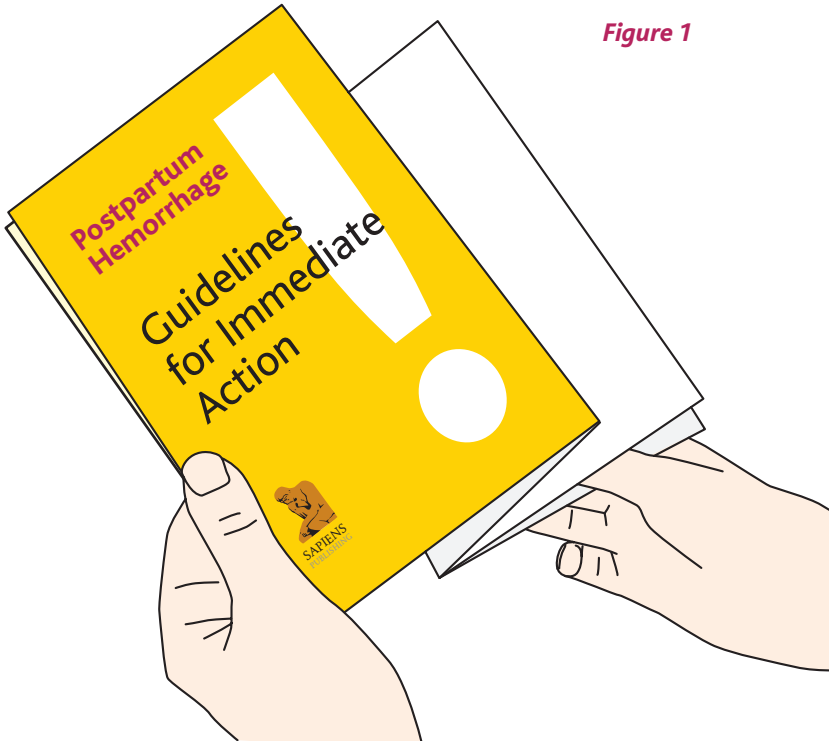

Figure 1

Figure 2

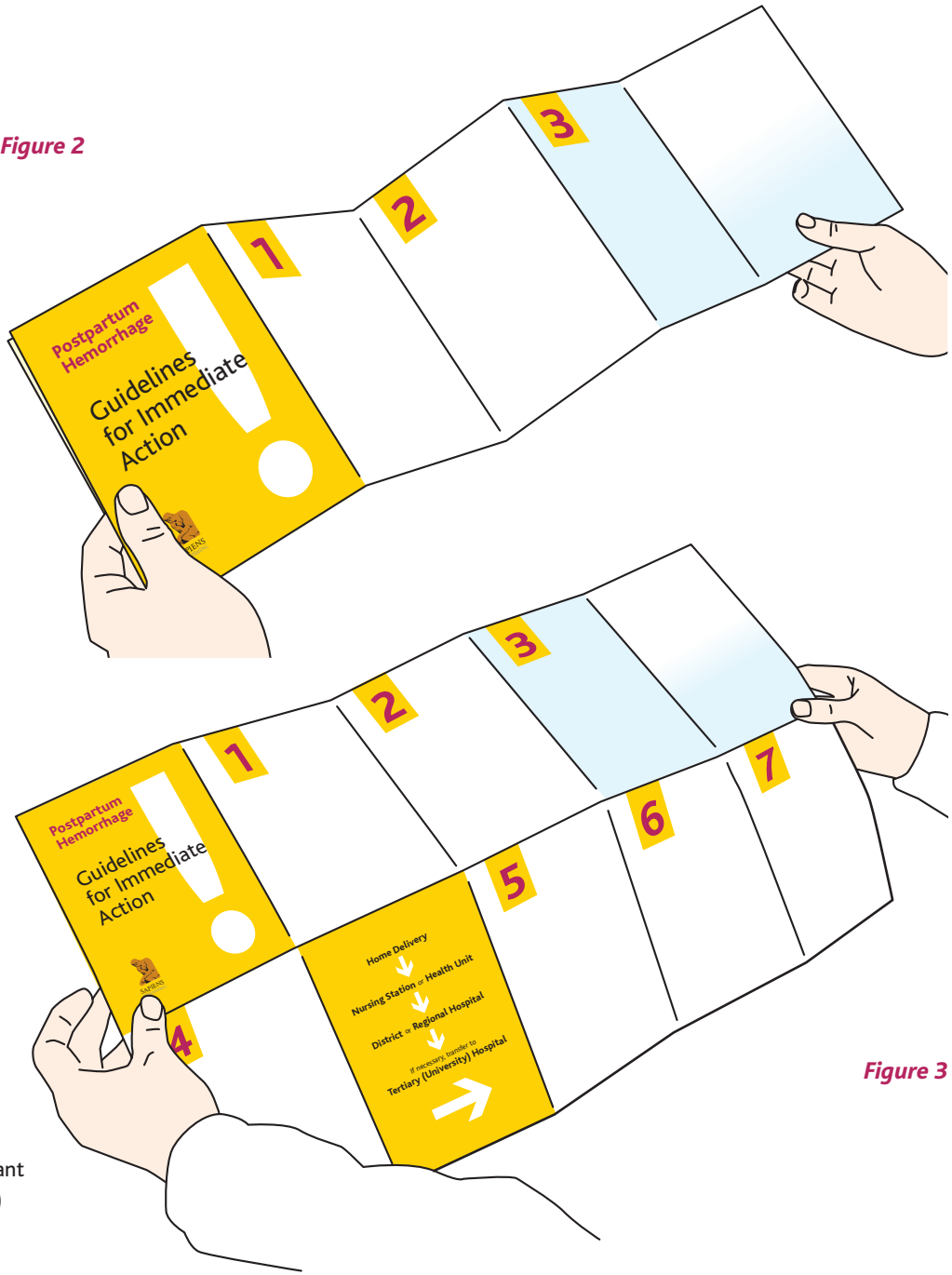

Figure 3

Postpartum Hemorrhage

Guidelines for Immediate Action

How this leaflet works – first as a ordinary leaflet, and then as a ready-reference wallchart

Ten-panel A5-format leaflet, concertina-folded. Folds out horizontally to view Steps 1–3 (***Figs. 1 & 2***), flip over to view Steps 4–7 or fold down to view all the steps (***Fig. 3***) and/or use as a wallchart. On the reverse face is further detail on each of the steps with references to relevant pages in *A Textbook of Postpartum Hemorrhage*. This reverse face (with a light yellow tint over it) is optional reading for those who want to know more. The front face, with the seven immediate action steps shown on a white background, is designed as the basic reading for most users.

Postpartum Hemorrhage

Guidelines for Immediate Action

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STEP 1

Immediate Action

Resuscitation

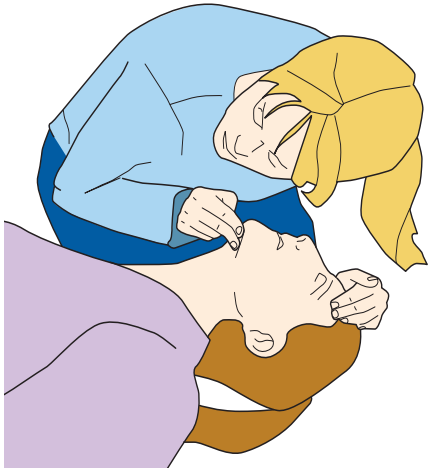
Follow a simple ABC approach, as problems with Airway, Breathing, and finally Circulation are identified. The medical logic behind the 'ABC' approach is that an ***A***irway problem will kill the patient more quickly than a ***B***reathing problem, which in turn will kill a patient more quickly than a ***C***irculatory (bleeding) problem.

Airway

In caring for the airway, the cervical spine must be protected. Place your hand on the patient's forehead and gently tilt the head back. At the same time, with your fingertips under the point of the patient's chin, lift the chin to open the airway. A jaw thrust may be required to facilitate this.

Breathing

Assess breathing for 10 seconds by looking for chest movements, listening for breath sounds and feeling for the movement of air. If no breathing is detected, put out a cardiac arrest call and administer two rescue breaths.



Circulation

If circulation is present but no breathing, continue rescue breathing at a rate of 10 breaths per minute. Recheck the circulation every 10 breaths, taking no more than 10 seconds each time. If the patient starts to breathe on her own but remains unconscious, turn her into the recovery position and administer oxygen at a rate of 15 liters/minute.

For more detailed information, see text on the reverse side of this leaflet →

STEP 2

Check for:

Uterine Tone

In parallel with resuscitation, assessment of uterine tone should take place when managing primary postpartum hemorrhage because uterine atony is overwhelmingly the dominant cause of postpartum hemorrhage. Uterine atony is suggested by the presence of a boggy soft uterus. If the uterus is atonic, immediate attention is given by intravenous bolus oxytocics and mechanical massage (rub-up contraction).

Trauma

Continued bleeding after uterotonic administration frequently results from unrecognized laceration of the genital tract, including uterine rupture. Hence, examination of the whole genital tract is essential under a good light source, with the necessary equipment to visualize all of the vagina and cervix.

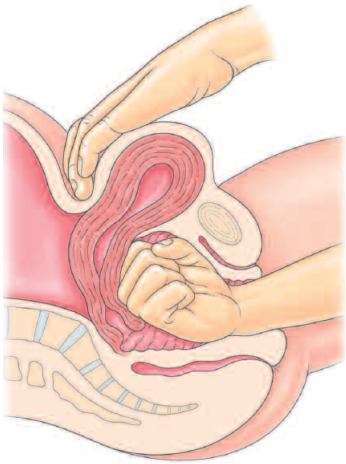
Placenta

Inspection of the placenta after delivery must be routine to check for its completeness.

Bimanual Compression

Insert one gloved hand into the vagina and push up against the body of the uterus. Place the other hand above the uterine fundus on the abdomen and compress the uterus against the hand in the vagina.

NB This procedure is usually only undertaken if drugs are not available or if drug therapy fails.



For more detailed information, see text on the reverse side of this leaflet →

STEP 3

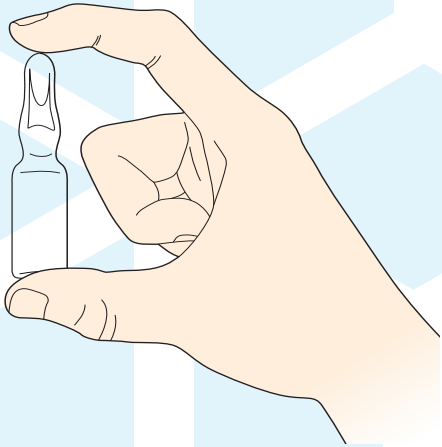
Drug Therapy

Syntocinon/oxytocin

Syntocinon/oxytocin **requires refrigeration**. The usual dose is 20 IU in 500 ml of crystalloid solution. The intravenous route is used, with the dosage rate adjusted according to the response (typical rate 250 ml/h).

Intramuscular administration of 10 IU results in a slower onset of action (3–7 min) but with a longer-lasting effect (up to 60 min).

The preferred storage of oxytocin is refrigeration but it may be stored at temperatures of up to 30°C for up to 3 months without significant loss of potency.



Syntometrine/ergometrine

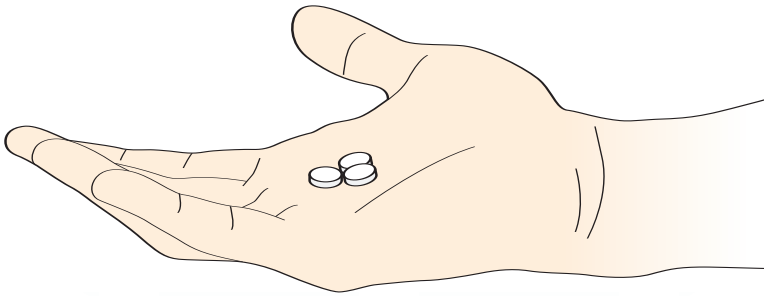
Syntometrine **requires refrigeration**. It can be administered intramuscularly or intravenously, at a dose of 1 ampule (500 µg of ergometrine and 5 IU of syntocinon). Syntometrine is contraindicated in patients with hypertension and cardiac disease.

For more detailed information, see text on the reverse side of this leaflet →

Drug Therapy *continued*

Misoprostol

Misoprostol **does NOT require refrigeration** and its cost is low. Three 200 µg tablets (i.e. 600 µg in total) can be administered orally or rectally all at once. But repeat doses are not recommended.



Prostaglandin $F_{2\alpha}$

Prostaglandin $F_{2\alpha}$ **requires refrigeration**. It is administered intramuscularly, in a dose of 250 µg; the maximum number of doses is eight (2 mg). It is contraindicated in patients with asthma and cardiac disease.

Recombinant Factor VIIa (rFVIIa)

rFVIIa is very expensive and **requires refrigeration**. It is used when uterine massage, uterotonic medications (oxytocin, ergometrine, prostaglandins) have all failed to control postpartum hemorrhage. The recommended dose is 40–60 µg/kg, administered intravenously.

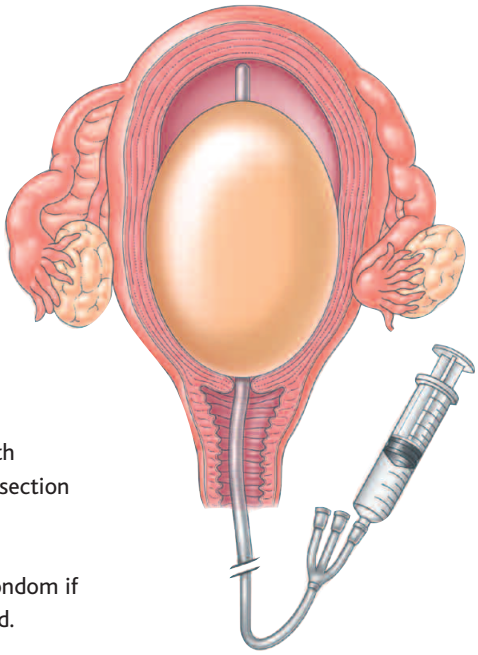
For more detailed information, see text on the reverse side of this leaflet →

STEP 4

Balloon Tamponade

Inflate up to 500 ml

Remove after 24 hours



Use following a vaginal delivery and atonic postpartum hemorrhage, unresponsive to uterotonics, and before interventional radiological procedures or surgical interventions, such as the B-Lynch suture, or iliac artery ligation or hysterectomy is considered.

It can be used during or after Cesarean section and in a woman with vaginal birth after previous Cesarean section with postpartum hemorrhage.

A Sengstaken tube, Rüsch balloon, Bakri balloon – or even an inflated condom if nothing else is available – can be used.

For more detailed information, see text on the reverse side of this leaflet →

Home Delivery

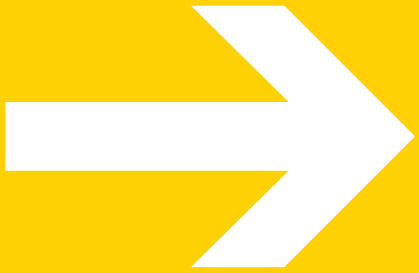
Nursing Station or **Health Unit**

District or **Regional Hospital**

If necessary, transfer to

Tertiary (University) Hospital

In instances where full therapeutic measures such as blood bank facilities, surgical expertise, operating theater facilities, or embolization are not available or for intensive care monitoring in a patient who continues to bleed.

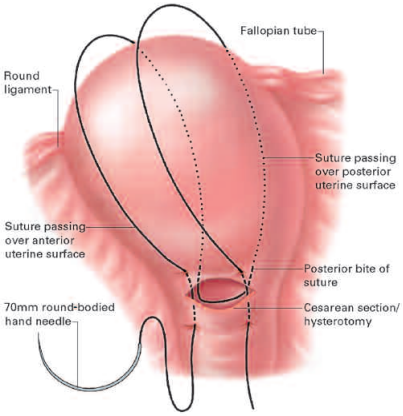


STEP 5

B-Lynch Suture

Use Monocryl suture or Vicryl number 2.

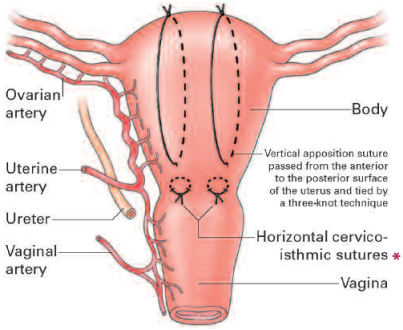
The B-Lynch suture aims to exert continuous vertical compression on the uterine vascular and muscular system. Laparotomy, uterine exteriorization and an opened uterine cavity are always necessary.



Other Conservative Suture Procedures:

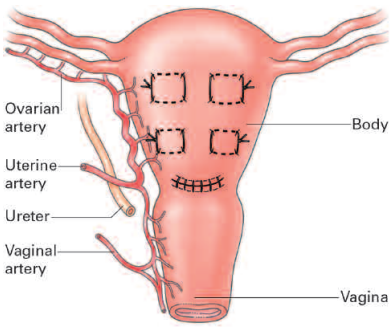
Vertical Uterine Compression Sutures

These are an alternative to the B-Lynch technique if no lower segment Cesarean incision is present. They may be placed without opening the uterus.



Cho Multiple Square Compression Sutures

Multiple square sutures are used to cover the whole body of the uterus and this may be useful in placenta previa.



* Horizontal cervico-isthmic sutures are for lower segment bleeding in cases of placenta previa

For more detailed information, see text on the reverse side of this leaflet →

STEP 6

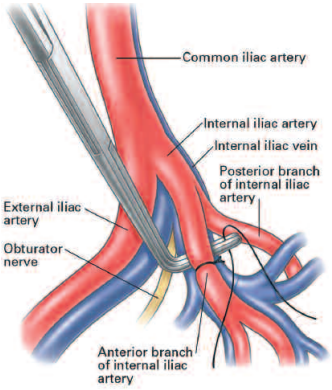
Other Procedures

Uterine Artery Embolization

A patient must be sufficiently stable to transport to the angiography suite. Embolization should be considered early, because it may take time to mobilize services. When embolization is successful, the patient can rapidly recover without undergoing additional surgery. Embolization not only saves the life of the patient, but also the uterus and adnexal organs, thus preserving fertility.

Stepwise Devascularization

The essential requirements are not simple and may not be available in every unit. There is a need for a competent obstetrician who is conversant and competent at pelvic gynecological procedures, and who has a working knowledge of the pelvic anatomy, including the vascular and neurological supply of the pelvic organs.



Internal Iliac Artery Ligation

This could be used as a prophylactic or therapeutic operation. There is a need for a competent obstetrician who is conversant and competent at pelvic gynecological procedures.

Hysterectomy

Hysterectomy is the best immediate option to save the hemorrhaging woman's life when uterine atony is unresponsive to uterotonics and where facilities for embolization are not available and/or the obstetrician is not well versed with the technical aspects of conservative surgical procedures or iliac artery ligation.

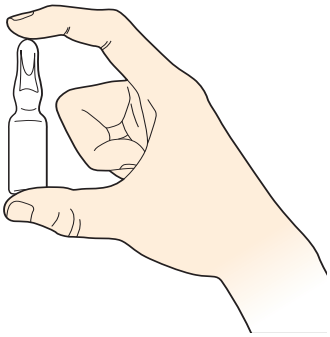
For more detailed information, see text on the reverse side of this leaflet →

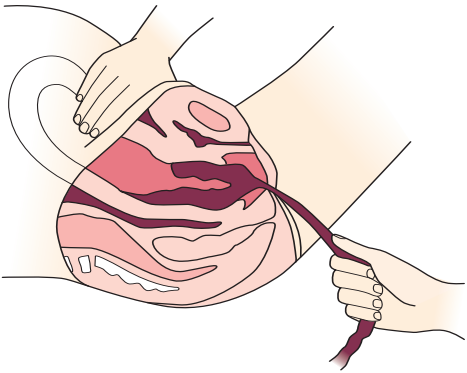
STEP 7

Prevention

Prevention of postpartum hemorrhage involves the practice of active management of the third stage of labor and identification of those at high risk for postpartum hemorrhage, such as patients with prolonged labor, pre-eclampsia, previous postpartum hemorrhage and multiple pregnancy. Active management of the third stage of labor incorporates three main interventions:

- **administration of oxytocin or another uterotonic drug within 1 minute after the birth of the baby**;
- **controlled cord traction**; and
- **uterine massage after delivery of the placenta**.





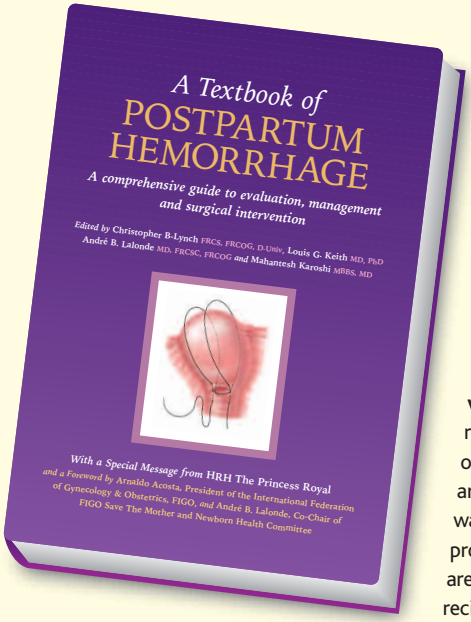
NB. If oxytocin is not available, administering 600 µg of misoprostol soon after the birth of the baby reduces occurrence of hemorrhage.

For more detailed information, see text on the reverse side of this leaflet →

This Leaflet

has been compiled by Dr Mahantesh Karoshi and is based on *A Textbook of Postpartum Hemorrhage*, edited by:

Christopher B-Lynch **FRCS, FRCOG, D.Univ,** Louis G. Keith **MD, PhD**
André B. Lalonde **MD, FRCSC, FRCOG** *and* Mahantesh Karoshi **MBBS, MD**



This practical *Guidelines for Immediate Action* is based on material published in *A Textbook of Postpartum Hemorrhage*. The book, which is available through the normal commercial channels in the Western World, is being provided free to a large number of physicians in developing countries and at a special low price to members of all national obstetric and gynecological societies worldwide. The whole book is also available entirely free of charge on the internet via the Publisher's website: **www.sapienspublishing.com**, where it may be read or downloaded at will by anyone. A CD-ROM of the book, designed as a resource for lecturers and teachers, and an aide-mémoire surgical wallchart are also being produced. All these items are available to selected recipients free of charge.

For further information, please contact the Publishers – who are making all these materials available free, on a selective basis, in loving memory of their daughter Abigail Bloomer.

Abigail Bloomer
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STEP 1

Immediate Action

Resuscitation

The care-giver must ensure a safe environment; shake the patient and shout. If there is no response, call for assistance and then return to the patient.

Speak to the patient at the very beginning of the resuscitation process. Her verbal response gives several pieces of clinical information. To be able to speak, a patient must have circulating oxygenated blood, a reasonable patent airway, a reasonable tidal volume, and a reasonable cerebral perfusion for her to comprehend and answer.

If the patient does not respond and appears lifeless, open the airway, assess for breathing by watching the chest, listening and feeling and, if necessary, give two rescue breaths and assess for signs of circulation (swallowing and breathing movements and carotid pulse).

If there is no circulation, start chest compression as in the cardiopulmonary resuscitation drill (see *A Textbook of Postpartum Hemorrhage*, p. 176).

Airway

Place your hand on the patient's forehead and gently tilt the head back. At the same time, with your fingertips under the point of the patient's chin, lift the chin to open the airway. A jaw thrust may be required to facilitate this.

Breathing

Assess breathing for 10 seconds by looking for chest movements, listening for breath sounds and feeling for the movement of air. If no breathing is detected, put out a cardiac arrest call and administer two rescue breaths.

Circulation

If circulation is present but no breathing, continue rescue breathing at a rate of 10 breaths per minute. Recheck the circulation every 10 breaths, taking no more than 10 seconds each time. If the patient starts to breathe on her own but remains unconscious, turn her into the recovery position and administer oxygen at a rate of 15 liters/minute.

Communication & Teamwork

Wherever possible, have senior input from the obstetric, anesthetic and midwifery professions. Ensure that the family is looked after and kept informed. Document timings and interventions accurately.

Logistics

Recruit as many staff as possible. You will need an individual responsible for each of the following: recording events and management, communication, runner/porter/transport.

For detailed reading, consult *A Textbook of Postpartum Hemorrhage*, Chapter 20, p. 170

STEP 2

Check for:

Uterine Tone

After resuscitation, assessment of uterine tone is always the next step in the management of primary postpartum hemorrhage for which uterine atony is overwhelmingly the dominant cause. Uterine atony is suggested by the presence of a boggy soft uterus. If the uterus is atonic, immediate attention must be given to mechanical massage by rubbing up for a contraction and by using pharmacological maneuvers to contract the uterus.

Trauma

At any time that bleeding persists in the presence of a firmly contracted intact uterus, and after failures of initial measures to control postpartum bleeding, hemorrhage from lacerations of the cervix, vagina or uterus should be suspected. Adequate exposure of the vagina and cervix under good light and then repair form the keystone of the management of trauma. If uterine rupture is suspected, then laparotomy and repair or hysterectomy become life-saving procedures.

Placenta

Inspection of the placenta after delivery must be routine. If a portion of the placenta is missing, the uterus should be explored and the fragment removed, particularly if postpartum hemorrhage continues.

Bimanual Uterine Compression

Bimanual compression causes mechanical constriction of myometrial vessels and stimulates uterine contractions. The steps of uterine massage are, first, insert a gloved hand into the vagina, and push up against the body of the uterus, and, second, place the other hand above the uterine fundus on the abdomen and compress the posterior uterine wall against the hand in the vagina. Bimanual compression also helps to reduce bleeding, thus aiding rapid resuscitation.

For detailed reading, consult *A Textbook of Postpartum Hemorrhage*, Chapter 31, p. 288

STEP 3

Drug Therapy

Syntocinon /oxytocin

With timely and appropriate use of uterotonic therapy, the majority of women with uterine atony can avoid surgical intervention. Stimulation of uterine contraction is usually achieved, in the first instance, by external uterine massage. Syntocinon acts rapidly, with a latency period of < 1 minute after intravenous injection and 2–4 minutes after intramuscular injection. When syntocinon is administered by a continuous intravenous infusion, the uterine response begins gradually and reaches a steady state within 20–40 minutes. The mode of action of oxytocin involves stimulation of the upper uterine segment to contract in a rhythmical fashion. Owing to its short half-life (3 minutes), a continuous intravenous infusion is required in order to maintain the uterus in a contracted state. Rapid intravenous bolus administration of undiluted oxytocin results in relaxation of vascular smooth muscle, which can cause severe hypotension. Therefore, it is best given by intravenous infusion or the intramuscular route. Syntocinon is stable at temperatures up to 25°C, but refrigeration may prolong its shelf-life.

The preferred storage of oxytocin is refrigeration but it may be stored in temperatures up to 30°C for up to 3 months without significant loss of potency (WHO 1993).

Syntometrine/ergometrine

Syntometrine causes sustained tonic uterine contraction. It stimulates contraction of both the upper and lower uterine segments in a tetanic manner. Intramuscular injection of a 500 µg dose results in an onset of action after 2–5 minutes. The clinical effect of syntometrine persists for approximately 3 hours. The co-administration of ergometrine and syntocinon results in a complementary effect, with syntocinon achieving an immediate response and ergometrine a more sustained action. Contraindications include hypertension and pre-eclampsia. First-line treatment of uterine atony, therefore, involves administration of oxytocin or ergometrine as an intramuscular or diluted intravenous bolus, followed by repeat dosage if no effect is observed after 5 minutes, and complemented by continuous intravenous syntocinon infusion. Atony that is refractory to these first-line oxytocics will warrant prostaglandin therapy.

Misoprostol

Misoprostol is a synthetic analogue of prostaglandin E_1. It can be given orally, vaginally or rectally. The rectal route of administration is associated with a sustained action, and a more favorable side-effect profile. It takes 20–30 minutes to achieve peak serum levels, compared

For detailed reading, consult *A Textbook of Postpartum Hemorrhage*, Chapter 27, p. 257–9

to 3 minutes for oxytocin. Common side-effects are shivering and pyrexia. Side-effects are less marked when the rectal route of administration is used, the standard dose being 600 µg rectally (**NB** Repeated doses of misoprostol are not recommended). Misoprostol is recommended for its low cost and ease of administration, and is a powerful uterotonic with an excellent safety profile and long shelf-life. In situations where appropriate methods exist to diagnose quantity of blood loss and where births are attended by traditional birth attendants who are trained to use misoprostol, its use results in a highly significant reduction in the number of women who need to be referred to hospital for further treatment.

Prostaglandin $F_{2\alpha}$

The third-line agent for use in the management of uterine atony unresponsive to syntocinon, ergometrine or misoprostol is prostaglandin $F_{2\alpha}$, which has been shown to control hemorrhage in up to 86% of cases where other means have failed. It is given intramuscularly in a dose of 250 µg every 15 minutes, up to a maximum of eight doses (2 mg). Intramuscular injection yields peak plasma concentrations at 15 minutes. It should be used with caution in patients with asthma, hypertension, cardiac and pulmonary disease. Side-effects include nausea, vomiting, diarrhea, pyrexia and bronchospasm. It is light- and heat-sensitive and must be kept refrigerated at 4°C.

Recombinant Factor VIIa (rFVIIa)

Patients who develop massive, life-threatening postpartum hemorrhage often exhibit a combination of 'coagulopathic' diffuse bleeding in addition to 'surgical bleeding'. Whereas bleeding from larger vessels may be controlled by surgeons using a variety of operations, the ability to control diffuse bleeding is limited and, in many cases, not feasible. Thus administration of hemostatic drugs that can control the coagulopathic component of blood loss may reduce mortality and morbidity in such patients.

- rFVIIa has a special role in patients with HELLP syndrome and in patients with disseminated intravascular coagulopathy who are experiencing postpartum hemorrhage.
- The recommended dose is 40–60 µg/kg administered intravenously.

For detailed reading, consult *A Textbook of Postpartum Hemorrhage*, Chapter 26, p. 233; Chapter 27, p. 258–9

STEP 4

Balloon Tamponade

The Balloon Tamponade

The balloon tamponade two-way catheter provides temporary control of postpartum uterine bleeding when conservative management is warranted. The balloon tamponade is especially feasible in a scenario of atonic postpartum hemorrhage following a vaginal delivery, unresponsive to medical management and before interventional radiological procedures or surgical interventions, such as the B-Lynch suture, or iliac artery ligation or hysterectomy are considered.

The insertion technique is simple and consists of placing the balloon portion of the Sengstaken, Rüsch or Bakri catheter directly into the uterus, making sure that the entire balloon (500 ml capacity) is inserted past the cervical canal and internal os. A 60 ml syringe can be used for inflating the balloon. Gentle traction on the balloon shaft ensures proper contact between the balloon and the tissue surface and enhances the tamponade effect. Success is judged by a declining loss of blood from the cervix and that seen through the drainage port.

All patients should be managed by close monitoring of vital signs, fluid input/output, fundal height and vaginal blood loss. Continued oxytocin infusion may be necessary to keep the uterus contracted over 12–24 hours. A prophylactic broad-spectrum antibiotic should be administered. The mean time for leaving the tamponade balloon ranges from 8 to 48 hours. A gradual deflation of the balloon is advised to reduce the potential risk of further bleeding. Tamponade procedures are simple, cheap, easy to use and effective measures that should be considered for intractable postpartum hemorrhage, especially when other options are not available.

Alternative

An alternative innovative approach from Bangladesh uses a sterile rubber catheter fitted with a condom as a tamponade balloon device. The sterile catheter is inserted within the condom and tied near the mouth of the condom with a silk thread; the outer end of the catheter is connected to a saline set. After placement in the uterus, the condom is inflated with 250–500 ml normal saline according to need, and the outer end of the catheter is folded and tied with thread after bleeding has stopped. To keep the balloon *in situ*, the vaginal cavity is packed with roller gauze. This method represents a cheap, simple and quick intervention, which is invaluable in resource-poor countries.

For detailed reading, consult *A Textbook of Postpartum Hemorrhage*, Chapter 28, p. 264; p. 266

Home Delivery

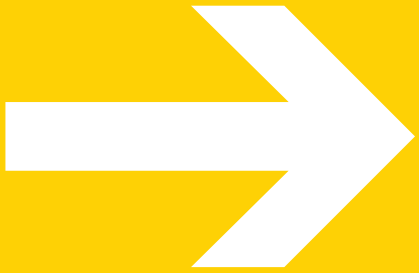
Nursing Station or **Health Unit**

District or **Regional Hospital**

If necessary, transfer to

Tertiary (University) Hospital

In instances where full therapeutic measures such as blood bank facilities, surgical expertise, operating theater facilities, or embolization are not available or for intensive care monitoring in a patient who continues to bleed.



STEP 5

B-Lynch Suture

The B-Lynch suture aims to exert continuous vertical compression on the uterine vascular system. Laparotomy, uterine exteriorization and an opened uterine cavity are necessary.

Test for the potential efficacy of the B-Lynch suture by performing open bimanual compression to see whether the bleeding stops, before proceeding to place the suture into the uterus. If the bleeding stops on applying such compression, there is a good chance that application of the B-Lynch suture will stop the bleeding.

Procedure

The assistant performs compression and maintains it with two hands during the placement of the suture by the surgeon *(see p. 291 for details)*. To perform the procedure, the operating surgeon should be well accustomed with the steps, which can be achieved by regular practice during skills and drills courses on dummies.

Other Procedures

Square Compression Sutures

Multiple square sutures are used to cover the whole body of the uterus and may be useful in cases of placenta previa (make sure to leave a drainage portal). Check that the compression sutures have worked by observing blood loss vaginally before closing the abdomen. Suture through and through with a straight 10-cm needle.

Uterine Compression Sutures – Vertical

These are an alternative to the B-Lynch technique if no lower segment Cesarean incision is present. They may be placed without opening the uterus, using a straight 10-cm needle. Ensure downward bladder retraction and place two to four vertical sutures. Check that the compression sutures have worked by observing blood loss per vaginum before closing the abdomen.

For detailed reading, consult *A Textbook of Postpartum Hemorrhage*, Chapter 22, p. 181; Chapter 31, p. 287–298

STEP 6

Other Procedures

Uterine Artery Embolization

Embolization is a highly feasible, safe and beneficial procedure, possibly precluding further laparotomy and hysterectomy. If successful, it not only saves the patient's life, but also the uterus and adnexal organs. Where available, it should be the procedure of choice for postpartum hemorrhage prior to surgical intervention, when other therapies have not achieved hemostasis. Embolization requires an obstetric department that is well aware of its implications in postpartum uterine hemorrhage and a proactive protocol providing easy access for the obstetricians to emergency care from the interventional radiology team.

Stepwise Devascularization

Essential requirements are an obstetrician competent in pelvic gynecological procedures and an obstetric anesthetist, and provisions for close supervision postoperatively.
The surgical approach starts with ligature of the uterine artery and its distribution to the uterus, either unilaterally or bilaterally, preferably as it emerges from crossing over the ureter or as it approaches the uterine wall to penetrate and establish its divisions and the infundibulo pelvic vessels before it enters the uterus.

Internal Iliac Artery Ligation

Conditions indicating ligation are postpartum hemorrhage due to atonic uterus refractory to other measures, abruptio placentae with uterine atony, abdominal pregnancy with pelvic implantation of the placenta and placenta accreta.

Therapeutic indications include: before or after hysterectomy for postpartum hemorrhage; continuous bleeding from the broad ligament base; profuse bleeding from the pelvic side-wall or the angle of the vagina; diffuse bleeding without a clearly identifiable vascular bed; ruptured uterus in which the uterine artery may be torn at its origin from the internal iliac artery; and where extensive lacerations of the cervix have occurred following difficult instrumental delivery.

Hysterectomy

Emergency peripartum hysterectomy is the best option when uterine atony is unresponsive to oxytocics and prostaglandins and where facilities for embolization are not available and/or the obstetrician is not versed with conservative surgical procedures. Uterine rupture secondary to obstructed labor and previous Cesarean section may be indications. If the rupture is extensive and hemorrhage cannot be contained by suture of the ruptured area, then hysterectomy may be necessary.

For detailed reading, consult *A Textbook of Postpartum Hemorrhage,* Chapter 30, p. 277; Chapter 31, p. 295; Chapter 32, p. 301–2; Chapter 34, p. 312

STEP 7

Prevention

Incidence and Risk Factors

Postpartum hemorrhage occurs in approximately 4% of vaginal deliveries, and it is estimated that it causes significant morbidity and 25% of all maternal childbirth-related deaths.

Active management of labor incorporates three main interventions: administration of a uterotonic medication after delivery of the baby; early cord clamping and cutting; and controlled traction on the umbilical cord while awaiting placental separation and delivery.

Good evidence shows that active management of the third stage of labor provides a better balance of benefits versus harms and should be practiced routinely to decrease the risk of postpartum hemorrhage. Active management involves facilitation for the separation and delivery of the placenta and enhances the effectiveness of the uterine contractions to shorten the duration of the third stage of labor and reduce the risk of postpartum hemorrhage.

Oxytocin is the uterotonic agent of choice; it can be administered as 10 units intramuscularly or as 5 units intravenously, and can safely and effectively be given to the mother after delivery of the placenta. Alternatively, 1 ampule of syntometrine can be given intravenously.

Risk Factors for Postpartum Hemorrhage

Risk factor	Odds ratio
Prolonged third stage of labor	7.6
Pre-eclampsia	5.0
Mediolateral episiotomy	4.7
Previous postpartum hemorrhage	3.5
Twin pregnancy	3.3
Arrest of descent	2.9
Soft-tissue lacerations	2.0
Asian ethnicity	1.7
Augmented labor	1.7
Forceps or vacuum delivery	1.7
Hispanic ethnicity	1.7
Midline episiotomy	1.6
Nulliparity	1.5

Adapted with permission from Combs CA, Murphy EL, Laros RK Jr. Factors associated with postpartum hemorrhage with vaginal birth. *Obstet Gynecol* 1991;77:73

For detailed reading, consult *A Textbook of Postpartum Hemorrhage*, Chapter 43, p. 398