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Postpartum Hemorrhage: Prevention and Treatment

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Postpartum hemorrhage is common and can occur in patients without risk factors for hemorrhage. Active management of the third stage of labor should be used routinely to reduce its incidence. Use of oxytocin after delivery of the anterior shoulder is the most important and effective component of this practice. Oxytocin is more effective than misoprostol for prevention and treatment of uterine atony and has fewer adverse effects. Routine episiotomy should be avoided to decrease blood loss and the risk of anal laceration. Appropriate management of postpartum hemorrhage requires prompt diagnosis and treatment. The Four T's mnemonic can be used to identify and address the four most common causes of postpartum hemorrhage (uterine atony [Tone]; laceration, hematoma, inversion, rupture [Trauma]; retained tissue or invasive placenta [Tissue]; and coagulopathy [Thrombin]). Rapid team-based care minimizes morbidity and mortality associated with postpartum hemorrhage, regardless of cause. Massive transfusion protocols allow for rapid and appropriate response to hemorrhages exceeding 1,500 mL of blood loss. The National Partnership for Maternal Safety has developed an obstetric hemorrhage consensus bundle of 13 patient- and systems-level recommendations to reduce morbidity and mortality from postpartum hemorrhage. (*Am Fam Physician*. 2017;95(7):442-449. Copyright © 2017 American Academy of Family Physicians.)

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Approximately 3% to 5% of obstetric patients will experience postpartum hemorrhage.[1] Annually, these preventable events are the cause of one-fourth of maternal deaths worldwide and 12% of maternal deaths in the United States.[2,3] The American College of Obstetricians and Gynecologists defines early postpartum hemorrhage as at least 1,000 mL total blood loss or loss of blood coinciding with signs and symptoms of hypovolemia within 24 hours after delivery of the fetus or intrapartum loss.[4,5] Primary postpartum hemorrhage may occur before delivery of the placenta and up to 24 hours after delivery of the fetus. Complications of postpartum hemorrhage are listed in *Table 1*[3,6,7]; these range from worsening of common postpartum symptoms such as fatigue and depressed mood, to death from cardiovascular collapse.

This review presents evidence-based recommendations for the prevention of and appropriate response to postpartum hemorrhage and is intended for physicians who provide antenatal, intrapartum, and postpartum care.

Prevention

Risk factors for postpartum hemorrhage are listed in *Table 2*.[8] However, 20% of postpartum hemorrhage occurs in women with no risk factors, so physicians must be prepared to manage this condition at every delivery.[9] Strategies for decreasing the morbidity and mortality associated with postpartum hemorrhage are listed in *Table 3*,[6,10-14] including the choice to deliver infants in women at high risk of hemorrhage at facilities with immediately available surgical, intensive care, and blood bank services.

The most effective strategy to prevent postpartum hemorrhage is active management of the third stage of labor (AMTSL). AMTSL also reduces the risk of a postpartum maternal hemoglobin level lower than 9 g per dL (90 g per L) and the need for manual removal of the placenta.[11] Components of this practice include: (1) administering oxytocin (Pitocin) with or soon after the delivery of the anterior shoulder; (2) controlled cord traction (Brandt-Andrews maneuver) to deliver the placenta; and (3) uterine massage after delivery of the placenta.[11] Placental delivery can be achieved using the

Brandt-Andrews maneuver, in which firm traction on the umbilical cord is applied with one hand while the other applies suprapubic counterpressure[15] *(eFigure A)*.

The individual components of AMTSL have been evaluated and compared. Based on existing evidence, the most important component is administration of a uterotonic drug, preferably oxytocin.[12,16] The number needed to treat to prevent one case of hemorrhage 500 mL or greater is 7 for oxytocin administered after delivery of the fetal anterior shoulder or after delivery of the neonate compared with placebo.[16] The risk of postpartum hemorrhage is also reduced if oxytocin is administered after placental delivery instead of at the time of delivery of the anterior shoulder.[17] Dosing instructions are provided in *Table 4*.[6]

An alternative to oxytocin is misoprostol (Cytotec), an inexpensive medication that does not require injection and is more effective than placebo in preventing postpartum hemorrhage.[12] However, most studies have shown that oxytocin is superior to misoprostol.[12,18] Misoprostol also causes more adverse effects than oxytocin—commonly nausea, diarrhea, and fever within three hours of birth.[12,18]

The benefits of controlled cord traction and uterine massage in preventing postpartum hemorrhage are less clear, but these strategies may be helpful.[15,19,20] Controlled cord traction does not prevent severe postpartum hemorrhage, but reduces the incidence of less severe blood loss (500 to 1,000 mL) and reduces the need for manual extraction of the placenta.[21]

Diagnosis and Management

Diagnosis of postpartum hemorrhage begins with recognition of excessive bleeding and targeted examination to determine its cause *(Figure 1[6])*. Cumulative blood loss should be monitored throughout labor and delivery and postpartum with quantitative measurement, if

Table 1. Complications of Postpartum Hemorrhage

Anemia	Death
Anterior pituitary ischemia with delay or failure of lactation (i.e., Sheehan syndrome or postpartum pituitary necrosis)	Dilutional coagulopathy
Blood transfusion	Fatigue
	Myocardial ischemia
	Orthostatic hypotension
	Postpartum depression

Information from references 3, 6, and 7.

Table 2. Risk Factors for Postpartum Hemorrhage

Antepartum hemorrhage	Maternal obesity
Augmented labor	Multifetal gestation
Chorioamnionitis	Preeclampsia
Fetal macrosomia	Primiparity
Maternal anemia	Prolonged labor

Information from reference 8.

Table 3. Strategies to Reduce Morbidity and Mortality from Postpartum Hemorrhage

Readiness by every unit
Have a hemorrhage cart with medications, supplies, checklist, and instruction cards immediately available
Establish a response team and know who to call when help is needed
Establish massive and emergency release transfusion protocols
Institute unit education on protocols and run unit-based drills
Recognition and prevention efforts for every patient
Antenatal assessment
Screen for and treat anemia antenatally
Screen for sickle cell disease and thalassemia in women of African, Southeast Asian, or Mediterranean descent
Obtain sonograms for women at high risk of invasive placenta
Perform delivery in facility with blood bank and in-house surgical services if the patient has a high risk of hemorrhage
Identify Jehovah's Witnesses and other patients who decline blood products
Intrapartum management
Use active management of the third stage of labor in every delivery
Avoid routine episiotomy
Avoid instrumented deliveries, especially forceps
Use perineal warm compresses
Measure cumulative blood loss and track postpartum vital signs
Response for every hemorrhage
Use an emergency management plan with checklists
Provide support program for patients, families, and staff
Reporting and systems learning for every unit
Establish a culture of huddles and postevent debriefs
Complete a multidisciplinary review for systems issues
Establish a perinatal quality improvement committee

Adapted with permission from Council on Patient Safety in Women's Health Care. Obstetric hemorrhage patient safety bundle. http://safehealthcareforeverywoman.org/patient-safety-bundles/obstetric-hemorrhage/ [login required]. Accessed October 16, 2016. Additional information from references 6, and 11 through 14.

Table 4. Medications Used for Prevention and Treatment of Postpartum Hemorrhage

Medication	*Dosage*	*Prevention*	*Treatment*	*Contraindications and cautions*
First-line agent				
Oxytocin (Pitocin)	Prevention: 10 IU IM or 5 to 10 IU IV bolus Treatment: 20 to 40 IU in 1 L normal saline, infuse 500 mL over 10 minutes then 250 mL per hour	+	+	Overdose or prolonged use can cause water intoxication Possible hypotension with IV use following cesarean delivery
Second-line agents				
Carboprost (Hemabate), a prostaglandin $F_{2\text{-alpha}}$ analogue	250 mcg IM or into myometrium, repeated every 15 to 90 minutes for a total dose of 2 mg	–	+	Avoid in patients with asthma or significant renal, hepatic, or cardiac disease
Methylergonovine (Methergine)	0.2 mg IM, repeat every two to four hours	–	+	Avoid in hypertensive disorders of pregnancy, including chronic hypertension Use with caution in patients with human immunodeficiency virus infection who are receiving protease inhibitors
Misoprostol (Cytotec),† a prostaglandin E_1 analogue	Prevention: 600 mcg orally Treatment: 800 to 1,000 mcg rectally or 600 to 800 mcg sublingually or orally	Use only when oxytocin is not available	+	Use with caution in patients with cardiovascular disease
Tranexamic acid (Cyklokapron)†	1 g intravenously over 10 minutes, may be repeated after 30 minutes	-	+	Use within three hours of onset of bleeding Use with caution in patients with renal impairment and with other clotting factors such as prothrombin complex concentrate

IM = intramuscularly; IV = intravenous; NA = not available.

**—Estimated retail price based on information obtained at http://online.lexi.com/action/home (login required; accessed June 10, 2016). Generic price listed first; brand price listed in parentheses.*

†—Misoprostol and tranexamic acid are not approved by the U.S. Food and Drug Administration for use in prevention or treatment of postpartum hemorrhage.

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possible.[22] Although some important sources of blood loss may occur intrapartum (e.g., episiotomy, uterine rupture), most of the fluid expelled during delivery of the infant is urine or amniotic fluid. Quantitative measurement of postpartum bleeding begins immediately after the birth of the infant and entails measuring cumulative blood loss with a calibrated underbuttocks drape, or by weighing blood-soaked pads, sponges, and clots; combined use of these methods is also appropriate for obtaining an accurate measurement.[22] Healthy pregnant women can typically tolerate 500 to 1,000 mL of blood loss without having signs or symptoms.[9] Tachycardia may be the earliest sign of postpartum hemorrhage. Orthostasis, hypotension, nausea, dyspnea, oliguria, and chest pain may indicate hypovolemia from significant hemorrhage. If excess bleeding is diagnosed, the Four T's mnemonic (uterine atony [Tone]; laceration, hematoma, inversion, rupture [Trauma]; retained tissue or invasive placenta [Tissue]; and coagulopathy [Thrombin]) can be used to identify specific causes *(Table 5[6])*. Regardless of the cause of bleeding, physicians should immediately summon additional personnel and begin appropriate emergency hemorrhage protocols.

TONE (UTERINE ATONY)

Uterine atony is the most common cause of postpartum hemorrhage.[9] Brisk blood flow after delivery of the placenta unresponsive to transabdominal massage should prompt immediate action including bimanual compression of the uterus and use of uterotonic medications *(Table 4[6])*. Massage is performed by placing one hand in the vagina and pushing against the body of the uterus while the other hand compresses the fundus from above through the abdominal wall *(eFigure B)*.

Uterotonic agents include oxytocin, ergot alkaloids, and prostaglandins. Oxytocin is the most effective treatment for postpartum hemorrhage, even if already used for labor induction or augmentation or as part of AMTSL.[8,23,24] The choice of a second-line uterotonic should be based on patient-specific factors such as hypertension, asthma, or use of protease inhibitors. Although it is not a uterotonic, tranexamic acid (Cyklokapron)

Mechanism of action	*Adverse effects*	*Cost**
Stimulates the upper segment of the myometrium to contract rhythmically, constricting spiral arteries and decreasing blood flow through the uterus	Rare	$1 ($13) for 10 units of injectable solution
Improves uterine contractility by increasing the number of oxytocin receptors and causes vasoconstriction	Nausea, vomiting, and diarrhea	NA ($270) for 250 mcg of injectable solution
Causes vasoconstriction and contracts smooth muscles and upper and lower segments of the uterus tetanically	Nausea, vomiting, and increased blood pressure	$9 (NA) for 0.2 mg of injectable solution
Causes generalized smooth muscle contraction	Nausea, vomiting, diarrhea, pyrexia, and shivering	$1 ($5) per 200-mcg tablet
Inhibits breakdown of fibrin and fibrinogen by plasmin	May increase risk of thrombosis and cause visual defects	$24 ($50)

may reduce mortality due to bleeding from postpartum hemorrhage (but not overall mortality) when given within the first three hours and may be considered as an adjuvant therapy.[25] *Table 4* outlines dosages, cautions, contraindications, and common adverse effects of uterotonic medications and tranexamic acid.[6]

TRAUMA

Lacerations and hematomas due to birth trauma can cause significant blood loss that can be lessened by hemostasis and timely repair. Episiotomy increases the risk of blood loss and anal sphincter tears; this procedure should be avoided unless urgent delivery is necessary and the perineum is thought to be a limiting factor.[26]

Vaginal and vulvar hematomas can present as pain or as a change in vital signs disproportionate to the amount of blood loss. Small hematomas can be managed with ice packs, analgesia, and observation. Patients with persistent signs of volume loss despite fluid replacement, as well as those with large (greater than 3 to 4 cm) or enlarging hematomas, require incision and evacuation of the clot.[27] The involved area should be irrigated and hemostasis achieved by ligating bleeding vessels, placing figure-of-eight sutures, and creating a layered closure, or by using any of these methods alone.

Uterine inversion is rare, occurring in only 0.04% of deliveries, and is a potential cause of postpartum hemorrhage.[27] AMTSL does not appear to increase the incidence of uterine inversion, but invasive placenta does.[27,28] The contributions of other conditions such as fundal implantation of the placenta, fundal pressure, and undue cord traction are unclear.[27] The inverted uterus usually appears as a bluish-gray mass protruding from the vagina. Patients with uterine inversion may have signs of shock without excess blood loss. If the placenta is attached, it should be left in place until after reduction to limit hemorrhage.[27] Every attempt should be made to quickly replace the uterus. The Johnson method of reduction begins with grasping the protruding fundus with the palm of the hand, directing the fingers toward the posterior fornix.[27] The uterus is returned to position by lifting it up through the pelvis and into the abdomen *(eFigure C)*. Once the uterus is reverted, uterotonic agents can promote uterine tone and prevent recurrence. If initial attempts to replace the uterus fail or contraction of the lower uterine segment (contraction ring) develops, the use of magnesium sulfate, terbutaline, nitroglycerin, or general anesthesia may allow sufficient uterine relaxation for manipulation.[28]

Uterine rupture can cause intrapartum and postpartum hemorrhage.[29] Although rare in an unscarred uterus, clinically significant uterine rupture occurs in 0.8% of vaginal births after cesarean delivery via low transverse uterine incision.[30] Induction and augmentation increase the risk of uterine rupture, especially for patients with prior cesarean delivery.[31] Before delivery, the primary sign of uterine rupture is fetal bradycardia.[31,32] Other signs and symptoms of uterine rupture are listed in *eTable A*.

TISSUE

Retained tissue (i.e., placenta, placental fragments, or blood clots) prevents the uterus from contracting enough to achieve optimal tone. Classic signs of placental separation include a small gush of blood, lengthening of the umbilical cord, and a slight rise of the uterus. The

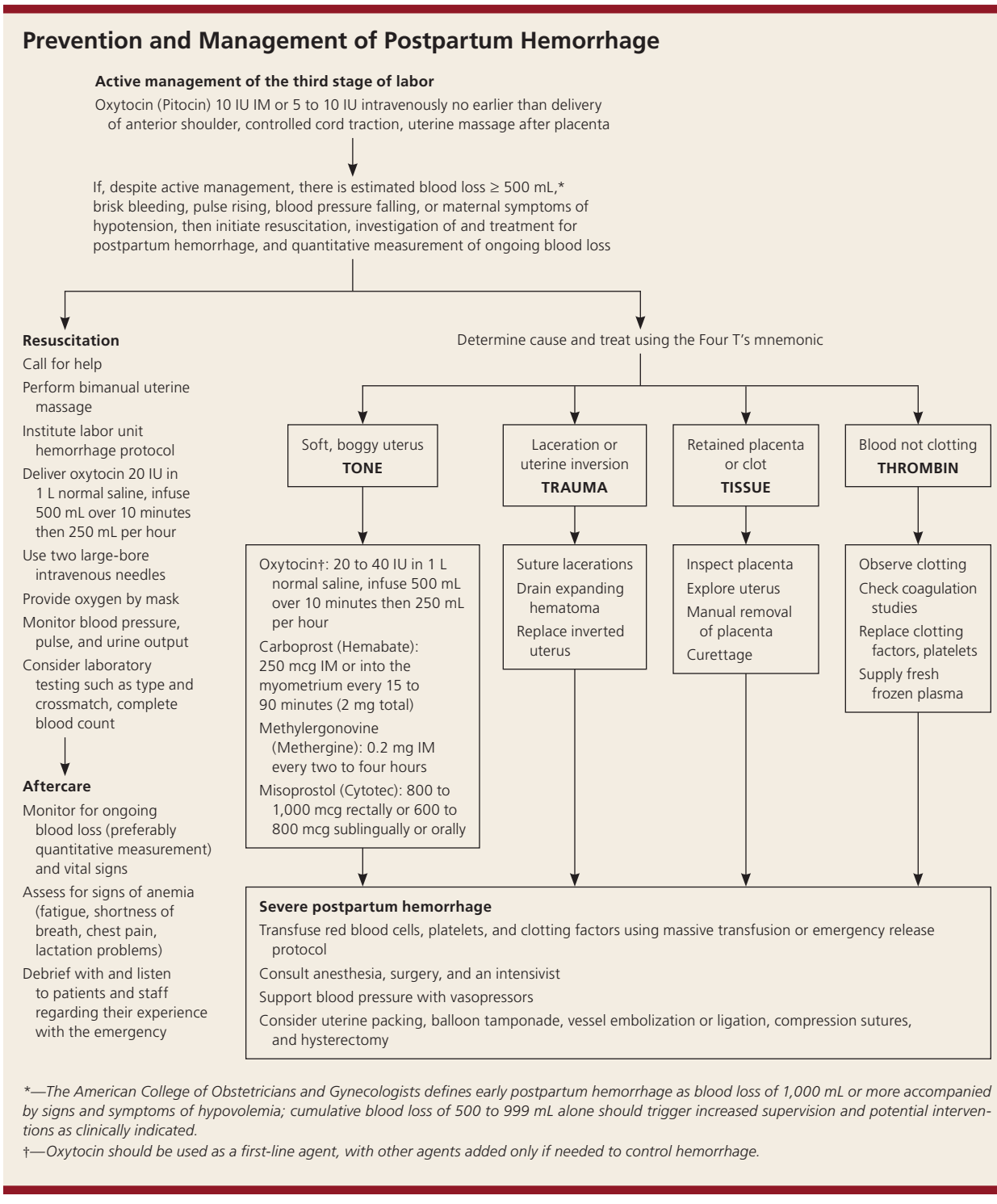

Figure 1. Algorithm for the prevention and management of postpartum hemorrhage. Many of the steps involved in diagnosing and treating postpartum hemorrhage must be undertaken simultaneously. Steps in maternal resuscitation may differ based on the actual cause. (IM = intramuscularly; PPH = postpartum hemorrhage.)

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mean time from delivery to placental expulsion is eight to nine minutes.[33] Longer intervals are associated with an increased risk of postpartum hemorrhage, with rates doubling after 10 minutes.[33] Retained placenta (i.e., failure of the placenta to deliver within 30 minutes) occurs in less than 3% of vaginal deliveries.[34,35] If the placenta is retained, consider manual removal using appropriate analgesia.[35] Injecting the umbilical vein with saline and

Table 5. Four T's Mnemonic for the Specific Causes of Postpartum Hemorrhage

Pathology	*Specific cause*	*Approximate incidence (%)*
Tone	Atonic uterus	70
Trauma	Lacerations, hematomas, inversion, rupture	20
Tissue	Retained tissue, invasive placenta	10
Thrombin	Coagulopathies	1

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oxytocin does not clearly reduce the need for manual removal.[35-37] If blunt dissection with the edge of the gloved hand does not reveal the tissue plane between the uterine wall and placenta, invasive placenta should be considered.

Invasive placenta (placenta accreta, increta, or percreta) can cause life-threatening postpartum hemorrhage.[13,34,35] The incidence has increased with time, mirroring the increase in cesarean deliveries.[13,34] In addition to prior cesarean delivery, other risk factors for invasive placenta include placenta previa, advanced maternal age, high parity, and previous invasive placenta.[13,34] Treatment of invasive placenta can require hysterectomy or, in select cases, conservative management (i.e., leaving the placenta in place or giving weekly oral methotrexate).[13]

THROMBIN (COAGULATION DEFECTS)

Coagulation defects can cause a hemorrhage or be the result of one. These defects should be suspected in patients who have not responded to the usual measures to treat postpartum hemorrhage or who are oozing from puncture sites. A coagulation defect should also be suspected if blood does not clot in bedside receptacles or red-top (no additives) laboratory collection tubes within five to 10 minutes. Coagulation defects may be congenital or acquired (*eTable B*). Evaluation should include a platelet count and measurement of prothrombin time, partial thromboplastin time, fibrinogen level, fibrin split products, and quantitative D-dimer assay. Physicians should treat the underlying disease process, if known, and support intravascular volume, serially evaluate coagulation status, and replace appropriate blood components using an emergency release protocol to improve response time and decrease risk of dilutional coagulopathy.[7,38,39]

Ongoing or Severe Hemorrhage

Significant blood loss from any cause requires immediate resuscitation measures using an interdisciplinary, stage-based team approach. Physicians should perform a primary maternal survey and institute care based on American Heart Association standards and an assessment of blood loss.[14,40] Patients should be given oxygen, ventilated as needed, and provided intravenous fluid and blood replacement with normal saline or other crystalloid fluids administered through two large-bore intravenous needles. Fluid replacement volume should initially be given as a bolus infusion and subsequently adjusted based on frequent reevaluation of the patient's vital signs and symptoms. The use of O negative blood may be needed while waiting for type-specific blood.

Elevating the patient's legs will improve venous return. Draining the bladder with a Foley catheter may improve uterine atony and will allow monitoring of urine output. Massive transfusion protocols to decrease the risk of dilutional coagulopathy and other postpartum hemorrhage complications have been established. These protocols typically recommend the use of four units of fresh frozen plasma and one unit of platelets for every four to six units of packed red blood cells used.[7,39]

Uterus-conserving treatments include uterine packing (plain gauze or gauze soaked with vasopressin, chitosan, or carboprost [Hemabate]), artery ligation, uterine artery embolization, B-lynch compression sutures, and balloon tamponade.[7,41-43] Balloon tamponade (in which direct pressure is applied to potential bleeding sites via a balloon that is inserted through the vagina and cervix and inflated with sterile water or saline), uterine packing, aortic compression, and nonpneumatic antishock garments may be used to limit bleeding while definitive treatment or transport is arranged.[7,41,44] Hysterectomy is the definitive treatment in women with severe, intractable hemorrhage.

Follow-up of postpartum hemorrhage includes monitoring for ongoing blood loss and vital signs, assessing for signs of anemia (fatigue, shortness of breath, chest pain, or lactation problems), and debriefing with patients and staff. Many patients experience acute and posttraumatic stress disorders after a traumatic delivery. Individual, trauma-focused cognitive behavior therapy can be offered to reduce acute traumatic stress symptoms.[45] Debriefing with staff may identify necessary systems-level changes *(Table 3)*.[6,10-14]

Systems Approach to Prevention and Treatment

Complications of postpartum hemorrhage are common, even in high-resource countries and well-staffed delivery suites. Based on an analysis of systems errors identified in The Joint Commission's 2010 Sentinel Event Alert, the commission recommended that hospitals establish protocols to enable an optimal response to changes in maternal vital signs and clinical condi-

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	*Evidence rating*	*References*
Routinely use active management of the third stage of labor, preferably with oxytocin (Pitocin). This practice will decrease the risks of postpartum hemorrhage and a postpartum maternal hemoglobin level lower than 9 g per dL (90 g per L), and reduce the need for manual removal of the placenta.	A	11, 12, 16, 18
Oxytocin is the most effective treatment for postpartum hemorrhage, even if already used for labor induction or augmentation or as part of active management of the third stage of labor.	A	8, 23, 24
In women with postpartum hemorrhage, tranexamic acid (Cyklokapron) given within the first three hours after birth reduces mortality due to bleeding, but not overall mortality.	B	25
Avoid routine episiotomy, which increases the risk of blood loss and anal sphincter tears, unless urgent delivery is necessary and the perineum is thought to be a limiting factor.	A	26
When needed, use massive transfusion protocols to decrease the risk of dilutional coagulopathy and other postpartum hemorrhage complications.	C	7, 39
Interdisciplinary team training with realistic simulation should be used to improve perinatal safety.	C	47, 48

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to http://www.aafp.org/afpsort.

tion. These protocols should be tested in drills, and systems problems that interfere with care should be fixed through their continual refinement.[46] In response, The Council on Patient Safety in Women's Health Care outlined essential steps that delivery units should take to decrease the incidence and severity of postpartum hemorrhage[14] *(Table 3*[6,10-14]*)*. The creation of a hemorrhage cart with supplies, and the use of huddles, rapid response teams, and massive transfusion protocols are among the recommendations. Advanced Life Support in Obstetrics (ALSO) training can be part of a systems approach to improving patient care. The use of interdisciplinary team training with in situ simulation, available through the ALSO program and from TeamSTEPPS (Team Strategies and Tools to Enhance Performance and Patient Safety), has been shown to improve perinatal safety.[47,48]

This article updates previous articles on this topic by Maughan, et al.,[49] and by Anderson and Etches.[50]

Data Sources: A PubMed search was completed in Clinical Queries using the key term postpartum hemorrhage. The search included meta-analyses, randomized controlled trials, clinical trials, and reviews. Also searched were the Cochrane Database of Systematic Reviews, Essential Evidence Plus, National Institute for Health and Care Excellence guidelines, Agency for Healthcare Research and Quality evidence reports, the Institute for Clinical Systems Improvement, and the National Guideline Clearinghouse. Search dates: October 12, 2015, and January 19, 2016.

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eTable A. Signs and Symptoms of Uterine Rupture

Abdominal tenderness
Circulatory collapse
Elevation of presenting fetal part
Fetal bradycardia*
Increasing abdominal girth
Loss of uterine contractions
Maternal tachycardia
Vaginal bleeding

**—Most common initial presenting sign.*

Information from:

American College of Obstetricians and Gynecologists. ACOG practice bulletin no. 115: vaginal birth after previous cesarean delivery. Obstet Gynecol. *2010;116(2 Pt 1):450-463.*

Guise JM, McDonagh MS, Osterweil P, Nygren P, Chan BK, Helfand M. Systematic review of the incidence and consequences of uterine rupture in women with previous caesarean section. BMJ. *2004;329(7456):19-25.*

National Institutes of Health Consensus Development Conference Panel. National Institutes of Health Consensus Development conference statement: vaginal birth after cesarean: new insights March 8-10, 2010. Obstet Gynecol. *2010;115(6):1279-1295.*

eTable B. Causes of Disordered Coagulation

Acquired

Amniotic fluid embolism
Consumptive coagulation secondary to excessive bleeding of any origin
Disseminated intravascular coagulation secondary to abruption
Fetal demise
HELLP (hemolysis, elevated liver enzyme levels, and low platelet levels) syndrome
Placental abruption
Preeclampsia with severe features
Sepsis
Use of anticoagulants such as aspirin or heparin

Chronic or congenital

Hemophilia
Idiopathic thrombocytopenic purpura
Thrombotic thrombocytopenic purpura
Von Willebrand disease

Information from:

Evensen A, Anderson J. Chapter J. Postpartum hemorrhage: third stage pregnancy. In: Leeman L, Quinlan J, Dresang LT, eds. Advanced Life Support in Obstetrics: Provider Syllabus. *5th ed. Leawood, Kan.: American Academy of Family Physicians; 2014.*

BONUS DIGITAL CONTENT

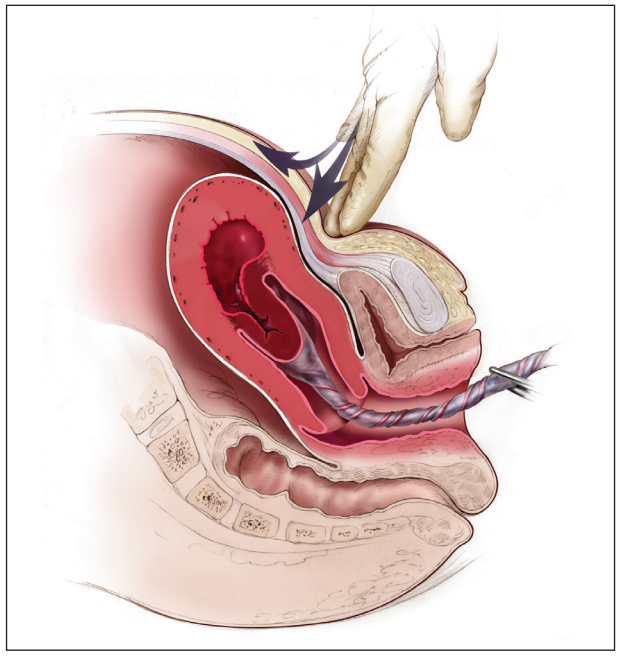
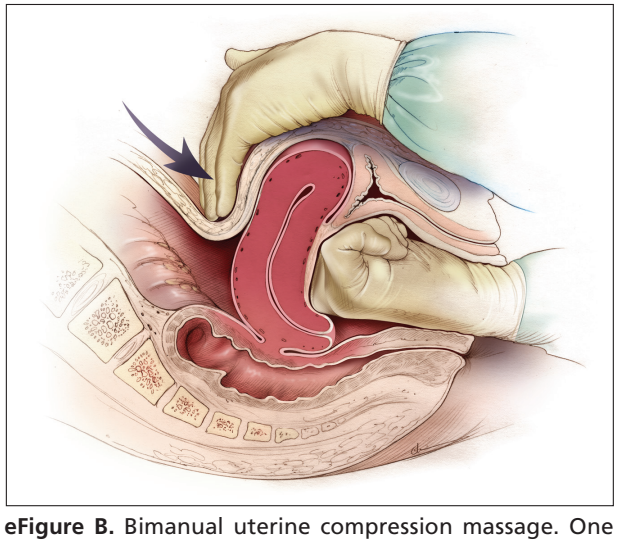


ILLUSTRATION BY CHRISTY KRAMES

eFigure A. Brandt-Andrews maneuver for controlled cord traction. Firm traction is applied to the umbilical cord with one hand while the other hand applies suprapubic counterpressure.

Reprinted with permission from Anderson JM, Etches D. Prevention and management of postpartum hemorrhage. Am Fam Physician. *2007;75(6):880.*



REDRAWN BY CHRISTY KRAMES

eFigure B. Bimanual uterine compression massage. One hand is placed in the vagina and pushes against the body of the uterus while the other hand compresses the fundus from above through the abdominal wall. The posterior aspect of the uterus is massaged with the abdominal hand and the anterior aspect with the vaginal hand.

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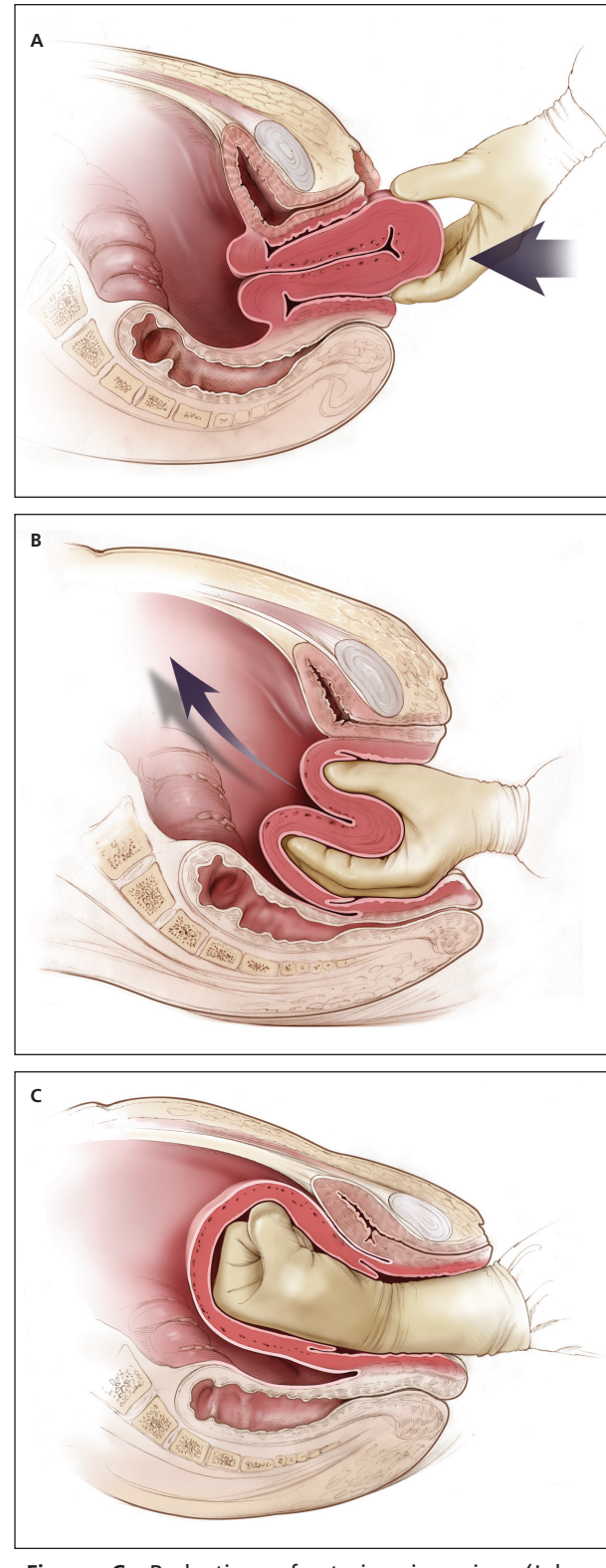

ILLUSTRATION BY CHRISTY KRAMES

eFigure C. Reduction of uterine inversion (Johnson method). *(A)* The protruding fundus is grasped with fingers directed toward the posterior fornix. *(B)* The uterus is returned to position by pushing it through the pelvis and *(C)* into the abdomen with steady pressure toward the umbilicus.

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