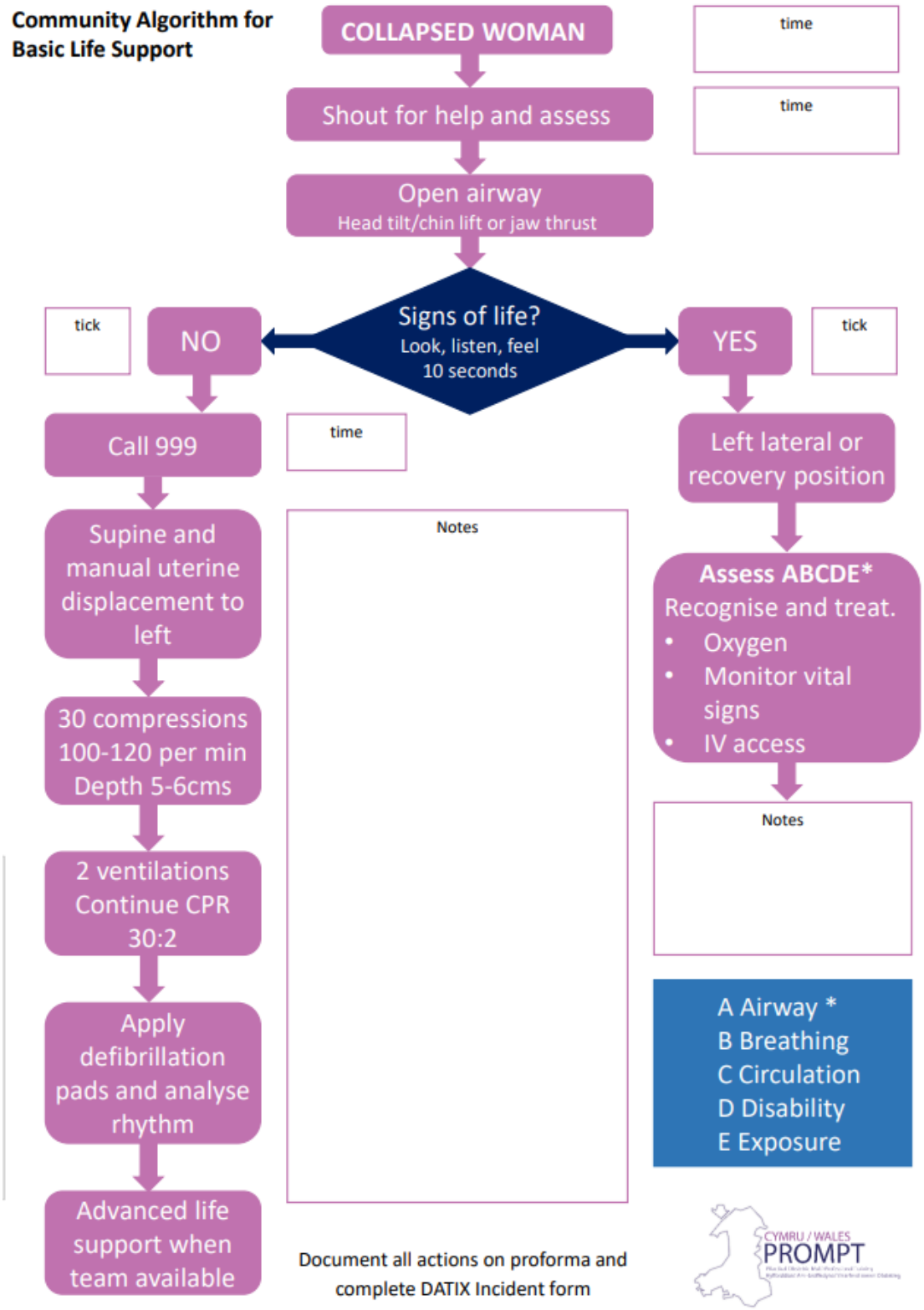
Prompt (Practical Obstetric Multi-Professional Training) Course manual 2017.

Resuscitation Council UK. https://www.resus.org.uk/ - opens in new tab

Appendix A. Maternal collapse algorithm



Appendix B Community Algorithm for Maternal Collapse.



Appendix C Maternal Cardiac Arrest Algorithm.