

Mobile Obstetric Hemorrhage Simulation Training



Please Fill Out Pre-Training Survey

Purpose

The goal of this training is to expand knowledge about the **management** and **treatment** of **obstetric hemorrhage** to help **reduce** the rates of **maternal mortality** and **morbidity** related to obstetric hemorrhage.



Voices of Impact: Jamie's Story



(Alliance for Innovation on Maternal Health [AIM], 2022a)

Learning Objectives

After attending this presentation participants will be able to:

- Define obstetric hemorrhage
- Recognize common causes of postpartum hemorrhage
- Identify key components and steps involved in managing simulations
- Understand how obstetric hemorrhage simulations can improve OB teams ability to recognize and manage obstetric emergencies



Obstetric Hemorrhage AIM Patient Safety Bundle

- **Readiness (every unit)**
- **Recognition & Prevention (every patient)**
- **Response (every hemorrhage)**
- **Reporting & Systems Learning (every unit)**
- **Respectful, Equitable & Supportive Care (every patient)**

(AIM, 2022a)

AIM's Five Rs Framework

- **Readiness**
 - Hemorrhage kit/cart
 - Response team
 - Massive transfusion protocol
 - Unit education
- **Recognition & Prevention**
 - Risk assessments
 - Quantitative blood loss (QBL) measurements
 - Active management of 3rd stage

(AIM, 2022a)

AIM's Five Rs Framework

- **Response**
 - Management plan (Policies and procedures)
 - Checklists
 - Support patients and families
- **Reporting & Systems Learning**
 - Debriefs
- **Respectful, Equitable & Supportive Care**
 - Engage in open, transparent, and empathetic communication with patients and families

(AIM, 2022a)

Arizona's AIM Hemorrhage Bundle Goals

Goal 1: The proportion of hospitals that have OB hemorrhage carts readily available is **100%**

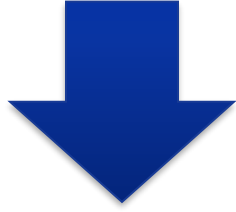
Goal 2: The proportion of patients who had their blood loss measured from birth through the recovery period using quantitative and cumulative techniques meets or exceeds **80%**

Goal 3: Percentage of facilities who established a standardized process to complete a hemorrhage risk assessment at the time of admission for birth is **100%**

Goal 4: Among the denominator (already being collected for process measure 3-patient Support After OB Hemorrhage-Pregnant and Postpartum people with greater than or equal to 1000mL blood loss during the birth admission) number of cases debriefed meets or exceeds **50%**

(AIM, 2022a)

AIM's Primary Objective



Reduce preventable maternal deaths and severe maternal morbidity (SMM) in the United States.

BY:

- Promoting safe care for every US birth.
- Engaging multidisciplinary partners at the national, state, and hospital levels.
- Developing and providing tools for implementation of evidence-based patient safety bundles.
- Utilizing data-driven quality improvement strategies.
- Aligning existing efforts and disseminating evidence-based resources.

The AIM Impact

50

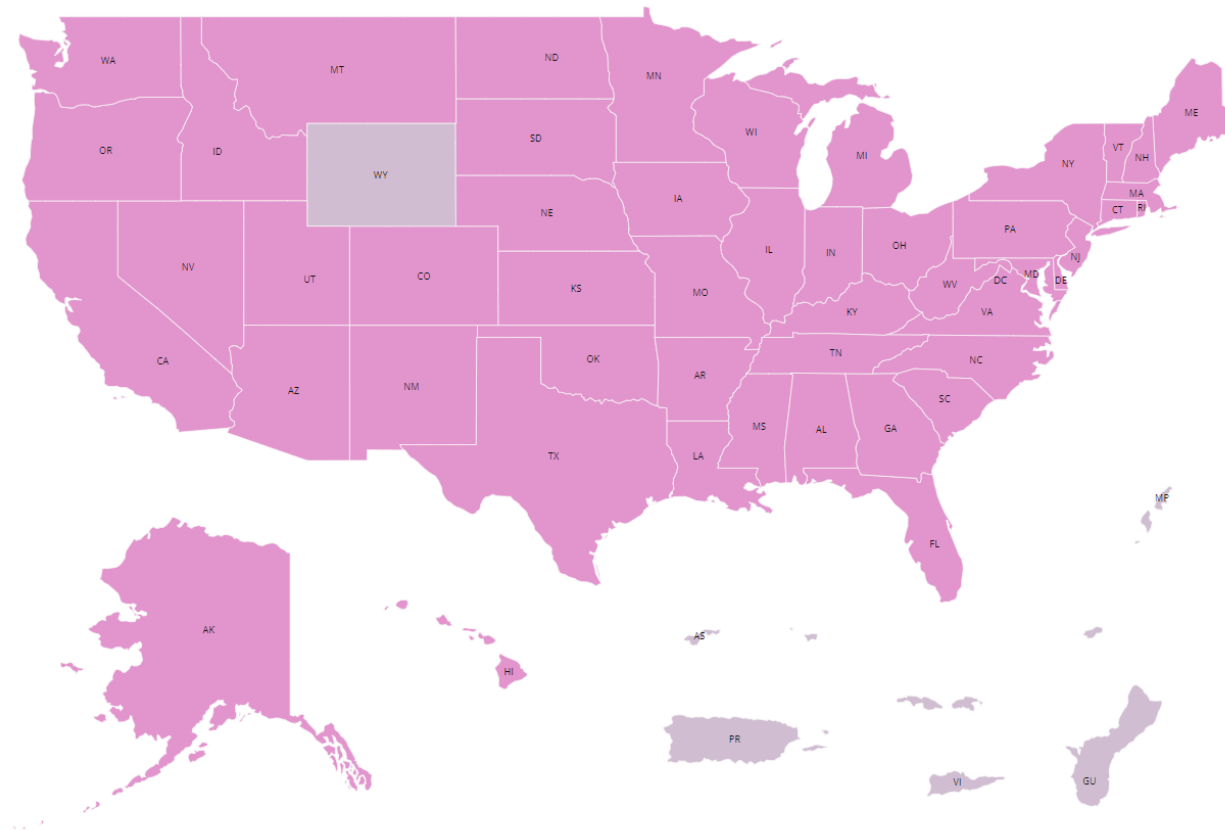
49 Enrolled States + District of
Columbia

1,996

AIM Participating Facilities

6

Not Yet Enrolled States +
Jurisdictions Currently Engaging
with AIM



Core AIM Patient Safety Bundles



Background

Problem

- Increasing mortality and morbidity rates caused by obstetric hemorrhage
- Long-term health consequences to mother and newborn
- Healthcare providers need to know how to recognize and manage

(Trikha & Singh, 2018; van den Broek, 2020)

Epidemiology

Worldwide

- Leading cause of maternal mortality worldwide
- About **14 million** women experience postpartum hemorrhage (PPH) each year, with about **70,000 maternal deaths globally**

(World Health Organization [WHO], 2022)

Epidemiology

United States

Hemorrhage was the
2nd leading underlying
cause of pregnancy-
related deaths

Table 4. Underlying causes of pregnancy-related deaths*, overall and by race or ethnicity¹, data from 36 US states, 2017–2019¹

	Total		Hispanic		AIAN		Asian	
	N	%	n	%	n	%	n	%
Mental health conditions ²	224	22.7	34	24.1	2	-	1	3.1
Hemorrhage ³	135	13.7	30	21.3	2	-	10	31.3
Cardiac and coronary conditions ⁴	126	12.8	15	10.6	1	-	7	21.9
Infection	91	9.2	15	10.6	1	-	0	0.0
Embolism-thrombotic	86	8.7	9	6.4	0	-	2	6.3
Cardiomyopathy	84	8.5	5	3.6	0	-	2	6.3

*Preliminary data shown from Arizona Department of Health Services (ADHS)

(Centers for Disease Control and Prevention [CDC], 2023)

Epidemiology

Arizona

- Native American women **4X more** likely to die than white women
- **90%** of Arizona's maternal deaths were PREVENTABLE

American Indian/Alaska Native women experienced the highest Pregnancy-Associated Mortality Ratio.

(Deaths per 100,000 live births)



**Suppressed due to figures less than 6.
(Misclassification bias may be present for cases &/or live births with multiple racial/ethnic identities. Please interpret data with caution.)*

(Arizona Department of Health Services [ADHS], 2022; CDC, 2023)

Epidemiology

Arizona

- In 2018-2019, pregnancy-associated mortality ratios and pregnancy-related mortality ratios **increased** by **15.3%** and **43.7%**
- Rural areas had an **increase** from **15.7%** in 2016-2017 to **17.4%** in 2018-2019

The Pregnancy-Associated Mortality Ratio in the Northern and Western Region of Arizona were the highest in the state. (Deaths per 100,000 live births)



(ADHS, 2022; CDC, 2023)

Postpartum Hemorrhage

Cumulative blood loss of ≥ 1000 ml or bleeding associated with signs or symptoms of hypovolemia within 24 h following the birth process regardless of mode of delivery

(American College of Obstetricians & Gynecologists [ACOG], 2017; Trikha & Singh, 2018)

Causes of Postpartum Hemorrhage

Primary

- Uterine atony
- Retained placenta
- Defects in coagulation
- Uterine inversion
- Genital tract hematomas

Secondary

- Infection
- Subinvolution of placenta site
- Retained placenta
- Inherited coagulation defects

(Evensen et al., 2017)

Four T's of Postpartum Hemorrhage

TONE	TISSUE	TRAUMA	THROMBIN
• Uterine atony • Infection • Prolonged induction of labor	• Retained products of conception • Abnormal placentation • Placental tissue or blood clots	• Vascular and soft tissue injury • Lacerations (perineum, vagina, cervix, or uterus) • Hematomas-vulvar, paravaginal, broad ligament, retroperitoneal may be concealed	• Coagulopathy • Inherited • Acquired

(Evensen et al., 2017)

Hemorrhage Risk Assessments

- On admission
- Ongoing from start of 2nd stage of labor
- Transfer to postpartum care

Low Risk	Medium Risk	High Risk
• Specimen on hold in Blood bank	• Order Type & Screen • Review Hemorrhage Protocol	• Order Type & Crossmatch 2 units PRBCs • Review Hemorrhage Protocol • Notify OB Anesthesia

(California Maternal Quality Care Collaborative [CMQCC], 2022)

Low Risk

- First and early second trimester D&C without history of bleeding (scheduled)
- Cerclage
- Vaginal birth
 - No previous uterine incision
 - No history of bleeding problems
 - No history of PP hemorrhage
 - Four or less previous vaginal births
 - Singleton pregnancy

(CMQCC, 2022)

Medium Risk

- VBAC
- Cesarean sections
- Multiple gestations or macrosomia
- History of prior postpartum hemorrhage
- Uterine fibroids
- Mid to late second trimester D&Es or induces vaginal births
- Other increased risks as designated by physician/certified nurse midwife

(CMQCC, 2022)

High Risk

- Placenta previa
- Suspected placenta accreta
- Hematocrit less than 26
- Vaginal bleeding on admission
- Coagulation defects
- Other high risks as designated by the physician/certified nurse midwife

(CMQCC, 2022)

Hemorrhage Risk Assessments

ADMISSION & LABOR RISK FACTORS		
MONITOR FOR HEMORRHAGE <i>Routine obstetric care</i>	NOTIFY CARE TEAM <i>Personnel that could be involved in response are made aware of patient status and risk factors</i>	NOTIFY CARE TEAM MOBILIZE RESOURCES <i>Consider anesthesia attendance at delivery</i>
Low	Medium	High
No previous uterine incision	Prior cesarean(s) or uterine surgery	Placenta previa, low lying placenta
Singleton pregnancy	Multiple gestation	Suspected/known placenta accreta spectrum
≤ 4 vaginal births	> 4 vaginal births	Abruption or active bleeding (> than show)
No known bleeding disorder	Chorioamnionitis	Known coagulopathy
No history of PPH	History of previous postpartum hemorrhage	History of > 1 postpartum hemorrhage
	Large uterine fibroids	HELLP Syndrome
	Platelets 50,000 - 100,000	Platelets < 50,000
	Hematocrit < 30% (Hgb < 10)	Hematocrit < 24% (Hgb < 8)
	Polyhydramnios	Fetal demise
	Gestational age < 37 weeks or > 41 weeks	2 or more medium risk factors
	Preeclampsia	
	Prolonged labor/Induction (> 24 hrs)	
If low risk: ☐ Specimen on Hold in Blood Bank	If medium risk: ☐ Order Type & Screen ☐ Review Hemorrhage Protocol	If high risk: ☐ Order Type & Crossmatch 2 units PRBCs ☐ Review Hemorrhage Protocol ☐ Notify OB Anesthesia

(CMQCC, 2022)

Stage-Based Care

Stage 0: All births	Stage 1: Blood loss >1000mL after delivery with normal VS and labs	Stage 2: Continued bleeding ≤1500mL OR ≥2 uterotonics, normal VS and labs
• Active management of 3rd stage with oxytocin • Quantitative blood loss (QBL) evaluation • Close monitoring	• Ensure at least 18G IV access • Increase fluids • Fundal/bimanual massage • Empty bladder (indwelling catheter or straight cath) • VS, O2 sat & LOC q5 mins • QBL q5-15mins • Consider etiology (Four T's) • Ensure Type & Cross 2 units PRBC • Increase oxytocin, additional uterotonics	• Call for additional help (OB rapid response) • Place 2nd IV • Draw STAT labs (CBC, Coags, Fibrinogen) • Prepare OR • Continue Stage 1 medications; consider TXA • Obtain 2 units of PBRCs • Thaw 2 units FFP

(ACOG, 2019b; CMQCC, 2022)



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Stage-Based Care

Stage 3: Continued bleeding >1500mL OR >2 PBRCs given OR abnormal VS/labs OR suspected DIC	Stage 4: Cardiovascular collapse (massive hemorrhage, profound hypovolemic shock, or amniotic fluid embolism)
• Call for additional help (Code Crimson) • Activate Massive Transfusion Protocol (MTP) • Move to OR • Repeat coags & ABGs • Central line • Upper body warming device • Warmer for IV fluids • Sequential Compression Devices (SCDs) • Family Support	• Mobilize additional resources • ACLS • Simultaneous aggressive massive transfusion • Immediate surgical intervention to ensure hemostasis (hysterectomy)

(ACOG, 2019b; CMQCC, 2022)



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Stage-Based Care

Post-Hemorrhage Management

- Determine disposition of patient
- Debrief with the whole obstetric care team
- Debrief with patient and family
- Document

(ACOG, 2019b; CMQCC, 2022)



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Obstetric Hemorrhage Checklist

EXAMPLE

Complete all steps in prior stages plus current stage regardless of stage in which the patient presents.

Postpartum hemorrhage is defined as cumulative blood loss of greater than or equal to 1,000mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours. However, blood loss >500mL in a vaginal delivery is abnormal, and should be investigated and managed as outlined in Stage 1.

RECOGNITION:

☐ Call for assistance (Obstetric Hemorrhage Team)

Designate: ☐ Team leader ☐ Checklist reader/recorder ☐ Primary RN

Announce: ☐ Cumulative blood loss ☐ Vital signs ☐ Determine stage

STAGE 1: Blood loss >1000mL after delivery with normal vital signs and lab values. Vaginal delivery 500-999mL should be treated as in Stage 1.

INITIAL STEPS:

- ☐ Ensure 16G or 18G IV Access
- ☐ Increase IV fluid (crystalloid without oxytocin)
- ☐ Insert indwelling urinary catheter
- ☐ Fundal massage

MEDICATIONS:

- ☐ Ensure appropriate medications given patient history
- ☐ Increase oxytocin, additional uterotonics

BLOOD BANK:

- ☐ Confirm active type and screen and consider crossmatch of 2 units PRBCs

ACTION:

- ☐ Determine etiology and treat
- ☐ Prepare OR, if clinically indicated (optimize visualization/examination)

Oxytocin (Pitocin):

10-40 units per 500-1000mL solution

Methylergonovine (Methergine):

0.2 milligrams IM (may repeat);

Avoid with hypertension

15-methyl PGF₂α (Hemabate, Carboprost):

250 micrograms IM (may repeat in q15 minutes, maximum 8 doses); **Avoid with asthma; use with caution with hypertension**

Misoprostol (Cytotec):

800-1000 micrograms PR
600 micrograms PO or 800 micrograms SL

Tone (i.e., atony)

Trauma (i.e., laceration)

Tissue (i.e., retained products)

Thrombin (i.e., coagulation dysfunction)

STAGE 2: Continued Bleeding (EBL up to 1500mL OR ≥ 2 uterotonics) with normal vital signs and lab values (*two or more uterotonics in addition to routine oxytocin administration; or ≥ 2 administrations of the same uteronic)

INITIAL STEPS:

- ☐ Mobilize additional help
- ☐ Place 2nd IV (16-18G)
- ☐ Draw STAT labs (CBC, Coags, Fibrinogen)
- ☐ Prepare OR

MEDICATIONS:

- ☐ Continue Stage 1 medications; consider TXA

BLOOD BANK:

- ☐ Obtain 2 units PRBCs (DO NOT wait for labs. Transfuse per clinical signs/symptoms)
- ☐ Thaw 2 units FFP

ACTION:

- ☐ For uterine atony → consider uterine balloon or packing, possible surgical interventions
- ☐ Consider moving patient to OR
- ☐ Escalate therapy with goal of hemostasis

Tranexamic Acid (TXA)

1 gram IV over 10 min (add 1 gram vial to 100mL NS & give over 10 min; may be repeated once after 30 min)

Possible interventions:

- Bakri balloon
- Compression suture/B-Lynch suture
- Uterine artery ligation
- Hysterectomy

Huddle and move to Stage 3 if continued blood loss and/or abnormal VS

Safe Motherhood Initiative

Revised September 2020



STAGE 3: Continued Bleeding (EBL > 1500mL OR ≥ 2 RBCs given OR at risk for occult bleeding/coagulopathy OR any patient with abnormal vital signs/labs/oliguria)

INITIAL STEPS:

- ☐ Mobilize additional help
- ☐ Move to OR
- ☐ Announce clinical status (vital signs, cumulative blood loss, etiology)
- ☐ Outline and communicate plan

MEDICATIONS:

- ☐ Continue Stage 1 medications; consider TXA

BLOOD BANK:

- ☐ Initiate Massive Transfusion Protocol (if clinical coagulopathy: add cryoprecipitate, consult for additional agents)

ACTION:

- ☐ Achieve hemostasis, intervention based on etiology
- ☐ Escalate interventions

Oxytocin (Pitocin):

10-40 units per 500-1000mL solution

Methylergonovine (Methergine):

0.2 milligrams IM (may repeat);

Avoid with hypertension

15-methyl PGF₂α (Hemabate, Carboprost):

250 micrograms IM (may repeat in q15 minutes, maximum 8 doses)

Avoid with asthma;

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Misoprostol (Cytotec):

800-1000 micrograms PR
600 micrograms PO or 800 micrograms SL

Tranexamic Acid (TXA)

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Possible interventions:

- Bakri balloon
- Compression suture/B-Lynch suture
- Uterine artery ligation
- Hysterectomy

STAGE 4: Cardiovascular Collapse (massive hemorrhage, profound hypovolemic shock, or amniotic fluid embolism)

INITIAL STEP:

- ☐ Mobilize additional resources

MEDICATIONS:

- ☐ ACLS

BLOOD BANK:

- ☐ Simultaneous aggressive massive transfusion

ACTION:

- ☐ Immediate surgical intervention to ensure hemostasis (hysterectomy)

Post-Hemorrhage Management

- Determine disposition of patient
- Debrief with the whole obstetric care team
- Debrief with patient and family
- Document

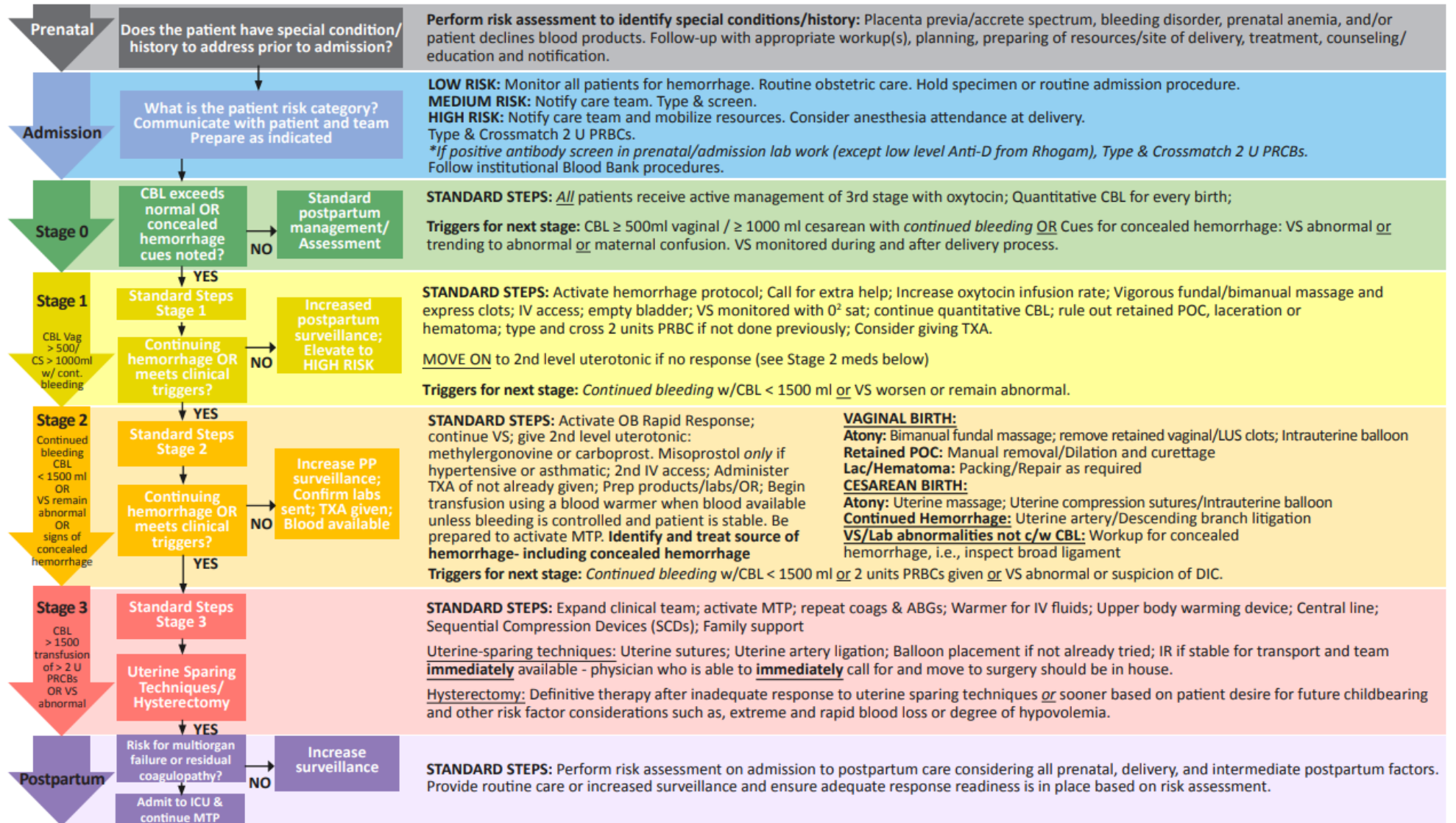
Revised September 2020

Safe Motherhood Initiative



(ACOG, 2019b)

Appendix D: Obstetric Hemorrhage Care Guidelines: Flowchart Format **ERRATA 7.18.22**



This figure was adapted from the Improving Health Care Response to Obstetric Hemorrhage: A California Quality Improvement Toolkit, funded by the California Department of Public Health, 2015; supported by Title V funds.

(CMQCC, 2022)

Appendix C: Obstetric Hemorrhage Care Guidelines: Table Format Errata
7.18.22

	Assessments	Meds/Procedures	Blood Bank
Stage 0	All births		
- Risk assessment - Active management of 3rd stage	- Prepare for every patient according to hemorrhage risk factors - Measure quantitative cumulative blood loss for every birth	Active Management of 3rd Stage Oxytocin IV infusion or 10u IM	Medium Risk: T&S High Risk: T&C 2 U Positive Antibody Screen (prenatal or current, exclude low level anti-D from RhoGam): T&C 2 U
Stage 1	Triggers: CBL ≥ 500mL vaginal / ≥ 1000 mL cesarean with <i>continued bleeding</i> or Signs of concealed hemorrhage: VS abnormal or trending (HR ≥ 110, BP ≤ 85/45, O2 sat < 95%, shock index 0.9) or Confusion		
- Activate hemorrhage protocol - Rule out hemorrhage causes besides atony	- Activate OB hemorrhage protocol and checklist - Notify charge nurse, OB/CNM, anesthesiologist - VS, O2 Sat q5 min - Record quantitative cumulative blood loss q5-15 min - Careful inspection with <u>good exposure</u> of vaginal walls, cervix, uterine cavity, placenta. If intra-op, inspect broad ligament, posterior uterus and placenta.	IV Access: Minimum 18 gauge Increase IV fluid (LR) and oxytocin rate Fundal/bimanual massage MOVE ON to 2nd level uterotonic if no response (see Stage 2 meds below) Empty bladder: Straight cath or Foley with urometer	Convert to High Risk and take appropriate precautions - Consider T&C 2 Units PRBCs where clinically appropriate if not already done
Stage 2	Triggers: <i>Continued bleeding w/</i> CBL < 1500 mL <i>or</i> VS remain abnormal		
- Sequentially advance through medications and procedures - Mobilize team and blood bank support - Keep ahead with volume and blood products - Determine source of bleeding including concealed hemorrhage	OB to bedside Mobilize team: 2nd OB, OB Rapid Response, assign roles - Continue VS & record cumulative quantitative blood loss q5-15 min Complete evaluation of vaginal wall, cervix, placenta, uterine cavity - Send additional labs including DIC panel - If in Postpartum: Move to L&D/OR - Evaluate for special cases: - Uterine inversion - Amniotic fluid embolism	2nd Level Uterotonic: Methylergonovine 0.2mg IM (if no HTN) <u>or</u> Carboprost 250 mcg IM (if no asthma) <u>or</u> - Only if hypertensive and asthmatic - Misoprostol 800 mcg SL 2nd IV access (minimum 18 gauge) - Bimanual/uterine massage - TXA 1 gram - may repeat in 30 min Vaginal: (typical order) - Move to OR - Repair any tears - D&C: r/o retained placenta - Place intrauterine balloon Intra-op Cesarean: (typical order) - Inspect broad ligament, posterior uterus, and placenta - Uterine sutures - Place intrauterine balloon - Uterine artery ligation	Notify Blood Bank of OB hemorrhage - Bring 2 Units PRBCs to bedside, consider use of Emergency Release products (un-crossmatched) and transfuse per clinical signs – <i>do not wait for lab values</i> - Use blood warmer for transfusion - Consider activating MTP if there is <i>continued bleeding</i>
Stage 3	Triggers: <i>Continued bleeding</i> with CBL > 1500mL <i>or</i> > 2 units PRBCs given <i>or</i> abnormal VS or Suspicion of DIC		
- Initiate Massive Transfusion Protocol - Invasive surgical approaches	Expand team - Advanced GYN surgeon 2nd anesthesia provider - OR staff - Adult intensivist Repeat coags & ABGs - Central line - Family support	- Selective embolization (IR) - Laparotomy - Uterine sutures - Uterine artery ligation - Hysterectomy - Patient support - Warmer for IV fluids - Upper body warming device - SCDs	Activate Massive Transfusion Protocol Transfuse aggressively - Near 1:1 PRBC: FFP 1 PLT apheresis pack per 4-6 units PRBCs

This table was adapted from the Improving Health Care Response to Obstetric Hemorrhage: A California Quality Improvement Toolkit, funded by the California Department of Public Health, 2015; supported by Title V funds.

(CMQCC, 2022)

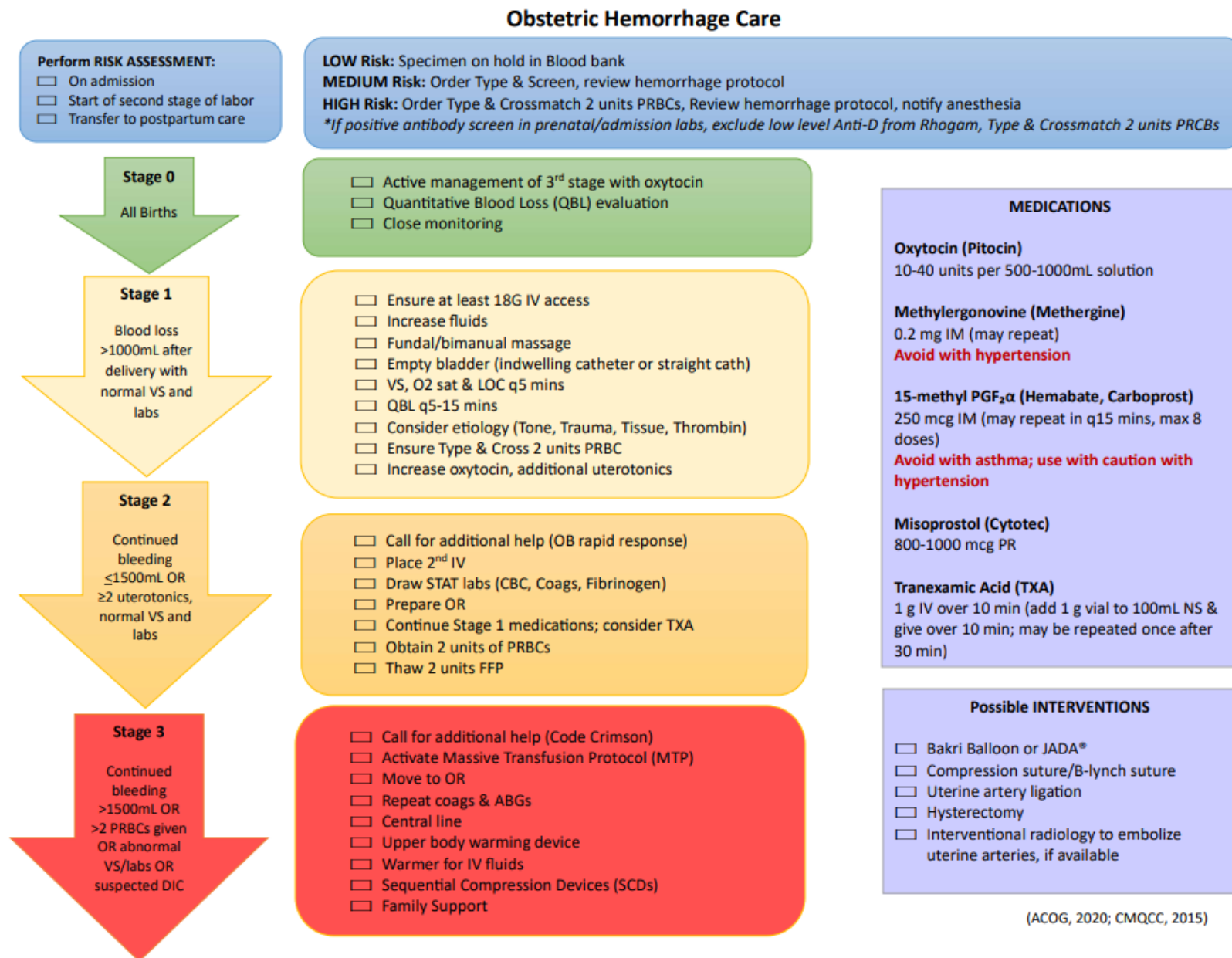


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AzHHA
Arizona Hospital and
Healthcare Association

Stage-Based Care Checklist



Quantitative Blood Loss (QBL)

- Objective
- Quantifiably measured
- Lower rate of error
- Not 100% accurate
- Continues 2 hours PP or until bleeding is stable

NSVD QBL Calculation Worksheet

Under buttocks, drape fluid/blood QBL	Final Fluid Level: _____ Total amount of fluid collected in bag after delivery of baby, placenta and after repair.	
	Baby Delivery Fluid: _____ Initial fluid collected in collection bag after baby is delivered.	
	Drape QBL: _____	
Lap Blood QBL	Wet lap weight: _____	—
	Dry lap weight: _____	=
	Lap QBL: _____	
Total QBL	Drape QBL: _____	+
	Lap QBL: _____	=
	Total QBL: _____	

(ACOG, 2019a; Sawyer, n.d.)

Qualitative Blood Loss (QBL)

Vaginal Delivery

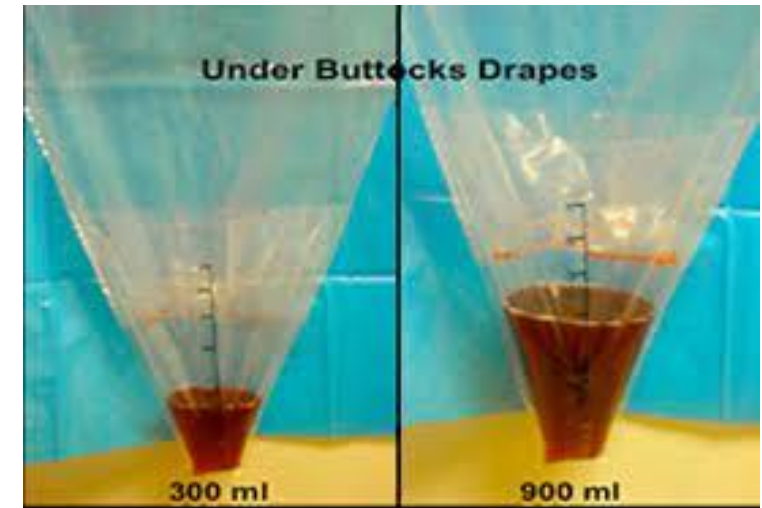
1. Create a list of dry weights
2. Begin immediately after birth (before delivery of placenta)
3. Record total volume of fluid collected in under-buttocks drape
4. Subtract preplacental fluid volume from the post placenta fluid volume
5. Add fluid volume collected in the drapes to the blood volume measured by weighing soaked items
6. Weigh all blood-soaked materials and clots to determine cumulative volume
7. $\text{WET item gram weight} - \text{DRY item gram weight} = \text{mL of blood within the item}$

***1 gram weight=1 mL blood loss volume**

(ACOG, 2019a)

Qualitative Blood Loss (QBL)

Before delivery of placenta:	300 mL
Total volume of fluid:	900 mL
Post placental fluid volume	900
Minus	<u>- 300</u>
Pre placenta fluid volume	600
Total blood loss after delivery:	600mL
Blood-soaked items:	<u>+ 90mL</u>
TOTAL QBL:	690mL



Item	DRY Weight	WET weight
Disposable Chux	110g	170g
Perineal Cold Pack	180g	210g

(ACOG, 2019a)

Qualitative Blood Loss (QBL)

Cesarean Births

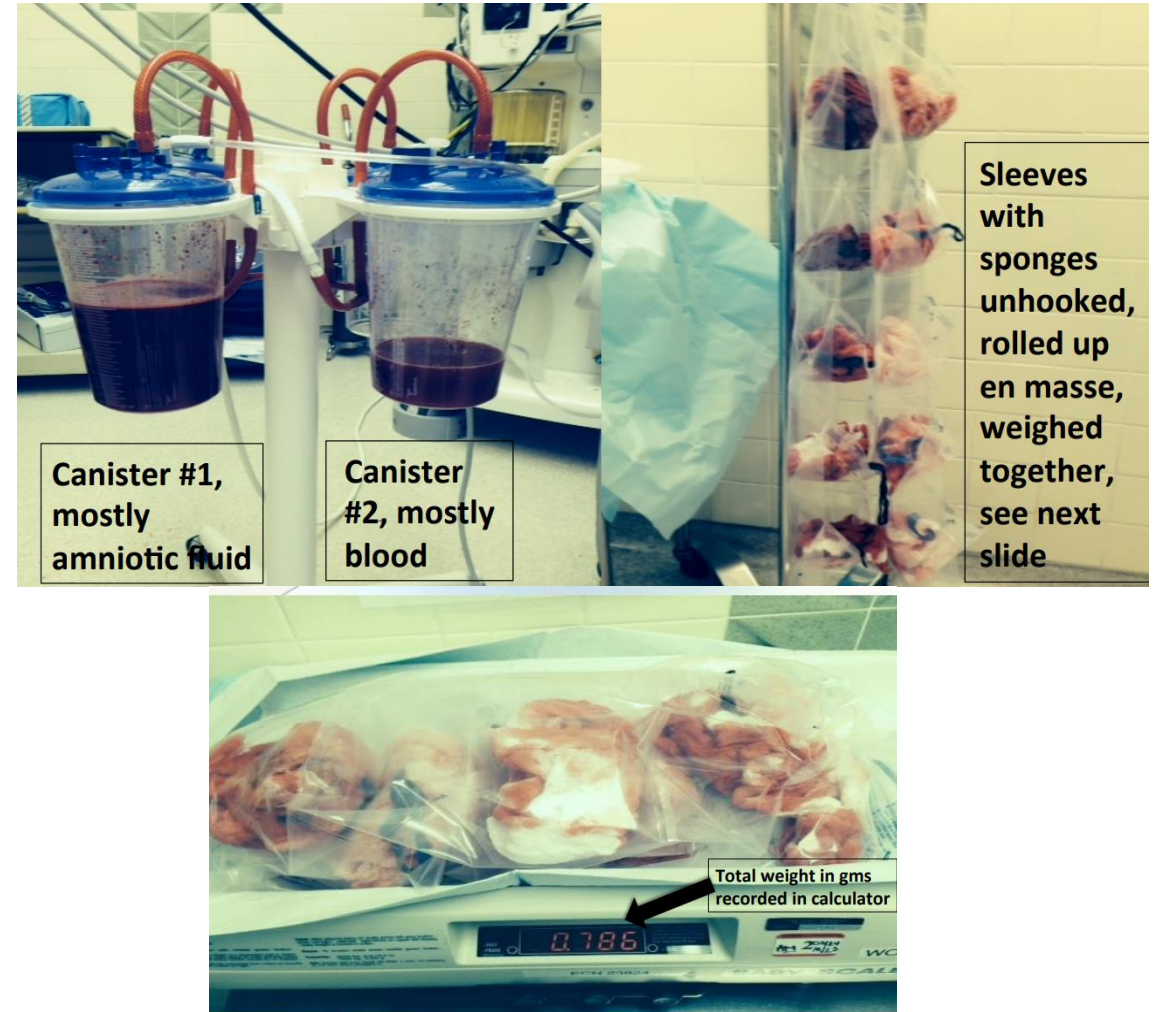
1. Begin measuring when the amniotic membranes are ruptured or after the infant is born.
2. Suction and measure all amniotic fluid within the suction canister before delivery of placenta.
3. After placenta delivers, measure the amount of blood loss in the canister and drapes.
4. Before adding irrigation fluid, scrub team should communicate when irrigation begins.
5. Continue to suction into the same canister and measure irrigation fluid OR provide another suction tube to collect the irrigation separately.
6. Weigh all blood-soaked materials and clots. Calculate the weight and convert to mL.
7. At the end of surgery, add the volume of quantified blood calculated by weight with the volume of quantified blood in the suction canister to determine total quantification of blood loss.

***1 gram weight=1 mL blood loss volume**

(ACOG, 2019a)

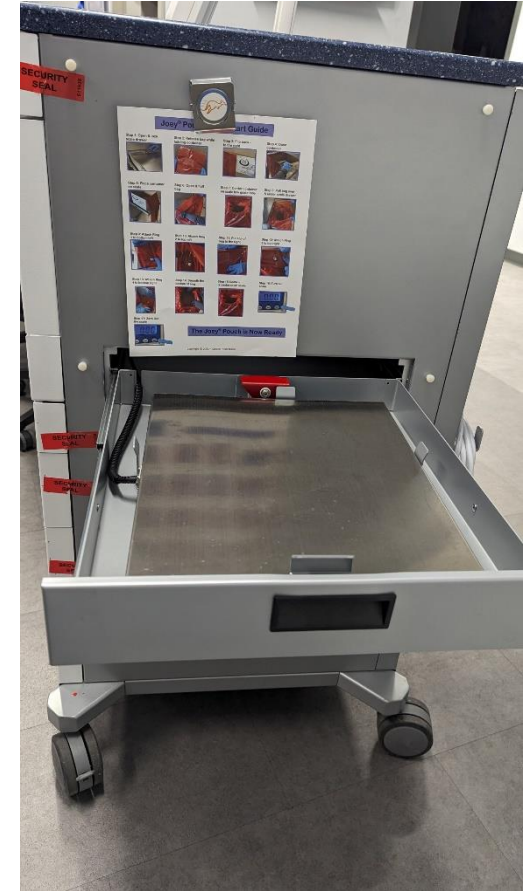
Quantitative Blood Loss (QBL)

1. Suction and measure all amniotic fluid within the suction canister before delivery of placenta
2. Change canisters before irrigation begins OR take note of amount in canister prior to start of irrigation
3. Weight the laps and sleeve
4. Add blood loss from canister, blood loss from laps, and blood loss from under the patient to get total QBL

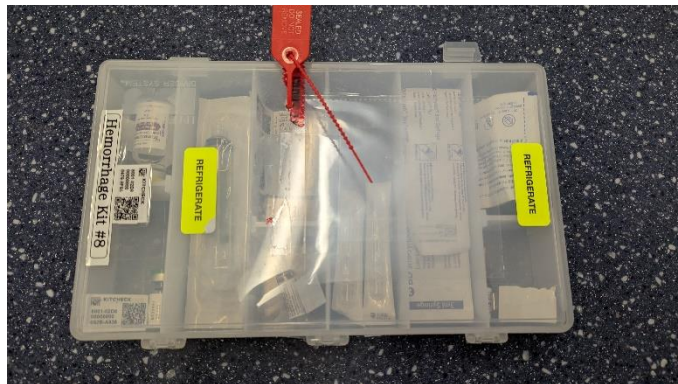


(ACOG, 2019a; Sawyer, n.d.)

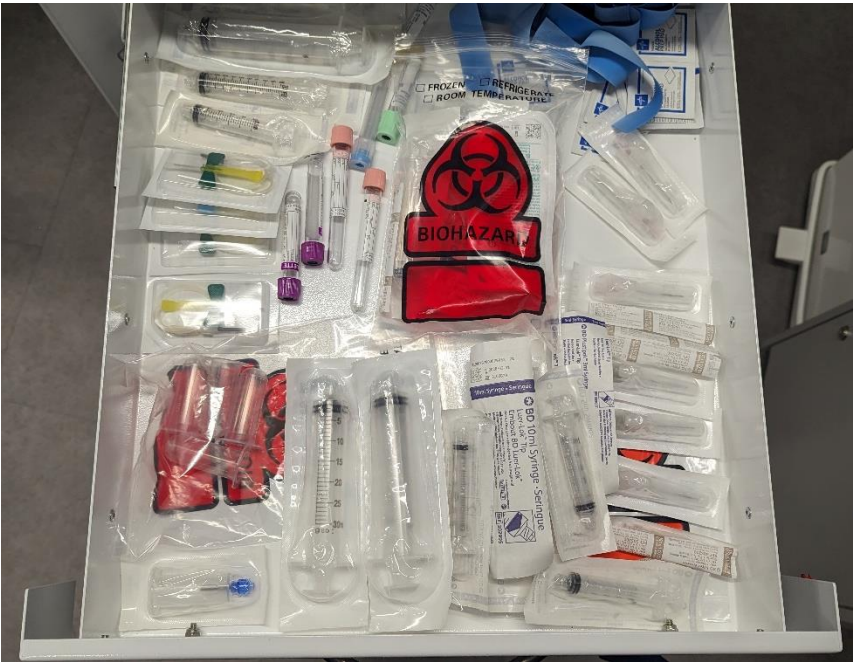
Hemorrhage Cart



Hemorrhage Cart



Hemorrhage Cart



Drawer 1:

- Vacutainer blood collection needle
- Butterfly needle
- 30 mL syringe
- 10 mL syringe
- 5 mL syringe
- 3 mL syringe
- 19 g filter needle
- 18 g needle
- 22 g needle

- Lab bags
- Pink lab tube
- Blue lab tube
- Purple lab tube (short)
- Green lab tube
- Alcohol

TXA kit:

- 100 mL NS
- 18 g needle
- 10 mL syringe
- Secondary tubing

Hemorrhage Cart

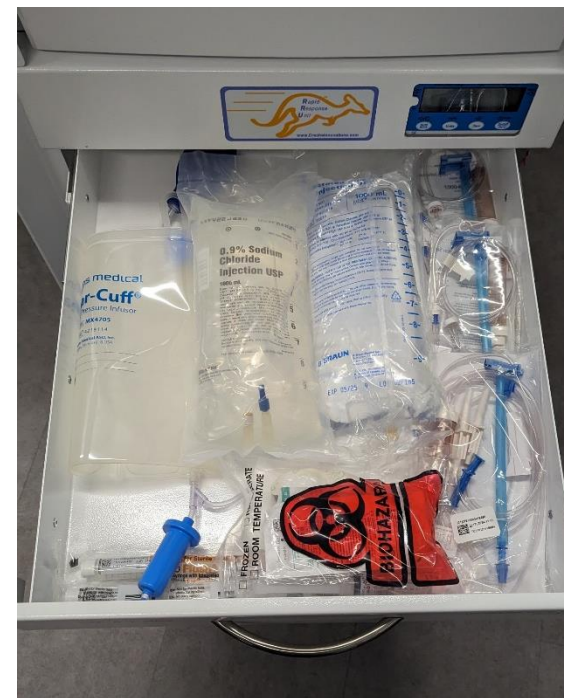
Drawer 2:

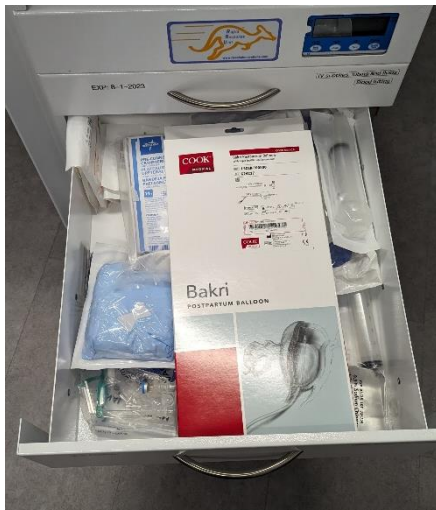
- Medication kit



Drawer 3:

- Saline flushes
- 20g IV cath
- 18g IV cath
- 16g IV cath
- 500 mL pressure bag
- Blood tubing
- Lactated Ringers 1000mL
- Normal Saline 1000mL
- Primary tubing
- IV start kit

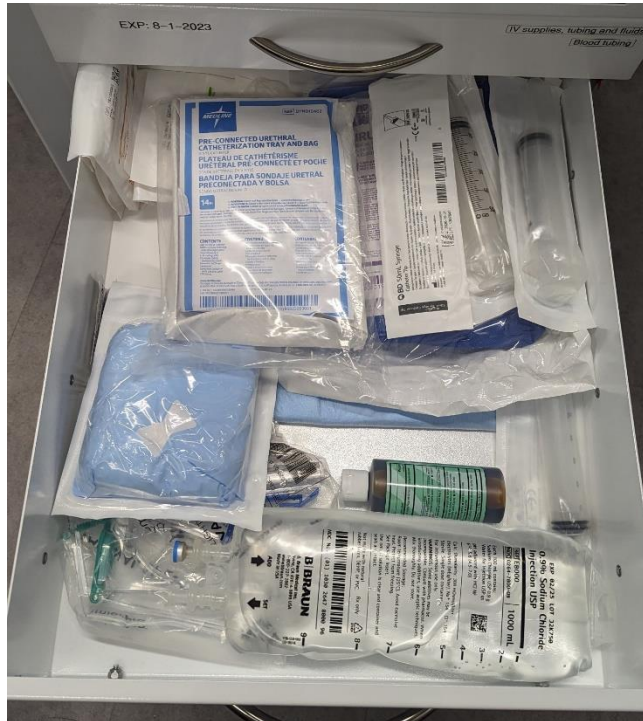




Hemorrhage Cart

Drawer 4:

- Size 6 protexis
- Size 6.5 protexis
- Size 7 protexis
- Size 8 protexis
- Lap sponge
- Iodine
- Lubricant
- Surgical gown
- Bakri® balloon
- JADA®
- LED speculum (medium, large)
- Large disposable chux
- Urine meter with drainage bag
- 3-way stop cock
- Normal saline 1000 mL



Hemorrhage Cart

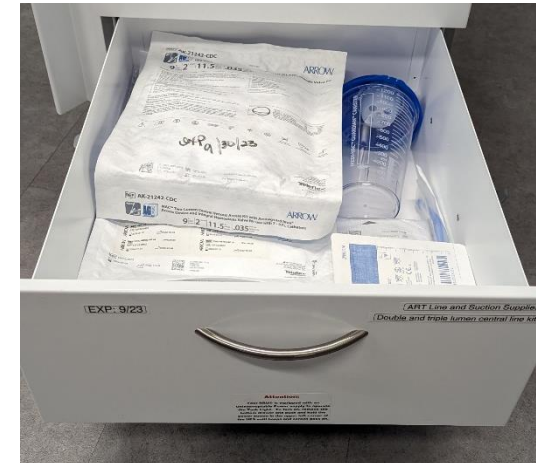
Drawer 5:

- 16F Foley with urine catheter
- Joey Pouch
- Sterile Water 1000 mL
- Oxygen Mask (non-rebreather)



Drawer 6:

- ART line kit
- Suction catheter
- Suction tubing
- Yankauer
- Sterile sponges
- Double lumen kit
- Triple lumen kit



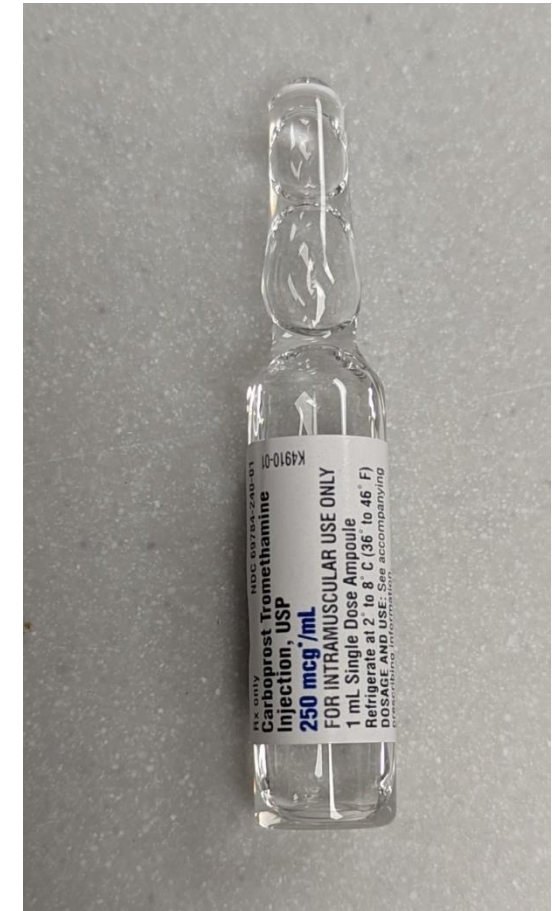
Medications



oxytocin

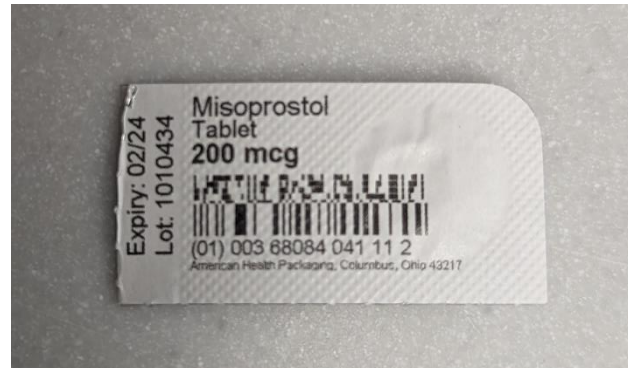


methylergonovine



carboprost

Medications



misoprostol



tranexamic acid

Interventions

The Belmont® Rapid Infuser



Level 1™ Rapid Infuser

3M™ Ranger Pressure Infusor



Interventions

Jada®

- Evaluate patient for:
 - Lacerations
 - Products of conception
 - Other causes of bleeding
 - Organized clots to remove
- Remain on active vacuum for at least 1 hour after bleeding is controlled.
- When treatment is no longer needed, disconnect from vacuum.
- Monitor patient for at least 30 minutes, confirm tone, and remove Jada.



(Organon, 2022)

Interventions

Bakri®



- Used to provide temporary control or reduction of postpartum bleeding when conservative management is warranted.
- Can be used following vaginal or cesarean delivery.
- May be used with B-lynch compression sutures if clinically warranted.
- Confirm before placement:
 - The uterus is free of placental fragments.
 - The genital tract has no trauma or lacerations.
 - The sources of the bleeding are not arterial.
 - Patient does not present with any contraindication for use of this device.

(Cook Medical, 2024)

Code Crimson

Activate when patient reaches **STAGE 3**

- Active bleeding with QBL >1500mL
- Active bleeding and patient has received >2 units of PRBCs
- Active bleeding and VS unstable
- Active bleeding and/or suspect DIC
- Spiritual Care, if in house

Code Crimson

Team members to respond:

- OB/GYN laborist on shift
- Primary obstetrician or designee
- Anesthesia provider scheduled in L&D
- Primary RN of patient
- All available L&D RNs on shift

• Rapid Response Team includes:

- ✓ Critical Care Supervisor or designee
- ✓ Respiratory Therapist Shift Leader or designee
- Laboratory personnel
- Nursing Supervisor (coordinate with main OR if needed)
- Blood Bank
- Spiritual care, if in-house

Code Crimson Record

Original Copy Placed in Patient Chart
Photocopy and Debrief Sent to Nurse Manager

Massive Transfusion Protocol (MTP)

To provide safe obstetric care, institutions MUST:

- Have a minimum of 4 units of O-negative PRBCs
- Have the ability to obtain 6 units PRBCs & 4 units FFP (compatible or type specific) for a bleeding patient
- Have a mechanism in place to obtain platelets & additional products in a timely fashion

Blood transfusion or crossmatching should not be used as a negative quality marker & is warranted for certain obstetric events.

(ACOG, 2019b)

Massive Transfusion Protocol (MTP)

IMPORTANT PROTOCOL ITEMS TO BE DETERMINED AT EACH INSTITUTION:

- How to activate MTP:

- Blood bank # & location; notify ASAP:

I will call: _____

- Emergency release protocol that both blood bank staff & ordering parties (MD/RN/CNM) understand:

- How will blood be brought to L&D?

- How will additional blood products/platelets be obtained?

- Mechanism for obtaining serial labs, such as with each transfusion pack, to ensure transfusion targets achieved:

(ACOG, 2019b)

Debrief

- Review the basic assumption
- Ask how it went
- Review case notes
- Discuss key takeaways
- Develop list of potential system changes
- Present system changes to leadership
- Address mental health impacts to staff, patients, and families

(AIM, 2022b)

Debrief

Opportunities for improvement

“human factors”

- Communication
- Role clarity
- Teamwork
- Situational awareness
- Decision-making

Opportunities for improvement

“systems issue”

- Equipment
- Medication
- Blood product availability
- Inadequate support (in unit or other areas of the hospital)
- Delays in transporting the patient (within hospital or to another facility)

(AIM, 2022b)

Obstetric Team Debriefing Form

Remember: Debriefing is meant to be a learning experience and a way to address both human factors and systems issues to improve the response for next time. There is to be no blaming/finger-pointing.

Type of event: _____ Date of event: _____

Location of event: _____

Members of team present: (check all that apply)

- | | | | |
|---|--|-------------------------------------|---|
| ☐ Primary RN | ☐ Primary MD | ☐ Charge RN | ☐ Resident(s) |
| ☐ Anesthesia personnel | ☐ Neonatology personnel | ☐ MFM leader | ☐ Patient Safety Officer |
| ☐ Nurse Manager | ☐ OB/Surgical tech | ☐ Unit Clerk | ☐ Other RNs |

Thinking about how the obstetric emergency was managed,|

Identify what went well:
(Check if yes)

- ☐ Communication
- ☐ Role clarity (leader/supporting roles identified and assigned)
- ☐ Teamwork
- ☐ Situational awareness
- ☐ Decision-making
- ☐ Other: _____

Identify opportunities for improvement:
"human factors" (Check if yes)

- ☐ Communication
- ☐ Role clarity (leader/supporting roles identified and assigned)
- ☐ Teamwork
- ☐ Situational awareness
- ☐ Decision-making
- ☐ Other: _____

Identify opportunities for improvement:
"systems issue" (Check if yes)

- ☐ Equipment
- ☐ Medication
- ☐ Blood product availability
- ☐ Inadequate support (in unit or other areas of the hospital)
- ☐ Delays in transporting the patient (within hospital or to another facility)
- ☐ Other: _____

Safe Motherhood Initiative

(ACOG, 2021)



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APPENDIX C: DEBRIEFING TOOL

Directions: Form is to be completed immediately after patient situation by the designated team member. After completion, the form is given to _____ (designated by unit/hospital). After the debrief, team members who want to provide additional input are encouraged to complete an incident report.

Goal: Allow team a debrief mechanism to talk immediately about a patient care situation to capture what went well, what could have been done better and what prevented the team from caring for the patient effectively.

Patient Name: _____ Form completed by: _____

Date: _____ Time: _____

Team members attending debriefing (Print Names): _____

	Yes	No	Comments
Team Attendance			
1. Help arrived in a timely manner	☐		
2. Team members assumed or were assigned needed roles			
3. Team members stayed in role through situation			
4. Adequate help was present			
Medication Administration	Yes	No	Comments
N/A			
1. Medications arrived in a timely manner			
2. Medications were given in accordance with policy			
3. Adequate volume and type of medications were in room			
Device Placement	Yes	No	Comments
N/A			
1. Device was placed correctly			
2. More than one device was used			

Fluid & Blood Product Administration	Yes	No	Comments
1. Second IV was started in a timely manner			
2. Was any type of blood product administered?			
3. Blood arrived in a timely manner			
4. Was massive transfusion policy activated?			
5. Was rapid transfuser used?			
6. Rapid transfuser arrived in a timely manner			
7. Rapid transfuser was used effectively and according to procedure			
8. Adequate amount of blood was available			
Surgical Treatment	Yes	No	Comments
1. Operating room ready in timely manner			
2. Adequate staff for procedure			
3. Support staff called to room arrived in time to assist with procedure			
4. Appropriate supplies for procedure were readily available			
	Yes	No	Comments
Other Issues to Report			

AZHHA
Arizona Hospital and
Healthcare Association

Emergency Department Considerations

- Secondary postpartum hemorrhage is bleeding that occurs 24 hours to 12 weeks postpartum.
- Early recognition and management improve outcomes.
- Treat as a **traumatic hemorrhage**.
 - Notify an obstetrician/OB team
 - Resuscitate
 - Obtain adequate access
 - Source control
 - Administer uterotonics

(Lang & Macias, 2018)

Managing Maternal Hemorrhage Resource for the ED

VITAL SIGNS

Normal vitals do not always assure patient stability

AIRWAY

- Provide adequate ventilation
- Assess need for intubation

BREATHING

- Supplemental O₂ 5-7 L/min by tight face mask

CIRCULATION

- Pallor, delayed capillary refill, and decreased urine output can indicate compromised blood volume without change in BP or HR
- Decreased urine output, decreased BP, and tachycardia may be late signs of compromise

ACTIONS

- Notify team
- Bring cart & medications to patient room
- Activate Massive Transfusion Protocol

INFUSIONS

- Start 2nd large bore IV (16 gauge if possible)
- Ringers Lactate (RL) replaces blood loss at 2:1
- Prepare for transfusion
- Blood coagulation factors
- Warm blood products and infusions to prevent hypothermia, coagulopathy, and arrhythmias

Important Phone Numbers

Rapid Response Team:

Blood Bank:

Anesthesia:

Interventional Radiology:

Senior Surgeon:

ICU:

Director of Service:

Other:

MEDICATION FOR UTERINE ATONY

OXYTOCIN (PITOCIN)

10-40 units per 500-1000mL solution

METHYLERGONOVINE (METHERGINE)

0.2 milligrams IM

Avoid with hypertension

PROSTAGLANDIN F2 ALPHA (HEMABATE)

250 micrograms IM (may repeat in q15 minutes, maximum 8 doses)

Avoid with asthma; use with caution with hypertension

MISOPROSTOL (CYTOTEC)

800-1000 micrograms PR, 600 micrograms PO, or 800 micrograms SL

OTHER CONSIDERATIONS

Intrauterine balloon tamponade

SURGICAL INTERVENTIONS

May be a life-saving measure and should not be delayed pending correction of coagulopathy, the most common reason for the delay

(ACOG, 2019b)

Postpartum Warning Signs

**SAVE
YOUR
LIFE:**

Get Care for These POST-BIRTH Warning Signs

Most women who give birth recover without problems. But any woman can have complications after the birth of a baby. Learning to recognize these POST-BIRTH warning signs and knowing what to do can save your life.

**POST-
BIRTH
WARNING
SIGNS**

Call 911
if you have:

- ☐ **P**ain in chest
- ☐ **O**bstructed breathing or shortness of breath
- ☐ **S**eizures
- ☐ **T**houghts of hurting yourself or your baby

**Call your
healthcare
provider**
if you have:

(If you can't reach your healthcare provider, call 911 or go to an emergency room)

- ☐ **B**leeding, soaking through one pad/hour, or blood clots, the size of an egg or bigger
- ☐ **I**ncision that is not healing
- ☐ **R**ed or swollen leg, that is painful or warm to touch
- ☐ **T**emperature of 100.4°F or higher
- ☐ **H**eadache that does not get better, even after taking medicine, or bad headache with vision changes

**Trust
your instincts.**
ALWAYS get medical
care if you are not
feeling well or
have questions or
concerns.

**Tell 911
or your
healthcare
provider:**

"I had a baby on _____ and
(Date)
I am having _____"
(Specific warning signs)

(Association of Women's Health, Obstetric and Neonatal Nurses [AWHONN], 2021)



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Hemorrhage ED Visit Stop Sign



Tell us if you
ARE PREGNANT *or*
HAVE BEEN PREGNANT
within the past 6 weeks



Come to the front of the line if you have:

- ▶ Persistent headache
- ▶ Visual change (floaters, spots)
- ▶ History of preeclampsia
- ▶ Shortness of breath
- ▶ History of high blood pressure
- ▶ Chest pain
- ▶ Heavy bleeding
- ▶ Weakness
- ▶ Severe abdominal pain
- ▶ Confusion
- ▶ Seizures
- ▶ Fevers or chills
- ▶ Swelling in hands or face

(CMQCC, 2022)



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URGENT MATERNAL WARNING SIGNS



Headache that won't go away or gets worse over time



Dizziness or fainting



Thoughts about hurting yourself or your baby



Changes in your vision



Fever



Trouble breathing



Chest pain or fast-beating heart



Severe belly pain that doesn't go away



Severe nausea and throwing up (not like morning sickness)



Baby's movements stopping or slowing



Vaginal bleeding or fluid leaking during pregnancy



Vaginal bleeding or fluid leaking after pregnancy



Swelling, redness, or pain of your leg



Extreme swelling of your hands or face



Overwhelming tiredness

If you have any of these symptoms during or after pregnancy, contact your health care provider and get help right away.

If you can't reach your provider, go to the emergency room. Remember to say that you're pregnant or have been pregnant within the last year.



(AIM, 2022a)

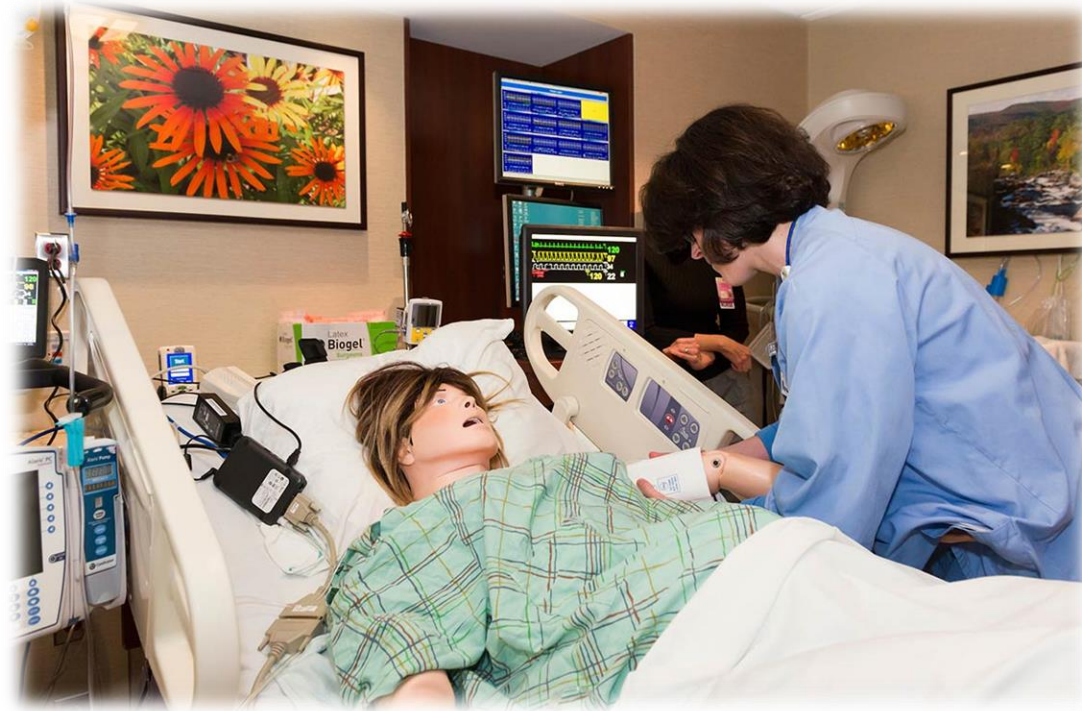


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Questions?

Simulations



Benefits of Simulations/Drills

- Realistic Scenarios
- Safe learning
- Enhanced learning
- Skills improvement
- Decision-making
- Confidence building



(Abbas et al., 2022; Baldvinsdottir et al., 2018; Brogaard et al., 2022; Casper et al., 2023; Chou et al., 2022; Finlayson et al., 2019; Gaucher et al., 2019; Goffman et al., 2019; Kwon et al., 2022; Smith et al., 2019)

Simulation Learning Objectives

- Recognize risk factors for postpartum hemorrhage
- Identify postpartum hemorrhage due to uterine atony
- Be able to treat with appropriate medical management
- Demonstrate teamwork and communication skills during simulation



Prebrief

Case 1: Postpartum Hemorrhage Secondary to Uterine Atony

M.M. is a 38-year-old

- G3P2012
- Admitted in active labor at **39+3** weeks
- **Spontaneous vaginal delivery** 30 mins ago
- Delivery was **uncomplicated**
- She had a **1st degree laceration** without repairs
- She is approximately 30 minutes postpartum and has just called out stating she feels **dizzy** and has **more bleeding**



(AIM, 2022b)

Prebrief

Case 1: Postpartum Hemorrhage Secondary to Uterine Atony

Patient Information

- No significant past medical history
- No known drug allergies
- Uncomplicated pregnancy except for an elevated 1hr GTT with a normal 3hr GTT

Laboratory Data (On Admission)

- Hemoglobin 12.2
- Hematocrit 36.6
- WBC 12,000
- Platelets 218,000

Delivery Information

- Cumulative blood loss from delivery was **300cc** (*as quantitative as possible*)
- Delivery note states intact placenta at time of delivery
- Infant weighed **4120 grams**
- Patient has an IV line in place with oxytocin running

(AIM, 2022b)

Simulation Time

Meet after for Debrief

Debrief

- Initial reactions?
- What aspects were managed well and why?
- What aspects do you want to change and why?



Decision Making



Technical Skills



Communication



Resource Utilization



Leadership



Situational Awareness



Teamwork

(Bajaj et al., 2017)

Debrief

What Went Well & Opportunities for Improvement

- Communication
- Role clarity
- Teamwork
- Situational awareness
- Decision-making



(AIM, 2022b)

Case 1: Scenario Main Points

- ☐ Performed uterine massage
- ☐ Examined for lacerations
- ☐ Evaluated for retained products of conception
- ☐ Administered two medications to correct uterine atony (correct dose and route)
- ☐ Called for blood

OR

- ☐ Team fails to correct hemorrhage within 10 mins or fails to call for blood

(AIM, 2022b)

Takeaways

THE 5 R's OF PATIENT SAFETY BUNDLES

- R**eadiness
- R**ecognition & Prevention
- R**esponse
- R**eporting & Systems Learning
- R**espectful, Equitable, & Supportive Care

(AIM, 2022a)

Takeaways

- Identify **causes** of an obstetric hemorrhage
- Complete hemorrhage **risk assessments**
- Utilize facility resources, including **hemorrhage carts** and **stage-based care** checklists
- Perform **quantitative** blood loss (QBL)
- Participate in **debrief** with clinical team



Please Fill Out Post-Training Survey

Questions

maternalhealth@azhha.org

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