November 3rd, 2022
3:00 PM ET

AIM TAP WEBINAR:

Implementing A Stage-Based Obstetric Hemorrhage Emergency Management Plan

with Drs. Dena Goffman, MD
and Lisa Nathan, MD, MPH

AIM

ALLIANCE FOR INNOVATION
ON MATERNAL HEALTH

The Alliance for Innovation on Maternal Health is a national, cross-sector commitment designed to support best practices that make birth safer, improve maternal health outcomes, and save lives.

This program is supported by a cooperative agreement with the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number UC4MC28042, Alliance for Innovation on Maternal Health. This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government.

Before we get started

AIM TAP Webinars are recorded

Resources and products discussed are not vetted or endorsed by AIM or ACOG and are provided for your convenience

Resources should be used at your discretion

If you need help during the call, please chat an AIM staff member

Implementing A Stage-Based Obstetric Hemorrhage Emergency Management Plan

Dr. Dena Goffman, MD

Dr. Lisa Nathan, MD, MPH

Implementing a Stage-Based Obstetric Hemorrhage Emergency Management Plan

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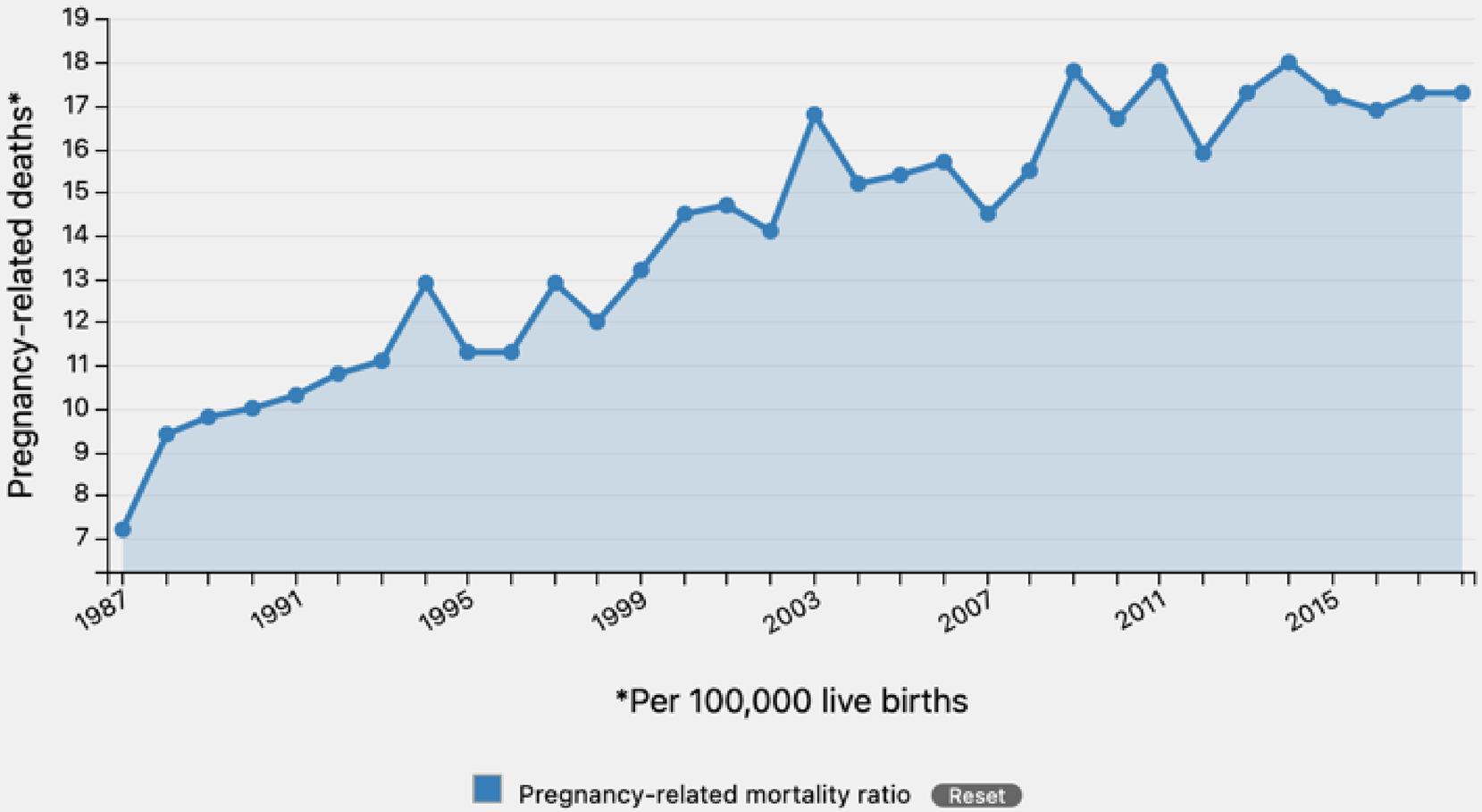
Disclosures

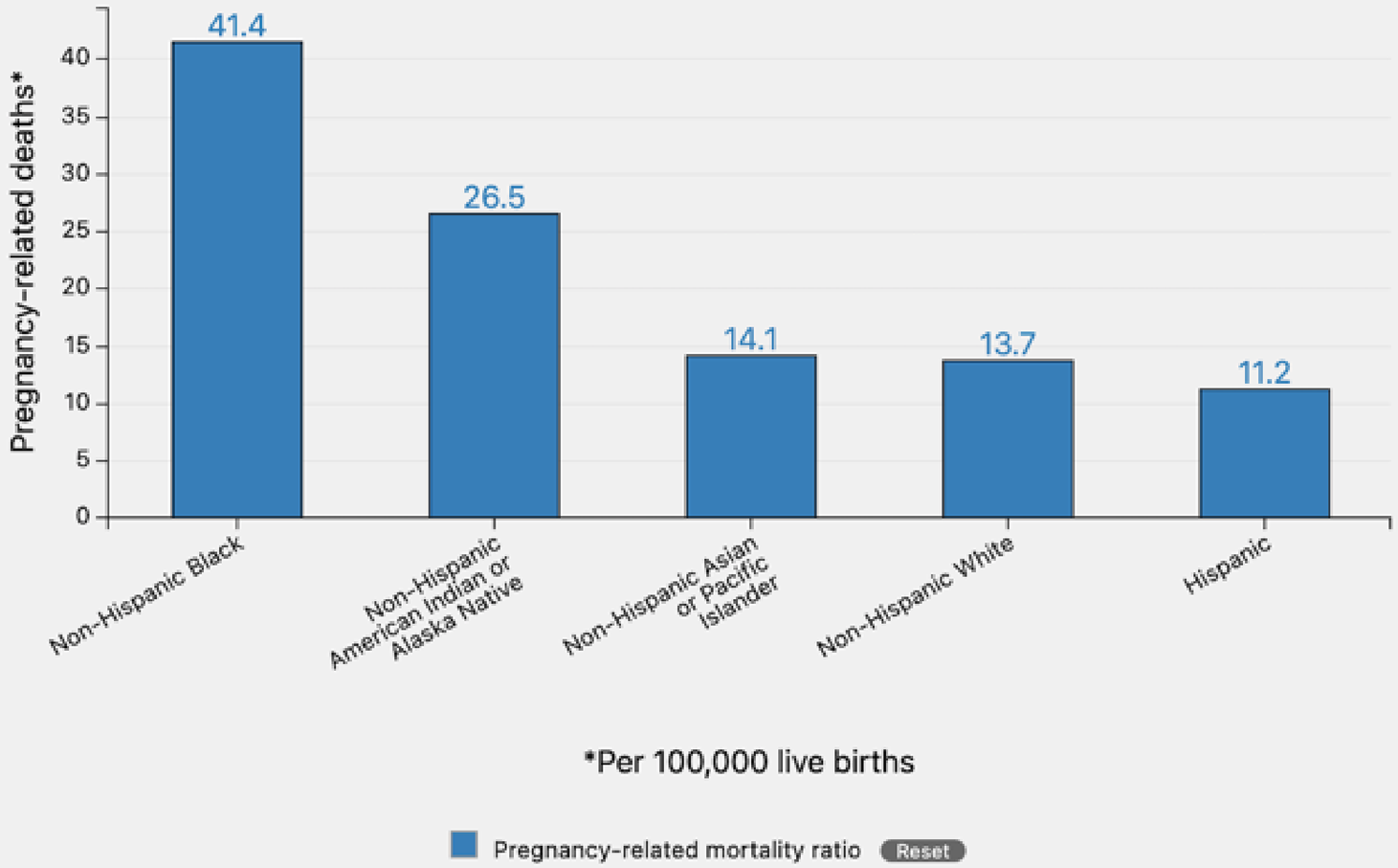
- Haymarket PPH Educational Video
- Cooper Surgical Obstetrical Safety Council
- Laborie Speaker
- Organon Scientific Advisory Board
- PI for Jada Pivotal Trial and Post Market Registry

Trends in pregnancy-related mortality in the United States: 1987-2018

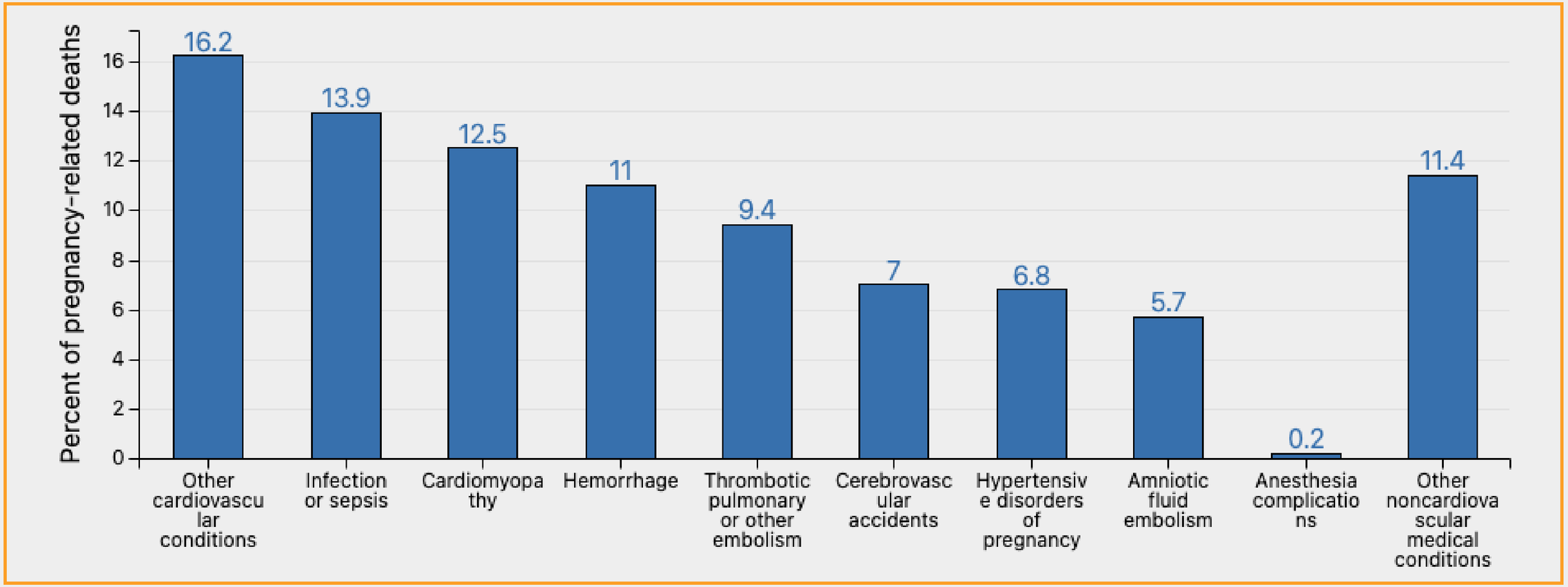


Note: From 2016 onwards, data is shown only for maternal deaths of mothers who were NYS residents and died in NYC in compliance with CDC standards. In previous years, we included deaths of mothers from other states that died in NYC.

Pregnancy-Related Mortality Ratio by Race/Ethnicity: 2016-2018



Causes of pregnancy-related death in the United States: 2016-2018



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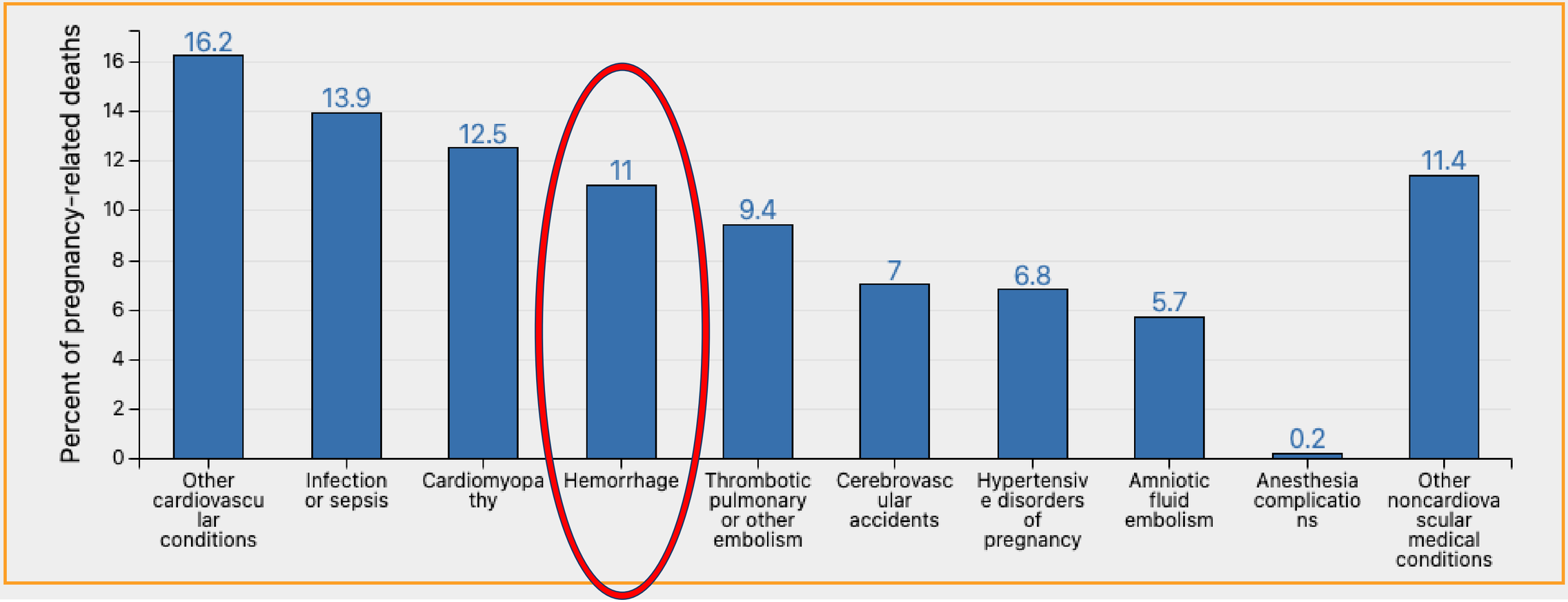

Cause-specific proportionate pregnancy related mortality

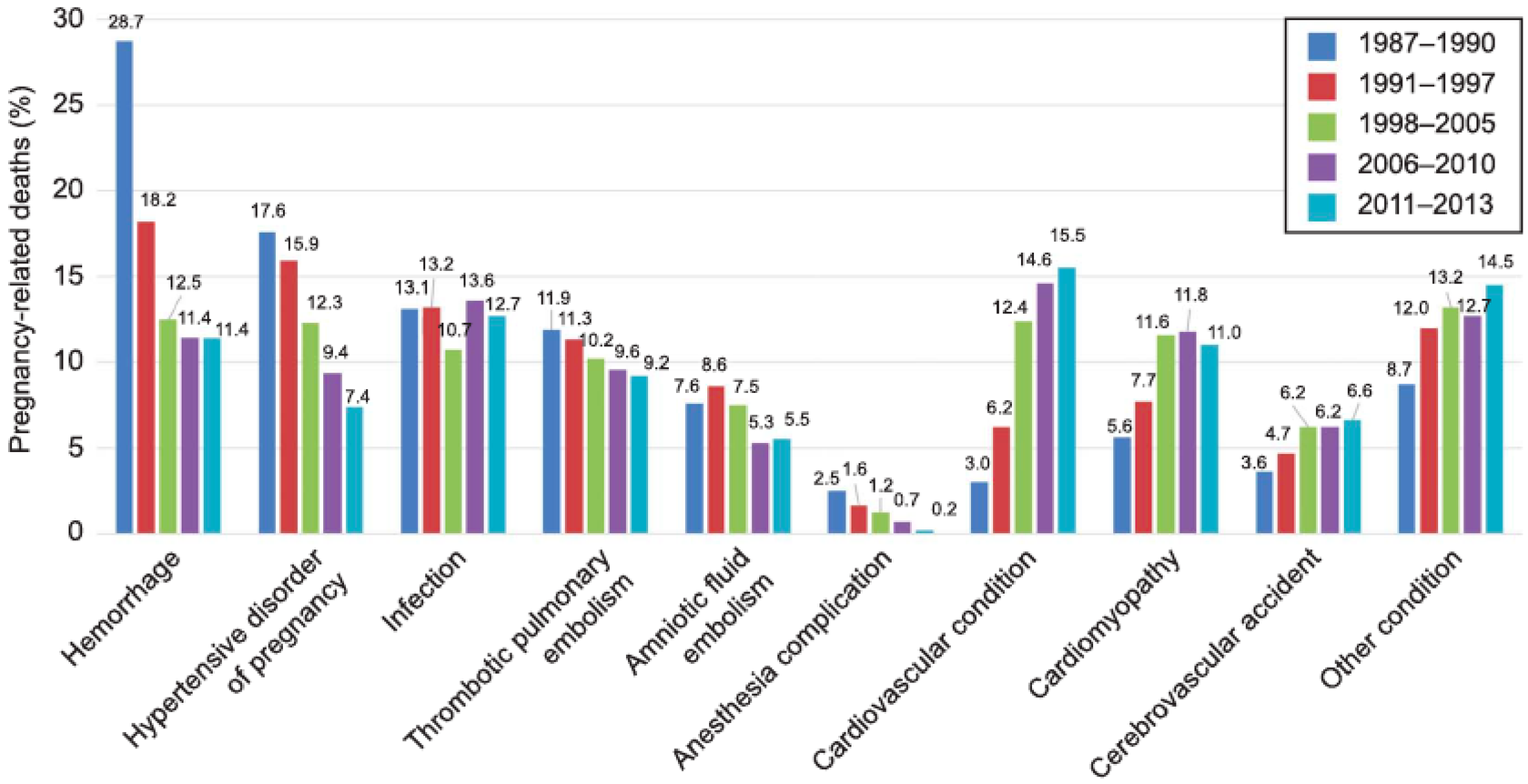

Figure 2. Population-level, cause-specific proportionate pregnancy-related mortality for 1987–1990, 1991–1997, 1998–2005, 2006–2010, and 2011–2013. Results are population-level and can be compared as absolute values.

Creanga. Pregnancy-Related Mortality in the United States. Obstet Gynecol 2017.

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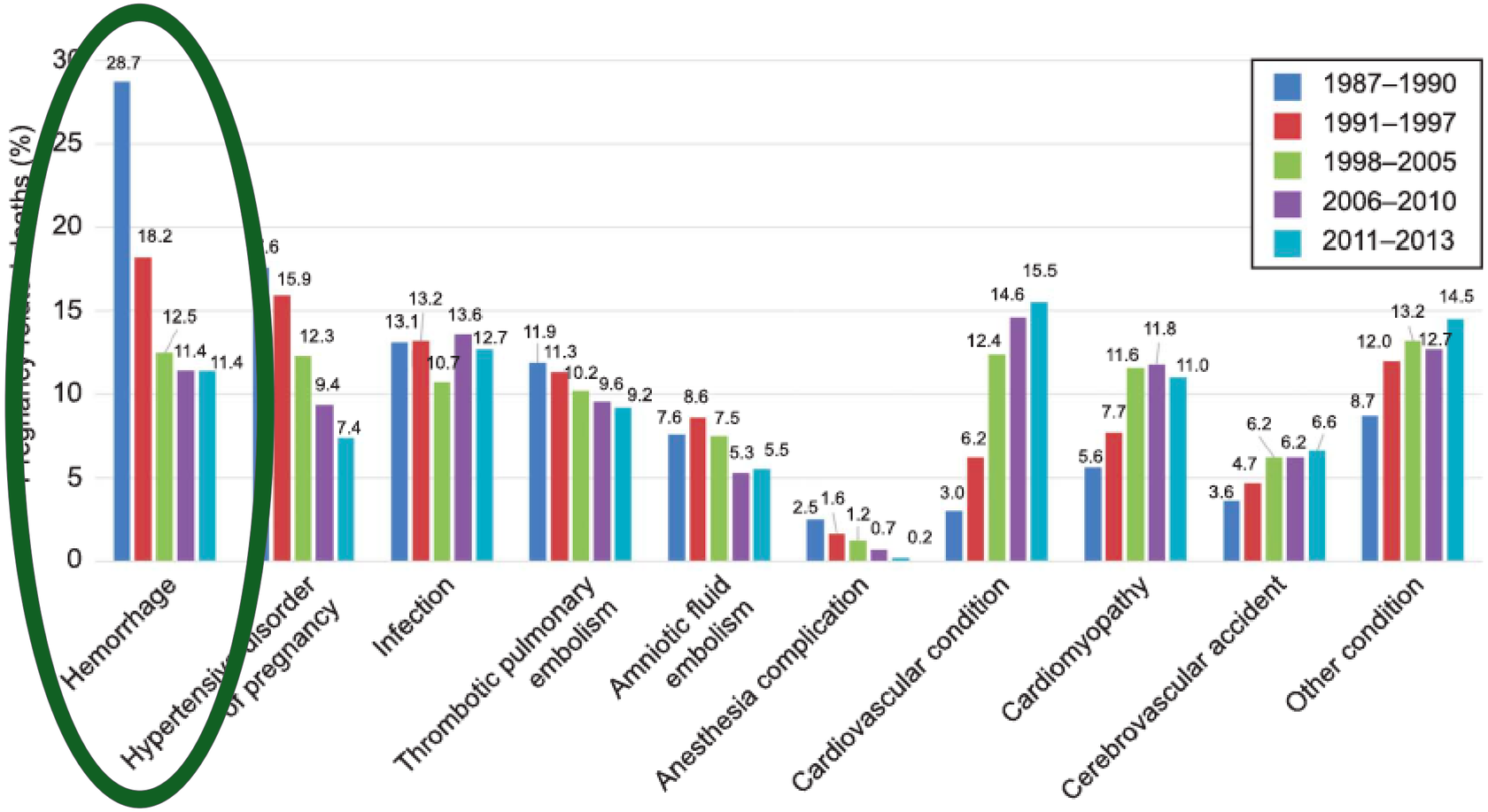

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Frequencies of PPH and Etiology According to Year of Delivery, per 1000 Deliveries

Table. - Frequencies of PPH and Etiology According to Year of Delivery, per 1000 Deliveries

	2010	2011	2012	2013	2014	Odds Ratios (95% CI)
Total deliveries	3,715,836	3,669,042	3,764,041	3,739,673	3,799,465	
Postpartum hemorrhage (95% CI)	28.6 (26.7–30.6)	29.2 (26.3–32.1)	30.7 (29.6–31.8)	31.5 (30.4–32.6)	32.1 (31.0–33.3)	1.03 (1.01–1.05)
Transfusion among deliveries	11.1 (10.2–12.0)	12.3 (11.3–13.2)	11.8 (11.3–12.3)	11.8 (11.4–12.3)	12.2 (11.7–12.8)	1.02 (0.99–1.04)
Hysterectomy among deliveries	0.9 (0.8–0.9)	1.0 (0.9–1.1)	1.0 (0.9–1.0)	1.1 (1.0–1.1)	1.1 (1.0–1.2)	1.05 (1.02–1.09)
Causes of postpartum hemorrhage						
Uterine atony	22.3 (20.7–23.9)	22.8 (20.4–25.3)	24.3 (23.3–25.2)	25.0 (24.0–26.0)	25.8 (24.8–26.8)	1.04 (1.02–1.06)
Retained placenta (including accreta)	2.4 (2.2–2.7)	2.5 (2.2–2.9)	2.5 (2.4–2.7)	2.6 (2.5–2.8)	2.6 (2.5–2.8)	0.99 (0.97–1.01)
Delayed (>24 h after delivery)	2.3 (2.1–2.5)	2.4 (2.2–2.6)	2.5 (2.3–2.6)	2.5 (2.4–2.6)	2.5 (2.3–2.6)	0.99 (0.97–1.01)
Coagulopathy	2.5 (2.0–2.9)	2.4 (2.0–2.8)	2.4 (2.2–2.5)	2.4 (2.2–2.5)	2.2 (2.0–2.3)	0.94 (0.90–0.98)
Associated morbidity						
PPH resulting in transfusion	4.0 (3.6–4.4)	4.9 (4.4–5.4)	4.7 (4.5–5.0)	4.9 (4.6–5.1)	5.0 (4.7–5.2)	1.04 (1.02–1.07)
PPH resulting in hysterectomy	0.6 (0.5–0.7)	0.7 (0.6–0.8)	0.7 (0.6–0.8)	0.7 (0.7–0.8)	0.7 (0.6–0.8)	1.03 (1.00–1.07)
Atony resulting in transfusion	3.0 (2.7–3.3)	3.8 (3.3–4.3)	3.7 (3.5–3.9)	3.8 (3.5–4.0)	3.9 (3.7–4.1)	1.05 (1.02–1.07)
Atony resulting in hysterectomy	0.3 (0.3–0.3)	0.4 (0.3–0.5)	0.4 (0.3–0.4)	0.4 (0.3–0.4)	0.4 (0.3–0.4)	1.02 (0.98–1.07)

Abbreviations: CI, confidence interval; PPH, postpartum hemorrhage.

ANESTHESIA & ANALGESIA

Reale, SC, *et al.* Anesthesia & Analgesia130(5):e119-e122, May 2020.

The majority of PPH deaths can be avoided by timely response and use of appropriate treatment…

but

you need to be ready for it and know how to recognize it

Definition of Postpartum Hemorrhage

- The cumulative blood loss of 1000mL or greater *or blood loss accompanied by signs/symptoms of hypovolemia within 24 hours following the birth process*
- Volume of blood loss may not appear significant, but clinical exam and vital signs indicate severe hypovolemia
  - need for closer supervision and possible interventions
- Often diagnosed at a later stage in the process
- Increased risks of:
  - hemorrhagic shock, coagulopathy, infertility, adult respiratory distress syndrome, and Sheehan syndrome

Stages of Hemorrhagic Shock

	CLASS I	CLASS II	CLASS III	CLASS IV
BloodLoss (ml) %	<750 15%	750-1500 15%-30%	1500-2000 30-40%	>2000 >40%
HR	<100	>100	>120	>140
BP	normal	normal	decrease	decrease
PP	normal	decrease	decrease	decrease
RR	14-20	20-30	30-40	>35
UOP	>30	20-30	5-15	negligible
CNS	slightly anxious	mildly anxious	anxious confused	confused lethargic

Obstetric Hemorrhage: Key Resources

Consensus Statement

National Partnership for Maternal Safety

Consensus Bundle on Ob

Elliott K. Main, MD, Dena Goffman, MD
Debra Bingham, DrPH, RN, Patricia L. Fo
and Barbara S. Levy, MD

Hemorrhage is the most frequent cause of seve
nal morbidity and preventable maternal mort
therefore is an ideal topic for the initial national
patient safety bundle. These safety bundles outli
clinical practices that should be implemented
maternity unit. They are developed by multidi
work groups of the National Partnership for
Safety under the guidance of the Council on Pati
in Women's Health Care. The safety bundle is
into four domains: Readiness, Recognition and Pr
Response, and Reporting and System Learning.
the bundle components may be adapted to me
sources available in individual facilities, standa
within an institution is strongly encouraged. R

From the California Maternal Quality Care Collaborative, Stanfor
the American College of Obstetricians and Gynecologists, District 1
New York; the Society for Obstetric Anesthesia and Perinatology,
Wisconsin; the American College of Nurse-Midwives, Silver Sp
American Association of Blood Banks, Bethesda, Maryland; the
Women's Health, Obstetric and Neonatal Nurses, and the America
Obstetricians and Gynecologists, Washington, DC; and the Ameri
of Family Physicians, Leawood, Kansas.

Barbara S. Levy, MD, is an employee of the American Congress of
and Gynecologists (ACOG). All opinions expressed in this article ar
and do not necessarily reflect the policies and views of ACOG. Any
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Association of Blood Banks (AABB) Liaison to the Americ
Obstetricians and the Gynecologists, the Association of Women's H
rs, and Neonatal Nurses (AWHONN), and the California Mat
Care Collaborative (CMQCC.). The other authors did not report
conflicts of interest.

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The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

ACOG PRACTICE BULLETIN

Clinical Management Guidelines for Obstetrician–Gynecologists

NUMBER 183, OCTOBER 2017 (Replaces Practice Bulletin Number 76, October 2006)

Committee on Practice Bulletins—Obstetrics. This Practice Bulletin was developed by the American College of Obstetricians and Gynecologists' Committee on Practice Bulletins–Obstetrics in collaboration with Laurence E. Shields, MD; Dena Goffman, MD; and Aaron B. Caughey, MD, PhD.

Obstetric Hemorrhage Patient Safety Bundle

Readiness — Every Unit/Team

Develop processes for the management of patients with obstetric hemorrhage, including:
- A designated rapid response team co-led by nursing, obstetrics, and anesthesia with membership appropriate to the facility's Level of Maternal Care;*
- A standardized, facility-wide, stage-based obstetric hemorrhage emergency management plan with checklists and escalation policy;*
- Emergency release and massive transfusion protocols to ensure immediate access to blood products;*
- A protocol, including education and consent practices, to collaborate with patients who decline blood products, but may accept alternative approaches;* and
- Review of policies to identify and address organizational root causes of racial and ethnic disparities in outcomes related to the diagnosis, management, and surveillance of obstetric hemorrhage.

Maintain a hemorrhage cart or equivalent with supplies, checklists, and instruction cards for devices or procedures where antepartum, laboring, and postpartum patients are located.*

Ensure immediate access to first- and second-line hemorrhage medications in a kit or equivalent per the unit's obstetric hemorrhage emergency management plan.*

Conduct interprofessional and interdepartmental team-based drills with timely debriefs that include the use of simulated patients.*

Recognition & Prevention — Every Patient

Assess and communicate hemorrhage risk to all team members as clinical conditions change or high-risk conditions are identified; at a minimum, on admission to labor and delivery, during the peripartum period, and on transition to postpartum care.*

Measure and communicate cumulative blood loss to all team members, using quantitative approaches.*

Actively manage the third stage of labor per department-wide protocols.

Provide ongoing education to all patients on obstetric hemorrhage risk and causes, early warning signs, and risk for postpartum complications.*

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

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)

Oxytocin (Pitocin):
10-40 units per 500-1000mL solution

Methylergonovine (Methergine):
0.2 milligrams IM (may repeat);
Avoid with hypertension

15-methyl $PGF_{2\alpha}$ (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

Tranexamic Acid (TXA)
1 gram IV over 10 min (add 1 gram vial to 100mL

Obstetric Hemorrhage Patient Safety Bundle

Response — Every Event

Utilize a standardized, facility-wide, stage-based, obstetric hemorrhage emergency management plan, with checklists and escalation policies for stage-based management of patients with obstetric hemorrhage, including:
- Advance preparations made based on hemorrhage risk (e.g. cell saver, blood bank notification, etc.)
- Evaluating patients for etiology of hemorrhage;
- Use of obstetric rapid response team;
- Evidence-based medication administration or use of nonpharmacological interventions;* and
- Appropriate activation of expanded care team and clinical resources as necessary.

Provide trauma-informed support for patients, identified support network, and staff for all obstetric hemorrhages, including discussions regarding birth events, follow up care, resources, and appointments.*

Reporting and Systems Learning — Every Unit

Establish a culture of multidisciplinary planning, huddles, and post-event debriefs for every obstetric hemorrhage, which identify successes, opportunities for improvement, and action planning for future events.

Perform multidisciplinary reviews of serious complications per established facility criteria to identify system issues.*

Monitor outcomes and process measures related to obstetric hemorrhage, with disaggregation by race and ethnicity due to known racial and ethnic disparities in obstetric hemorrhage outcomes.

Establish processes for data reporting and the sharing of data with the obstetric rapid response team, care providers, and facility stakeholders to inform care and change care systems, as necessary.*

Respecful, Equitable, and Supportive Care — Every Unit/Provider/Team Member

Include each patient that experienced an obstetric hemorrhage and their identified support network as respected members of and contributors to the multidisciplinary care team and as participants in patient-centered huddles and debriefs.*

Engage in open, transparent, and empathetic communication with pregnant and postpartum people and their identified support network to understand diagnoses, options, and treatment plans, including consent regarding blood products and blood product alternatives.*

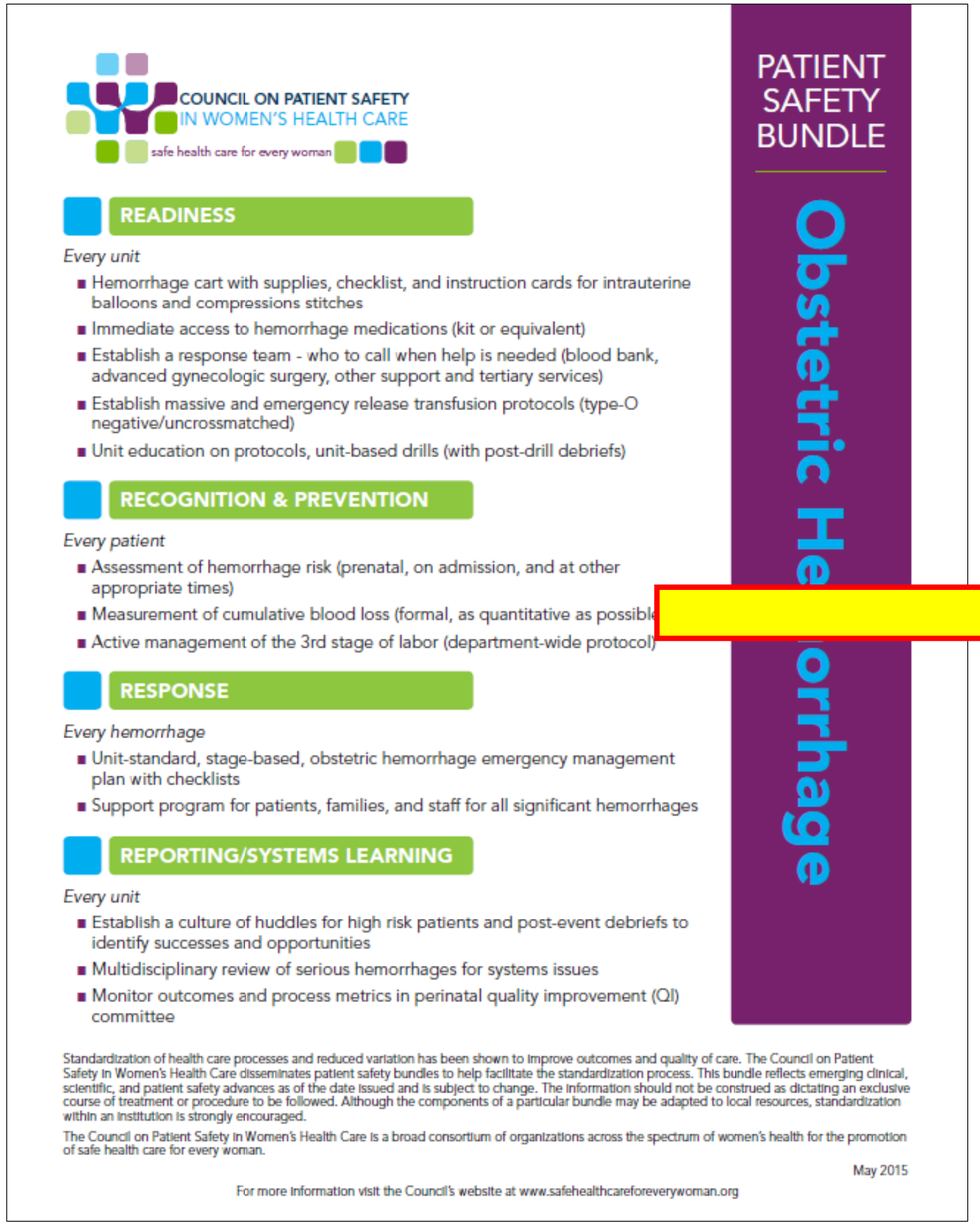
CMQCC
California Maternal
Quality Care Collaborative

Improving Health Care Response to Obstetric Hemorrhage, V3.0

A CMQCC Quality Improvement Toolkit

Bundle updates from AIM released Spring 2022…

IHI Change Package released to augment implementation opportunities…



COUNCIL ON PATIENT SAFETY IN WOMEN'S HEALTH CARE

safe health care for every woman

PATIENT SAFETY BUNDLE

Obstetric Hemorrhage

READINESS

Every unit

- Hemorrhage cart with supplies, checklist, and instruction cards for intrauterine balloons and compressions stitches
- Immediate access to hemorrhage medications (kit or equivalent)
- Establish a response team - who to call when help is needed (blood bank, advanced gynecologic surgery, other support and tertiary services)
- Establish massive and emergency release transfusion protocols (type-O negative/uncrossmatched)
- Unit education on protocols, unit-based drills (with post-drill debriefs)

RECOGNITION & PREVENTION

Every patient

- Assessment of hemorrhage risk (prenatal, on admission, and at other appropriate times)
- Measurement of cumulative blood loss (formal, as quantitative as possibl
- Active management of the 3rd stage of labor (department-wide protocol)

RESPONSE

Every hemorrhage

- Unit-standard, stage-based, obstetric hemorrhage emergency management plan with checklists
- Support program for patients, families, and staff for all significant hemorrhages

REPORTING/SYSTEMS LEARNING

Every unit

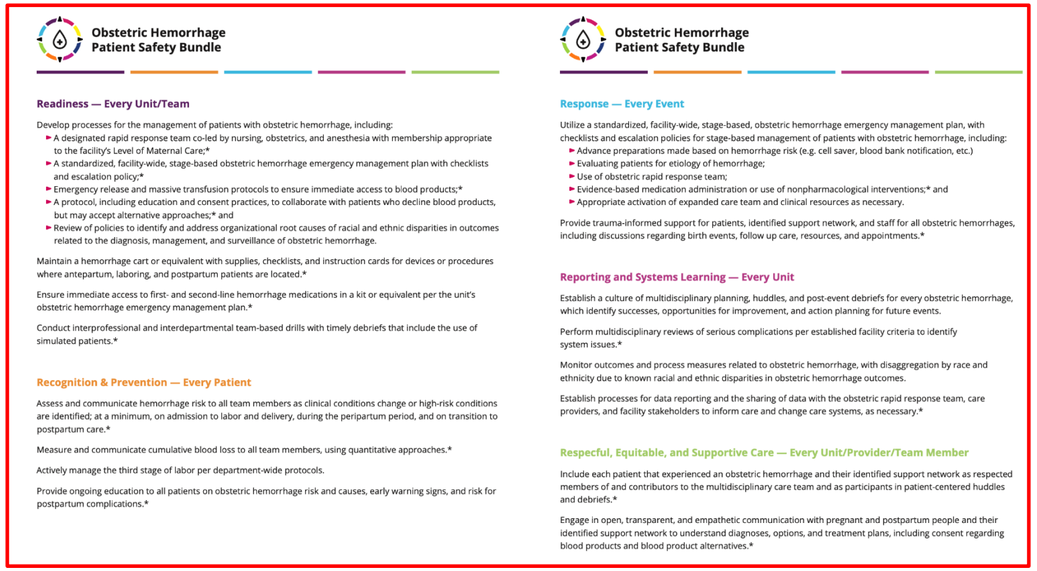
- Establish a culture of huddles for high risk patients and post-event debriefs to identify successes and opportunities
- Multidisciplinary review of serious hemorrhages for systems issues
- Monitor outcomes and process metrics in perinatal quality improvement (QI) committee

Standardization of health care processes and reduced variation has been shown to improve outcomes and quality of care. The Council on Patient Safety in Women's Health Care disseminates patient safety bundles to help facilitate the standardization process. This bundle reflects emerging clinical, scientific, and patient safety advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed. Although the components of a particular bundle may be adapted to local resources, standardization within an institution is strongly encouraged.

The Council on Patient Safety in Women's Health Care is a broad consortium of organizations across the spectrum of women's health for the promotion of safe health care for every woman.

May 2015

For more information visit the Council's website at www.safehealthcareforeverywoman.org



Obstetric Hemorrhage Patient Safety Bundle

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- Review of policies to identify and address organizational root causes of racial and ethnic disparities in outcomes related to the diagnosis, management, and surveillance of obstetric hemorrhage.

Maintain a hemorrhage cart or equivalent with supplies, checklists, and instruction cards for devices or procedures where antepartum, laboring, and postpartum patients are located.*

Ensure immediate access to first- and second-line hemorrhage medications in a kit or equivalent per the unit's obstetric hemorrhage emergency management plan.*

Conduct interprofessional and interdepartmental team-based drills with timely debriefs that include the use of simulated patients.*

Recognition & Prevention — Every Patient

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Measure and communicate cumulative blood loss to all team members, using quantitative approaches.*

Actively manage the third stage of labor per department-wide protocols.

Provide ongoing education to all patients on obstetric hemorrhage risk and causes, early warning signs, and risk for postpartum complications.*

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Response — Every Event

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Reporting and Systems Learning — Every Unit

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Perform multidisciplinary reviews of serious complications per established facility criteria to identify system issues.*

Monitor outcomes and process measures related to obstetric hemorrhage, with disaggregation by race and ethnicity due to known racial and ethnic disparities in obstetric hemorrhage outcomes.

Establish processes for data reporting and the sharing of data with the obstetric rapid response team, care providers, and facility stakeholders to inform care and change care systems, as necessary.*

Respecful, Equitable, and Supportive Care — Every Unit/Provider/Team Member

Include each patient that experienced an obstetric hemorrhage and their identified support network as respected members of and contributors to the multidisciplinary care team and as participants in patient-centered huddles and debriefs.*

Engage in open, transparent, and empathetic communication with pregnant and postpartum people and their identified support network to understand diagnoses, options, and treatment plans, including consent regarding blood products and blood product alternatives.*

Obstetric Hemorrhage Change Package

Contents

Response

Every Event

Change Concept	Change Idea	Key Resources and Tools
1. Utilize a standardized, facility-wide, stage-based, obstetric hemorrhage emergency management plan, with checklists and escalation policies for stage-based management of patients with obstetric hemorrhage, including: a. Advance preparations made based on hemorrhage risk (e.g., cell saver, blood bank notification, etc.)	Designate a patient and identified support network liaison to provide updates in real-time and include these communications on emergency checklist ◊	Florida Obstetric Hemorrhage Initiative Tool Kit (p 33)[21] Preparing for Clinical Emergencies in Obstetrics and Gynecology, ACOG CO #590 [9]
	Perform multi-disciplinary debriefing at the following timepoints: • After resolution of an acute hemorrhage • At the time of transfer to reassess hemorrhage risk and to convey risk to the postpartum team	Obstetric Team Debriefing Form | ACOG[37]
b. Evaluate patients for etiology of hemorrhage		
c. Use of obstetric rapid response team		
d. Evidence-based medication administration or use of nonpharmacological interventions	Communicate directly with patient about clinical concerns and planned management, prior to performing any physical interventions such as bimanual pelvic exam, tamponade placement, or speculum exam ◊	The SHARE Approach | AHRQ[38] Partnering in healthcare: A framework for better care and outcomes[39]
	Include patient-reported pain in assessment and have clear plans for pain management	

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Obstetric Hemorrhage
Patient Safety Bundle

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- Review of policies to identify and address organizational root causes of racial and ethnic disparities in outcomes related to the diagnosis, management, and surveillance of obstetric hemorrhage.

Maintain a hemorrhage cart or equivalent with supplies, checklists, and instruction cards for devices or procedures where antepartum, laboring, and postpartum patients are located.*

Ensure immediate access to first- and second-line hemorrhage medications in a kit or equivalent per the unit's obstetric hemorrhage emergency management plan.*

Conduct interprofessional and interdepartmental team-based drills with timely debriefs that include the use of simulated patients.*

Recognition & Prevention — Every Patient

Assess and communicate hemorrhage risk to all team members as clinical conditions change or high-risk conditions are identified; at a minimum, on admission to labor and delivery, during the peripartum period, and on transition to postpartum care.*

Measure and communicate cumulative blood loss to all team members, using quantitative approaches.*

Actively manage the third stage of labor per department-wide protocols.

Provide ongoing education to all patients on obstetric hemorrhage risk and causes, early warning signs, and risk for postpartum complications.*

…stage based obstetric hemorrhage emergency management plan

Obstetric Hemorrhage
Patient Safety Bundle

…stage based obstetric hemorrhage emergency management plan

Obstetric Hemorrhage
Patient Safety Bundle

Response — Every Event*

Utilize a standardized, facility-wide, stage-based, obstetric hemorrhage emergency management plan, with checklists and escalation policies for stage-based management of patients with obstetric hemorrhage, including:

- Advance preparation, made based on hemorrhage risk (e.g. cell saver, blood bank notification, etc.)
- Evaluating patients for etiology of hemorrhage;
- Use of obstetric rapid response team;
- Evidence-based medication administration or use of nonpharmacological interventions;* and
- Appropriate activation of expanded care team and clinical resources as necessary.

Provide trauma-informed support for patients, identified support network, and staff for all obstetric hemorrhages, including discussions regarding birth events, follow up care, resources, and appointments.*

rting and Systems Learning — Every Unit

sh a culture of multidisciplinary planning, huddles, and post-event debriefs for every obstetric hemorrhage, identify successes, opportunities for improvement, and action planning for future events.

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Establish processes for data reporting and the sharing of data with the obstetric rapid response team, care providers, and facility stakeholders to inform care and change care systems, as necessary.*

Respecful, Equitable, and Supportive Care — Every Unit/Provider/Team Member

Include each patient that experienced an obstetric hemorrhage and their identified support network as respected members of and contributors to the multidisciplinary care team and as participants in patient-centered huddles and debriefs.*

Engage in open, transparent, and empathetic communication with pregnant and postpartum people and their identified support network to understand diagnoses, options, and treatment plans, including consent regarding blood products and blood product alternatives.*

What is a Stage-Based Obstetric Hemorrhage Emergency Management Plan?

Two Stage-Based Plans

SMI

- Obstetric Hemorrhage Checklist

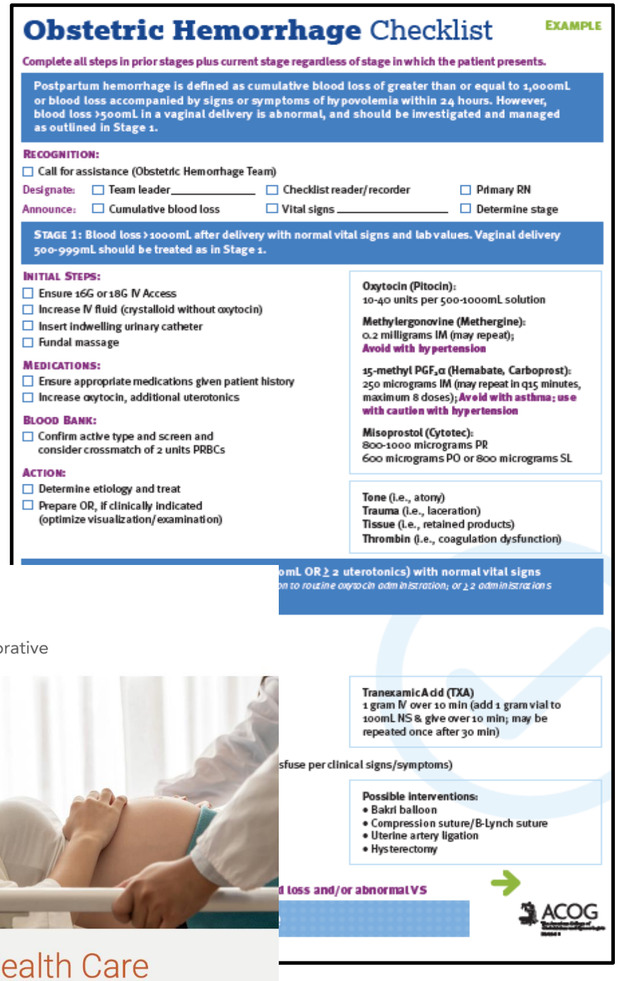
CMQCC

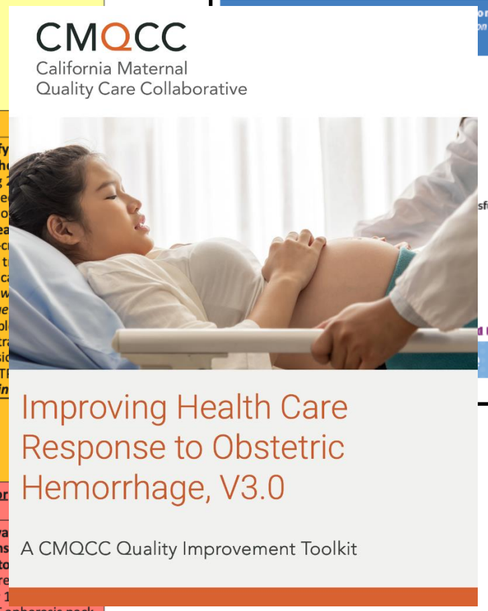
- Obstetric Hemorrhage Care Guidelines

Appendix C: Obstetric Hemorrhage Care Guidelines: Table Format

	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 *continued bleeding* 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 good exposure 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: *Continued bleeding* w/ CBL < 1500 mL or 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*) or - **Carboprost** 250 mcg IM (*if no asthma*) or *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** **OB h** • Bring to be use o **Relea** (un-c and t clinic *not w* *value* • Use bl for tr Consi MTI ***contin***
Stage 3	**Triggers: *Continued bleeding* with CBL > 1500mL or > 2 units PRBCs given or 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	• **Activa** **Trans** **Proto** aggre • Near 1 • 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.





How Do you Implement a Stage-Based Plan?

#1: Be ready on your unit and within your team at *all times*

#2: Recognize *every* high risk patient and *every* PPH case

#3: Respond consistently in a standardized way *every time*

Readiness — Every Unit/Team

Develop processes for the management of patients with obstetric hemorrhage, including:

- A designated rapid response team co-led by nursing, obstetrics, and anesthesia with membership appropriate to the facility's Level of Maternal Care;*
- A standardized, facility-wide, stage-based obstetric hemorrhage emergency management plan with checklists and escalation policy;*
- Emergency release and massive transfusion protocols to ensure immediate access to blood products;*
- A protocol, including education and consent practices, to collaborate with patients who decline blood products, but may accept alternative approaches;* and
- Review of policies to identify and address organizational root causes of racial and ethnic disparities in outcomes related to the diagnosis, management, and surveillance of obstetric hemorrhage.

Maintain a hemorrhage cart or equivalent with supplies, checklists, and instruction cards for devices or procedures where antepartum, laboring, and postpartum patients are located.*

Ensure immediate access to first- and second-line hemorrhage medications in a kit or equivalent per the unit's obstetric hemorrhage emergency management plan.*

Conduct interprofessional and interdepartmental team-based drills with timely debriefs that include the use of simulated patients.*

Recognition & Prevention — Every Patient

Assess and communicate hemorrhage risk to all team members as clinical conditions change or high-risk conditions are identified; at a minimum, on admission to labor and delivery, during the peripartum period, and on transition to postpartum care.*

Measure and communicate cumulative blood loss to all team members, using quantitative approaches.*

Actively manage the third stage of labor per department-wide protocols.

Provide ongoing education to all patients on obstetric hemorrhage risk and causes, early warning signs, and risk for postpartum complications.*

Obstetric Hemorrhage
Patient Safety Bundle

Response — Every Event

Utilize a standardized, facility-wide, stage-based, obstetric hemorrhage emergency management plan, with checklists and escalation policies for stage-based management of patients with obstetric hemorrhage, including:

- Advance preparations made based on hemorrhage risk (e.g. cell saver, blood bank notification, etc.)
- Evaluating patients for etiology of hemorrhage;
- Use of obstetric rapid response team;
- Evidence-based medication administration or use of nonpharmacological interventions;* and
- Appropriate activation of expanded care team and clinical resources as necessary.

Provide trauma-informed support for patients, identified support network, and staff for all obstetric hemorrhages, including discussions regarding birth events, follow up care, resources, and appointments.*

Reporting and Systems Learning — Every Unit

Establish a culture of multidisciplinary planning, huddles, and post-event debriefs for every obstetric hemorrhage, which identify successes, opportunities for improvement, and action planning for future events.

Perform multidisciplinary reviews of serious complications per established facility criteria to identify system issues.*

Monitor outcomes and process measures related to obstetric hemorrhage, with disaggregation by race and ethnicity due to known racial and ethnic disparities in obstetric hemorrhage outcomes.

Establish processes for data reporting and the sharing of data with the obstetric rapid response team, care providers, and facility stakeholders to inform care and change care systems, as necessary.*

Respecful, Equitable, and Supportive Care — Every Unit/Provider/Team Member

Include each patient that experienced an obstetric hemorrhage and their identified support network as respected members of and contributors to the multidisciplinary care team and as participants in patient-centered huddles and debriefs.*

Engage in open, transparent, and empathetic communication with pregnant and postpartum people and their identified support network to understand diagnoses, options, and treatment plans, including consent regarding blood products and blood product alternatives.*

Readiness - Every Unit/Team

Develop processes for the management of patients with obstetric hemorrhage, including:

a. A designated **rapid response team** co-led by nursing, obstetrics, and anesthesia with membership appropriate to the facility's Level of Maternal Care;

b. A standardized, facility-wide, **stage-based obstetric hemorrhage emergency management plan** with checklists and escalation policy;

c. **Emergency release and massive transfusion protocols** to ensure immediate access to blood products; *

d. A **protocol**, including education and consent practices, **to collaborate with patients who decline blood products**, but may accept alternative approaches;

e. **Review of policies to identify and address organizational root causes of racial and ethnic disparities in outcomes** related to the diagnosis, management, and surveillance of obstetric hemorrhage.

Readiness - Every Unit/Team

- Maintain a **hemorrhage cart or equivalent** with supplies, checklists, and instruction cards for devices or procedures where antepartum, laboring, and postpartum patients are located.
- Ensure immediate access to first- and second-line **hemorrhage medications in a kit or equivalent** per the unit’s obstetric hemorrhage emergency management plan.
- Conduct **interprofessional and interdepartmental team-based drills with timely debriefs** that include the use of simulated patients.

Recognition and Prevention - Every Patient

- **Assess and communicate hemorrhage risk to all team members** as clinical conditions change or high-risk conditions are identified; at a minimum, on admission to labor and delivery, during the peripartum period, and on transition to postpartum care.

- **Measure and communicate cumulative blood loss** to all team members, using quantitative approaches.

- **Actively manage the third stage of labor** per department-wide protocols.

- Provide **ongoing education to all patients** on obstetric hemorrhage risk and causes, early warning signs, and risk for postpartum complications.

Response - Every Event

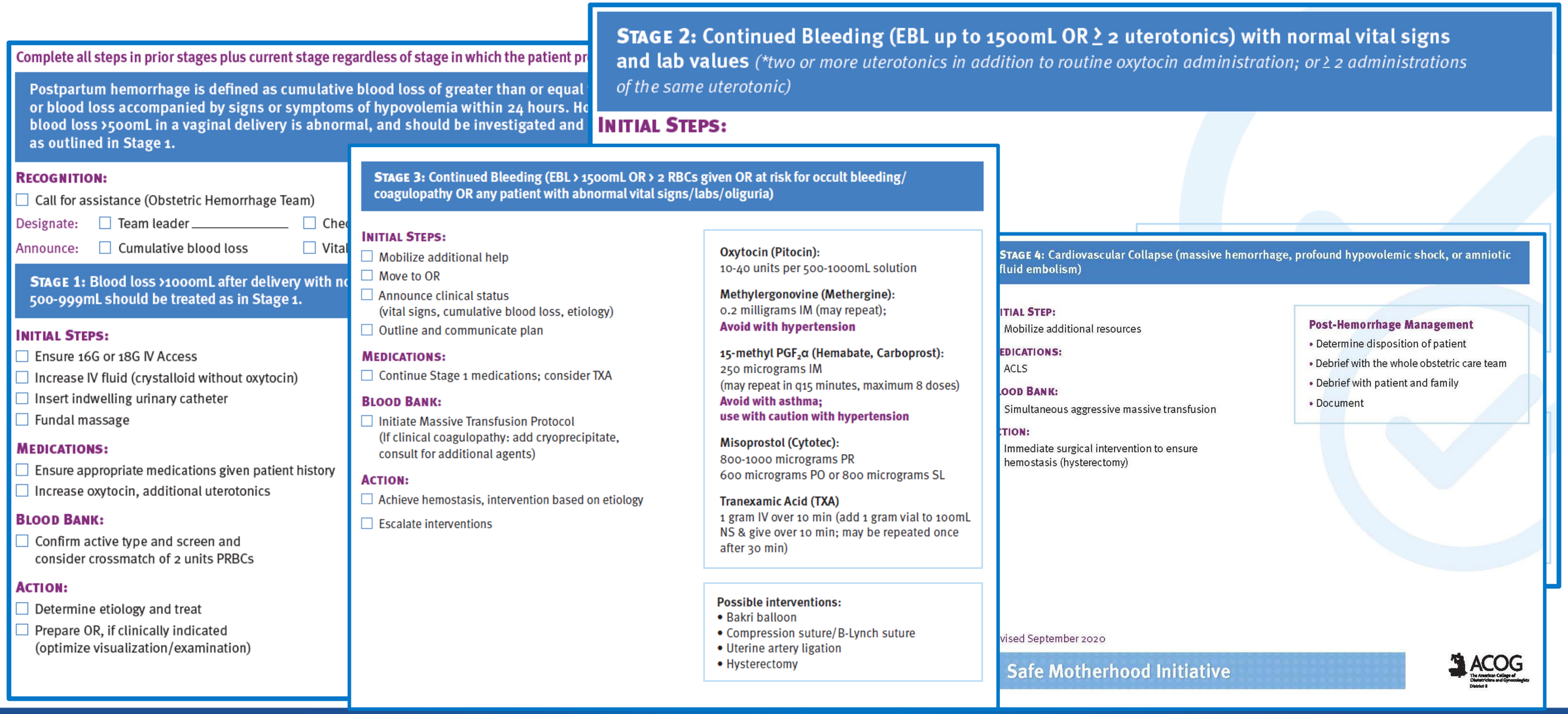
Utilize a standardized, facility-wide, **stage-based obstetric hemorrhage emergency management plan**, with checklists and escalation policies for stage-based management of patients with obstetric hemorrhage, including:

a. **Advance preparations** made based on hemorrhage risk (e.g. cell saver, blood bank notification, etc.)
b. **Evaluating patients for etiology of hemorrhage**;
c. Use of **obstetric rapid response team**;
d. **Evidence-based medication administration or use of nonpharmacological interventions**;
e. **Appropriate activation of expanded care team** and clinical resources as necessary.

Response - Every Event

- Provide **trauma-informed support for patients, identified support network, and staff for all obstetric hemorrhages**, including discussions regarding birth events, follow up care, resources, and appointments**.**

SMI Stage-Based PPH Management Plan



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

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

RECOGNITION:

- ☐ Call for assistance (Obstetric Hemorrhage Team)

Designate: ☐ Team leader _____ ☐ Chec

Announce: ☐ Cumulative blood loss ☐ Vital

STAGE 1: Blood loss >1000mL after delivery with nc
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)

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 uterotonic)*

INITIAL STEPS:

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 $PGF_2\alpha$ (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

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

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

ITIAL STEP:
Mobilize additional resources

EDICATIONS:
ACLS

LOOD BANK:
Simultaneous aggressive massive transfusion

CTION:
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

vised September 2020

Safe Motherhood Initiative

ACOG

SMI: Stage-based PPH Management Plan

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 $PGF_2\alpha$ (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)

https://www.acog.org/-/media/project/acog/acogorg/files/forms/districts/smi-ob-hemorrhage-bundle-hemorrhage-checklist.pdf

Response Opportunity: *Medical Therapy*

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

Dan L. Longo, M.D., *Editor*

Postpartum Hemorrhage

Jessica L. Bienstock, M.D., M.P.H., Ahizechukwu C. Eke, M.D., Ph.D., and Nancy A. Hueppchen, M.D.

POSTPARTUM HEMORRHAGE CONTINUES TO BE THE LEADING PREVENTable cause of maternal illness and death globally.[1,2] Worldwide, postpartum

Table 1. Medical Therapy for Postpartum Hemorrhage.*

Medication	Mechanism of Action	Route of Administration and Dose	Concerns and Contraindications	Adverse Effects
First-line therapy: oxytocin	Stimulates oxytocin receptors in the uterus	IV route, 10–40 IU/500–1000 ml of lactated Ringer's solution; IM or IMM route, 5–10 IU for up to 4 doses	SIADH, hypotension	Rapid bolus administration may cause hyponatremia, hypotension, tachycardia, and arrhythmia
Second-line therapy				
Methylergonovine maleate (ergot alkaloid)	Partial agonist or antagonist at serotoninergic, dopaminergic, α_1-adrenergic receptors in the uterus	IM or IMM route, 0.2 mg every 2–4 hr, for a maximum of 5 doses; oral route, 0.2 mg every 6–8 hr for 2–7 days	Hypertension, cardiovascular disease (stroke, Renaud's disease)	Elevated blood pressure, nausea, vomiting, myocardial infarction
Carboprost tromethamine ($PGF_{2\alpha}$)	$PGF_{2\alpha}$ agonist in uterine myometrium	IM or IMM route, 250 μg every 15–90 min for a maximum of 8 doses	Asthma, cardiovascular disease, hepatic disease, renal disease	Nausea, vomiting, and diarrhea
Adjunctive agents				
Tranexamic acid	Diminishes the dissolution of hemostatic fibrin by plasmin, stabilizing clot in uterine vessels	IV route, 1 g (100 mg/ml) over a 10-min period; if bleeding persists after 30 min or stops and restarts within 24 hr after the first dose, a second dose may be administered	Contraindicated if known hypersensitivity to tranexamic acid, thromboembolic event during pregnancy, history of hypercoagulopathy	Headache, musculoskeletal pain, nausea, diarrhea
Recombinant factor VIIa	Activates clotting cascade by cleaving factor IX and factor X, which activates these factors and leads to activation of thrombin and fibrin	IV route, 50–100 μg/kg (single dose)	Severe anemia, severe thrombocytopenia, hyperfibrinogenemia, allergy to mouse, hamster, or bovine proteins	Thromboembolic events, cerebrovascular infarcts, myocardial infarction
Treatment of uncertain usefulness: misoprostol	PGE_1 agonist in the uterine myometrium	Sublingual, oral, or rectal route (sublingual route preferred), 600–1000 μg in single dose; repeat doses not recommended	Sepsis, allergy to misoprostol, concurrent anticoagulant therapy, cardiovascular disease; efficacy is disputed	Nausea, vomiting, fever, diarrhea

* IM denotes intramuscular, IMM intramyometrial, IV intravascular, PGE_1 prostaglandin E_1, $PGF_{2\alpha}$ 15-methyl prostaglandin $F_{2\alpha}$, and SIADH syndrome of inappropriate antidiuretic hormone secretion.

SMI: Stage-based PPH Management Plan

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 uterotonic)*

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

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)

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

Possible interventions:

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

https://www.acog.org/-/media/project/acog/acogorg/files/forms/districts/smi-ob-hem bundle-hemorrhage-checklist.pdf

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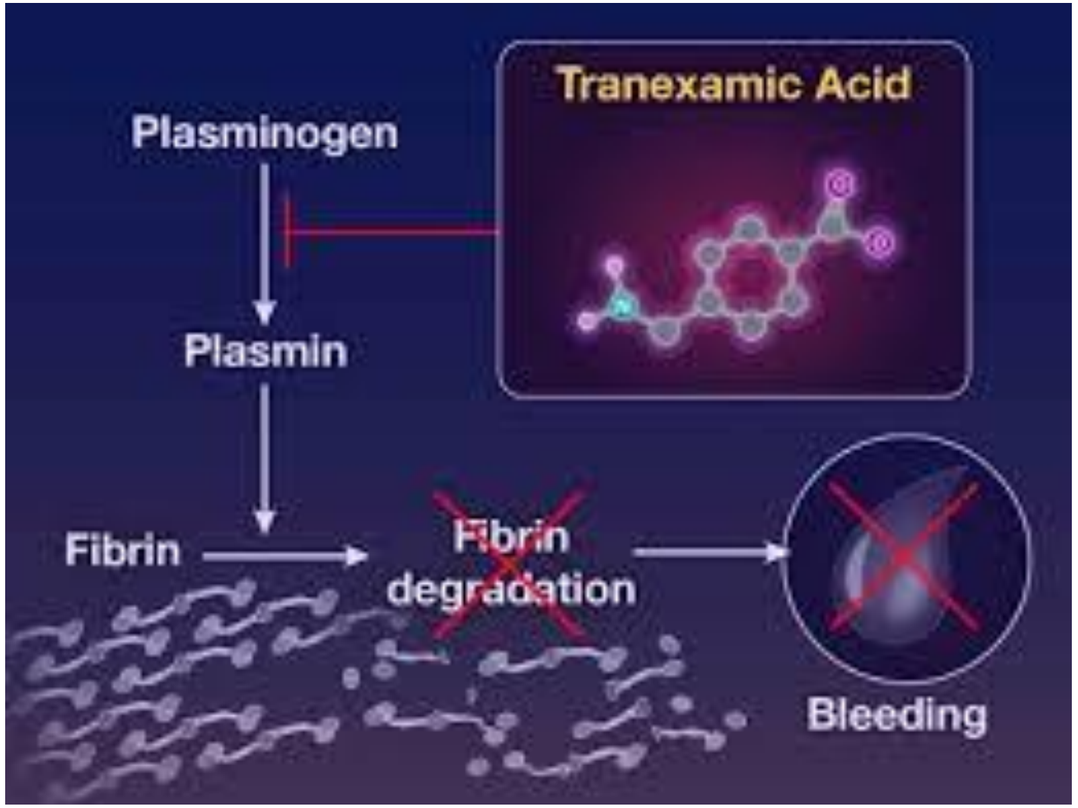
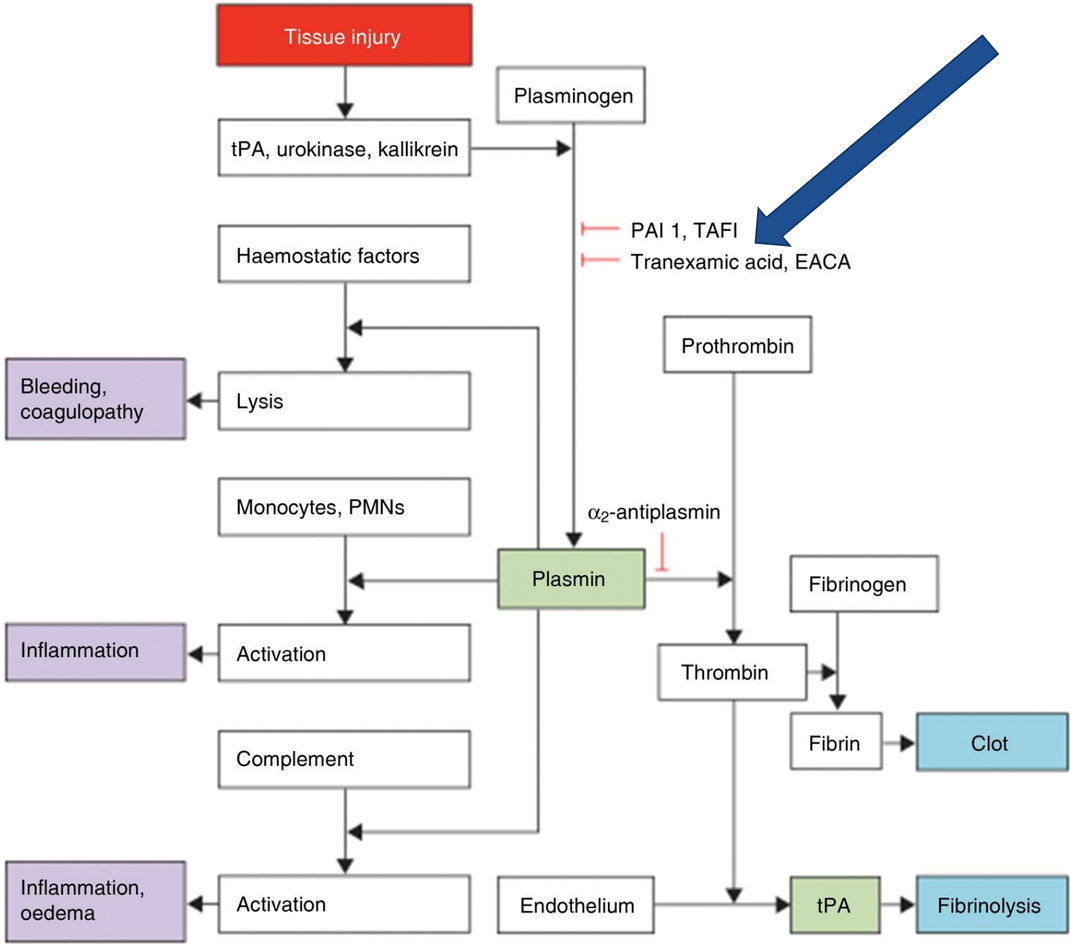
Tranexamic Acid – What is it? Mechanism of action?





Tranexamic Acid – Why do you give it?

- Death due to bleeding was reduced by 19% overall, irrespective of mode of birth
- Death due to bleeding was reduced by 31% when TXA initiated within 3hrs of birth
- Death due to bleeding was reduced by 26% for bleeding due to atony
- Did not increase the risk of thromboembolic events

- Increases overall survival from bleeding and immediate treatment improved survival by more than 70%
- The survival benefit decreased by 10 percent for every 15 minutes of treatment delay until 3 hours, after which there was no benefit

Tranexamic Acid – When do you give it?

- The benefit of TXA is greatest with early administration, have a low threshold to add after uterotonics have been given
  - order blood products as needed but do not wait for them to administer TXA
- Ideally within 3 hours of delivery
- If bleeding continues after 30 minutes or stops and restarts within 24 hours after the first dose, a second dose of 1g over 10 minutes may be given
- *Should consider in the setting of obstetric hemorrhage* ***when initial medical therapy fails*** *(ACOG)*

Tranexamic Acid – How do you administer it?

- Administer IV bolus of TXA as soon as possible after diagnosis of PPH and after uterotonics given
  - TXA 1g IV push over 10 – 20 mins

    OR
  - TXA 1g IV in 50-100cc bag NS over 10-30 mins
    - Infusion >1mL/min can cause hypotension
- DO NOT inject in lines with blood, penicillin or Mannitol

Candidates and Contraindications for TXA

- **Candidates**:
  - Vaginal births
  - Cesarean births

- **Contraindications**:
  - renal disease - relative
  - known thromboembolic event in pregnancy
  - history of coagulopathy
  - active intravascular clotting
  - known hypersensitivity to TXA

SMI: Stage-based PPH Management Plan

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

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https://www.acog.org/-/media/project/acog/acogorg/files/forms/districts/smi-ob-hemorrhage-bundle-hemorrhage-checklist.pdf

Bakri- Intrauterine Balloon Technique

INSERT UNDER ULTRASOUND GUIDANCE

Inflate up to 500cc (can hold 1300cc)

- Sterile fluid – Never with air!!

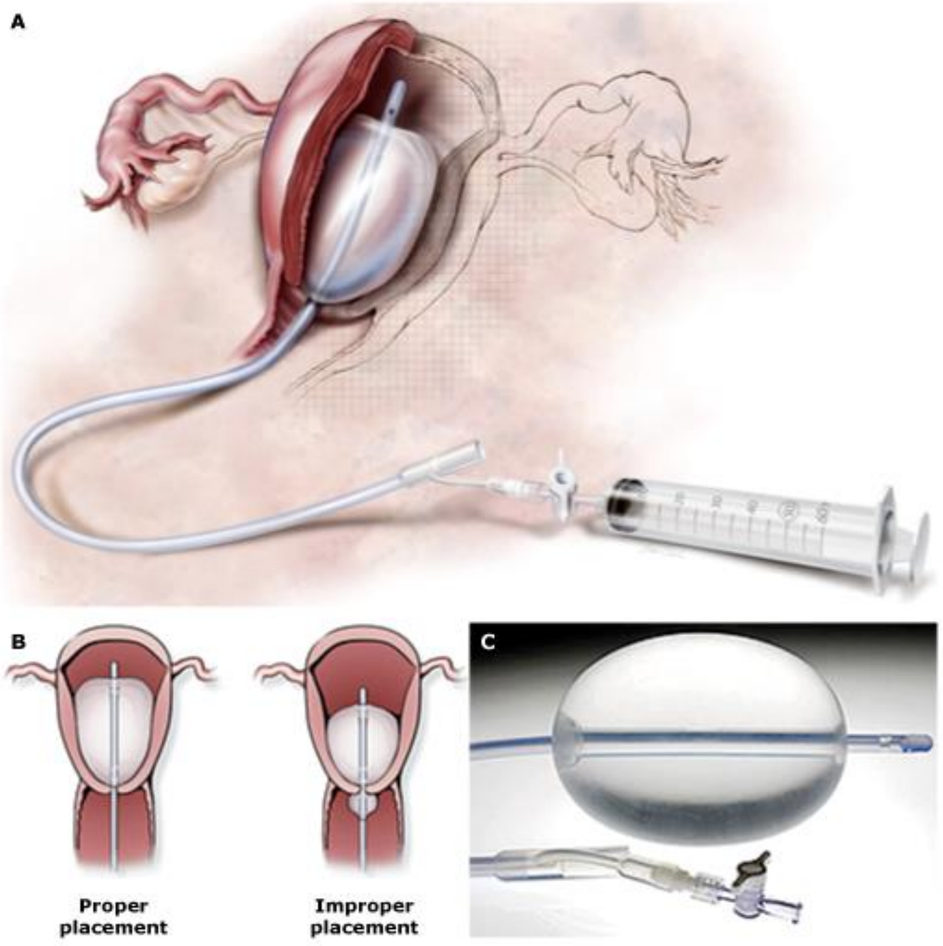
Vaginal packing to maintain correct placement, or additional 50-100cc

Gentle traction, tape to leg

Connect to collection bag monitor hemostasis/bleeding

- May need to flush clots w sterile saline

MAXIMUM time in situ = 24hrs



Bakri Management

Requires close monitoring for evidence of continued bleeding

- Enlarging uterus
- Excessive bleeding into foley bag
- Bleeding from cervix
- Evidence of hypovolemia – proceed to laparotomy

(Slowly) deflate balloon – if bleeding resumes, proceed to laparotomy

Response Opportunity: Tamponade

OBJECTIVE:

To assess the efficacy, effectiveness, and safety of uterine balloon tamponade (UBT) for treating PPH

RESULTS:

Ninety-one studies, including 4729 women, met inclusion criteria (6 randomized trials, 1 cluster randomized trial, 15 nonrandomized studies, and 69 case series)
Overall pooled UBT success rate was 85.9% (95% CI, 83.9-87.9%)
Highest success rates: uterine atony (87.1%), placenta previa (86.8%)
Lowest success rates: placenta accreta spectrum (66.7%), retained products of conception (76.8%)
UBT success rate was lower with cesarean deliveries (81.7%) than with vaginal deliveries (87.0%)

Suarez S, et al. *Am J Obstet Gynecol*. 2020;222:293.e1-e52.

Jada SYSTEM — Quick Reference Guide

1. EVALUATE PATIENT & PREPARE JADA

Evaluate patient for lacerations, retained products of conception, or other causes of bleeding before using Jada.

Connect a vacuum canister and standard vacuum tubing to a regulated vacuum source.

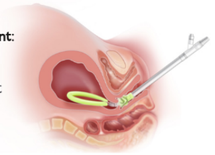
Connect syringe to Seal Valve to **REMOVE AIR** from Cervical Seal before use.

2. INSERT JADA

Grasp and compress Intrauterine Loop and **insert transvaginally**.

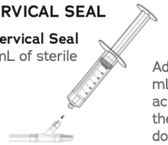
Use gentle traction on the anterior cervical lip to stabilize the cervical opening, if needed.

Ensure correct placement: Intrauterine Loop within the uterus and Cervical Seal within the vagina at the external cervical os.



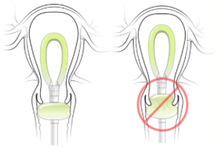
3. FILL CERVICAL SEAL

Fill the Cervical Seal with 60 mL of sterile fluid.



Add up to another 60 mL of fluid, if needed, to achieve full coverage of the external cervical os; do not exceed 120 mL.

Do NOT advance Cervical Seal into the uterus while filling. Confirm Cervical Seal is outside cerfical os.



4. TURN ON & SET VACUUM, THEN CONNECT TUBING

Turn on vacuum source and set to 80 mm Hg (+/- 10 mm Hg) while occluding the end of the tubing.
Maximum vacuum pressure is 90 mm Hg.

80 mm Hg = 1.5 psi = 10.7 kPa = 3.2 in Hg = 106.7 mbar

Connect Jada to vacuum tubing.

5. TREATMENT

- **Leave Jada in place** with vacuum applied, using tape to secure the Tube to the patient's inner thigh.
- Blood flow into the vacuum tubing and/or improvement in uterine tone should be noted after initiation of vacuum.
- After initial evacuation of any pooled blood, presentation may vary during treatment: there may be no further blood evacuation, or additional blood moving into the tubing, or accumulation of blood in the canister.
- **Verify bleeding is controlled.**
- **Leave vacuum on for at least one hour** after bleeding is controlled, and verify the uterus is firm and patient is stable before disconnecting vacuum.
- Consider prophylactic antibiotics for prolonged use. **Do not leave the Jada in place for >24 hours.**

6. VERIFY

- Ensure Tube remains secured with tape to patient's inner thigh.
- **Disconnect vacuum tubing** from Jada while vacuum is on.
- **Remove all sterile fluid** from Cervical Seal.
- **Wait at least 30 minutes** to verify bleeding is controlled.
- If bleeding recurs, repeat steps 3 – 6, if appropriate.

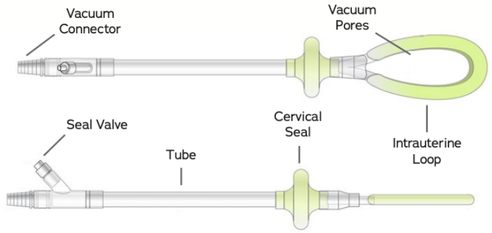
7. REMOVE JADA

- If bleeding remains controlled and the uterus remains firm, **remove the Jada slowly** while supporting the uterine fundus.

TROUBLESHOOTING

SITUATION	RECOMMENDED ACTION
Vacuum is not detected at the end of the vacuum tubing.	a) Check connection on all system components: • Confirm vacuum source is functional, including regulator. • Confirm lid of vacuum canister is fully seated and that canister is not cracked. • Confirm vacuum tubing is securely connected at both ends and any connection in between. b) Confirm desired vacuum level is regulated in the appropriate units (i.e. mm Hg vs. cm Hg).
Vacuum system is connected and working but uterus does not collapse and/or bleeding does not stop.	a) Increase vacuum pressure to maximum (90 mm Hg). b) Disconnect the vacuum tubing from Jada and occlude the end of the tubing to check vacuum. c) Confirm appropriate Jada placement, with ultrasound if needed: • Confirm proper placement of Intrauterine Loop in uterus (vs. misplacement in posterior vaginal fornix). • Confirm proper placement of Cervical Seal outside of the cervical os (vs. misplacement into uterus). • Ensure Cervical Seal is sufficiently filled with sterile fluid to create adequate seal at the cervix. d) Re-evaluate patient for other sources of bleeding.

JADA COMPONENTS



MATERIALS REQUIRED BUT NOT SUPPLIED

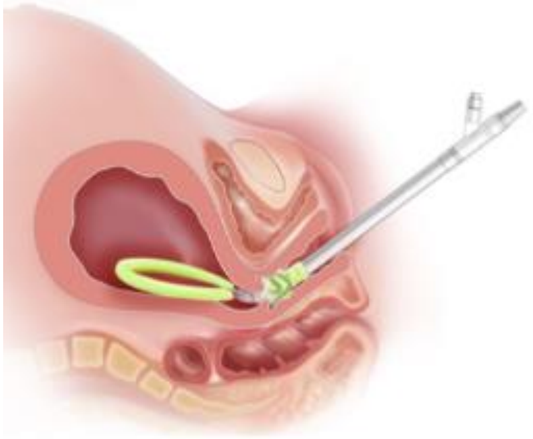
- Regulated Vacuum Source
- Vacuum Canister
- Tape
- Sterile Vacuum Tubing: 10'-12'
- 60 mL Sterile Fluid (Max 120 mL)
- Sterile Luer Tapered Syringe: 60 mL recommended

CAUTION: Please refer to the Jada System Instructions for Use (IFU) for complete information. The Jada System IFU can be found at www.alydiahealth.com/IFU

Federal law (USA) restricts the Jada System to sale by or on the order of a physician.

Alydia HEALTH

Response Opportunity: Jada®



OBJECTIVE:

To evaluate effectiveness and safety of an intrauterine vacuum-induced hemorrhage-control device for PPH treatment

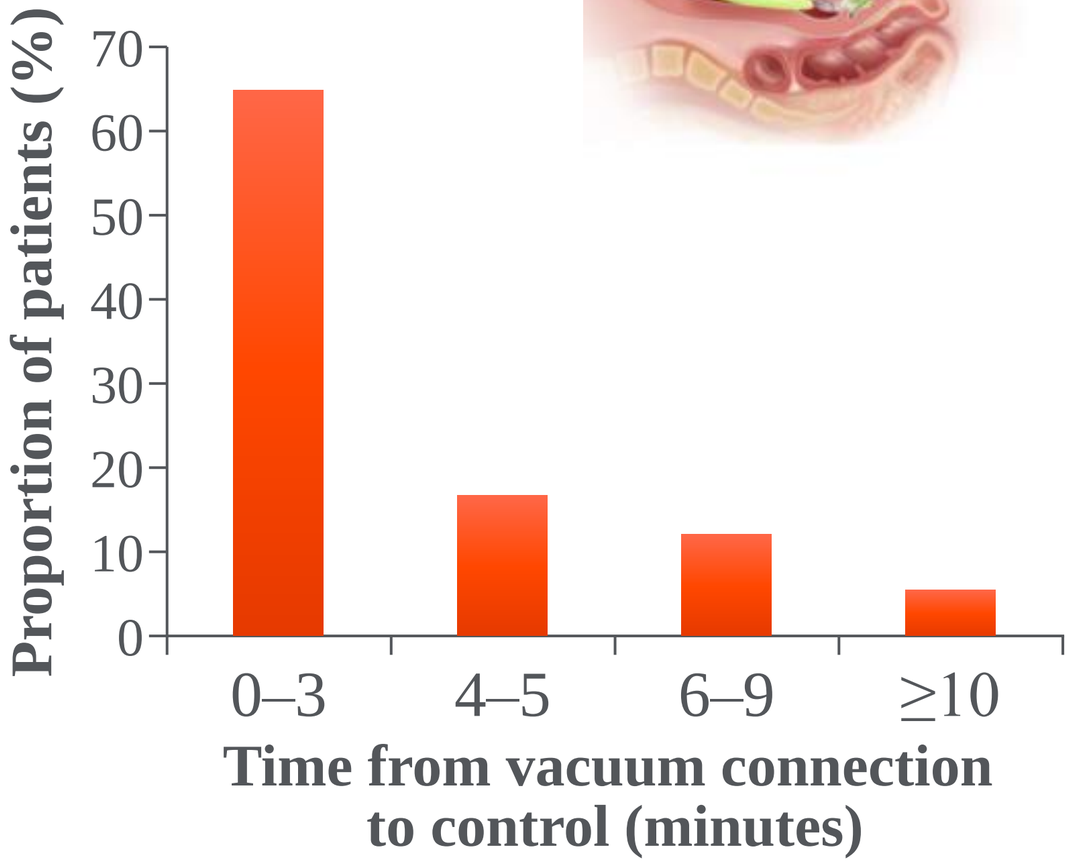
METHODS:

Multicenter, prospective, single-arm treatment study of a novel intrauterine device that uses low-level vacuum to induce uterine myometrial contraction to achieve control of abnormal postpartum uterine bleeding and PPH

RESULTS:

106 received any study treatment with the device connected to vacuum

Successful treatment was observed in 94% (100/106, 95% CI 88–98%) of participants



D'Alton ME, et al. *Obstet Gynecol*. 2020 Nov;136(5):882-891

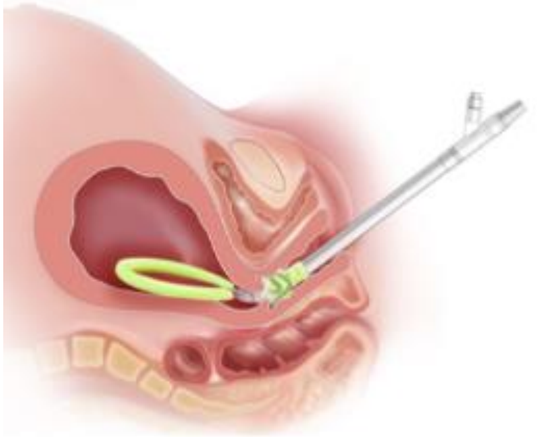
Response Opportunity: Jada®

SAFETY

Eight adverse events reported deemed “possibly related” to the procedure

All events were expected risks and resolved with treatment

Events included mild endometritis, mild presumed endometritis, mild bacterial vaginosis, mild vaginal candidiasis, mild laceration repair disruption (n=1), and moderate endometritis (n=3)



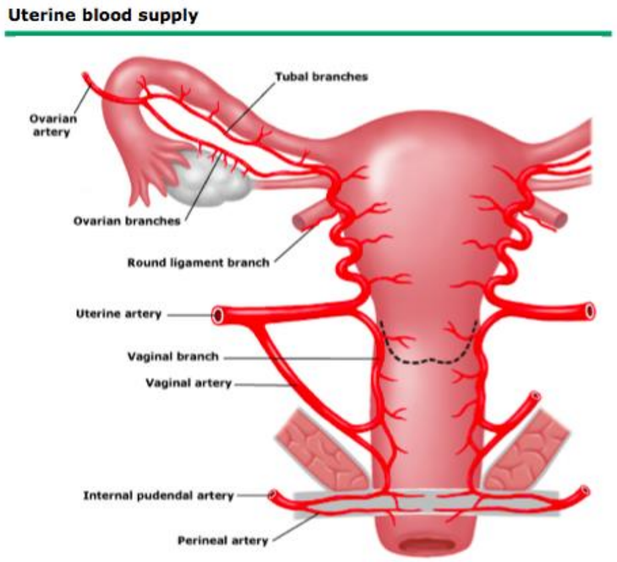
OVERALL INVESTIGATOR ASSESSMENT

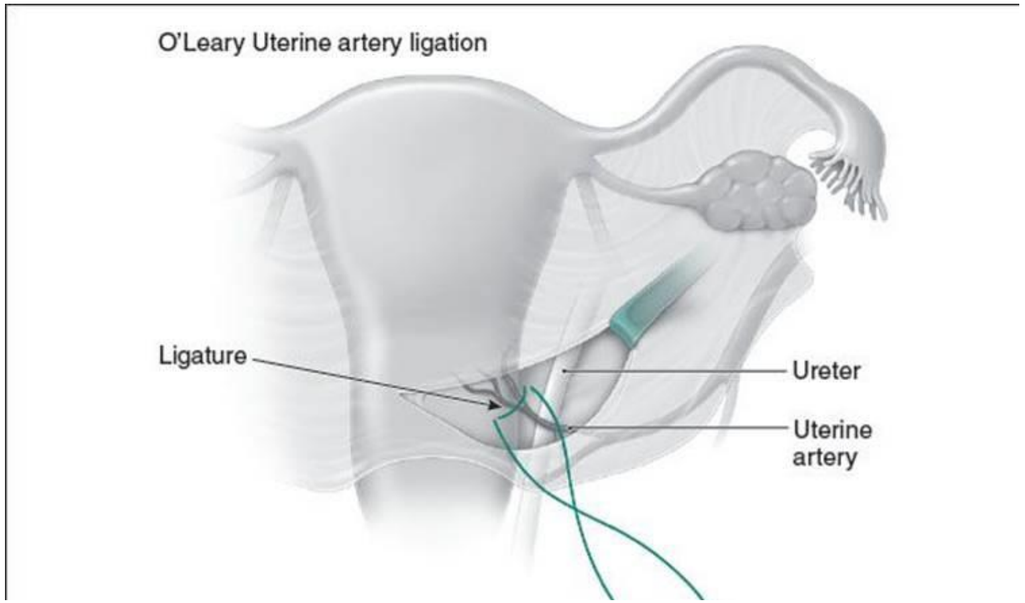
98% reported device did not prohibit normal postpartum activities

Surgical Interventions

Uterine artery and utero-ovarian artery ligation

- O’Leary Stitch – bilateral uterine artery ligation
  - First line approach if PPH from laceration of the uterine artery or branches of the utero-ovarian artery
  - Does not control bleeding from atony but may decrease blood loss while other interventions are being attempted
  - #0-Chromic or polyglycolic acid suture – at level of internal cervical os, pass suture laterally through the broad ligament and lower uterine segment, tie suture to compress the vessels

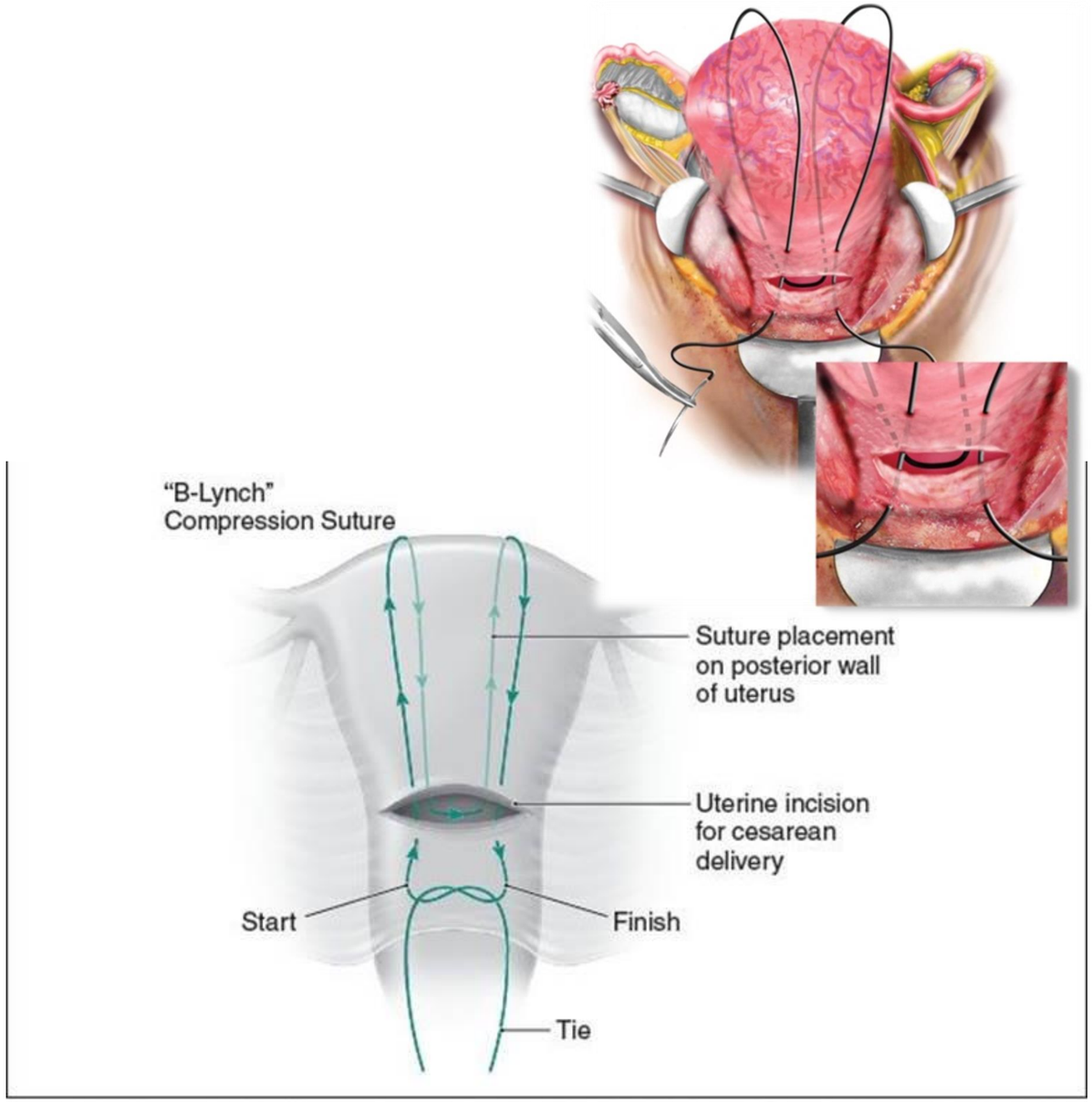




Surgical Interventions

Uterine Compression Sutures – B-Lynch Suture

- Effective for controlling bleeding due to uterine atony
- Sutures are placed to compress the uterus, similarly to manual compression
- Large Mayo needle with #2-Chromic catgut is used



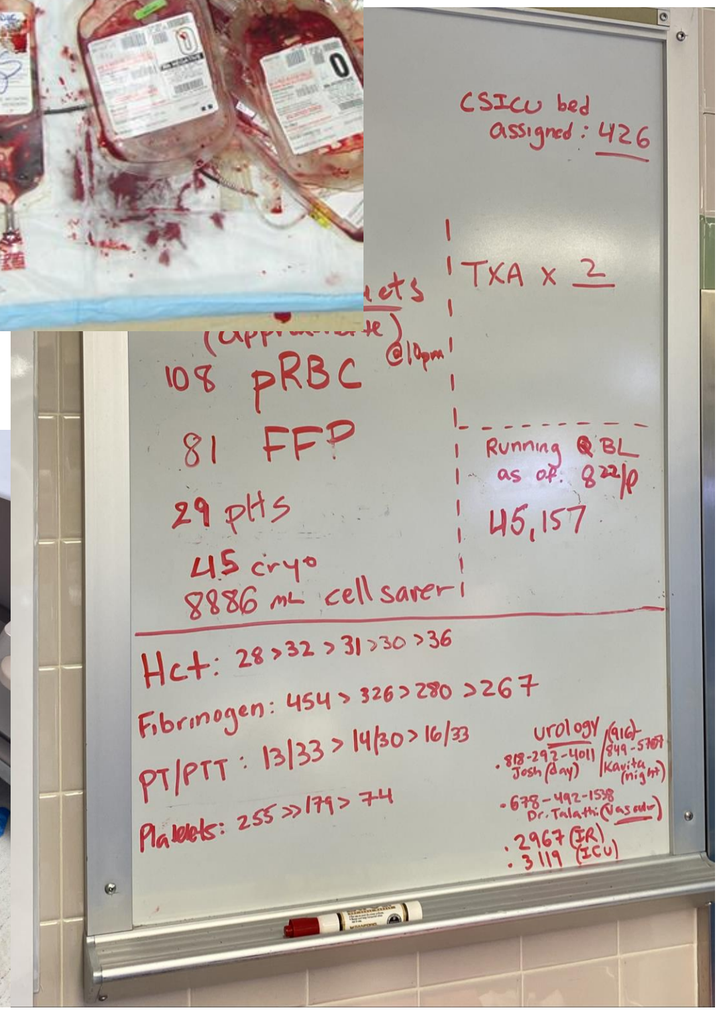
(Reprinted with permission from Beckmann CRB, Ling FW, Smith RP, et al. *Obstetrics & Gynecology*. 6th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2009)

Surgical Interventions

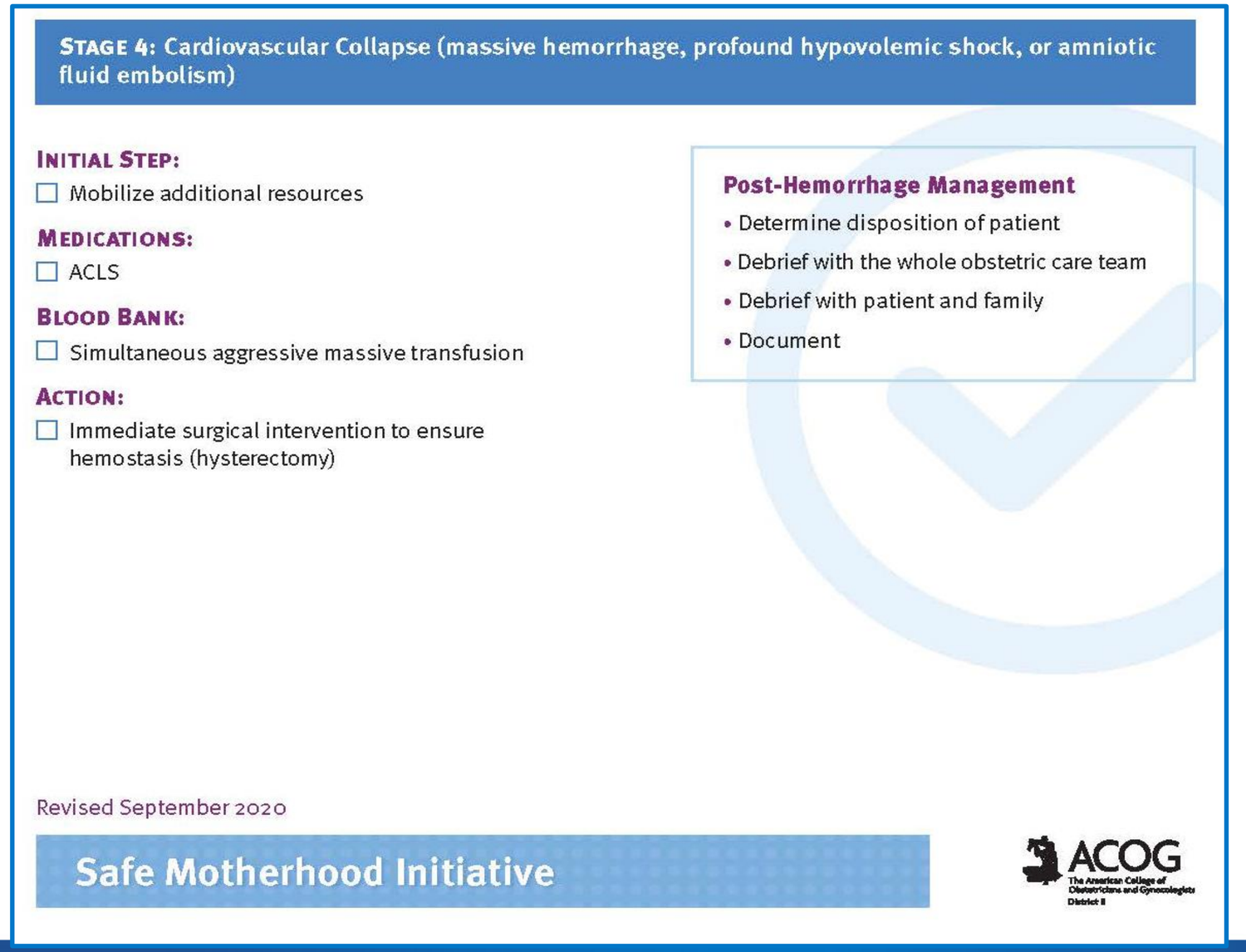
Hysterectomy is definitive treatment when uterotonics and surgical interventions fail

Do not delay – once coagulopathy has set in, can spiral downward quickly

Continued blood loss can lead to severe morbidity and mortality



Response Opportunity: Stage-based PPH Management Plan



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
The American College of Obstetricians and Gynecologists
District II

https://www.acog.org/-/media/project/acog/acogorg/files/forms/districts/smi-ob-hemorrhage-bundle-hemorrhage-checklist.pdf

Final Thoughts

- Every labor and delivery/birth unit should have a stage-based hemorrhage management plan
- Successful implementation of the plan hinges on the unit being able to:

  #1: Be ready on your unit and within your team at *all times*

  #2: Recognize *every* high risk patient and *every* PPH case

  #3: Respond consistently in a standardized way *every time*

- Each unit needs to put these processes in place to be able to optimally treat each PPH patient with a stage-based hemorrhage management plan

How did you find us?








Upcoming TAP Webinars

Register at saferbirth.org under Resources > Events

Get the 411 on WA211: Building and Implementing a Substance Use Resource Map

November 17th at 3 PM ET

Hannah Newton, Skyler Young, & Shanell Brown

Postpartum Discharge Transition Bundle Overview

December 1st at 3 PM ET

Patricia Supplee, Ph.D., RNC-OB, FAAN

Thank you!

The recording will be emailed to all attendees once ready

AIM will also post the recording on our website, saferbirth.org

Any questions about this webinar or the series can be sent to AIM@acog.org

Remember to register for upcoming webinars!