QUICK REFERENCE GUIDE

MANAGEMENT OF MAJOR OBSTETRIC HAEMORRHAGE

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General points on PPH and OBSCymru

- Management of PPH is founded upon 4 pillars of care defined in OBSCymru, allowing for timely identification and prompt management
    - Risk assessment
    - Early identification by measuring blood loss
    - Multi-disciplinary team working
    - Point of care Rotem testing
- Early identification allows escalating levels of care to be given as promptly as possible, therefore many of our resuscitation measures will be underway before the MOH protocol is activated.
- Below is a description of OBSCymru and therefore our, approach to PPH and the measures that should have been commenced before the MOH protocol is activated.

OBSCymru

- **OBSCymru Postpartum Haemorrhage (PPH) Management Checklist (see Appendix 1) is the standard of documentation expected in all PPHs**
- All women wherever possible should have contemporaneous measured blood loss (MBL) during delivery
    - This may well require the presence of a second person in the room with the delivering midwife to ensure this is possible.
    - MBL can be documented on the OBSCymru checklist.
- Patients in theatre should also have contemporaneous measured blood loss
    - Documented on MBL board and communicated to team
    - Careful noting of liquor volume by theatre staff to ensure not added in to MBL
    - Ensuring timely change of / suction attached to Y-drapes during perineal procedures
- Extreme care should be taken for patients at the lower extremities of weight as any given MBL will be a significantly higher percentage of their total blood volume (see Appendix 2)
- Stage 0 should be completed on admission, stage 1 at 500ml MBL, proceeding to stage 2 at 1000ml MBL and to stage 3 at 1500ml MBL

Stage 0 – Complete before delivery

All women on the consultant led unit (CLU) should have this checklist in their notes with Stage 0 completed on admission

- Stage 0 is the risk assessment for haemorrhage
- If a woman is at increased risk, then steps should be taken to prepare for haemorrhage including:
    - Communicating risk to obstetric and anaesthetic teams
    - Ensure patient is suitable for electronic issue (EI) blood (If not suitable then X-matched for 2 units)
    - Large bore IV access
    - Do blood loss triggers need to be amended for low BMI / weight?
    - Plan active 3rd stage management

Stage 1 – 500ml MBL

- Notify midwife in charge
- HCA help with contemporaneous MBL
- Monitor BP, HR, oxygen saturations, RR on MEOWS chart (every 10 mins)
- Large bore IV access (if not already in place)
- Identify possible causes (Tone / Trauma / Tissue / Thrombin)
- Uterine massage
- Uterotonics
- Tranexamic Acid 1g (Note can be prophylactically after delivery in CS with high risk of PPH)
- Consider
    - Emptying bladder
    - Inspect genital tract
    - Check placenta complete
    - Bimanual compression
- Ensure clear leadership and document on OBSCymru chart

Stage 2 – 1000ml MBL or clinical concern of further bleeding

- Get help – midwife in charge, Obstetrician, Anaesthetist, HCA
- Ensure ongoing contemporaneous MBL (at least every 15 mins)
- Continue monitoring and record on MEOWS (every 10 mins)
- 2nd IV access
- Send bloods URGENTLY for
    - Venous blood gas – blood gas syringe (processed on labour ward)
    - Rotem – blue top bottle (processed on labour ward)
    - FBC – Purple top bottle (send to laboratory)
    - Coagulation – blue top bottle (send to laboratory)
    - X-match – pink top bottle (send to laboratory)
    - Remember to ring laboratory to inform them that samples are on way
- Fluid bolus
- Then consider
    - Further uterotonics
    - Tranexamic acid 1g IV (if not already given)
    - Bimanual compression
    - EUA uterus
    - Empty bladder
    - Surgical interventions i.e B-Lynch suture / Bakri balloon (See appendix 4 & 5)
    - Inspect and repair genital tract
    - Placenta checked and complete
- Ensure Rotem results are documented in OBSCymru chart (interpretation flow chart for ROTEM is to be found in Appendix 3)

Stage 3 >1500ml MBL or ongoing clinical concern

- Ensure blood loss communicated to team
- Activate Major Obstetric Haemorrhage (MOH) protocol (see activating MOH section)
    - Clinical judgement should be used when it is considered that the MOH protocol should be activated at less than 1500ml MBL; for example:
        - Rapid, ongoing blood loss that looks likely to exceed 1500ml or
        - Low booking weight (as % of total blood volume lost will be higher)
- Inform obstetric and anaesthetic consultants
- Porter will attend labour ward for blood collection slip
    - 4 units of O negative blood will be available immediately from blood bank fridge
    - 4g Fibrinogen will be available immediately from blood bank
    - Liaise with blood bank re further transfusion requirement (see Blood Bank below)
    - If patient is suitable for electronic issue then fully cross-matched blood will available rapidly and therefore should be considered
- Order coagulation products as per ROTEM protocol (see appendix 3)
- Review causes – Tone / Trauma / Tissue / Thrombin
- Repeat 1g tranexamic acid with ongoing bleeding after 30 minutes
- Consider advanced surgical techniques (see below) – does patient need to be moved to theatre?

ACTIVATING MAJOR OBSTETRIC HAEMORRHAGE

- **CALL 3333 AND TELL THEM**

    MAJOR OBSTETRIC HAEMORRHAGE

    LABOUR WARD

    NAMED CONTACT (Usually Band 7 midwife)

    TELEPHONE NUMBER FOR THIS CONTACT (CISCO PHONE 25675)

    - This will alert only
        - Blood Bank
        - Porters (and Portering manager)
        - Clinical site matron
        - Consultant Haematologist
- If further clinical staff are required i.e. on-site O and G or anaesthetic personnel, theatre team or anaesthetic nurse then an **Obstetric Emergency** team should also be asked for.
- If ante-partum haemorrhage ensure the neonatal team are specifically asked for
- If non-resident consultants are required this needs to be specifically requested

Communication

Blood bank

- On receiving the MOH call from switchboard, blood bank will ring the labour ward co-ordinator (CISCO phone 25675)
- Blood bank will request the details of the patient
- 4 units of O negative blood will be available to be collected from blood bank fridge immediately along with 4g Fibrinogen
- However, as many of our patients are electronic issue then there may be other blood rapidly available that is also suitable
- Blood bank will decide the most appropriate blood that can be provided in a timely manner
- The porter is to collect this blood and fibrinogen from blood bank
- Blood bank should be told if the person designated to communicate with them will change i.e. labour ward co-ordinator to consultant anaesthetist

Porter

- On activation of the MOH protocol a porter will make their way to labour ward
- On arrival they are to be given a blood request form with the details of the patient
- They can also be given urgent blood samples from the patient to transport to laboratory
- They will then go straight to blood bank and pick up the blood and fibrinogen, returning straight to labour ward
- They will remain on labour ward, dedicated to the MOH patient until they are informed by the band 7 midwife they can leave

Treatment for uterine atony

- Bimanual uterine massage
- Uterotonics
    - Syntocinon 10 iUnits IM or 5 iUnits IV (x2)
    - Syntometrine 5 iUnits / 500microgrammes IM
        - Caution in hypertension
    - Syntocinon infusion 40 iUnits in 500ml NaCl 0.9% at 125ml / hr
        - Alternative regimen if fluid restricted
        - Eg 40iUnits (4ml of 10iUnits/ml) in 36mls NaCl 0.9% at 10ml / hr
    - Ergometrine up to 500 microgrammes IM/IV (IV given slowly by anaesthetist)
        - Caution in hypertension
    - Misoprostil 1.2g PR
    - Carboprost 250microgrammes IM, maximum every 15 mins
        - Up to 2mg total dose
        - Caution in asthmatics
- Advanced surgical techniques
    - B-lynch suture (see appendix 4)
    - Bakri balloon (see appendix 5)
    - Consider hysterectomy (2nd O and G consultant may be helpful)

Fluid and blood replacement

- Initial resuscitation will be with crystalloid (Hartmann's solution)
- All fluids should ideally be warmed (warmed fluid in warming cabinet in theatre)
- Although O negative blood may initially be delivered to labour ward this may not be required immediately. If it is not, then consideration should be given as to whether group specific or indeed fully cross-matched blood are available, if they are then they should be used.
- It is not possible to define specific transfusion thresholds for red cells as it is dependent on many criteria including speed of blood loss. Decision to transfuse should be decided by the clinical team at the time of the PPH.
- However, the following can be used for guidance:
    - Hb >80g/L
    - Plts >75 $x10^9$ /L
    - Rotem guided fibrinogen replacement
        - Fibtem A5 ≥12mm No fibrinogen
        - Fibtem A5 7-11mm 4g Fibrinogen
        - Fibtem A5 <7mm 6g Fibrinogen
    - Laboratory fibrinogen >2g/L
        - Only to be used if Rotem unavailable or unsuitable
    - When Fibtem A5 >12mm AFTER transfusing Fibrinogen then review Extem CT
        - Extem CT <75secs No FFP
        - Extem CT ≥75secs Give FFP (See Appendix B)
- All of above can be given without contacting consultant haematologist
- However, if ongoing bleeding or coagulation abnormalities after initial attempts at correction then Consultant Haematology advice should be sought
- Rotem should be repeated if there is significant clinical concern or every 500ml of further blood loss
- If in theatre, consider Belmont infusion device
- Unused blood should be returned to blood bank as soon as possible
    - Unused blood in a cold box must reach blood bank within 2 hours of coming out of fridge to be re-used.
    - Unused blood in a bag must reach blood bank within 30 minutes of coming out of the fridge to be re-used.
- Always consider cell salvage
    - Increasingly cell salvage is being used without a leucocyte depletion filter which can be particularly helpful in MOH due to speed of returning blood to the patient.

Ongoing resuscitation

- Ensure ongoing monitoring
    - HR, BP, Oxygen saturations, RR recorded every 5 mins
    - Temp every 15 mins
    - Urine output hourly
- Document on HDU chart
- Consider need for arterial BP monitoring
- Ensure
    - Temp >36ºC
    - pH >7.2
    - Ionised Ca^{2+} >1mmol/L
- Repeat tranexamic acid 1g after 30 mins
- Consider antibiotics if surgical delivery and need for further doses for up to 24 hours post-delivery

Anaesthetic Management

- If severe haemorrhage or coagulopathy then GA
- If neither of above are present then regional can be considered
    - If epidural in situ then epidural top-up is more cardiovascularly stable than spinal. Fast acting local anaesthetic mixes (eg. lidocaine/adrenaline/bicarbonate) can be considered
- Full AAGBI monitoring
- Consider invasive monitoring, however do not delay surgery for arterial line insertion
- Hourly urometer
- Anaesthetic nurse to set up cell salvage
- Consider need for Belmont rapid infuser
- Keep patient warm: Forced air warming blanket, fluid warmer and pre-warmed fluids
- Consider intra-osseous access if IV access difficult (found in bottom of resuscitation trolley in anaesthetic room)
- If ongoing difficulty, then CVC or if patient becoming vasopressor dependent.

Major Antepartum Haemorrhage (>1.5L or clinical concern)

Key differences with antepartum haemorrhage

- Left Lateral tilt
- Early consideration of need for delivery
- Involve neonates early
- Causes of bleeding differ
    - Placental abruption
    - Placenta praevia
- Most of the approach used in PPH can be applied
    - Contemporaneous MBL
    - ABC assessment
    - Large bore IV access x2
    - Bloods for FBC, X-match (4 Units), Rotem, Venous blood gas
    - IV fluid bolus
    - Monitor HR, BP, Oxygen saturations and respiratory rate (every 5 minutes) and record on MEOWS / HDU chart
    - Tranexamic acid 1g
    - Transfuse RBCs as clinically required
    - Rotem guided coagulation product use
- Ensure effective clinical leadership and contemporaneous documentation

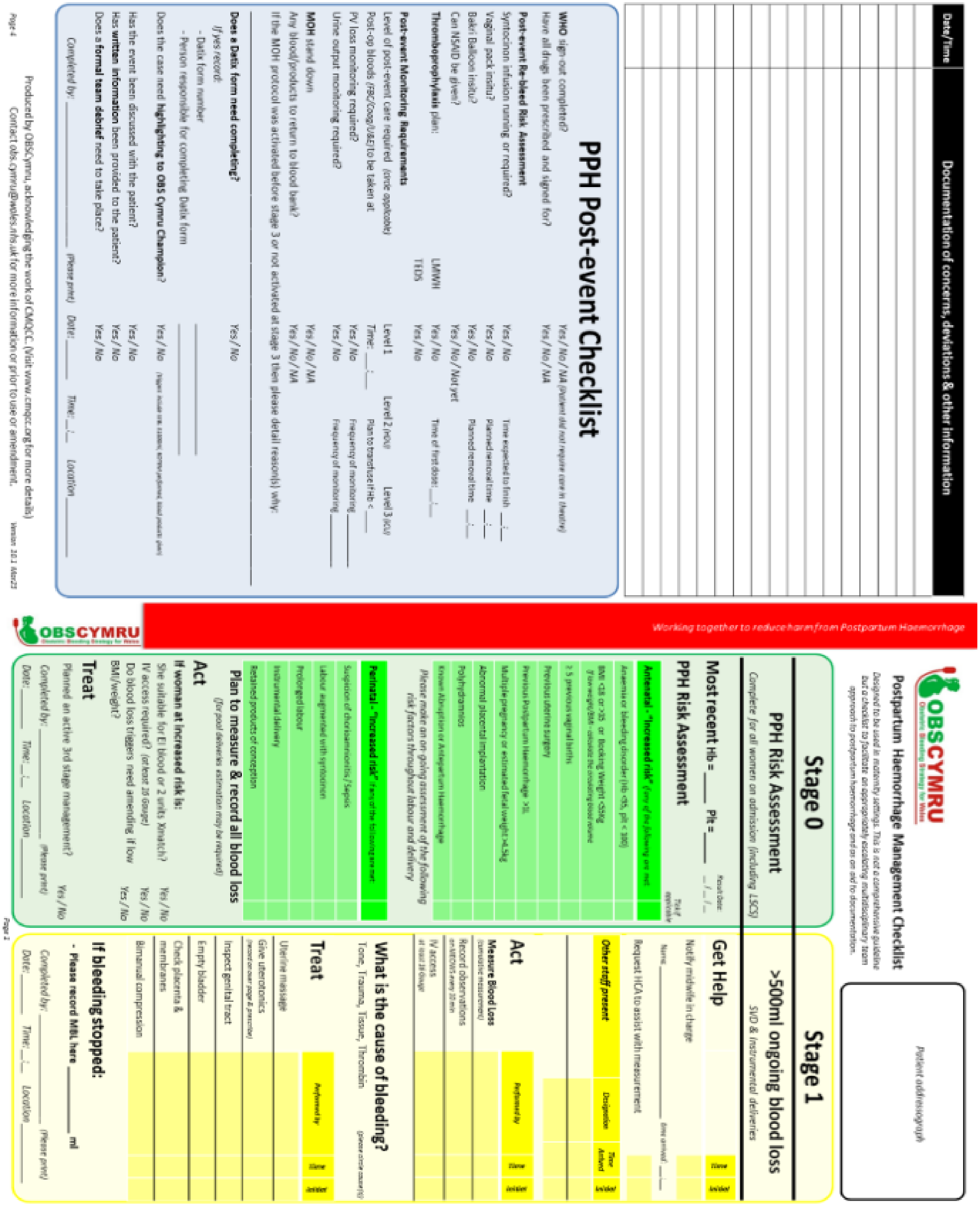
General points on communication (including with patient and birth partner)

- Appoint leader to co-ordinate and ensure OBSCymru PPH checklist followed
- Noise within the room should be kept to a minimum to aid clear communication amongst the team.
- SBAR handovers and closed loop communication should be used
- Obstetric haemorrhage can be extremely frightening for the patient and partner, leading to significant post-natal problems including PTSD and requests for caesarean section in subsequent deliveries.
- It is therefore important, if at all possible that someone is allocated to the mother and birth partner to explain to them what is happening.
- Clear, calm communication amongst the team not only ensures a more efficient response but also leaves the mother and birth partner with a sense of trust and competence in the team.

Post-resuscitation care

- Follow PPH post-event checklist
- Most essential step is to define level of care required post-PPH
    - Potential indications for transfer to critical care
        - Acidosis, hypoxia, coagulopathic or vasopressor dependent
    - Any of the above in an intubated patient should lead to considering transferring the patient to critical care still intubated
    - Otherwise patient will go to obstetric HDU
- Ensure midwives are aware of frequency of observations required after PPH has settled
    - If they have had an anaesthetic, then post-op observations for first 30mins i.e 5 min observations of
        - Oxygen saturations, resp. rate, heart rate, blood pressure, pain score and sedation score.
    - Beyond the first 30mins post-op or if no anaesthetic given then frequency of observations to be defined by involved clinicians
        - However, 15 min observations would seem appropriate initial minimum monitoring until risk of further bleeding is reduced
        - The above observations should be done (with exception of pain score and sedation score if no anaesthetic given)
    - Observations should also include
        - Hourly urine output
        - Assessment of PV loss
        - Temperature measurement
        - Assessment of nausea and vomiting score (if anaesthetic given)
    - If long-acting intra-thecal opiates (ITO) have been given, then the absolute minimum monitoring should be as per ITO monitoring policy.
- Have all drugs been prescribed and signed for?
- Are there any retained packs / sutures / balloons?
    - If so **green wrist band** and plan for review / removal of these
- Is syntocinon infusion running?
    - If so is it prescribed?
- Discuss
    - Timing of post-op bloods
    - Timing of thromboprophylaxis
    - Whether to give NSAIDs
    - If surgical delivery - need for antibiotics for 24 hours
- Return any blood products to blood bank
- Stand down porter
- Datix event
- Debrief team
- Ensure timely post PPH Medical review (should be within 2 hours or earlier if concerned)
- Debrief patient and birth partner
    - Consider whether attendance at debrief clinic is required?

Appendix 1 – OBSCymru PPH Management Checklist



Date/Time	Documentation of concerns, deviations & other information

Working together to reduce harm from Postpartum Haemorrhage

OBSCYMRU Obstetric Bleeding Strategy for Wales

Postpartum Haemorrhage Management Checklist

Designed to be used in maternity settings. This is not a comprehensive guideline but a checklist to facilitate an appropriately escalating multidisciplinary team approach to postpartum haemorrhage and as an aid to documentation.

Patient addressograph

Stage 0

PPH Risk Assessment

Complete for all women on admission (including LSCS)

Most recent Hb = ____ Plt = ____ Result Date: __/__/__

PPH Risk Assessment *Tick if applicable*

Antenatal - "Increased risk" *if any of the following are met:*
- Anaemia or bleeding disorder (Hb <95, plt < 100)
- BMI <18 or >35 or Booking Weight <55Kg (if low weight/BMI - calculate the circulating blood volume)
- ≥ 5 previous vaginal births
- Previous uterine surgery
- Previous Postpartum Haemorrhage >1L
- Multiple pregnancy or estimated fetal weight >4.5kg
- Abnormal placental implantation
- Polyhydramnios
- Known Abruption or Antepartum Haemorrhage

Please make an on-going assessment of the following risk factors throughout labour and delivery

Perinatal - "Increased risk" if any of the following are met:
- Suspicion of chorioamnionitis / Sepsis
- Labour augmented with syntocinon
- Prolonged labour
- Instrumental delivery
- Retained products of conception

Plan to measure & record all blood loss
(for pool deliveries estimation may be required)

Act

If woman at increased risk is:
- She suitable for EI blood or 2 units Xmatch? Yes / No
- IV access required? *(at least 16 Gauge)* Yes / No
- Do blood loss triggers need amending if low BMI/weight? Yes / No

Treat

Planned an active 3rd stage management? Yes / No

Completed by: ____________ *(Please print)*
Date: ______ Time: __:__ Location ________

Page 1

Stage 1

>500ml ongoing blood loss

SVD & instrumental deliveries

Get Help Time Initial
- Notify midwife in charge — Name ______ time arrived: __:__
- Request HCA to assist with measurement

Other staff present | Designation | Time Arrived | Initial

Act Performed by | Time | Initial
- **Measure Blood Loss** *(cumulative measurement)*
- Record observations *on MEOWS every 10 min*
- IV access *at least 16 Gauge*

What is the cause of bleeding?
Tone, Trauma, Tissue, Thrombin *(please circle cause(s))*

Treat Performed by | Time | Initial
- Uterine massage
- Give uterotonics *(record on over page & prescribe)*
- Inspect genital tract
- Empty bladder
- Check placenta & membranes
- Bimanual compression

If bleeding stopped:
- **Please record MBL here** ________ ml

Completed by: ____________ *(Please print)*
Date: ______ Time: __:__ Location ________

PPH Post-event Checklist

WHO sign-out completed?	Yes / No / NA *(Patient did not require care in theatre)*	
Have all drugs been prescribed and signed for?	Yes / No / NA	
Post-event Re-bleed Risk Assessment		
Syntocinon infusion running or required?	Yes / No	Time expected to finish __:__
Vaginal pack insitu?	Yes / No	Planned removal time __:__
Bakri Balloon insitu?	Yes / No	Planned removal time __:__
Can NSAID be given?	Yes / No / Not yet	
Thromboprophylaxis plan: LMWH	Yes / No	Time of first dose: __:__
TEDS	Yes / No	
Post-event Monitoring Requirements		
Level of post-event care required *(circle applicable)*	Level 1 Level 2 *(HDU)*	Level 3 *(ICU)*
Post-op bloods *(FBC/Coag/U&E)* to be taken at	Time: __:__	Plan to transfuse if Hb < ____
PV loss monitoring required?	Yes / No	Frequency of monitoring ________
Urine output monitoring required?	Yes / No	Frequency of monitoring ________
MOH stand down	Yes / No / NA	
Any blood/products to return to blood bank?	Yes / No / NA	

If the MOH protocol was activated before stage 3 or not activated at stage 3 then please detail reason(s) why:

Does a Datix form need completing?	Yes / No	
If yes record:		
- Datix form number	________	
- Person responsible for completing Datix form	________	
Does the case need **highlighting to OBS Cymru Champion?**	Yes / No	
Has the event been discussed with the patient?	Yes / No	
Has **written information** been provided to the patient?	Yes / No	
Does a **formal team debrief** need to take place?	Yes / No	

Completed by: ____________ *(Please print)* *Date:* ______ *Time:* __:__ *Location* ________

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Contact obs.cymru@wales.nhs.uk for more information or prior to use or amendment.

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Stage 2 >1000mL blood loss *OR* clinical concern (eg. Abruption or concealed bleeding) *OR* abnormal vital signs indicating urgent medical review

Progress to here from stage 1 if SVD / instrumental delivery. Re-start here after stage 0 if LSCS

Get Help

		Time arrived:			Time arrived:
MW in charge	Name:	time:	Other staff: Name:	Designation:	time:
Obstetrician	Name:	time:	Name:	Designation:	time:
Anaesthetist	Name:	time:	Name:	Designation:	time:
HCA	Name:	time:			

Act

	Performed by	Time	Initial
Measure & record cumulative blood loss			
Record observations on MEOWS *every 10 min*			
2nd IV access *(at least 16 Gauge)* & fluid bolus			
Take bloods Point of care tests - ROTEM, venous lactate, venous Hb Lab test - FBC, Coag, XMatch, U&E			

	Initial VBG Test Results		Initial ROTEM Test Results	
Time:	Hb =	Lactate =	FIBTEM A5 = *(aim ≥ 12mm)*	EXTEM CT = *(aim < 75 sec)*

Review causes *(circle all identified)* Tone / Trauma / Tissue / Thrombin

Treat

	Performed by	Time	Initial		Performed by	Time	Initial
Review uterotonics *(record on page 3)*				Empty bladder			
Give tranexamic acid *(1g IV, if no CI's)*				Foley catheter inserted			
Bimanual compression				Inspect genital tract			
Consider ranitidine				Repair genital tract			
				Check placenta & membranes			

If bleeding stopped ensure PPH post-event checklist completed & Management plan written in notes

Completed by: _____ *(Please print)* *Date:* _____ *Time:* __:__ *Location* _____

If bleeding *ongoing* transfer patient to theatre *time arrived:* __:__

Stage 3 >1500mL blood loss *OR* ongoing clinical concern

Act

	Performed by	Time	Initial
Communicate current measured blood loss to team			
Activate MOH protocol			
Inform Obstetric and Anaesthetic consultants			
Order blood and coagulation products as per MOH and ROTEM protocol *- Do you need to discuss the case with a haematologist?*			

Review causes *(circle all identified)* Tone / Trauma / Tissue / Thrombin

Treat

	Performed by	Time	Initial
Review uterotonics *(Record on page 3)*			
Consider repeat tranexamic acid if bleeding ongoing *(1g IV, if no CI's)*			
Consider advanced surgical techniques *(Document on page 4)*			

Additional Staff Present:	Time arrived:		Time arrived:
Name: Designation:	time:	Name: Designation:	time:
Name: Designation:	time:	Name: Designation:	time:

Once bleeding stopped ensure PPH post-event checklist completed & Management plan written in notes

Completed by: _____ *(Please print)* *Date:* _____ *Time:* __:__ *Location* _____

Working together to reduce harm from Postpartum Haemorrhage

Record of Uterotonics used

Please record all uterotonics used here and prescribe on medication or anaesthetic chart

Drug	Dose *(please circle route)*	Time	Drug	Dose	Time
Oxytocin	10 units IM *or* 5 units IV		Carboprost *(caution in asthma)*	250microg IM *(repeat up to every 15min)*	
Other			Carboprost	250microg IM	
Ergometrine *(caution in HTN/PET)*	500 microg IV or IM		Carboprost	250microg IM	
Syntometrine *(caution in HTN/PET)*	500 microg/5 units IM or IV		Carboprost	250microg IM	
Oxytocin INF	40 units over 4hr IV		Carboprost	250microg IM	
Other			Carboprost	250microg IM	
Misoprostol			Carboprost	250microg IM	
Misoprostol			*Other*		

Blood & Blood products transfused

Time	Product given	Time	Product given

Measured cumulative blood loss

Time	Blood Loss (ml)	Running Total (ml)

Total Measured Blood Loss = _____ml

Record of further blood test results

(Please do not duplicate records of blood results recorded in stage 2)

	Further VBG Test Results		Further ROTEM Test Results	
Time Taken	*Hb*	*Lactate*	*FBTEM A5 (Aim ≥ 12mm)*	*EXTEM CT (Aim < 75 sec)*

Management of Massive Obstetric Haemorrhage
Ratified by Labour Ward Forum: December 2023

Appendix 2 – Percentage blood volume loss compared with weight

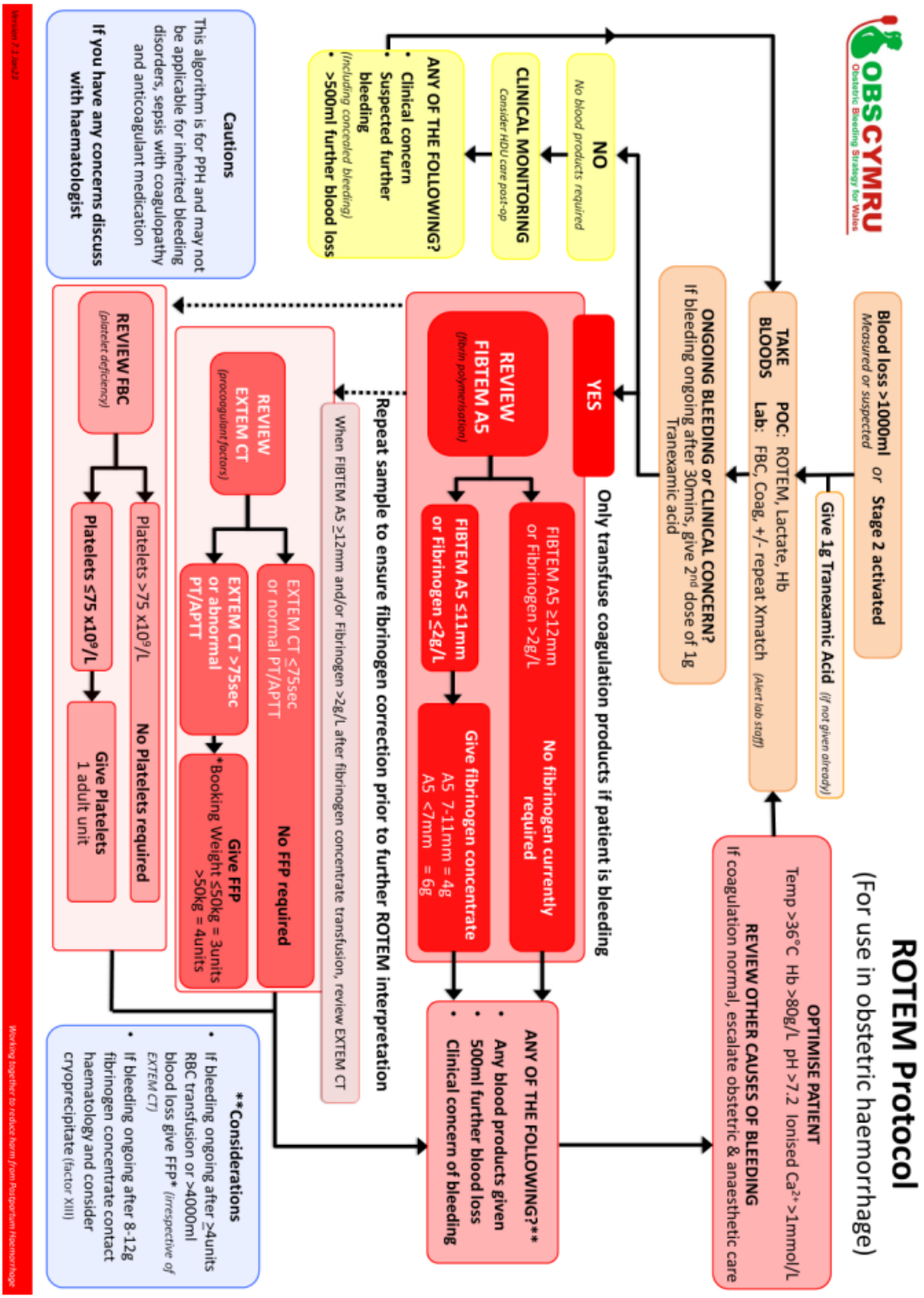
Ensure that the response to obstetric haemorrhage is tailored to the proportionate blood loss as a percentage of circulating blood volume based on a woman's body weight **N**

Table 7.2: Estimated blood volumes and proportionate losses according to body weight

Weight	Total blood volume*	15% blood volume loss (moderate haemorrhage)	30% blood volume loss (severe haemorrhage)	40% blood volume loss (life-threatening haemorrhage)
50kg	5000ml	750ml	1500ml	2000ml
60kg	6000ml	900ml	1800ml	2400ml
70kg	7000ml	1050ml	2100ml	2800ml
80kg	8000ml	1200ml	2400ml	3200ml
90kg	9000ml	1350ml	2700ml	3600ml
100kg	10000ml	1500ml	3000ml	4000ml

*Based on 100mls/kg blood volume in pregnancy but may overestimate blood volume in obese women (Lemmens et al. 2006)

Appendix 3 - Rotem interpretation flowchart



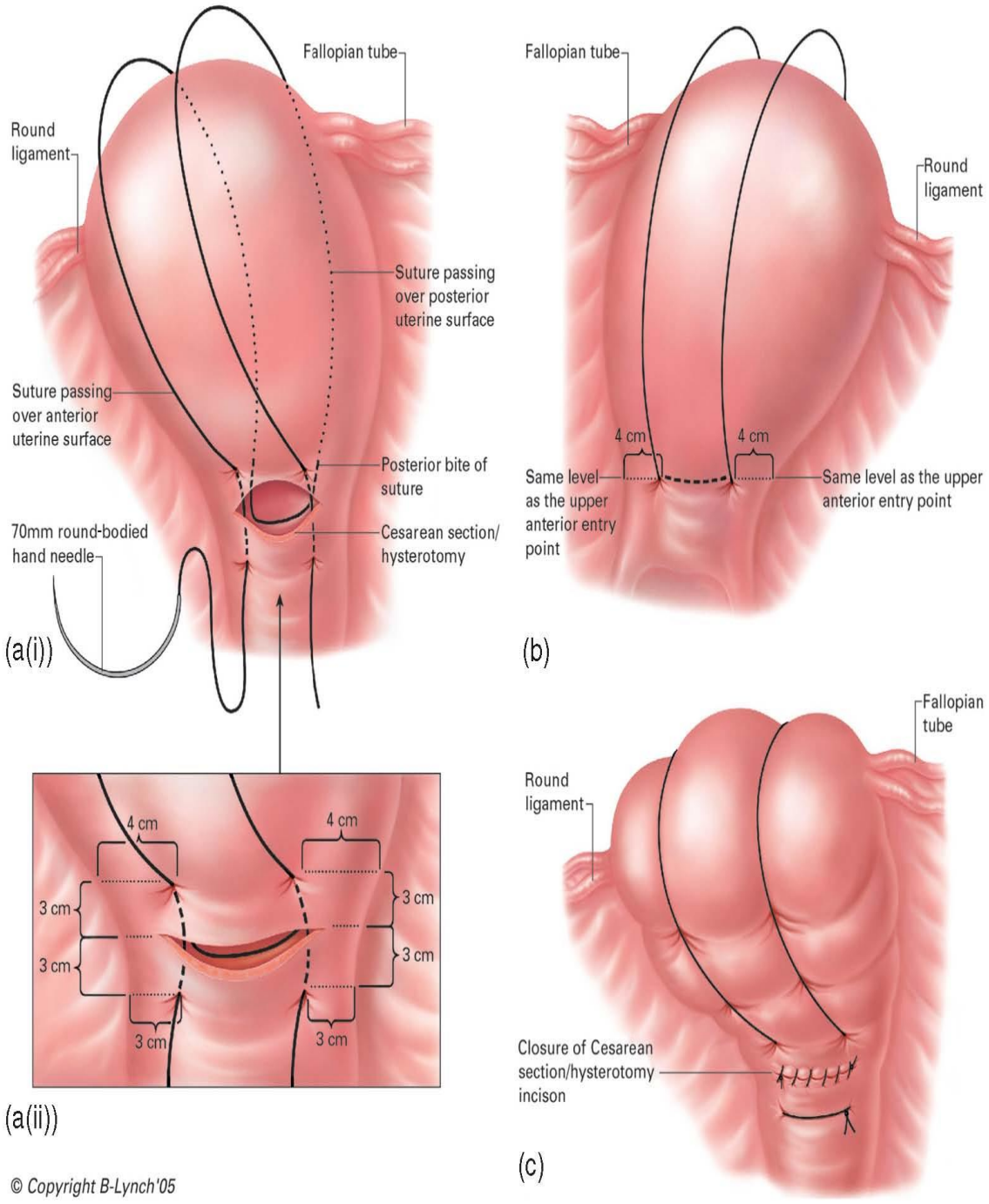
APPENDIX 4

Procedure for Insertion of B-Lynch suture

Ask for special suture – 70-8-mm round bodied blunt hand held needle mounted on number one monocryl (code W3709)

Place the woman in Lloyd Davies or Lithotomy position, an assistant stands between the patient's legs to monitor the vaginal blood loss; whilst two surgeons are needed on abdominal side to insert the suture.

- Exteriorise the uterus (warn the anaesthetist).
- Perform bimanual compression of the uterus
- If the bleeding stops by doing so, the procedure is likely to succeed.
- The first stitch is placed 3cm below the lower C/S incision on the patient's left side and threaded through the uterine cavity to emerge 3cm above the upper incision margins – 4cm from the lateral border of the uterus.
- Carry the suture on the outside of the uterus over the top and to the posterior side.
- The suture should be more or less vertical and lying about 4cm from the cornua.
- The experienced assistant compressing the uterus intermittently, now compresses the uterus further as the suture is fed through to enable progressive, successive tension to be maintained as the suture compresses the uterus.
- The suture now lies horizontally on the inner aspect of the posterior uterine wall.
- Bring the suture over the top of the fundus, it is placed exactly the same way as it was on the left side i.e. 3cm above the incision 4cm from the lateral side of the uterus through the top of the incision into the uterine cavity and then again back through 3cm below the incision.
- Now you are ready to tie the two ends of the suture, the assistant maintains the compression as the monocryl suture is milked through from its different portals to ensure uniform tension.
- The two end of the suture are put under tension, and a double throw knot applied for security and prevent slipping.
- The tension on the two ends maintained while the lower segment incision is closed or knot can be tied first. Either way ensures that when the lower segment is closed there is no escape of the edges/angles of the incision.
- Close the abdomen in a routine way after insertion of drain if appropriate.


Fallopian tube
Round ligament
Suture passing over posterior uterine surface
Suture passing over anterior uterine surface
Posterior bite of suture
Cesarean section/ hysterotomy
70mm round-bodied hand needle
(a(i))
4 cm
4 cm
3 cm
3 cm
3 cm
3 cm
3 cm
3 cm
(a(ii))
© Copyright B-Lynch'05
Fallopian tube
Round ligament
4 cm
4 cm
Same level as the upper anterior entry point
Same level as the upper anterior entry point
(b)
Fallopian tube
Round ligament
Closure of Cesarean section/hysterotomy incison
(c)

APPENDIX 5

Insertion of Bakri Balloon

Bakri Balloon tamponade is used when uterotonic and uterine massage do not stop the bleeding and local trauma and retained tissue in the uterus is excluded. It has beenfound to be more useful in lower uterine segment bleeding e.g. bleeding following C/S for Placenta Praevia.
An assistant is required.
An indwelling urinary catheter should be insitu.
Warm saline – 500ml should be available.
Usual antiseptic/aseptic precautions are required.

- Patient put in Lithotomy position.
- Speculum is passed in the vagina to visualise cervix.
- Anterior lip of the cervix is secured gently with a sponge forceps.
- Insert the Balloon portion of the catheter in the uterus, making certain that the entire balloon is inserted past the cervical canal and internal ostium.
- Avoid excessive force.
- Using enclosed syringe, inflate the balloon with warm normal saline, from 200-300ml. Rarely up to 500ml fluid is required to stop the bleeding.
- Once the balloon is placed and is inflated, connect the drainage to a fluid collection bag to monitor haemostasis.

Trans-abdominal placement of Bakri Balloon

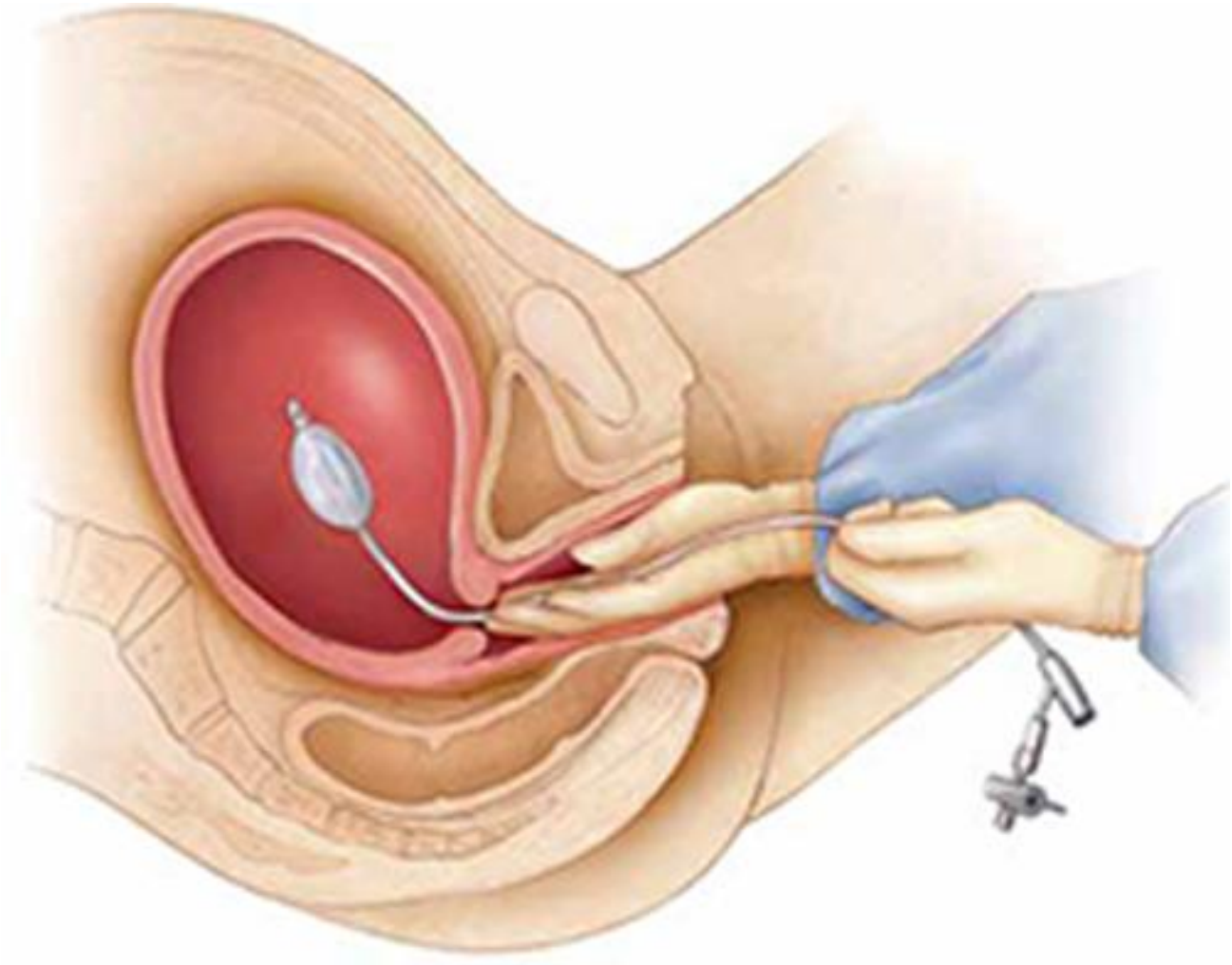
- Ensure uterine cavity is clear of any retained placental tissue.
- From above (via access of the Caesarean incision), pass the tamponade balloon, inflation port first. through the uterus and cervix.
- Have an assistant pull the shaft of the balloon through the vaginal canal until the deflated balloon base comes in contact with the internal os.
- Close the incision per normal procedure, taking care to avoid puncturing the balloon while suturing.
- Inflate the balloon as above, vaginally.

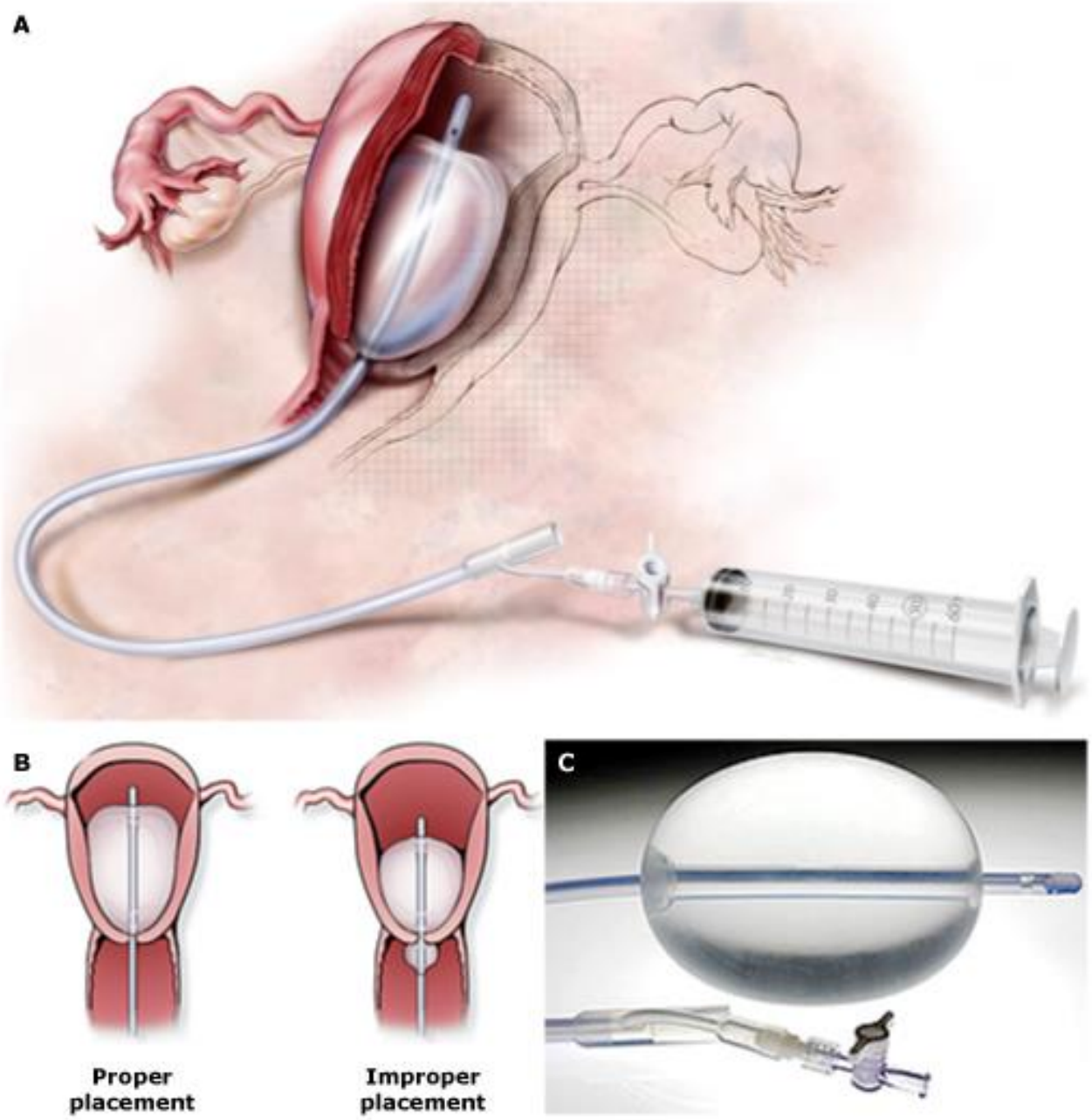
Post-insertion monitoring:

- If a Bakri Balloon, swab or a pack is left insitu a coloured identity band must be placed on woman's wrist which clearly documents the foreign body that is left insitu and is only removed when foreign body has been extracted
- The woman should be monitored for bleeding as per protocol.
- Intravenous Augmentin for three 8xhourly doses given in absence of penicillin allergy.
- Uterine fundal height should be monitored closely as clot collection posterior to the Balloon have been reported.

Removal of Bakri Balloon:

- The Bakri balloon is to be removed by an Obstetrician
- Maximum indwell time is twenty-four hours.
- Majority can be removed after 12 hours (Six hours seem to be sufficient for the placental bed to clot and stop bleeding).
- A plan for removal should be clearly made and documented by the operator.
- Ideally should aim to remove it first thing in the morning so the bleeding can be closely monitored during daytime.
- Gradual deflation of Balloon is not necessary.
- To date, no immediate problems such as bleeding or sepsis, or long-term complications such as menstrual problems or problem with conceiving have been reported in women who underwent uterine tamponade.





Note:

Repeated attempts (more than twice) at insertion of Bakri balloon should be avoided and alternative haemostatic technique should be considered, if unable to insert Bakri Balloon or it is ineffective.