

Background Reading & Appendix to Management of Major Obstetric Haemorrhage Guideline Chart and Algorithm

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Background

In the UK, severe obstetric haemorrhage had been previously estimated to be 3.7 per 1000 births. The SCASSM 10 year report issued in 2012 estimated Wishaw rates to equal the national average of 5.8/1000 births. This local and National figure was based on estimated and not measured blood loss. Since 2012, practice has changed to measured blood loss and the incidence has increased significantly.

Saving Lives, Improving Mothers' care in December 2018 from the MBRRACE-UK and Ireland Confidential Enquiries reported a near doubling of maternal death rate from haemorrhage in 2013-2015, almost entirely due to an increase in the numbers of women dying from placenta accreta, increta or percreta. 31 women died in the UK and Ireland from obstetric haemorrhage between 2013 and 2015, one after 42 days after the end of the pregnancy (mortality rate 0.88). 9 women died from haemorrhage in association with abnormal placentation, 8 of whom had placenta accreta, increta or percreta (*see related guideline and checklist*). Nine women died from amniotic fluid embolism, and five of these women were induced.

Key haemorrhage messages this report highlighted some recurrent themes from the 2014 and 2016 reports, and were:-

- 1) Haemorrhage should be considered when classic signs of hypovolaemia are present (tachycardia and / or agitation and the late signs of hypotension) even in the absence of revealed bleeding. *Do not rely on a single haemoglobin result.*
- 2) When there has been a massive haemorrhage, and the bleeding is ongoing, or there are clinical concerns, then *a massive haemorrhage call should be activated*
- 3) Once a *retained placenta* is diagnosed, *obstetric review and transfer to theatre should be expedited and MEWS carefully recorded (at appropriate frequency and escalated appropriately)*. Concealed bleeding can be marked and deterioration is likely.
- 4) *Misoprostol should always be used with extreme caution* for women with late intrauterine fetal death *especially in the presence of a uterine scar*. In those women dinoprostone (or PGE2) may be more appropriate
- 5) *Recurrent bleeding, pain or agitation* should be seen as "red flags" in women with *placenta accreta* and women should be advised to remain in hospital
- 6) *Early recourse to hysterectomy* is recommended where bleeding is associated with *placenta accreta or uterine rupture* or when bleeding occurs after an *unsuccessful intrauterine balloon*. In extremis/ and or while waiting for assistance, aortic compression and stepwise uterine devascularisation can help.
- 7) There is a need for consideration of how competence in abdominal hysterectomy can be achieved for obstetricians in training, and how these skills can be maintained at consultant level e.g. through simulation training, such as the locally delivered COMPOD course.

Both reports highlight the importance of human factors with a multidisciplinary approach to

- anticipate and avoid haemorrhage
- recognise the signs of hypovolaemia
- accurately measure blood loss
- prompt effective resuscitation with measures to control the bleeding quickly

We require advance planning to mount such a rapid and coordinated response.

Quality Improvement Programmes for Obstetric Haemorrhage

Protocols for recognising and responding to haemorrhage are associated with improved outcomes as a result of decreased use of blood products and less need for higher level intervention such as uterine artery embolisation and hysterectomy.

The California Maternal Quality Care Collaborative demonstrated over a 50 % reduction in maternal mortality, 21% reduction in morbidity and 70 % less transfusions in hospitals who implemented the obstetric haemorrhage toolkit.

The Scottish Patient Safety Maternity and Children's Quality Improvement Collaborative (MCQIC) have produced a **4 stage approach to PPH** (https://ihub.scot/media/2135/pph-4-stage-practical-guide_final.pdf) which promotes a multiprofessional team approach to the readiness, recognition of, response to and recording of postpartum haemorrhage.

Readiness incorporates both System level and Patient level Readiness to respond to haemorrhage.

System Level Readiness – includes PROMPT/ Simulation Training, use of a PPH trolley, Skills drills (including Debriefing), and up to date MOH and Related Protocols*

Patient Level Readiness - includes appropriate preparation for those with special factors- such as placenta praevia, accreta and percreta with MDT involvement, planning for women who decline blood transfusion and recognition and management of anaemia which includes appropriate and timely antenatal referral for intravenous iron.

Management of Anaemia in Pregnancy

<http://firstport2/staff-support/maternity/Documents/Clinical%20Guidelines/Anaemia%20in%20Pregnancy%20MAR%202015.pdf>

Blood Sampling (Including Transfusion)

<http://firstport2/staff-support/maternity/Documents/Clinical%20Guidelines/Blood%20Transfusion%20Sampling%202015.pdf>

[20Guideline%202015%20V3.pdf](#)

Guideline for the Management of a Woman who refuses Blood and Blood Components

<http://firstport2/staff->

[support/maternity/Documents/Clinical%20Guidelines/Refusal%20of%20Blood%20and%20Blood%20Components-August%202018%20Update.pdf](http://firstport2/staff-support/maternity/Documents/Clinical%20Guidelines/Refusal%20of%20Blood%20and%20Blood%20Components-August%202018%20Update.pdf)

Other *Related protocols include intravenous iron policy, Placenta Praevia and Accreta and Blood Clotting Disorders) and 4 stage approach to Postpartum Haemorrhage (https://ihub.scot/media/2135/pph-4-stage-practical-guide_final.pdf) which is on Badger

1. **Stage Zero** is considered **Readiness** for PPH with antenatal and intrapartum risk assessment, measured blood loss at delivery and Active Management Third Stage of labour
2. **Recognition of bleeding** includes **Stages Zero to Three** with use of MEWS, and ongoing Measurement of Blood Loss (MBL) for all patients.
3. **Response** is the recognition and treatment according to cause, with ongoing MBL, frequency of MEWS and escalation of signs of impending maternal collapse, and requires fluid and /or blood product replacement, and teamwork with critical communication and situational awareness of stages. Critical communication may include calling out blood loss, calling out vital signs, and knowing the responsibilities of each member of the team so everyone in the team are working together to improve the womans' outcome and to prevent further harm.
4. **Reporting** is complete documentation, debrief, anticipatory planning and data collection for system based quality improvement through reporting and system learning.

Measurement of Blood Loss

Procedure

- **Weigh all bloody items in grams**
- **Subtract dry weights in grams**
- **Remaining weight in grams = ml blood loss**
 - **1 gram = 1ml**

For example 400g = 400ml blood loss

a) Process for measurement of blood loss following vaginal delivery in room

- Change incontinence pads following delivery of baby and prior to delivery of placenta
- Discard those with liquor
- Measure those blood stained
- Continue to monitor loss- visually estimate (if loss ongoing and heavy call for assistance) otherwise change pads and measure
- Following completion of third stage measure all blood loss on scales and document.
- If blood loss ongoing and >500ml contact medical staff follow 4 stage PPH approach
- Document further loss following fourth stage of labour –i.e. 2 hours post delivery
- For instrumental delivery
- Measure blood loss from under buttock drape
- Document

b) Procedure for blood loss measurement at an Instrumental delivery / MROP in Theatre

- Connect suction to port on under buttock Drape
- Communicate total blood loss following delivery of placenta
- Advise operator of blood loss >750ml especially if ongoing.
- At end of procedure give total loss from swabs / drapes and suction jar

c) Process for measuring blood loss at Caesarean Section

- Observe liquor volume in suction jar at time of delivery - Document liquor volume on white board
- At beginning of uterine repair observe measured and estimated (e.g. floor and drape spill) blood loss and communicate this to medical staff
- Following closure of uterus give volume of blood loss i.e. swab weight and loss noted in suction jar / any spills to operator /anaesthetist. Weigh drapes if necessary.
- At end of procedure communicate total blood loss at operation
- Blue theatre table sheet to be bagged at end of procedure and weighed on L.W scales add to loss from theatre

Maternal weight & Percentage blood loss

Maternal weight	Estimated total blood volume (mL)	15% blood loss (mL)	30% blood loss (mL)	40% blood loss (mL)
50 kg	5000	750	1500	2000
60 kg	6000	900	1800	2400
70 kg	7000	1050	2100	2800
80 kg	8000	1200	2400	3200

Percentage Blood Loss and Vital signs (MEWS)

Blood loss	Clinical features	Level of shock
10% blood loss ~500 mL if 50 kg ~800 mL if 80 kg	Mild tachycardia Normal blood pressure	Compensated
15% blood loss ~750 mL if 50 kg ~1200 mL if 80 kg	Tachycardia (> 100 bpm) Hypotension (systolic 90–80 mmHg) Tachypnoea (21–30 breaths/minute) Pallor, sweating Weakness, faintness, thirst	Mild
30% blood loss ~1500 mL if 50 kg ~2400 mL if 80 kg	Rapid, weak pulse (> 120 bpm) Moderate hypotension (systolic 80–60 mmHg) Tachypnoea (> 30 breaths/minute) Pallor, cold clammy skin Poor urinary output (< 30 mL/hour) Restlessness, anxiety, confusion	Moderate
40% blood loss ~2000 mL if 50 kg ~3200 mL if 80 kg	Rapid, weak pulse (> 140 bpm) or bradycardia (< 60 bpm) Severe hypotension (< 70 mmHg) Pallor, cold clammy skin, peripheral cyanosis Air hunger Anuria Confusion or unconsciousness, collapse	Severe

'Rule of 30'

30% of Blood volume is probably lost if:

Fall of Systolic BP by 30

Heart Rate rises by 30

Respiratory Rate rises >30

Hb or Haematocrit drops by 30%

Urine Output <30ml/hr

Moderate to Severe Shock is likely

Measurement of Vital Signs (MEWS)

Vital Sign	Aim	Frequency of recording		
Heart rate	< 100/min	5 minute	Tachycardia is usually an early sign of significant blood loss	Occasionally relative bradycardia can persist despite significant blood loss
Systolic BP	> 90mmHg	5 minute	Can be maintained at normal levels even when there has been significant blood loss	Hypotension can be an indication of impending cardiovascular collapse
Respiratory Rate	8 – 20/min	5 minute	very sensitive and early indicator of pathology	
SpO ₂	> 94%	15 minutes	Inability to record SpO ₂ may indicate poor peripheral perfusion secondary to hypovolaemia	
Capillary Refill Time (CRT)	< 2 seconds	As required	Peripheral vasoconstriction will result in cool peripheries which can be formally assessed by measuring CRT	
Conscious Level	Record every 30 minutes using the AVPU system:	30 minutes	Alert/ Responding to Voice only/ Responding to Pain only Unresponsive	
Urine Output via catheter	> 0.5 ml/kg/hour	Hourly		
Temperature	Continuously monitored in theatre	Hourly	Hypothermia has significant deleterious effects including coagulopathy and increased risk of sepsis and therefore should be avoided	Use Bair Hugger

References

- 1) Healthcare Improvement Scotland – 4 stage approach to PPH
<https://ihub.scot/media/5687/20180124-pph-4-stage-approach-final.pdf>
https://ihub.scot/media/5690/pph-4-stage-practical-guide_final.pdf
- 2) RCOG Green Top 52 Postpartum Haemorrhage, Prevention and Management
<https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg52/>
- 3) SCASMM Report Healthcare Improvement Scotland: Scottish Confidential Audit of Severe Maternal Morbidity- reducing avoidable harm. 10th annual report. SCASMM 2014 –
www.healthcareimprovementscotland.org/ourwork/reproductive_maternal_child/programme_resources/scassmm.aspx.
- 3) MBRRACE December 2018 Messages for prevention and treatment of morbidity from major obstetric haemorrhage
<https://www.npeu.ox.ac.uk/downloads/files/mbrance-uk/reports/MBRRACE-UK%20Maternal%20Report%202018%20-%20Web%20Version.pdf>
pages 23-33
- 4) Californian Ob- Hemorrhage Toolkit <https://www.cmqcc.org/resources-toolkits/toolkits/ob-hemorrhage-toolkit>

Originator: Dr T Dunn / Dr S Maharaj / Obstetric Haemorrhage Group
Reviewed: Dr K Bennett and Dr G Peters - July 2013
Ratified: Clinical Effectiveness Maternity Sub Group May 2014
Review date: July 2017
Revised: Dr Willocks - December 2018
Ratified: Clinical Effectiveness Maternity Sub Group July 2019
(PDF version Uploaded June 2020)
Review date: July 2022 (date corrected Jan 2023)

MAJOR OBSTETRIC HAEMORRHAGE / MOH (INC STAGE 3 PPH)
BLOOD LOSS > 1500ML/ 30% BLOOD LOSS/ ANY SIGNS CIRCULATORY COLLAPSE
(RR >25, HR >120, BP < / = 90/40 MMHG , SAO₂ < 95% , URINE OUTPUT < 30 ML / HOUR)

ANY WORRYING OR UNCONTROLLED BLEEDING;

ANTEPARTUM

if > / = 24 w commence CTG and consider need for and mode of delivery

PATIENTS REFUSING BLOOD

Refer to NHSL protocol on refusal of blood and blood components

CALL FOR HELP

Telephone 2222, state 'obstetric emergency' and location. This will alert;

Maternity unit coordinator / obstetric ST and FY2/ GPST / anaesthetic resident / theatre team and Monday – Friday 0900-1700, consultant obstetrician / consultant anaesthetist

Out-of-hours, contact the consultant obstetrician and consultant anaesthetist via the switchboard

Haematology

- ◆ Maternity unit coordinator Page 062 (haematology BMS)
- ◆ State 'Major Obstetric Haemorrhage' and name, CHI and location BMS will contact portering

MATERNITY UNIT COORDINATOR

will act as a MOH coordinator

UNCONTROLLED SEVERE HAEMORRHAGE WITH LIKELY COAGULOPATHY

- ◆ Consider O negative blood
 - + 2 units in theatre fridge, more available in lab
- ◆ Order trauma pack
 - + MOH call will give 4 units PRC + 4 FFP. Requesting trauma pack will provide 6 units PRC+ 4FFP
 - + 2:1 replacement....
- ◆ If bleeding continues and blood results still not available, order further 4 PRC's/4 FFP/ 1 pool platelets
- ◆ Consider vitamin K

MASSIVE HAEMORRHAGE (> 10 UNITS PRC)

- ◆ Give 1:1 replacement RCC/ FFP / cryo / platelets and discuss extreme measures with haematologist

MAJOR OBSTETRIC HAEMORRHAGE

- ◆ Follow guidance below

RESUSCITATION

- Airway - ensure not obstructed
Breathing - oxygen 15 L/min via trauma mask, assist if required
Circulation;
- ◆ 2 large bore IV cannulae
 - ◆ Send blood for cross match 4 units, FBC, U&Es, coagulation screen
 - ◆ Up to 2 litres of warmed crystalloid or colloid
 - ◆ Fluid warmer and infusion pressure bags
 - ◆ 'Level 1' infusion warming device
 - ◆ Consider O negative blood
 - ◆ If full crossmatch not available, initially group specific
 - ◆ Anticipate needs / transfer to theatre if in room and ongoing bleeding
 - ◆ Request and transfuse PRC as clinically indicated
 - ◆ If full crossmatch not available, initially group specific / Consider O negative blood
 - ◆ Give FFP after 2 units RCC and Cryoprecipitate/platelets according to haemodynamic status and blood results (discuss with haematology)

MONITORING AND INVESTIGATIONS

- ◆ Continuous monitoring of all vital signs
- ◆ Repeat FBC (haemacue) coagulation screen, U&Es, calcium, ABGs, regularly and after blood products
- ◆ Consider invasive monitoring

BLOOD AND BLOOD COMPONENTS

- | | | |
|-------------------|---|-------------------------|
| ◆ PRC | Group O negative - immediately available
Group specific - 10 to 15 minutes to issue
Fully cross matched - 35 minutes to issue | ◆ Haemoglobin > 8g/dl |
| ◆ FFP | Dose 12 to 15 ml/kg
30 minutes to issue | ◆ PTR / APTR < / = 1.5 |
| ◆ Platelets | Dose 1 pool (or 2 pools if < 30)
1 pool in lab, others may have to come from Glasgow | ◆ Platelets > 75 |
| ◆ Cryoprecipitate | Dose 2 pools
30 minutes to issue | ◆ Fibrinogen > / = 2g/L |

STOP THE BLEEDING (FOR PPH NOT APH)

- ◆ Assess and treat cause
- ◆ Urinary catheter and hourly urine volumes
Give Tranexamic Acid 1g over 10 minutes and consider repeat dose if ongoing bleeding
- ◆ Give iv antibiotics for every 1500 ml
Tone Massage fundus +/- Bimanual uterine compression
- ◆ IV syntocinon 5 units slowly
- ◆ Slow IV injection or IM ergometrine* 500mcg (avoid if history hypertension).
- ◆ IM syntocinon 40 iu in 500ml saline @ 125ml/hr
- ◆ Consider repeat slow IV injection or IM ergometrine 500mcg and IV syntocinon 5 units
- ◆ Consider intrauterine balloon if second line uterotonics ineffective
- ◆ Consider misoprostol * up to 1,000 micrograms (5 tablets) rectally or sublingual
- ◆ Consider IM hemabate* 250mcg into thigh muscle (can be repeated every 15 minutes to maximum 8 doses) (*note contraindications)

Tissue Ensure placenta complete

Trauma Suture any obvious lacerations of vagina and cervix or extensions of uterine incision

Thrombin Treat coagulopathy

A. First Line Surgical Measures

- 1 Examination under anaesthesia/Manual removal placenta/ Intrauterine balloon tamponade/Cervical tear repair
- 2 Laparotomy: B-Lynch suture/Resuture uterine incision

B. Consider advanced surgical techniques: Stepwise uterine devascularisation - Request help from vascular surgeon (Hairmyres Switchboard) Hysterectomy

C. Extreme measures Contact Interventional Radiologist via UHH switchboard (01355 585000) or #6183. (No on call service).

REMEMBER

- ◆ If antepartum, displace uterus if > 20 weeks
- ◆ Measure and communicate ongoing blood loss
- ◆ Blood test results will lag behind current situation - Liaise closely with each other and labs
- ◆ Concealed haemorrhage
- ◆ Scribe (refer PPH field unless NA) and correct patient identification / labelling of samples
- ◆ Coordinator will inform BMS on '062' to stand down MOH when haemorrhage is under control
- ◆ Surgical sign out and Debrief – complete PPH post event checklist (unless NA) and debrief rather than post event requirements
- ◆ Consider subsequent care; ACCU or surgical high dependency unit or room 4 in ward 24
- ◆ Refer to first port for further commentary (policies>clinical policies>laboratories)

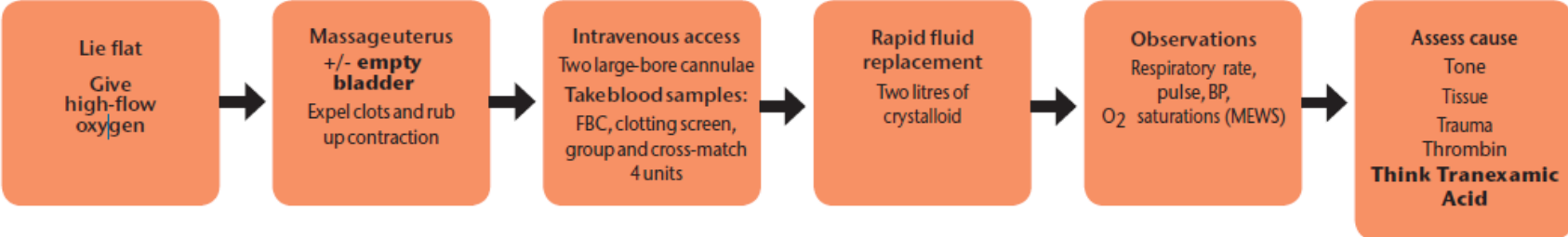
Immediate management of major postpartum haemorrhage

(stages 1-3) ≥ 500 ml for SVD/Instrumental deliveries

Algorithm for the initial management of a major PPH in room

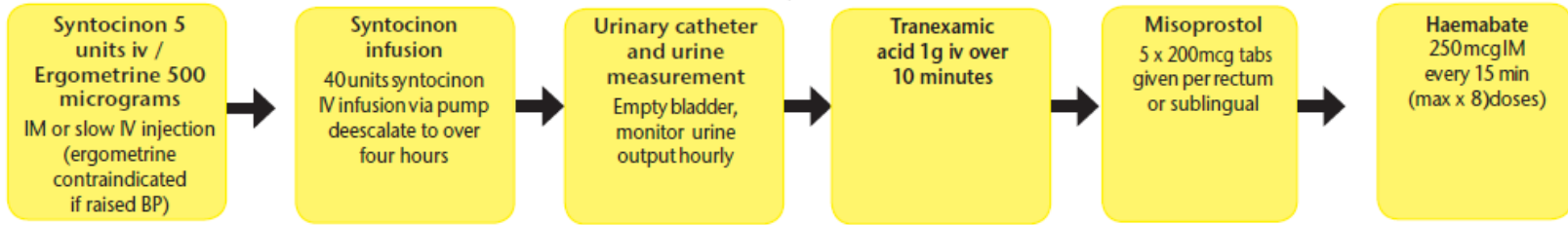
Call for help - Ext 2222
Senior Midwives, experienced obstetricians, anaesthetists, theatre staff.

INITIAL ACTIONS



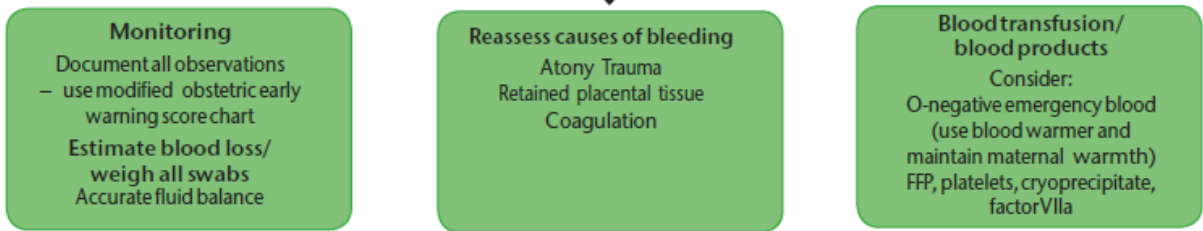
Stop the bleeding

ONGOING MANAGEMENT



Massage uterus and bimanual compression AND Repair perineal/vaginal/cervical tears

Assessment



FOR ONGOING HAEMORRHAGE (Stage 3)
 $\geq 1.5L$, ARRANGE THEATRE, declare **MOH via 062** and refer to the NHSL Major Obstetric Haemorrhage Flow Chart and Guideline