



Government of the Republic of Trinidad and Tobago

Ministry of Health



Women's Health

Major Obstetric Hemorrhage

Clinical Guideline
April 2019

Message from the Directorate

The Directorate of Women's Health was formed at the Ministry of Health to improve maternal and perinatal outcomes and address international targets for Trinidad and Tobago in achieving the milestones along the way to the Sustainable Developmental Goals, 2030. This document is one such response in order to create standardized clinical guidelines related to Obstetrics and Gynaecology.

We used an 'adopt and adapt' method in the production of this guideline based on existing resources and expertise. Consensus was obtained from the recognized multidisciplinary stakeholders based on the evidence and publications at the time of producing this document.

Worldwide, maternal haemorrhage, in the antepartum and postpartum periods, is the number one contributor to maternal morbidity and mortality. In our region, PAHO-WHO has embarked on a project titled "Zero Maternal Deaths from Hemorrhage" and this document complements this effort. In Trinidad and Tobago, haemorrhage was responsible for between 1-3 deaths annually for the period 2010 to 2016, but no cases were seen for 2017-2018. On a monthly basis there are near-misses however, and these contribute to significant morbidity including the use of resources such as the blood bank and intensive care unit utilization.

In line with the Sustainable Developmental Goals 2030-Agenda and the Global Strategy for Women's, Children's and Adolescent's Health (2016-2030), this document supports the objectives of "Survive, Thrive and Transform" by promoting the reduction of maternal and perinatal morbidity and mortality.

Early diagnosis and senior-led interventions are anticipated to result in significant improvement in these outcomes. This document captures evidence-based recommendations from international resources. The MOH has also introduced misoprostol for SMO-directed use at the public health institutions and this document also captures those recommendations. A strong recommendation for recorded three-monthly PPH-drills at all units is also noted.

It is recognised that there are different resources at different facilities. Appropriate triage and case selection should occur with transfer of high-risk cases to an appropriate level facility.

All routine antenatal care management guidelines apply including the Maternal and Child Health Manual (MOH, 2015) and the SOP Obstetric and Midwifery Services (MOH, 2011) unless specifically updated in this guideline. These areas are not repeated in this guideline.

Acknowledgements

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The contribution and recommendations from all the other stakeholders are also recognised. The work of the team from the Corporate Communications department in finalizing this document is also acknowledged.

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List of Abbreviations

ACOG	The American College of Obstetricians and Gynecologists
APH	Antepartum Haemorrhage
APTT	Activated Partial Thromboplastin Time
BLS	Basic Life Support
DIC	Disseminated Intravascular Coagulation
ECG	Electrocardiogram
FBC	Full Blood Count
FIGO	International Federation of Gynecology and Obstetrics
LFTs	Liver Function Tests
MCH	Maternal and Child Health
MCOS	Medical Chief of Staff
MHO	Massive Haemorrhage in Obstetrics
MOH	Ministry of Health
PAHO	Pan American Health Organization
PPH	Postpartum Haemorrhage
PT	Prothrombin Time
RCOG	The Royal College of Obstetricians and Gynaecologists
RHA	Regional Health Authority
RFTs	Renal function tests
SAMM	Severe Adverse Maternal Morbidity
SDGs	Sustainable Development Goals
SOGC	Society of Gynecologists and Obstetricians
SOP	Standard Operating Procedure
TED	Thromboembolic Deterrent
WHO	World Health Organization

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1.0 Case definition of MHO (Major Haemorrhage in Obstetrics)

MHO is defined as one of the following criteria:

- More than 1000 ml of cumulative blood loss, which is continuing.
- Signs of hypovolemia, clinical shock regardless of volume of blood loss
- A transfusion of 4 units of blood or more is required
- A decrease in haemoglobin of > 4 g/dl

2.0 Diagnosis

- Identification of large volume of blood loss (> 1000 ml), Or
- The recognition of maternal signs of shock in the absence of large amount of visible blood loss. (Note that blood loss is often difficult to estimate and is often underestimated)

2.1 Maternal signs of shock include:

- Tachycardia (on occasion, normal pulse rate or bradycardia can be seen)
- Hypotension
- Tachypnea
- Poor peripheral perfusion
- Confusion or unresponsive
- Oliguria
- Worsening metabolic acidosis (Lactate > 4 g/dl, pH <7.34)

3.0 Prevention and identification of MHO

- Risk factors for PPH may present antenatally or intrapartum; care plans must be modified as and when risk factors arise
- Clinicians must be aware of risk factors for PPH and should take these into account during antenatal counselling of women about the place of delivery (Tables 1-3)
- Women with known risk factors for PPH should only be delivered in a hospital with blood available on site or easily accessible (e.g. within 2 hours) in an emergency (Tables 1-3)
- The MOH continues to support a system of voluntary altruistic blood donation. Health promotion directed to partners and relatives encouraging the need for voluntary donors in society is encouraged. No donor 'chits' are required as part of routine patient-care activities.
- Antenatal anaemia should be investigated and treated appropriately as this may reduce the morbidity associated with PPH
- Prophylactic uterotonic agents must be routinely administered in the management of the third stage of labour in all women as they reduce the risk of PPH. This remains the policy of the MOH.
- Whenever possible, delaying cord clamping by at least 60 seconds is preferred to early clamping in premature newborns (<37 weeks' gestation) since there is less intraventricular haemorrhage and less need for transfusion in those with late clamping. Delayed umbilical cord clamping has not been found to increase the risk of PPH
- For women without risk factors for PPH delivering vaginally, oxytocin (10 iu by intramuscular injection) is the agent of choice for prophylaxis in the third stage of labour. A higher dose of oxytocin is unlikely to be beneficial
- For women delivering by caesarean section, unless contraindicated, carbetocin 100 µg given as an IV bolus over 1 minute, can be used instead of continuous oxytocin infusion in elective Caesarean section for the prevention of PPH and to decrease the need for therapeutic uterotonics. A slow bolus of Syntocinon 5 iu is an alternative if carbetocin is unavailable
- Prophylactic uterine massage has not been shown to reduce the incidence of PPH

Table 1. Causes of MHO

EARLY PREGNANCY	PRIMARY POSTPARTUM HAEMORRHAGE
<ul style="list-style-type: none"> • Incomplete miscarriage • Septic miscarriage • Ruptured ectopic pregnancy • Uterine perforation/trauma 	<ul style="list-style-type: none"> • Uterine atony • Retained products of conception • Genital tract trauma • Abnormally adherent placenta • Clotting defects • Acute uterine inversion
ANTEPARTUM HAEMORRHAGE	SECONDARY POSTPARTUM HAEMORRHAGE
<ul style="list-style-type: none"> • Placenta praevia • Placental abruption • Uterine rupture • Trauma 	<ul style="list-style-type: none"> • Subinvolution of the placental site • Puerperal sepsis • Retained products of conception • Inherited coagulation defects
ASSOCIATED WITH COAGULATION FAILURE	
<ul style="list-style-type: none"> • Placental abruption • Preeclampsia • Septicaemia/intrauterine sepsis • Retained dead fetus 	<ul style="list-style-type: none"> • Amniotic fluid embolism • Incompatible blood transfusion • Existing coagulation abnormalities

Table 2. Risk Assessment Tool example

LOW RISK	MEDIUM RISK	HIGH RISK
Singleton Less than four deliveries Unscarred uterus Absence of PPH history	Previous CS/uterine surgery More than 4 deliveries Multiple gestation Large uterine fibroids Chorioamnionitis Magnesium sulfate use Prolonged use of oxytocin	Praevia/morbidly adherent placenta HCT<30 Bleeding at admission Known coagulation defect History of major PPH Abnormal vital signs (tachycardia, hypotension)

Table 3. Antenatal and Intrapartum risk factors for PPH

LOW RISK	MEDIUM RISK	HIGH RISK
Abnormalities of uterine contraction-atonny	<p>Atonic uterus</p> <p>Over-distended uterus</p> <p>Fibroid uterus</p> <p>Uterine inversion</p>	<p>Prolonged use of oxytocin</p> <p>High parity</p> <p>Chorioamnionitis</p> <p>General anaesthesia</p> <p>Abruption</p> <p>Multiple gestation</p> <p>Polyhydramnios</p> <p>Macrosomia</p> <p>Uterine fibroids</p> <p>Excessive umbilical cord traction</p> <p>Short cord</p> <p>Fundal implantation of placenta</p>
Genital tract trauma	<p>Episiotomy</p> <p>Cervical, vaginal and perineal lacerations</p> <p>Uterine rupture</p>	<p>Operative vaginal delivery</p> <p>Precipitous delivery</p> <p>Obstructed labour</p> <p>Fetal macrosomia</p> <p>Inappropriate use of oxytocin to augment labour</p>
Retained placental tissue	<p>Retained placenta</p> <p>Morbidly adherent</p>	<p>Succenturiate lobe</p> <p>Previous uterine scars</p> <p>Incomplete membranes or placenta at delivery</p>
Coagulation abnormalities	<p>Inherited</p> <p>HELLP</p> <p>Thrombocytopaenia of pregnancy</p> <p>Amniotic fluid embolism</p> <p>Excessive crystalloid replacement</p> <p>Severe infection</p> <p>Therapeutic anticoagulation</p>	<p>Bruising</p> <p>Petechiae</p> <p>Fetal demise</p> <p>Abruption</p> <p>Fever, sepsis</p> <p>Ongoing haemorrhage</p> <p>Current treatment with anticoagulation</p>

4.0 Management of MHO

Once major haemorrhage is identified, management involves four components, all of which must be undertaken simultaneously

- Communication
- Resuscitation
- Monitoring and investigations
- Arresting the bleeding

4.1 Communication:

- call for help from all available staff especially senior clinicians on site
- call most senior midwife in addition to the midwife in charge
- call obstetric registrar and senior anaesthetist(s)
- alert consultant obstetrician on call
- alert blood bank services, laboratory, haematologist, operating theatre to be on standby

4.2 Resuscitation

4.2.1 A and B = assess Airway and Breathing

- Administer oxygen at 10 -15 litres/min via face mask/non-rebreather mask, regardless of maternal oxygen concentration
- If the airway is compromised owing to impaired conscious level, anaesthetist-assistance should be sought urgently
- Basic Life Support by first responder

4.2.2 C =Evaluate Circulation

- Establish two 14-gauge intravenous lines
- 20 ml of blood sample should be taken and sent for diagnostic tests including CBC, coagulation screen, baseline RFT, LFT, electrolytes and cross match for 4 units of blood
- Commence 2 litres of warm crystalloids/colloids intravenously; rate of infusion based on haemodynamic instability
- Transfuse blood as soon as possible (see below)
- Start automated continuous BP, ECG and SPO2 monitoring
- Maintain mean arterial pressure > 65 mmHg

4.2.3 D=Assess the fetus and decide on Delivery (if undelivered)

- Delivery of the fetus and placenta will control bleeding by allowing the uterus to contract and stop bleeding (from the site of placental separation)
- It will also remove placental tissue, a source of production of coagulation activators

RESUSCITATION PROTOCOL SUMMARY

- Assess airway for breathing
- Evaluate circulation
- Oxygen by mask at 10-15 litres/ min.
- Intravenous access (14-gauge cannula x2)
- Blood tests
- Input/Output
- BP/ECG/SPO2
- Position flat
- If undelivered, position in left lateral to minimize aortocaval compression.
- Keep the woman warm
- Transfuse blood as soon as possible (if no religious objections)
- Until blood is available, infuse up to 2 litres of warm normal saline or Ringer's solution and/or 1-2 litres of colloids / Gelatine-based products

4.3 Transfusion of Blood/ Blood Products (ensure no religious objections)

- With continuing massive haemorrhage and whilst awaiting coagulation studies, give up to 4 units of FFP and 10 units of cryoprecipitate empirically

4.3.1 Blood: Transfuse cross matched blood

- If cross matched blood is still unavailable, give uncrossed matched group specific blood or 'O Rh negative' blood in emergency situations
- Do not use special line filters to administer

4.3.2 Fresh Frozen Plasma:

- 4 units for every 6 units of packed red cells
- (12-15 ml/kg or total 1 litre) if PT/ APTT >1.5 times the control
- If no haemostatic tests are available, early FFP should be considered in cases of suspected coagulopathy e.g. Abruptio, Amniotic Fluid Embolism

4.3.3 Platelet- Concentrate:

- If count $< 50 \times 10^9/L$ and bleeding continuing

4.3.4 Cryoprecipate:

- If fibrinogen $< 2 \text{ g/l}$, or based on guidance by the haematologist

4.4 Monitoring and Charting

- Commence record chart
- Accurate documentation of all events and processes, treatment employed, persons present and consulted
- Continuous pulse rate, blood pressure, respiratory rate, ECG and SPO₂
- Monitor temperature regularly
- Foley catheter: monitor hourly urine output.
- Regular checks of FBC, haematocrit and clotting studies will help guide resuscitation (one hourly in the event of continuing haemorrhage). Consider bedside Point-Of-Care Machine or Blood Gas Hb analysis.
- Consider central line to guide in fluid management as guided by Anaesthetist
- Estimate ongoing cumulative blood loss

4.5 Main Haematological Therapeutic Goals of Management

is to maintain

- Haemoglobin $> 8 \text{ g/dl}$
- Platelet count $> 50 \times 10^9/L$
- PT < 1.5 times mean control
- aPTT < 1.5 times mean control
- Fibrinogen $> 2 \text{ g/L}$

4.6 Arresting the Bleeding

4.6.1 In the Event of Major Primary Postpartum Haemorrhage (PPH)

- Examine the placenta for completeness.

Uterine atony is the commonest cause. When uterine atony is perceived to be the cause of bleeding, initiate the following measures until bleeding is controlled

- Rubbing up the fundus to stimulate contraction
- Bimanual uterine compression (continuous)
- Ensure bladder is empty
- Syntocinon® 5 units by slow intravenous injection (may have repeat dose)
(or) Syntometrine® 1 ml by intramuscular injection/ slow IV (contraindicated in women with hypertension)
(or) Duratocin® (carbetocin) 100 mcg, in 1 ml by slow IV injection

- Misoprostol 800 micrograms sublingual (4 tablets)
- Start oxytocin infusion (40 units in 1000 ml of Ringer's solution at 125 ml/hr- do not rapidly infuse)
- Tranexamic Acid 1g IV in 10 ml (100 mg/ml) at 1 ml per minute (over 10 minutes), if within 3 hours and bleeding unresponsive to above therapies, with a second dose repeated after 30 minutes if bleeding continues

4.6.2 Compression of the aorta/antishock garment

- External aortic compression is an emergency manoeuvre to permit time for resuscitation & control of bleeding.
- The abdominal aorta can be compressed by a firm pressure with a closed fist just above the umbilicus
- An antishock suit has been provided to each RHA-Obstetric Unit for use

4.6.3 Surgical- If pharmacological measures fail to control the haemorrhage, initiate surgical haemostasis

4.6.3.1 Patient needs to be moved, sooner rather than later, to the operating theatre and examined under anaesthesia with proper lighting and instruments, to exclude other causes

- Retained products (placenta, membranes, clots)
- Vaginal/ cervical lacerations or haematoma.
- Ruptured uterus
- Broad ligament haematoma (labial/rectal or perineal pain may be only symptom)

4.6.3.2 For atonic uterus, the following conservative surgical interventions may be attempted, depending on clinical circumstances and available expertise:

- Intrauterine balloon tamponade / intrauterine packing
- Haemostatic brace suturing, B-lynch or modified compression sutures. See diagram (laminare and place in the theatre)
- Bilateral ligation of uterine arteries
- Bilateral ligation of internal iliac arteries

4.6.4 Hysterectomy

- Involve another senior Obstetrician if available to assist in decision making (Head of Department/MCOS level staff) and for assistance if necessary
- Resort to hysterectomy sooner rather than later (especially in cases of placenta accreta or uterine rupture)
- Subtotal hysterectomy is the operation of choice unless there is trauma to the cervix or the lower segment. Ensure that the vagina and cervix are inspected after the subtotal hysterectomy in case of bleeding below the level of amputation
- An explanation should be given to the woman and/or her partner and written consent should be documented where possible during the events

4.6.5 Intensive Care/High-Dependency Unit

- Once the bleeding has been controlled and initial resuscitation has been completed, continuous close observation in high-dependency unit or intensive care unit is required
- The Anaesthetist will guide this process
- TED stockings and thromboprophylaxis, once coagulopathy is corrected and platelets are normal
- Administer medication to reduce stomach acidity (stress ulcers/DIC/Bleeding risk)
- Watch for renal failure and DIC

5.0 Debriefing/Communication

- Debriefing of all staff involved by the senior clinician and supportive counselling may be required for staff, patients and family members
- All communication protocols to be in place especially with a consistent message by the lead clinician
- All cases of Severe Adverse Maternal Morbidity (SAMM) are to be reviewed at the monthly Morbidity and Mortality meeting (see reporting below)

6.0 Complications

- Adult Respiratory Syndrome
- Shock
- Cardiac failure/arrhythmias
- Acute Renal Failure
- Loss of fertility
- Sheehan's Syndrome (pituitary necrosis)
- Maternal demise
- Fetal demise (from APH)
- Disseminated Intravascular Coagulation

7.0 Reporting Accountabilities and Staff education

- All cases of SAMM are to be reported in the monthly and annual maternity unit statistics
- The Adverse Events Policy and Guidelines (2011) reporting systems are also applicable
- Three-monthly recorded departmental-drills on PPH are to be conducted and reported to the Ministry of Health

8.0 Bibliography

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APPENDIX 1 DRUGS USED IN THE MANAGEMENT OF PPH (ON NATIONAL FORMULARY)

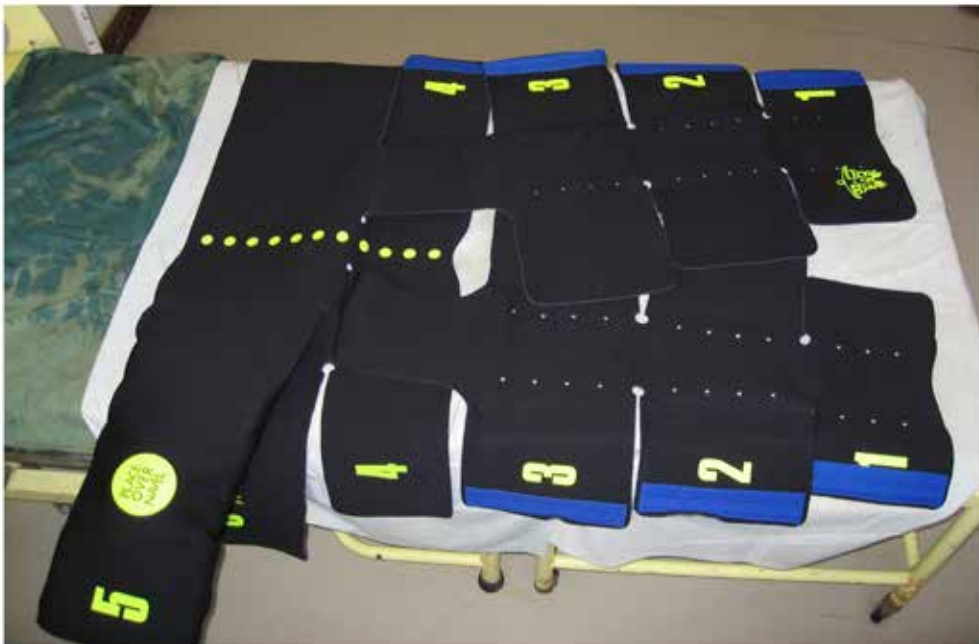
DRUG	DOSE AND ROUTE	FREQUENCY	CONTRAINDICATIONS	MAIN ADVERSE EFFECTS
Oxytocin	<p>Bolus 10 IU IM</p> <p>Bolus 5 IU IV slow</p> <p>Bolus 5 IU IV slow (2 doses)</p> <p>Infusion 40 IU per 1000 ml at 125 ml/hr</p>	<p>Prevention of PPH/ 1st line active Management</p> <p>At CS</p> <p>PPH</p> <p>Continuous Infusion (not rapid)</p>	Rare hypersensitivity	<p>Minimal usually</p> <p>Overdosage can result in nausea vomiting, hyponatremia, and fluid retention/ARD</p> <p>IV push not recommended due to hypotension, reflex tachycardia</p>
Carbetocin	<p>IV bolus Slow 100 micrograms</p> <p>(Bioequivalent activity of 50 IU acting for several hours)</p>	<p>At CS, PPH</p> <p>Single use only</p>	Rare hypersensitivity, hepatic or renal disease, Preeclampsia/eclampsia, severe cardiovascular disease, epilepsy	<p>Headache, tremor, flushing, hypotension ,nausea, abdominal pain, pruritus, feeling of warmth.</p> <p>Overdosage can result in hyponatremia and fluid retention /ARDS</p>
Misoprostol	<p>800 micrograms Sublingual</p>	PPH, single dose	Rare hypersensitivity to prostaglandins	Nausea, vomiting, diarrhoea, shivering, transient fever, headache
Syntometrine®	<p>5IU oxytocin/ 500 micrograms ergometrine</p> <p>IM is the recommended route</p>	<p>Active management of third stage (2nd line)</p> <p>PPH</p>	Hypertension, heart disease, porphyria, sepsis, severe renal or hepatic disease (vasoconstriction-cardiac ischaemia)	Nausea, vomiting, headache, dizziness hypertension, rare arrhythmias
Tranexamic acid	<p>1g IV over 10 minutes bolus dose (100 mg/ml)</p> <p>Repeat in 30 minutes if bleeding continues</p>	Cases unresponsive to first line drugs above	Hypersensitivity, acute venous or arterial thrombosis, severe renal impairment, convulsions,	<p>Diarrhoea, vomiting, nausea</p> <p>Rare anaphylaxis, convulsions, visual disturbances, hypotension,thrombosis</p>

Appendix II

Bimanual Compression



Anti-shock Garment

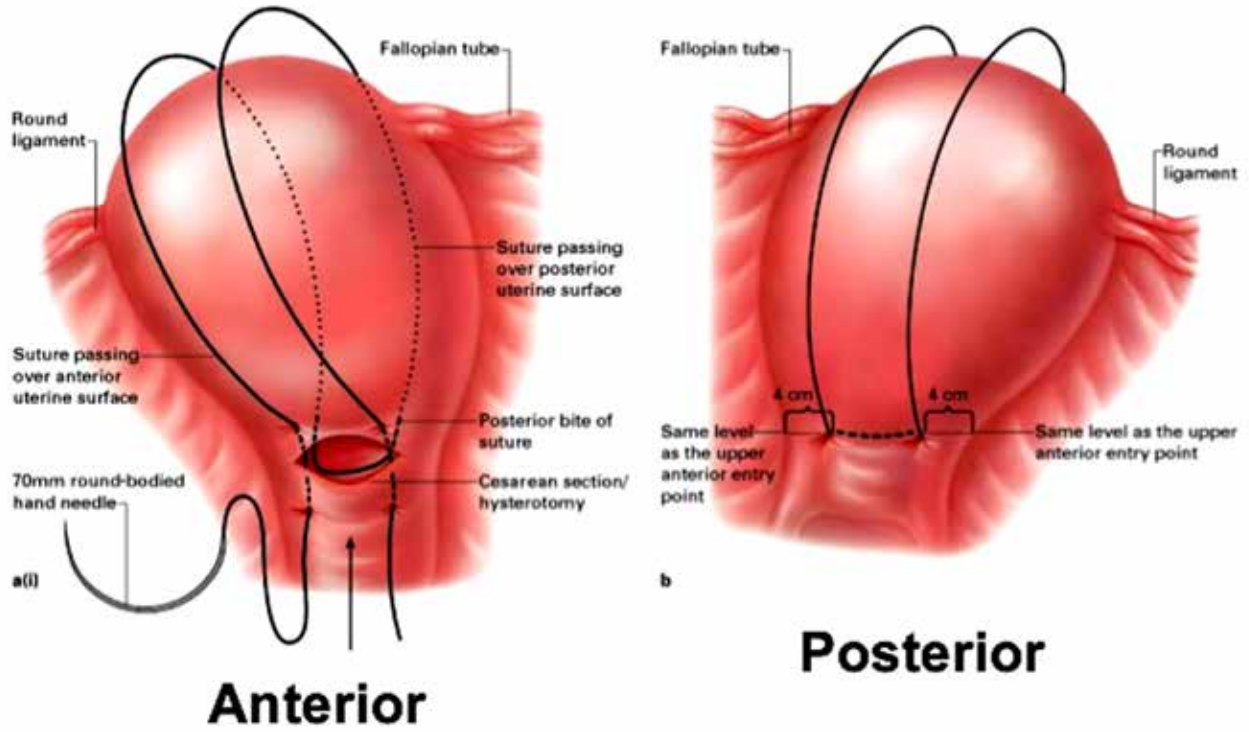


The actual antishock garment supplied may vary from illustration. Practice applying the suit at your RHA during the simulation exercises with your team

Appendix III

LAMINATE AND PLACE IN THE THEATRE

B-Lynch Suture



Appendix IV

Resuscitation, Monitoring, Investigation and Treatment Should Occur Simultaneously

