



## Additional Topic 1: Infection prevention

This section provides guidelines on infection prevention practices to use when providing maternal and newborn services and is adapted from materials developed by JHPIEGO, EngenderHealth, and WHO.<sup>32, 33, 34</sup>

### Principles of infection prevention

Infection prevention practices are based on the following five principles:

1. Every person (client or staff) is considered potentially infectious.
7. Hand washing is the single most important practice for preventing cross-contamination.
8. Wear gloves before touching anything wet—broken skin, mucous membranes, blood, or other body fluids.
9. Use protective gear (aprons, face masks, eye goggles) when splashes or spills of body fluids are expected.
10. Use safe work practices (e.g., do not recap or bend needles), following guidelines for handling and cleaning instruments and disposing of sharps and medical waste.

### Hand washing

The steps in hand washing are:

1. Wet hands with running water and apply soap.
2. Rub together all surfaces of the hands including wrists, between fingers, palms, the back of the hands, and under fingernails.
3. Wash for 15 seconds.
4. Rinse under a stream of running water.
5. Dry hands. Air dry, or use a clean cloth or paper towels.

Always wash hands:

- Upon arrival to and before leaving the health care facility.
- Before and after examining the woman or baby (or having any direct contact).
- After exposure to any blood or body fluids, even if gloves are worn.
- After removing gloves (the gloves may have very small holes).

### Gloves

Wear gloves when:

- Performing a procedure.
- Handling soiled items (e.g., instruments and gloves).
- Disposing contaminated waste.

A separate pair of gloves must be used for each woman to avoid cross-contamination.

Disposable gloves are preferred, but when resources are limited, surgical gloves can be reused if they are:

- Decontaminated by soaking in 0.5 percent chlorine for 10 minutes **AND**
- Washed and rinsed **AND**
- Sterilized by autoclaving or high-level disinfected by boiling or steaming.

Single-use or disposable surgical gloves should not be reused more than three times because invisible tears may occur.

**Note:** Do not use gloves that are cracked, peeling, visibly torn, or contain holes.

## Aprons or gowns

Wear a clean or sterile gown during delivery:

- If the gown has long sleeves, gloves should be placed over the gown sleeve to avoid contaminating the gloves.
- Ensure gloved hands are held high above the level of the waist and do not come into contact with the gown.

## Handling sharp instruments

- Do not leave sharp instruments or needles (“sharps”) in places other than “safe” zones:
  - Use a tray or basin to carry and pass sharp items.
  - Pass instruments with the handle (not the sharp end) pointing toward the receiver.
- Announce to others before passing sharps.

## Needles and syringes

Follow these guidelines to ensure safe handling of needles and syringes:

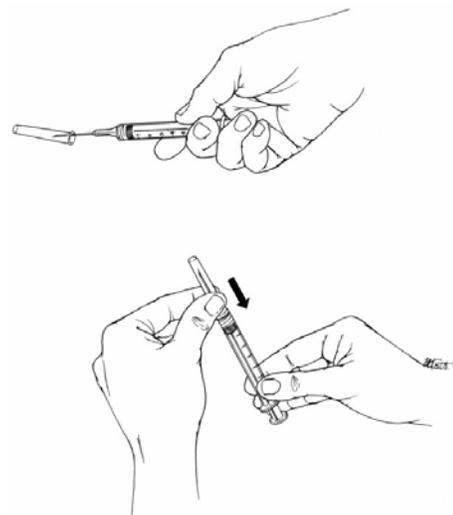
- Use each needle and syringe only once.
- Do not take needle and syringe apart after use.
- Do not recap, bend, or break needles before disposal.
- Dispose of needles and syringes in a puncture-proof container.

Where disposable needles are not available and you must recap the needle, use the “one-hand technique” for recapping (Figure 24).<sup>35</sup>

**Step 1:** Place the cap on a hard, flat surface.

**Step 2:** Hold the syringe with one hand and use the needle to “scoop up” the cap.

**Step 3:** When the cap covers the needle completely, hold the base of the needle and use



**Figure 24. One-hand technique for needle recapping**



the other hand to make sure the cap is firmly in place.

## Preventing splashes

Wear appropriate protective goggles, gloves, and gown during delivery. Prevent splashes from blood or amniotic fluid by following these guidelines:

- Avoid snapping the gloves when removing, as this may cause contaminants to splash into the eyes, mouth, or on to skin or others.
- Hold instruments and other items under the surface of the water while scrubbing and cleaning to avoid splashing.
- Place items gently into the decontamination bucket to avoid splashes.
- Avoid rupturing membranes during a contraction.
- Stand to the side when rupturing membranes to avoid splashes from amniotic fluid.

**Caution:** If blood or body fluids get in the mouth or on skin, wash with liberal soap and water as soon as it is safe for the woman and baby. If blood or body fluids splash in your eyes, irrigate well with water.

## Waste disposal

The purpose of waste disposal is to:

- Prevent the spread of infection to people who handle the waste.
- Prevent the spread of infection to the local community.
- Protect those who handle waste from accidental injury.

There is no risk from non-contaminated waste such as office paper, which can be disposed of according to local guidelines

Proper handling of contaminated waste (such as items with blood or body fluids) is required to minimize the spread of infection to other staff and the community. Proper handling includes:

- Wearing heavy-duty gloves.
- Transporting solid contaminated waste to the disposal site in covered containers.
- Carefully pouring liquid waste down a drain or flushable toilet.
- Burning or burying contaminated solid waste.
- Washing hands, gloves, and containers after disposal of infectious waste.

## The steps of processing instruments

Proper processing involves several steps that reduce the risk of transmitting infections from used instruments and other items to health care workers and clients: 1) decontamination, 2) cleaning, 3) either sterilization or high-level disinfection, and 4) storage. For proper processing, it is essential to perform the steps in the correct order. Table 6 provides an overview of the benefits gained by performing each step when processing instruments and gloves.

**Table 6. Steps and benefits for processing instruments for reuse**

Processing step		Benefit
Step 1	Decontaminate	<ul style="list-style-type: none"> <li>▪ Kills viruses (hepatitis B and C, HCV, HIV) and many other germs.</li> <li>▪ Makes items safer to handle during cleaning.</li> <li>▪ Makes items easier to clean.</li> <li>▪ Common decontamination process: soak in 0.5% chlorine solution for 10 minutes.</li> </ul>
Step 2	Clean	<ul style="list-style-type: none"> <li>▪ Removes blood, other body fluids, tissue, and dirt.</li> <li>▪ Reduces the number of germs.</li> <li>▪ Makes sterilization or HLD effective. If blood clot remains on instrument, germs in clot may not be completely killed by sterilization or HLD.</li> <li>▪ Wash items with soap and water and rinse with clean water.</li> </ul>
Step 3	High-level disinfect	<ul style="list-style-type: none"> <li>▪ Kills all germs except some endospores.</li> <li>▪ Use for items that have contact with broken skin or intact mucous membranes.</li> <li>▪ If sterilization is not possible, HLD may be the only other choice.</li> <li>▪ Can be done by boiling or steaming items for 20 minutes or chemical disinfection using 0.1% chlorine solution for 20 minutes.</li> </ul>
	Sterilize	<ul style="list-style-type: none"> <li>▪ Kills all germs including endospores.</li> <li>▪ May not be possible in all settings.</li> <li>▪ Can be done by dry (oven) or wet heat (autoclave).</li> </ul>
Step 4	Store or Use	<ul style="list-style-type: none"> <li>▪ If items are stored properly they will not become contaminated after processing. Proper storage is as important as proper processing.</li> <li>▪ Store or use items properly after completing the first three steps to prevent contamination for up to one week in HLD container.</li> </ul>

HLD High-level disinfection



## Making a chlorine decontamination solution

The ability to decontaminate instruments is a critical step in infection prevention. The most common decontamination process is to soak instruments in a 0.5% chlorine solution for 10 minutes. Chlorine solutions made from sodium hypochlorite are usually the most inexpensive, fast-acting, and effective for decontamination. A chlorine solution can be made from:

- Liquid household bleach (sodium hypochlorite).
- Bleach powder or chlorine compounds available in powder form (calcium hypochlorite or chlorinated lime).
- Chlorine-releasing tablets (sodium dichloroisocyanurate).<sup>30</sup>

Chlorine-containing compounds contain a certain percentage of "active" (or available) chlorine. Active chlorine in these products kills microorganisms. The amount of active chlorine is usually described as a percentage and differs among products, an important fact to ensure preparation of a chlorine solution with 0.5 percent "active" chlorine that can be used to decontaminate gloves, instruments, etc.

### Note that:

- Different products may contain different concentrations of available chlorine and the concentration should be checked before use.
- In countries where French products are available, the amount of active chlorine is usually expressed in "degrees chlorum." One degree chlorum is equivalent to 0.3 percent active chlorine.
- Household bleach preparations can lose some of their chlorine over time. Use newly manufactured bleach if possible. If the bleach does not smell strongly of chlorine it may not be satisfactory for the purpose and should not be used;
- Thick bleach solutions should never be used for disinfection purposes (other than in toilet bowls) as they contain potentially poisonous additives.

### When preparing chlorine solutions for use note that:

- Because of their low cost and wide availability, chlorine solutions prepared from liquid or powdered bleach are recommended.
- Organic matter destroys chlorine, and freshly diluted solutions must therefore be prepared whenever the solution looks as though it needs to be changed (such as when it becomes cloudy or heavily contaminated with blood or other body fluids).
- Chlorine solutions gradually lose strength, and freshly diluted solutions must therefore be prepared daily.
- Calculate the ratio of water to liquid bleach, bleach powder, or chlorine-releasing tablets (see the calculations below)
- Clear water should be used to make the solution because organic matter destroys chlorine.
- Use plastic containers for mixing and storing bleach solutions as metal containers are corroded rapidly and also affect the bleach.
- Prepare bleach solutions in a well ventilated area because they give off chlorine.
- Label the container with "\_\_\_ (0.1 or 0.5) percent chlorine decontamination solution," and note the day and time prepared.

- 0.5% bleach solution is caustic. Avoid direct contact with skin and eyes.

### Calculating the water to liquid household bleach ratio to make a 0.5% chlorine solution

Chlorine content in liquid bleach is available in different concentrations. You can use any concentration to make a 0.5 percent chlorine solution by using the following formula:

$[\% \text{ chlorine in liquid bleach divided by } 0.5\%] \text{ minus } 1 = \text{parts of water for each part bleach}$

**Note:** "Parts" can be used for any unit of measure (e.g., ounce, liter, or gallon) and do not have to represent a defined unit of measure (e.g., pitcher or container).

**For example:** To make a 0.5 percent chlorine solution from a 3.5 percent chlorine concentrate, use one part chlorine and 6 parts water:



$[3.5\% \text{ divided by } 0.5\%] \text{ minus } 1 = [7] \text{ minus } 1 = 6 \text{ parts water for each part chlorine}$

### Calculating the water to bleach powder ratio to make a 0.5% chlorine solution

When using bleach powder to make a decontamination solution, calculate the ratio of bleach to water using the following formula:

$[\% \text{ chlorine desired divided by } \% \text{ chlorine in bleach powder}] \text{ times } 1,000 = \text{grams of powder for each liter of water.}$

**Note:** When bleach powder is used, the chlorine solution will likely appear cloudy or milky.

**For example:** To make a 0.5 percent chlorine solution from calcium hypochlorite powder containing 35 percent available chlorine, use the following formula:

$[0.5\% \text{ divided by } 35\%] \text{ times } 1,000 = [0.0143] \text{ times } 1,000 = 14.3$

Therefore, dissolve 14.3 grams of calcium hypochlorite powder in one liter of water in order to get a 0.5 percent chlorine solution.

### Calculating the water to chlorine-releasing tablet ratio to make a 0.5% chlorine solution

Follow the manufacturer's instructions when using chlorine-releasing tablets because the percentage of active chlorine in these products varies. If instructions are not available with the tablets, ask for the product instruction sheet or contact the manufacturer. Table 7 provides details on how to mix a decontamination solution with chlorine.

**Table 7. Mixing a 0.5 percent chlorine decontamination solution<sup>29</sup>**

<b>Liquid bleach (sodium hypochlorite solution)</b>		
<b>Type or brand (by country)</b>	<b>% or grams active chlorine</b>	<b>Water to chlorine = 0.5% solution</b>
8° Chlorum*	2.4%	10 ml bleach in 40 ml water. 1 part bleach to 4 parts water.
JIK (Kenya, Zambia), Robin Bleach (Nepal)	3.5%	10 ml bleach in 60 ml water.
12° Chlorum	3.6%	1 part bleach to 6 parts water.
Household Bleach (Indonesia, USA), ACE (Turkey), Eau de Javel (France)	5%	10 ml bleach in 90 ml water. 1 part bleach to 9 parts water.
15° Chlorum, Lejia (Peru), Blanquedor, Cloro (Mexico)	6%	10 ml bleach in 110 ml water. 1 part bleach to 11 parts water.
Lavandina (Bolivia)	8%	10 ml bleach in 150 ml water. 1 part bleach to 15 parts water.
Chloros (United Kingdom)	10%	10 ml bleach in 190 ml water. 1 part bleach to 19 parts water.
Chloros (United Kingdom), Extrait de Javel (France), 48° Chlorum	15%	10 ml bleach in 290 water. 1 part bleach to 29 parts water.
<b>Dry powders</b>		
<b>Type or brand (by country)</b>	<b>% or grams active chlorine</b>	<b>Water to chlorine = 0.5% solution</b>
Calcium hypochlorite	70%	7.1 grams per liter.
Calcium hypochlorite	35%	14.2 grams per liter.
Sodium dichloroisocyanurate (NaDCC)	60%	8.3 grams per liter.
<b>Tablets</b>		
<b>Type or brand (by country)</b>	<b>% or grams active chlorine</b>	<b>Water to chlorine = 0.5% solution</b>
Chloramine tablets*	1 gram chlorine per tablet.	20 grams per liter (20 tablets per liter).
Sodium dichloroisocyanurate (NaDCC-based tablets)	1.5 grams chlorine per tablet.	4 tablets per liter.

\*Chloramine releases chlorine slower than hypochlorite. Before using solution, be sure the tablet is completely dissolved.





## Additional Topic 2: Birth preparedness and complication readiness

When delays occur in recognizing problems and referring women to appropriate health care facilities, the result can lead to maternal and newborn deaths. One solution to combat these problems is to work with the pregnant woman and her family to develop two plans: a birth-preparedness plan and a complication-readiness plan.<sup>36</sup>

### Birth-preparedness plan

Having a birth plan can reduce delayed decision-making and increase the probability of timely care. A birth-preparedness plan is an action plan made by the woman, her family members, and the health care provider. Often this plan is not a written document, but instead is an ongoing discussion between all concerned parties to ensure that the woman receives the best care in a timely manner. Each family should have the opportunity to make a plan for the birth. Health care providers can help the woman and her family to develop birth-preparedness plans and discuss birth-related issues. Work with the woman to:

Make plans for the birth:

- Discuss the idea of a birth plan and what to include during the first visit.
- Inquire about the birth-preparedness plan during the third or fourth antenatal visits.
- Ask if arrangements are made for a skilled birth attendant and the birth setting during the antenatal visit in the eighth month.
- If planning a home delivery with a skilled birth attendant, discuss access to a safe delivery kit consisting of 1) a piece of soap for cleaning the birth attendant's hands and the woman's perineum, 2) a plastic sheet about one square meter for use as a clean delivery surface, 3) clean string for tying the umbilical cord (usually two pieces), and 4) a clean razor blade for cutting the cord.

Make birth-related decisions:

- Where to give birth.
- Who will be the skilled birth attendant.
- How to contact the provider.
- How to get to the place of birth.
- Who will be the birth companion.
- Who will take care of the family while the woman is absent.
- How much money is needed and how to access these funds.

Prepare for the birth:

- Discuss items needed for the birth (perineal pads/cloths, soap, clean bed sheets, etc.) on the third antenatal visit.
- Confirm necessary items are gathered near the due date.

**Note:** In some cultures, superstition surrounds buying items for an unborn baby. If this is not the case, families can prepare

for the birth by buying baby supplies such as blankets, diapers, and clothes.

Save money:

- Discuss why and how to save money in preparation for the birth during the first visit.
- Discuss how to plan to make sure that any funds needed are available at birth.
- Check that the woman and her family have begun saving money or that they have ways to access necessary funds.

**Note:** Encourage the family to save money so necessary funds are available for routine care during pregnancy and birth. Assess financial needs with the women as well as sources for accessing these funds so they are available before labor.

## Complication-readiness plan

The complication-readiness plan is an action plan that outlines steps that can be discussed and determined prior to an emergency. Developing this plan helps the family to be prepared for and respond quickly when the woman or newborn has a complication and needs medical care. It is important that a complication-readiness plan is prepared with the woman and her chosen family members. Unless others are involved, the woman may have difficulties putting the plan into action should complications occur for her or her baby.

### Recognize danger signs

Women, family members, and community caregivers must know the signs of life-threatening complications. Many hours can be lost from the time a complication is recognized until the time arrangements are made for the woman to reach help. For PPH, the time from the start of bleeding to death can be as little as two hours. In too many cases, families of women who died in pregnancy, birth, or postpartum, did not recognize the problem in time. It is critical to reduce the time needed to recognize problems and make arrangements to receive care at the most appropriate level of care. Women, family members, and community caregivers must know the signs of life-threatening complications.

Maternal danger signs include:

- Vaginal bleeding (any vaginal bleeding during pregnancy; heavy vaginal bleeding or a sudden increase in vaginal bleeding during the postpartum period).
- Breathing difficulties.
- Fever.
- Severe abdominal pain.
- Severe headache/blurred vision.
- Convulsions or loss of consciousness.
- Foul-smelling discharge from vagina, tears, and incisions.
- Calf pain with or without swelling.
- Night blindness.
- Verbalization or behavior indicating she may hurt the baby or herself.
- Hallucinations.



Newborn danger signs include:

- Breathing problems.
- Feeding difficulties or not sucking.
- Feels cold or has fever.
- Redness, swelling, or pus from eyes or around the cord or umbilicus.
- Convulsions or fits.
- Jaundice (yellow skin).

### **Save money**

Similar to the birth preparedness plan, the family should be encouraged to save money so necessary funds are available for emergencies. In many situations, women either do not seek or receive care because they lack funding to pay for services.

### **Choose a decision-maker in case of emergency**

In many families, one person is the primary decision-maker. Too often, other members of the family do not feel they can make decisions if that person is absent. This can result in death when an emergency occurs and the primary decision-maker is absent. It is important to discuss how the family can make emergency decisions without disrupting or offending cultural and family values. If possible, find out which family member can make a decision in the absence of the chief decision-maker.

### **Have an emergency transportation plan**

Too many women and newborns die because they suffer serious complications and do not have access to transportation to the type of health care facility that can provide needed care. Each family should develop a transportation plan during the woman's early pregnancy in case the woman experiences complications and urgently needs a higher level of care. This plan should be prepared during pregnancy and after giving birth, either before discharge from the health facility or immediately after returning home. The plan should address the following:

- Where to go if complications arise.
- How to get to the next level of care in case of an emergency.
- Who in the family will accompany the woman.

### **Have an emergency blood donation plan**

Many health care facilities lack an inadequate, safe blood supply for transfusions. After birth, women are more likely to need blood transfusions because the complications they experience from birth lead to blood loss. For these reasons, it is extremely important that the woman and her family determine blood donors that can be available if needed.





## Additional Topic 3: Managing complications during the third stage of labor

Research shows that AMTSL does not increase the risk for obstetrical complications; however, problems may happen regardless of how the third stage is managed. The WHO publication “Managing Complications in Pregnancy and Childbirth: A Guide for Midwives and Doctors” provides the following guidelines for immediate management of complications during the third stage of labor.<sup>37</sup> Follow local guidelines for managing any complications and referring a woman for further treatment during or after the third stage of labor. For detailed information on clinical management, consult technical resources ([www.pphprevention.org](http://www.pphprevention.org)) or a supervisor.

### General management for an obstetric emergency

Emergencies can happen suddenly, as with a convulsion, or they can develop as a result of a complication that is not properly managed or monitored.

#### Preventing emergencies

Most emergencies can be prevented by:

- careful planning;
- following clinical guidelines;
- close monitoring of the woman.

#### Responding to an emergency

Responding to an emergency promptly and effectively requires that members of the clinical team know their roles and how the team should function to respond most effectively to emergencies. Team members should also know:

- clinical situations and their diagnoses and treatments;
- drugs and their use, administration and side effects;
- emergency equipment and how it functions.

**Note:** The ability of a facility to deal with emergencies should be assessed and reinforced by frequent practice emergency drills.

#### Initial management

In managing an emergency:

- Stay calm. Think logically and focus on the needs of the woman.
- Do not leave the woman unattended.
- Take charge. Avoid confusion by having one person in charge.
- **SHOUT FOR HELP.** Have one person go for help and have another person gather emergency equipment and supplies (e.g. oxygen cylinder, emergency kit).
- If the woman is **unconscious**, assess the airway, breathing and circulation.

- If **shock is suspected**, immediately begin treatment. Even if signs of shock are not present, keep shock in mind as you evaluate the woman further because her status may worsen rapidly. If **shock develops**, it is important to begin treatment immediately.
- Position the woman lying down on her left side with her feet elevated. Loosen tight clothing.
- Talk to the woman and help her to stay calm. Ask what happened and what symptoms she is experiencing.
- Perform a quick examination including vital signs (blood pressure, pulse, respiration, temperature) and skin color.
- Estimate the amount of blood lost and assess symptoms and signs.

## General management for shock

### Signs and symptoms usually seen in shock:

- Fast, weak pulse (110 per minute or more).
- Low blood pressure (systolic less than 90 mm Hg).

Other signs and symptoms of shock include:

- Pallor (especially of inner eyelid, palms, or around the mouth).
- Sweaty or cold, clammy skin.
- Rapid breathing (rate of 30 breaths per minute or more).
- Anxiousness, confusion, or unconsciousness.
- Low urine output (less than 30 mL per hour).

### Immediate management of shock

- **Shout for help.** Urgently mobilize all available personnel.
- Evaluate vital signs (pulse, blood pressure, respiration, temperature).
- Turn the woman onto her side to reduce the risk of aspiration from vomiting and to ensure an open airway.
- Keep the woman warm; however, avoid overheating which increases peripheral circulation and reduces blood supply to the vital organs.
- Elevate the legs to increase return of blood to the heart (if possible, raise the foot end of the bed).

### Specific management

- Start an IV infusion (or two if possible) using a large-bore cannula or needle (16 gauge or largest available).  
Collect blood to test hemoglobin; do an immediate cross-match and bedside clotting (see below) before infusion of fluids:
  - Rapidly infuse IV fluids (normal saline or Ringer’s lactate) initially at the rate of 1 L in 15 to 20 minutes.

**Note:** Avoid using plasma substitutes (e.g., dextran) because there is no evidence that plasma substitutes are superior to



normal saline in resuscitating a shocked woman. Also, dextran can be harmful in large doses.

- Give at least 2 L of these fluids in the first hour. (This amount is in addition to fluids given for lost blood.)

**Note:** Do not give fluids by mouth to a woman in shock. A quicker rate of infusion is needed in the management of shock from bleeding. Aim to replace 2 to 3 times the estimated fluid loss.

- When finding a **peripheral vein is not possible**, do a venous cut-down.
- Continue to monitor vital signs and blood loss (every 15 minutes).
- Catheterize the bladder and monitor fluid intake and urine output.
- If available, give oxygen at 6 to 8 L per minute by mask or nasal cannula.

### Bedside clotting test

Assess blood clotting status using this **bedside clotting test**:

1. Take 2 mL of venous blood into a small, dry, clean, plain glass test-tube (approximately 10 mm x 75 mm).
2. Hold the tube in your closed fist to keep it warm (+37°C).
3. After four minutes, tip the tube slowly to see if a clot is forming. Then tip it again every minute until the blood clots and the tube can be turned upside down.
4. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.

### Decide and manage the cause of shock

After the woman is stabilized, determine the cause of shock and manage the condition accordingly.

## General management for vaginal bleeding after childbirth

Excessive vaginal bleeding is life-threatening and requires immediate action. Follow these steps to manage excessive bleeding:

**Note:** The steps listed here are only a summary and do not include extensive details about PPH management. Refer to local protocols or a technical reference for detailed management.

- **Shout for help.** Urgently mobilize all available personnel.
- Conduct a rapid evaluation of the woman's general condition including vital signs (pulse, blood pressure, respiration, temperature).
- If **shock is suspected**, immediately begin treatment. If signs of shock are not present, continue evaluating the woman because her status can change or worsen rapidly.

- Massage the uterus to expel blood and blood clots. Blood clots trapped in the uterus will prevent effective uterine contractions.
- Give oxytocin 10 IU IM.
- Start an IV infusion.  
Just before infusion of fluids, collect blood to test hemoglobin, and do an immediate cross-match and bedside clotting (see below).  
If blood is available for transfusion, prepare blood (type and cross) before beginning infusion.
- Have the woman empty her bladder or ensure that the bladder is empty (catheterize the bladder only if necessary).
- Check to see if the placenta is expelled, and examine it for completeness.
- Examine the vagina and perineum for tears (examination of the cervix is only warranted if the uterus is firm, the placenta and membranes are complete, no perineal or vaginal lacerations are present, but the woman continues to bleed).
- Provide specific treatment for the cause of PPH (see Table 8).

**Table 8. Diagnosis of vaginal bleeding after childbirth**

<b>Presenting Symptom and Other Symptoms and Signs Typically Present</b>	<b>Symptoms and Signs Sometimes Present</b>	<b>Probable Diagnosis</b>
<ul style="list-style-type: none"> <li>• Immediate PPH<sup>a</sup></li> <li>• Uterus soft and not contracted</li> </ul>	<ul style="list-style-type: none"> <li>• Shock</li> </ul>	Atonic uterus
<ul style="list-style-type: none"> <li>• Immediate PPH<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Complete placenta</li> <li>• Uterus contracted</li> </ul>	Tears of cervix, vagina or perineum
<ul style="list-style-type: none"> <li>• Placenta not delivered within 30 minutes after delivery</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate PPH<sup>a</sup></li> <li>• Uterus contracted</li> </ul>	Retained placenta
<ul style="list-style-type: none"> <li>• Portion of maternal surface of placenta missing or torn membranes with vessels</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate PPH<sup>a</sup></li> <li>• Uterus contracted</li> </ul>	Retained placental fragments
<ul style="list-style-type: none"> <li>• Uterine fundus not felt on abdominal palpation</li> <li>• Slight or intense pain</li> </ul>	<ul style="list-style-type: none"> <li>• Inverted uterus apparent at vulva</li> <li>• Immediate PPH<sup>b</sup></li> </ul>	Inverted uterus

<sup>a</sup> Bleeding may be light if a clot blocks the cervix or if the woman is lying on her back.

<sup>b</sup> There may be no bleeding with complete inversion.

- Twenty-four hours after bleeding stops, check hemoglobin or hematocrit levels to evaluate the woman for anemia.
  - If hemoglobin is below 7 g/dL or hematocrit is below 20 percent (severe anemia), give ferrous sulfate or ferrous fumarate 120 mg by mouth plus folic acid 400 mcg by mouth once daily for three months.
  - If hemoglobin is between 7 to 11 g/dL, give ferrous sulfate or ferrous fumarate 60 mg by mouth plus folic acid 400 mcg by mouth once daily for six months.



## Management of uterine atony

An atonic uterus fails to contract after delivery.

### Signs and symptoms usually seen in cases of uterine atony:

- Immediate PPH.
- Bleeding may be light if a clot blocks the cervix or if the woman is lying on her back.
- Uterus is soft and does not contract.

Signs and symptoms sometimes present:

- Shock.

### Immediate management of atonic uterus

If the woman is bleeding and her uterus is soft/not contracted:

- Continue to massage the uterus.
- Have the woman empty her bladder or ensure that the bladder is empty (catheterize the bladder only if necessary).
- Administer uterotonic drugs, given together or sequentially (Table 9).
- Anticipate the need for blood as soon as possible, and transfuse as necessary.

**Table 9. Uterotonic drugs for PPH management**

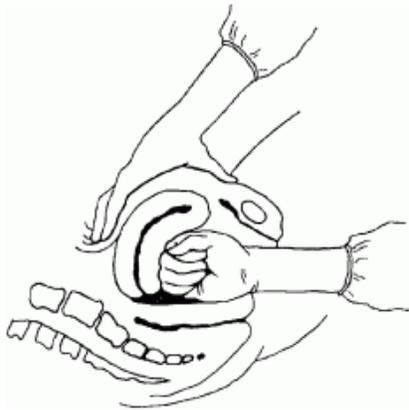
	Oxytocin	Ergometrine	Misoprostol
<b>Dose and route</b>	IV: Infuse 20 units in 1 L IV fluids at 60 drops per minute. IM: 10 IU.	IM: give 0.2 mg.	1,000 mcg rectally.
<b>Continuing dose</b>	IV: Infuse 20 units in 1 L IV fluids at 40 drops per minute.	Repeat 0.2 mg IM after 15 minutes. If required, give 0.2 mg IM every 4 hours.	Unknown.
<b>Maximum dose</b>	Not more than 3 L of IV fluids containing oxytocin.	5 doses (total 1.0 mg).	Oral dose should not exceed 600 mcg because of side effects of increased temperature and chills.
<b>Precautions and comments</b>	After 2–3 doses with no result, use alternate treatment.	Contraindicated in cases of pre-eclampsia, hypertension, heart disease.	Contraindicated in cases of asthma.

### If bleeding continues:

- Check placenta again for completeness.
- If there are **signs of retained placental fragments** (absence of a portion of maternal surface or torn membranes with vessels), remove remaining placental tissue.
- Assess clotting status using a bedside clotting test. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.

If **bleeding continues in spite of management**, perform bimanual compression of the uterus (Figure 25):

1. Wearing sterile or HLD gloves, insert a hand into the vagina and form a fist.
11. Place the fist into the anterior fornix and apply pressure against the anterior wall of the uterus.
12. With the other hand, press deeply into the abdomen behind the uterus, applying pressure against the posterior wall of the uterus.
13. Maintain compression until bleeding is controlled and the uterus contracts.



**Figure 25. Bimanual compression of the uterus<sup>34</sup>**

Alternatively, compress the aorta and prepare for potential surgical management (Figure 26):

1. Apply downward pressure with a closed fist over the abdominal aorta directly through the abdominal wall (the point of compression is just above the umbilicus and slightly to the left):
  - Aortic pulsations are felt easily through the anterior abdominal wall in the immediate postpartum period.
2. With the other hand, feel the femoral pulse to check the adequacy of compression:
  - If the femoral pulse is felt during compression, the pressure exerted by the fist is inadequate.
  - If the femoral pulse is not felt, the pressure exerted is adequate.
3. Maintain compression until bleeding is controlled.



**Figure 26. Compression of abdominal aorta and feeling the femoral pulse<sup>34</sup>**

**Note:** Packing the uterus is ineffective and wastes precious time.

When **bleeding continues in spite of compression**, the woman may require surgical intervention.

## Management of tears in the birth canal

Tears of the birth canal are the second most common cause of PPH. Tears may be present at the same time as uterine atony.

### Signs and symptoms usually seen with genital tears:

- Immediate PPH (bleeding may be light if a clot blocks the cervix or if the woman is lying on her back).
- Complete placenta.
- Uterus contracted.

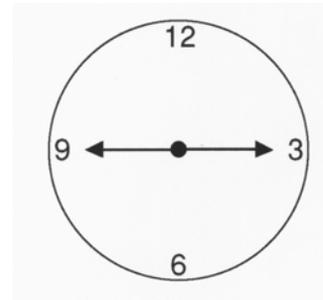
Signs and symptoms sometimes seen:

- Shock.

Postpartum bleeding with a contracted uterus is usually due to a cervical or vaginal tear.

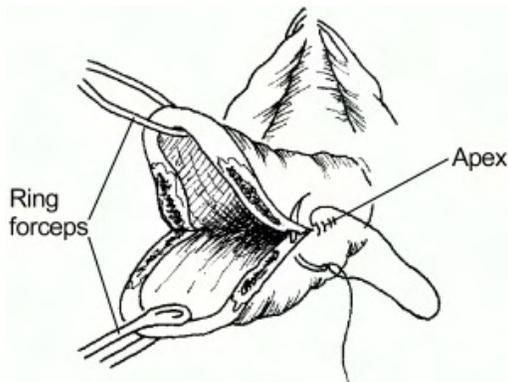
- Examine the woman carefully and repair tears to the vagina and perineum.
- If vaginal and perineal tears are absent or repaired and bleeding continues, examine the placenta again for completeness.
- If the placenta is complete, inspect the cervix.
  - Ask your assistant to press firmly down on the uterus. This moves the cervix lower in the vagina for careful examination. Good lighting may help facilitate the exam.

- Look carefully at all sides of the cervix for oozing or spurts of blood. Lacerations occur most frequently on the sides (9 and 3 o'clock positions) of the cervix (Figure 26).
- If you are unable to see the entire cervix due to bleeding, use two sponge forceps to “walk” around the cervix to inspect it completely. Put the first forceps at the 12 o'clock position and the second forceps at 2 o'clock position on the cervix. Hold the handles from both forceps in one hand.



**Figure 27. Common positions for cervical tears**

- To see the laceration better, pull the forceps handles toward you. Look for tears. Release the first forceps and place it on the cervix at 4 o'clock. Pull the forceps handles toward you and look for tears. Follow counter-clockwise in this manner until the entire cervix has been inspected.



**Figure 28. Repairing a cervical tear<sup>34</sup>**

- Repair lacerations by placing interrupted or continuous sutures the length of the tear, spaced about 1 cm apart using 0-chromic or polyglycolic sutures (Figure 27).

- If **bleeding continues**, assess clotting status using a bedside clotting test. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.



## Management of retained placenta

A retained placenta means that all or part of the placenta or membranes are left behind in the uterus during the third stage of labor. Normally after the placenta is delivered, the empty uterus contracts down to close off all the blood vessels inside the uterus. If the placenta only partially separates, the uterus cannot contract properly, so the blood vessels inside will continue to bleed.

### Signs and symptoms usually present with a retained placenta:

- Placenta not delivered within 30 minutes of delivery.

Signs and symptoms sometimes seen:

- Immediate PPH (Bleeding may be light if a clot blocks the cervix or if the woman is lying on her back).
- Shock.

**Note:** There may be no bleeding with a retained placenta.

- If you can see the placenta, ask the woman to squat and push.
- If you can feel the placenta in the vagina, remove it.
- Sometimes a full bladder will hinder delivery of the placenta. Help the woman empty her bladder to ensure that the bladder is empty (catheterize the bladder only if necessary).
- If the placenta is not expelled, give oxytocin 10 IU IM (if not already administered for AMTSL).

**Note:** Do not give ergometrine for a retained placenta because it causes tonic uterine contraction, which may delay expulsion.

- If the **placenta is undelivered after 30 minutes of oxytocin stimulation and the uterus is contracted**, attempt CCT with countertraction to the uterus.

**Note:** Avoid forceful cord traction and fundal pressure because these interventions may cause uterine inversion.

- If **CCT is unsuccessful** and the attendant is adequately trained to perform manual removal, attempt manual removal of the placenta and administer a single dose of prophylactic antibiotics: ampicillin 2 g IV PLUS metronidazole 500 mg IV or cefazolin 1 g IV PLUS metronidazole 500 mg IV.

**Caution:** Very adherent tissue may be placenta accreta. Efforts to extract a placenta that does not separate easily may result in heavy bleeding or uterine perforation which usually requires a hysterectomy.

- If **bleeding continues**, assess clotting status using a bedside clotting test. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.
- If **there are signs of infection** (fever, foul-smelling vaginal discharge), administer antibiotics as for metritis.

**Note:** In low-resource settings, do not attempt manual removal of the placenta unless the woman is bleeding. If she is not bleeding, refer her to a higher level of care.

## Management of retained placental fragments

If a portion of the placenta—one or more lobes—is retained, it prevents the uterus from contracting effectively and can cause PPH. **If small fragments of placenta or membrane are retained and are not detected immediately, this may cause heavy bleeding and infection later on.**

### Signs and symptoms usually present with retained placental fragments:

- A portion of maternal surface of placenta is missing or torn.

Signs and symptoms sometimes present:

- Immediate PPH (bleeding may be light if a clot blocks the cervix or if the woman is lying on her back).

**Note:** There may be no bleeding with retained placental fragments.

- Wearing sterile or HLD gloves, perform manual exploration of the uterus for placental fragments. Manual exploration of the uterus is similar to the technique described for removal of the retained placenta. Give prophylactic antibiotics according to local protocols.

**Caution:** Only providers trained to perform manual exploration of the uterus should attempt to do so.

- Remove placental fragments by hand, or with ovum forceps or large curette.

**Caution:** Very adherent tissue may be placenta accreta. Efforts to extract fragments that do not separate easily may result in heavy bleeding or uterine perforation which usually requires a hysterectomy.

- If **bleeding continues**, assess clotting status using a bedside clotting test. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.



## Management of uterine inversion

The uterus is inverted if it turns inside out during delivery of the placenta. This is very rare during a normal third stage of labor, whether managed actively or physiologically.

### Signs and symptoms usually seen with an inverted uterus:

- Uterine fundus not felt on abdominal palpation.
- Slight or intense pain.

Signs and symptoms sometimes present:

- Inverted uterus apparent at vulva.
- Immediate PPH (there may be no bleeding with complete inversion).

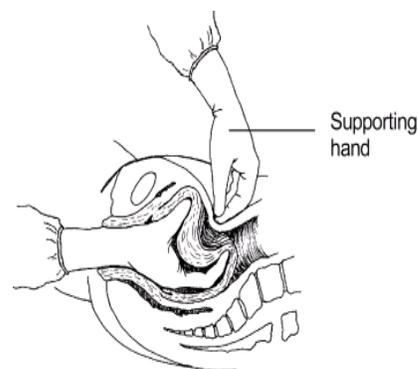
- Reposition the uterus immediately. As time passes, the uterus becomes more engorged with blood and is more difficult to put back into place.
- If the **woman is in severe pain**, give pethidine 1 mg/kg body weight (but not more than 100 mg) IM or IV slowly or give morphine 0.1 mg/kg body weight IM.

**Caution:** Do not give uterotonic drugs until the inversion is corrected.

- Support the uterus with your non-dominant hand and reposition the uterus with your dominant hand (Figure 29).

**Note:** If the placenta has not separated from the uterine wall when inversion occurs, do not attempt removal of the placenta until the inversion is corrected.

**Figure 29. Manual reduction of an inverted uterus**<sup>34</sup>



- If **bleeding continues**, assess clotting status using a bedside clotting test. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.
- Administer a single dose of prophylactic antibiotics after correcting the inverted uterus: ampicillin 2 g IV plus metronidazole 500 mg IV, **or** cefazolin 1 g IV plus metronidazole 500 mg IV.

- If there are signs of infection (fever, foul-smelling vaginal discharge), give antibiotics as for metritis.

## **Management if the cord tears off during CCT**

In many studies and experience with thousands of women, cord tears were not reported as a significant problem during AMTSL. In the rare event this happens:

- Have the woman empty her bladder to ensure that the bladder is empty (catheterize the bladder only if necessary).
- If the placenta has separated, ask the woman to squat and push with a contraction.
- If the placenta has not separated, the woman is not bleeding, and the provider has appropriate training, consider performing manual removal of the placenta. Otherwise, refer the woman to a higher level of care.



## Appendix A: FIGO/ICM joint statements



2003

### Joint Statement

#### Management of the Third Stage of Labour to Prevent Post-partum Haemorrhage



**International Confederation of Midwives (ICM)**  
**International Federation of Gynaecologists and Obstetricians (FIGO)**

ICM and FIGO are key partners in global Safe Motherhood efforts to reduce maternal death and disability in the world. Their mission statements share a common commitment in promoting the health, human rights and well-being of all women, most especially those at greatest risk for death and disability associated with childbearing. FIGO and ICM promote evidence-based, effective interventions that, when used properly with informed consent, can reduce the incidence of maternal mortality and morbidity in the world.

Severe bleeding is the single most important cause of maternal death worldwide. More than half of all maternal deaths occur within 24 hours of delivery, mostly from excessive bleeding. Every pregnant woman may face life-threatening blood loss at the time of delivery; women with anaemia are particularly vulnerable since they may not tolerate even moderate amounts of blood loss. Every woman needs to be closely observed and, if needed, stabilized during the immediate post-partum period.

Upon review of the available evidence, FIGO and ICM agree that active management of the third stage of labour is proven to reduce the incidence of post-partum haemorrhage, the quantity of blood loss, and the use of blood transfusion.

**Active management of the third stage of labour should be offered to women since it reduces the incidence of post-partum haemorrhage due to uterine atony.**

Active management of the third stage of labour consists of interventions designed to facilitate the delivery of the placenta by increasing uterine contractions and to prevent PPH by averting uterine atony. The usual components include:

- Administration of uterotonic agents
- Controlled cord traction
- Uterine massage after delivery of the placenta, as appropriate.

**Every attendant at birth needs to have the knowledge, skills and critical judgment needed to carry out active management of the third stage of labour and access to needed supplies and equipment.**

In this regard, national professional associations have an important and collaborative role to play in:

- Advocacy for skilled care at birth;
- Dissemination of this statement to all members of the organisation and facilitation of its implementation;
- Public education about the need for adequate prevention and treatment of post-partum

haemorrhage;

- Publication of the statement in national midwifery, obstetric and medical journals, newsletters and websites;
- Address legislative and other barriers that impede the prevention and treatment of post-partum haemorrhage;
- Incorporation of active management of the third stage of labour in national standards and clinical guidelines, as appropriate;
- Incorporation of active management of the third stage into pre-service and in-service curricula for all skilled birth attendants;
- Working with national pharmaceutical regulatory agencies, policymakers and donors to assure that adequate supplies of uterotonics and injection equipment are available.

### **MANAGEMENT OF THE THIRD STAGE OF LABOUR TO PREVENT POST-PARTUM HAEMORRHAGE**

#### **HOW TO USE UTEROTONIC AGENTS**

- Within one minute of the delivery of the baby, palpate the abdomen to rule out the presence of an additional baby(s) and give oxytocin 10 units IM. Oxytocin is preferred over other uterotonic drugs because it is effective 2-3 minutes after injection, has minimal side effects and can be used in all women.
- If oxytocin is not available, other uterotonics can be used such as: ergometrine 0.2 mg IM, syntometrine (1 ampoule) IM or misoprostol 400-600 mcg orally. Oral administration of misoprostol should be reserved for situations when safe administration and/or appropriate storage conditions for injectable oxytocin and ergot alkaloids are not possible.
- Uterotonics require proper storage:
  - Ergometrine: 2-8° C and protect from light and from freezing.
  - Misoprostol: room temperature, in a closed container.
  - Oxytocin: 15-30° C, protect from freezing
- Counselling on the side effects of these drugs should be given.

**Warning! Do not give ergometrine or syntometrine (because it contains ergometrine) to women with pre-eclampsia, eclampsia or high blood pressure.**

#### **HOW TO DO CONTROLLED CORD TRACTION**

- Clamp the cord close to the perineum (once pulsation stops in a healthy newborn) and hold in one hand.
- Place the other hand just above the woman's pubic bone and stabilize the uterus by applying counter-pressure during controlled cord traction.
- Keep slight tension on the cord and await a strong uterine contraction (2-3 minutes).
- With the strong uterine contraction, encourage the mother to push and very gently pull downward on the cord to deliver the placenta. Continue to apply counter-pressure to the uterus.
- If the placenta does not descend during 30-40 seconds of controlled cord traction do not continue to pull on the cord:
  - Gently hold the cord and wait until the uterus is well contracted again;
  - With the next contraction, repeat controlled cord traction with counter-pressure.



**Never apply cord traction (pull) without applying counter traction (push) above the pubic bone on a well-contracted uterus.**

- As the placenta delivers, hold the placenta in two hands and gently turn it until the membranes are twisted. Slowly pull to complete the delivery.
- If the membranes tear, gently examine the upper vagina and cervix wearing sterile/disinfected gloves and use a sponge forceps to remove any pieces of membrane that are present.
- Look carefully at the placenta to be sure none of it is missing. If a portion of the maternal surface is missing or there are torn membranes with vessels, suspect retained placenta fragments and take appropriate action (ref Managing Complications in Pregnancy and Childbirth).

#### **HOW TO DO UTERINE MASSAGE**

- Immediately massage the fundus of the uterus until the uterus is contracted.
- Palpate for a contracted uterus every 15 minutes and repeat uterine massage as needed during the first 2 hours.
- Ensure that the uterus does not become relaxed (soft) after you stop uterine massage.

**In all of the above actions, explain the procedures and actions to the woman and her family. Continue to provide support and reassurance throughout.**

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**November 2006**



**Prevention and Treatment of Post-partum Haemorrhage  
New Advances for Low Resource Settings  
Joint Statement  
*International Confederation of Midwives (ICM)*  
*International Federation of Gynaecology and Obstetrics (FIGO)***

The International Confederation of Midwives (ICM) and the International Federation of Gynaecology and Obstetrics (FIGO) are key partners in the global effort to reduce maternal death and disability around the world. Their mission statements share a common commitment in promoting the health, human rights and well-being of all women, most especially those at greatest risk for death and disability associated with childbearing. FIGO and ICM promote evidence-based interventions that, when used properly with informed consent, can reduce the incidence of maternal morbidity and mortality.

This statement reflects the current (2006) state-of-the-art and science of prevention and treatment of post-partum haemorrhage (PPH) in low resource settings. It incorporates new research evidence that has become available since the 2003 publication of the first FIGO/ICM Joint Statement: Management of the Third Stage of Labour to Prevent Post-partum Haemorrhage.<sup>1</sup>

Approximately 30 per cent of direct maternal deaths worldwide are due to haemorrhage, mostly in the post-partum period.<sup>2</sup> Most maternal deaths due to PPH occur in developing countries in settings (both hospital and community) where there are no birth attendants or where birth attendants lack the necessary skills or equipment to prevent and manage PPH and shock. The Millennium Development Goal of reducing the maternal mortality ratio by 75 per cent by 2015<sup>3</sup> will remain beyond our reach unless we confront the problem of PPH in the developing world as a priority.

Both ICM and FIGO endorse international recommendations that emphasise the provision of skilled birth attendants and improved obstetric services as central to efforts to reduce maternal and neonatal mortality. Such policies reflect what should be a basic right for every woman. Addressing PPH will require a combination of approaches to expand access to skilled care and, at the same time, extend life-saving interventions along a continuum of care from community to hospital. The different settings where women deliver along this continuum require different approaches to PPH prevention and treatment.

### **Call to Action**

Despite Safe Motherhood activities since 1987, women are still dying in childbirth. Women living in low resource settings are most vulnerable due to concurrent disease, poverty, discrimination and limited access to health care. The ICM and FIGO have a central role to play in improving the capacity of national obstetric societies and midwifery associations to reduce maternal mortality through safe, effective, feasible and sustainable approaches to reducing deaths and disabilities resulting from PPH. In turn, national obstetric and midwifery associations must lead the effort to implement the approaches described in this statement. Professional associations can mobilise to:

- Lobby governments to ensure healthcare for all women;
- Advocate for every woman to have a midwife, doctor or other skilled attendant at birth;
- Disseminate this statement to all members through all available means including publication in national newsletters or professional journals;
- Educate their members, other health care providers, policy makers, and the public about the approaches described in this statement and about the need for skilled care during childbirth;



- Address legislative and regulatory barriers that impede access to life-saving care, especially policy barriers that currently prohibit midwives and other birth attendants from administering uterotonic drugs;
- Ensure that all birth attendants have the necessary training, appropriate to the settings where they work, to safely administer uterotonic drugs and implement other approaches described in this statement and that uterotonics are available in sufficient quantity to meet the need;
- Call upon national regulatory agencies and policy makers to approve misoprostol for PPH prevention and treatment;
- Incorporate the recommendations from this statement into current guidelines, competencies and curricula.

We also call upon funding agencies to help underwrite initiatives aimed at reducing PPH through the use of cost-effective, resource- appropriate interventions.

### **Prevention of Post-partum Haemorrhage**

Pregnant women may face life-threatening blood loss at the time of delivery. Anaemic women are more vulnerable to even moderate amounts of blood loss. Fortunately, most PPH can be prevented. Different approaches may be employed depending on the setting and availability of skilled birth attendants and supplies.

#### **Active Management of the Third Stage of Labour (AMTSL)**

Data support the use of active management of the third stage of labour (AMTSL) by all skilled birth attendants regardless of where they practice. AMTSL reduces the incidence of PPH, the quantity of blood loss and the use of blood transfusion<sup>4</sup>, and thus should be included in any programme of interventions aimed at reducing deaths from PPH.

The usual components of AMTSL include:

- Administration of oxytocin\* or another uterotonic drug within one minute after the birth of the baby
- Controlled cord traction\*\*
- Uterine massage after delivery of the placenta as appropriate.

(For more detailed information on AMTSL, see the FIGO/ICM Joint Statement: Management of the Third Stage of Labour to Prevent Post- partum Haemorrhage.)

#### **Misoprostol and the Prevention of Post-Partum Haemorrhage**

In situations where no oxytocin is available or birth attendants' skills are limited, administering misoprostol soon after the birth of the baby reduces the occurrence of haemorrhage<sup>7, 8</sup>. The most common side effects are transient shivering and pyrexia. Education of women and birth attendants in the proper use of misoprostol is essential.

The usual components of giving misoprostol include:

- Administration of 600 micrograms (mcg) misoprostol orally or sublingually after the birth of the baby\*\*\*
- Controlled cord traction ONLY when a skilled attendant is present at the birth
- Uterine massage after the delivery of the placenta as appropriate.

\*The preferred storage of oxytocin is refrigeration but it may be stored at temperatures up to 300C up to three months without significant loss of potency.<sup>5</sup>

\*\*Delaying cord clamping by one to three minutes reduces anaemia in the newborn.<sup>6</sup>

\*\*\*Data from two trials comparing misoprostol with placebo show that misoprostol 600 mcg given orally or sublingually reduces PPH with or without controlled cord traction or use of uterine massage.<sup>7,8</sup>

### **Management of the Third Stage of Labour in the Absence of Uterotonic Drugs**

In some settings there will be no uterotonics available due to interruptions of supplies or the setting of birth. In the absence of current evidence, ICM and FIGO recommend that when no uterotonic drugs are available to either the skilled or non-skilled birth attendant, management of the third stage of labour includes the following components:

- Waiting for signs of separation of the placenta (cord lengthening, small blood loss, uterus firm and globular on palpation at the umbilicus)
- Encouraging maternal effort to bear down with contractions and, if necessary, to encourage an upright position
- Controlled cord traction is not recommended in the absence of uterotonic drugs, or prior to signs of separation of the placenta, as this can cause partial placental separation, a ruptured cord, excessive bleeding and uterine inversion
- Uterine massage after the delivery of the placenta as appropriate.

### **Treatment of Post-partum Haemorrhage**

Even with major advances in prevention of PPH, some women will still require treatment for excessive bleeding. Timely and appropriate referral and transfer to basic or comprehensive Emergency Obstetric Care (EmOC) facilities for treatment is essential to saving lives of women. Currently, the standard of care in basic EmOC facilities includes administration of IV/IM uterotonic drugs and manual removal of the placenta and retained products of conception; comprehensive emergency obstetrical care facilities would also include blood transfusion and/or surgery.<sup>9</sup>

#### **Community-based Emergency Care – Home-based Life-saving Skills (HBLSS)**

Anyone who attends a delivery can be taught simple home-based life-saving skills. Community-based obstetric first aid with home-based life-saving skills (HBLSS) is a family and community-focused programme that aims to increase access to basic life-saving measures and decrease delays in reaching referral facilities. Family and community members are taught techniques such as uterine fundal massage and emergency preparedness. Field tests suggest that HBLSS can be a useful adjunct in a comprehensive PPH prevention and treatment programme.<sup>10</sup> Key to the effectiveness of treatment is the early identification of haemorrhage and prompt initiation of treatment.

#### **Misoprostol in the Treatment of Post-partum Haemorrhage**

While there is less information about the effect of misoprostol for treatment of PPH, it may be appropriate for use in low resource settings and has been used alone, in combination with oxytocin, and as a last resort for PPH treatment. In the published literature, a variety of doses and routes of administration have shown promising results.<sup>11</sup> In home births without a skilled attendant, misoprostol may be the only technology available to control PPH. An optimal treatment regimen has not yet been determined. One published study on treatment of PPH found that 1000 mcg rectally significantly reduces the need for additional interventions.<sup>12</sup> Studies are ongoing to determine the most effective and safe dose for the treatment of PPH. A rare case of non-fatal hyperpyrexia has been reported after 800 mcg of oral misoprostol.<sup>13</sup>

**NOTE: Repeated doses of misoprostol are not recommended.**



### Innovative techniques

Other promising techniques appropriate for low resource settings for assessment and treatment of PPH include easy and accurate blood loss measurement,<sup>14, 15</sup> oxytocin in Uniject,<sup>16</sup> uterine tamponade,<sup>17</sup> and the anti-shock garment.<sup>18</sup> These innovations are still under investigation for use in low resource settings but may prove programmatically important, especially for women living far from skilled care.

### Research Needs

Important strides have been made in identifying life-saving approaches and interventions appropriate for PPH prevention and treatment in low resource settings. The field is rapidly evolving and the following issues have been identified as priorities for further research in low resource settings:

- Determine the optimal dose and route of misoprostol for prevention and treatment of PPH that will still be highly effective but will minimize the risk of side effects.
- Determine the most effective method of third stage management when no uterotonics are available.
- Assess the impact of better measurement of blood loss (e.g. with a calibrated drape or other means) on birth attendants' delivery practices.
- Assess options for treatment of PPH in lower-level (basic EmOC) facilities, in particular, uterine tamponade and the anti-shock garment.
- Identify the most efficient and effective means of teaching and supporting the skills needed by birth attendants and for community empowerment to address PPH.

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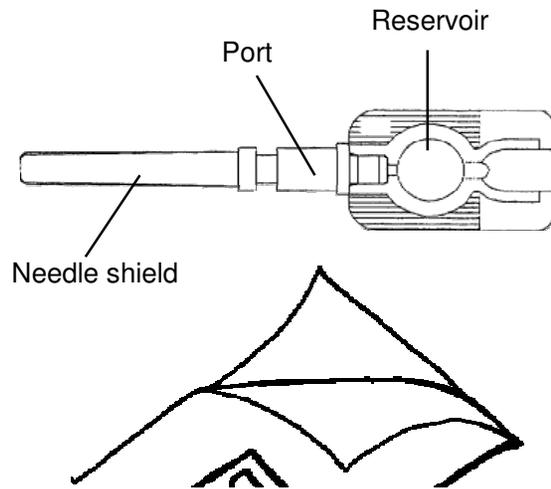
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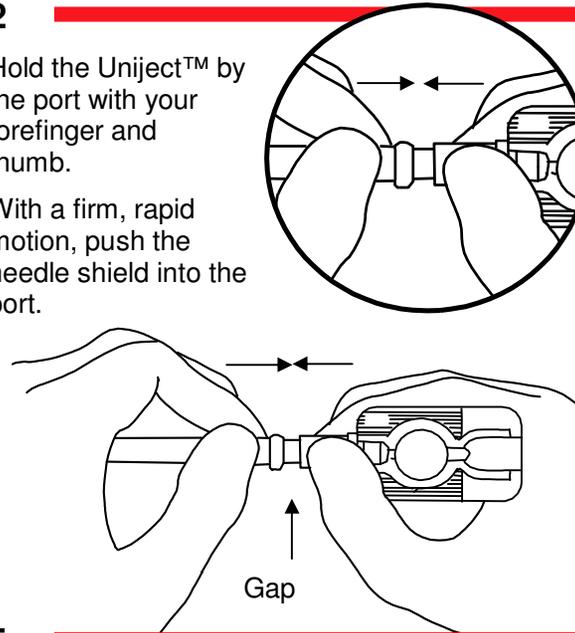
## Appendix B: Uniject™ activation and use

**1** Open the foil pouch and remove the Uniject™.

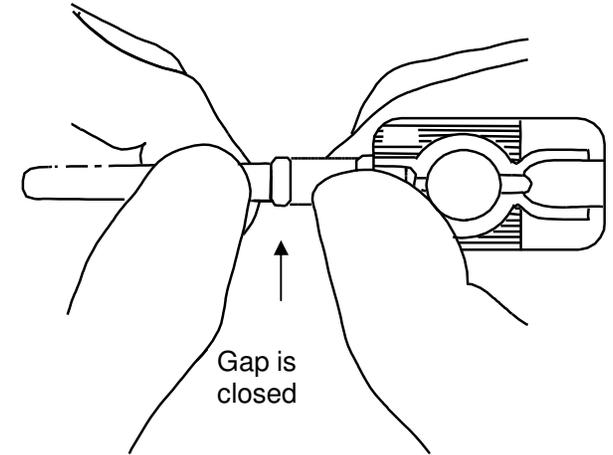


**2** Hold the Uniject™ by the port with your forefinger and thumb.

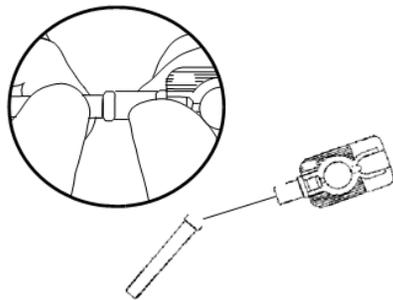
With a firm, rapid motion, push the needle shield into the port.



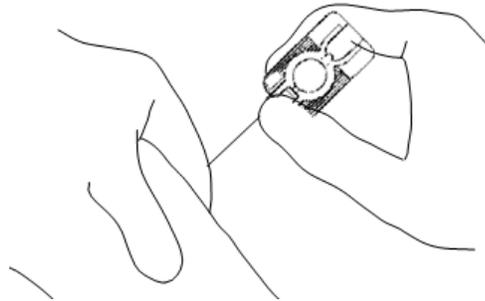
**3** As Uniject™ activates, you will feel a “click.” Continue to push firmly until you close the gap between the needle shield and the port.



**4** Remove the needle shield.



**5** Continue to hold the Uniject™ by the port and inject into the patient.



**6** Squeeze the reservoir firmly to inject. After the reservoir completely collapses, remove the Uniject™. Do not reshield used Uniject™. Discard the Uniject™ according to established medical waste disposal procedures.





## Appendix C: AMTSL job aid

### Active Management of the Third Stage of Labor (AMTSL)

**Offer to every woman...**



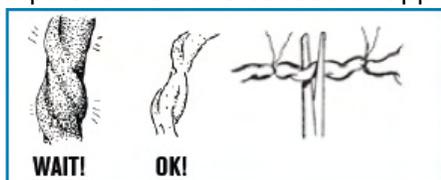
skin contact with the mother

**1:** Dry the baby, assess the baby's breathing and perform resuscitation if needed, and place the baby in skin-to-skin contact with the mother

**2:** Administer a uterotonic (the uterotonic of choice is oxytocin 10 IU IM) immediately after birth of the baby, and after ruling out the presence of another baby.



**3:** Clamp and cut the cord after cord pulsations have ceased or approximately 2-3 minutes after birth of the baby, whichever comes first.

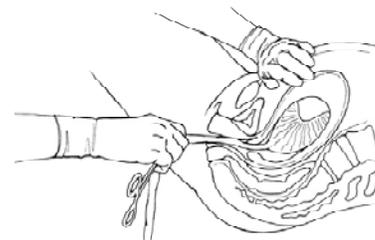


3 minutes after birth of the baby, whichever comes first.

**4:** Place the infant directly on the mother's chest, prone, with the newborn's skin touching the mother's skin. Cover the baby's head with a cap or cloth.



**5:** Perform controlled cord traction while, at the same time, supporting the uterus by applying external pressure on the uterus in an upward direction towards the woman's head.



**6.** Massage the uterus immediately after delivery of the placenta and membranes until it is firm.



During recovery, assist the woman to breastfeed if this is her choice, monitor the newborn and woman closely, palpate the uterus through the abdomen every 15 minutes for two hours to make sure it is firm and monitor the amount of vaginal bleeding. Provide PMTCT care as needed.



**...at every birth, by every skilled provider.**





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