Updates for management of postpartum hemorrhage

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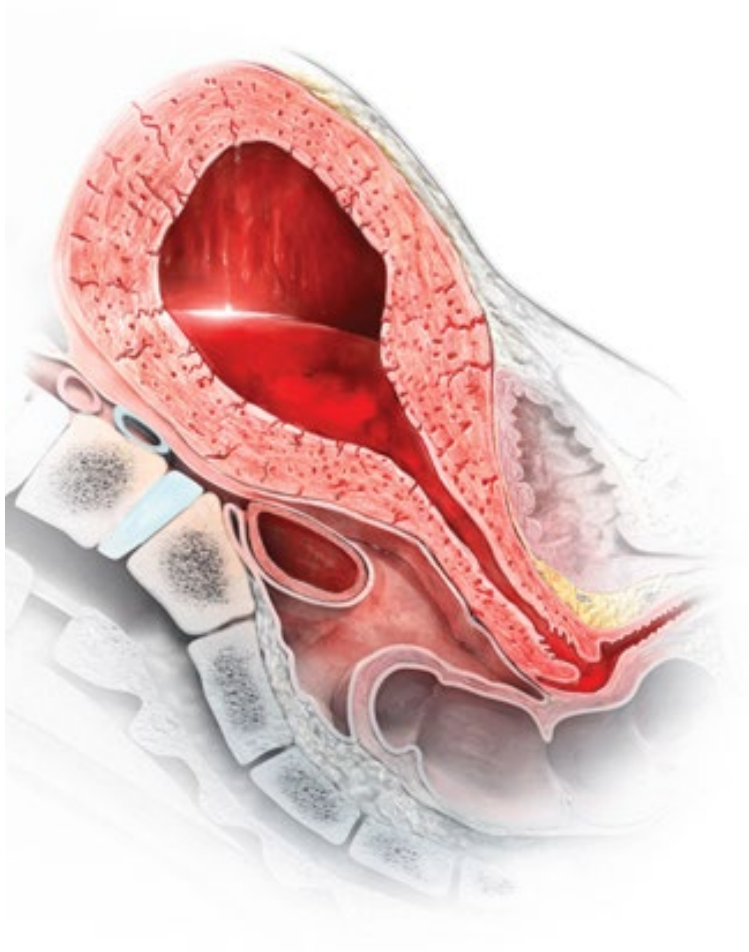
Disclosures

- None

Objectives

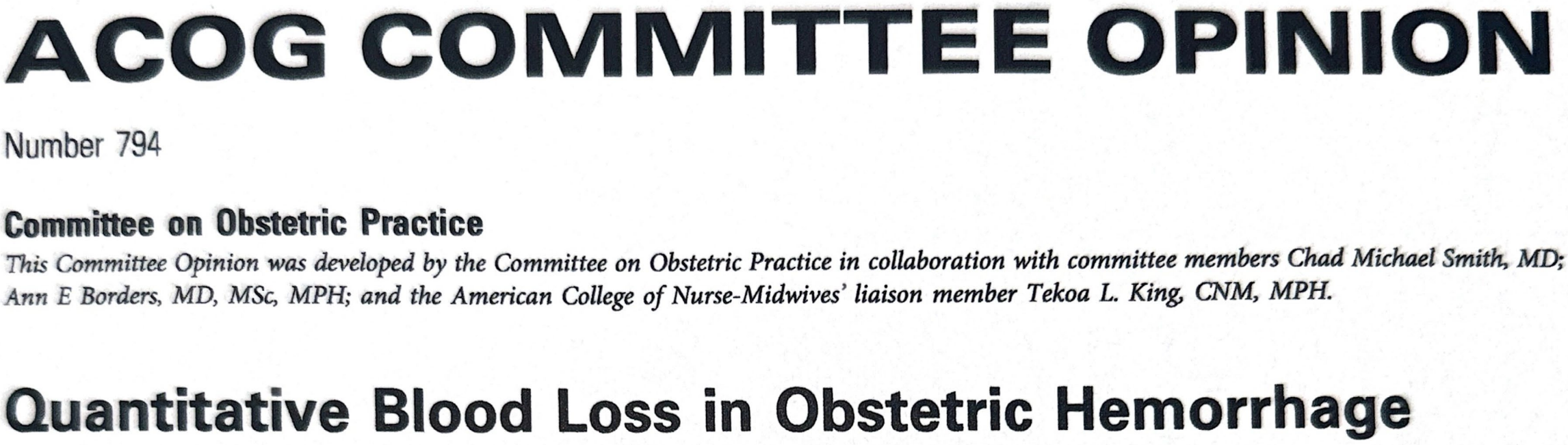
- Learn how to properly identify and diagnose postpartum hemorrhage.
- Review current trends in postpartum hemorrhage
- Understand the available treatment options for management of postpartum hemorrhage.

ACOG revitalize program



- 1,000 mL
- Blood loss + hypovolemia

Calculating blood loss



ACOG COMMITTEE OPINION

Number 794

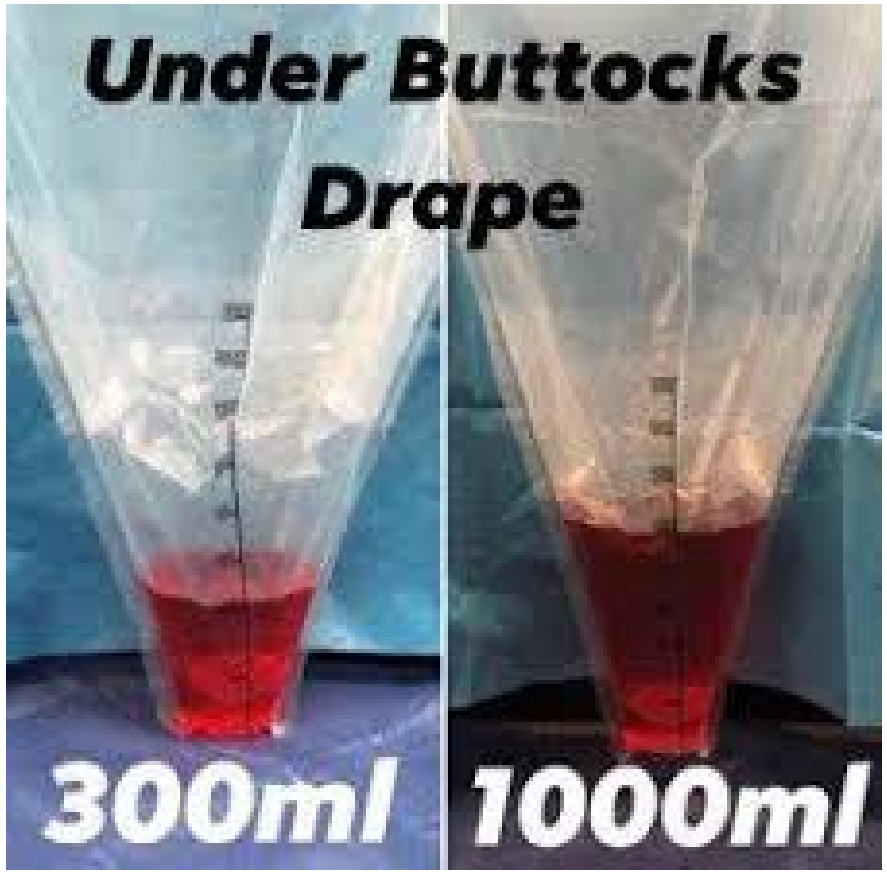
Committee on Obstetric Practice

This Committee Opinion was developed by the Committee on Obstetric Practice in collaboration with committee members Chad Michael Smith, MD; Ann E Borders, MD, MSc, MPH; and the American College of Nurse-Midwives' liaison member Tekoa L. King, CNM, MPH.

Quantitative Blood Loss in Obstetric Hemorrhage

- Studies have shown that inaccurate health care provider EBL is the leading cause of delayed response to hemorrhage.

Calculating blood loss



https://mopqc.org/

https://www.augusta.edu/mcg/center-for-digital-health/bridging-the-gap-conference/documents/innovationearleydetection.pdf

QBL ≠ improved clinical outcomes such as hemorrhage associated morbidity

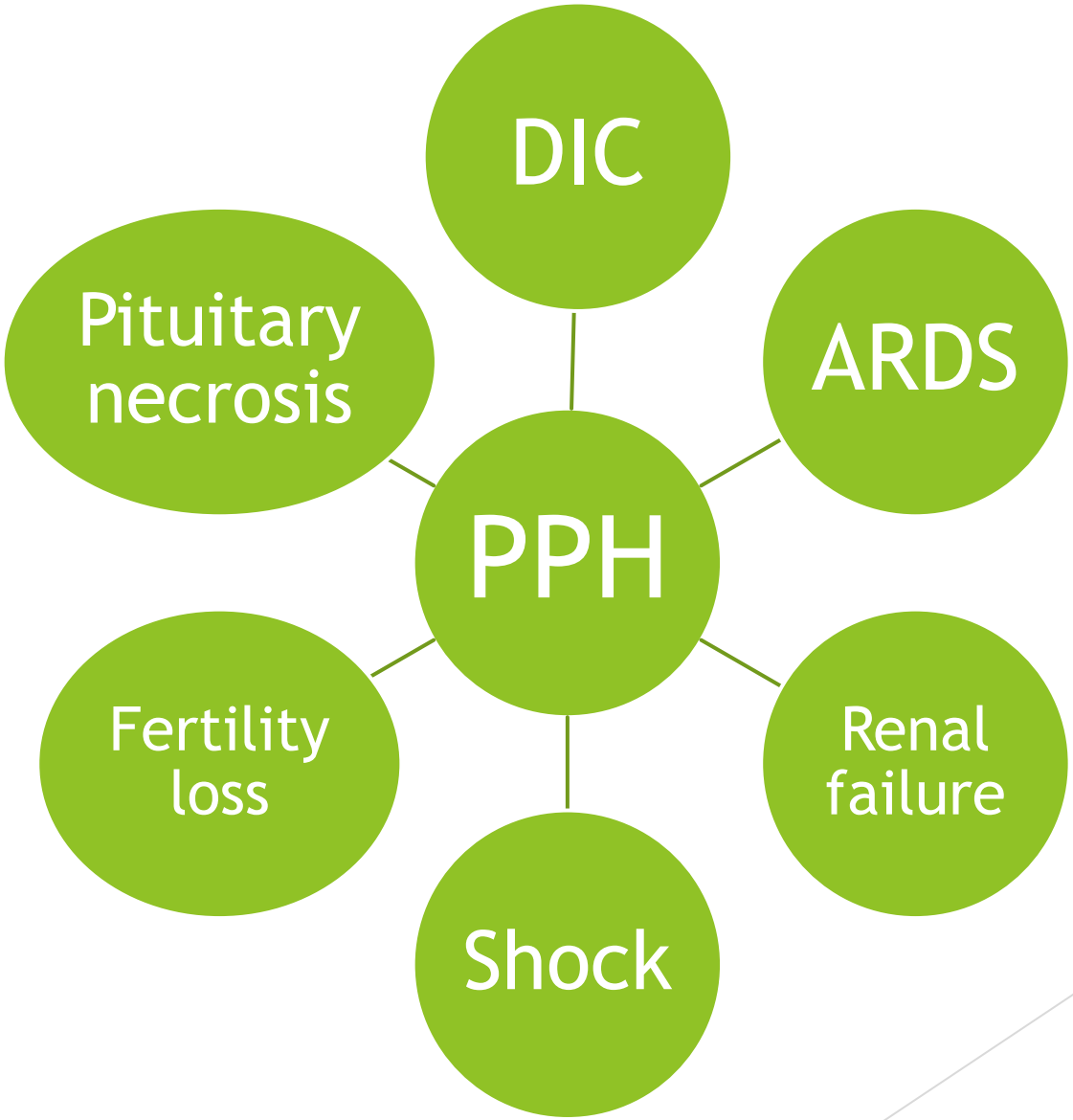
Stages of Postpartum Hemorrhage

Stage 0 – Every patient giving birth
Stage 1 – Blood loss > 500 mL for a vaginal delivery or > 1000 mL for a Cesarean delivery Vital Signs Unstable with continued bleeding
Stage 2- Blood loss 1000 – 1500 mL with continued bleeding
Stage 3 – Blood loss greater than 1500 mL, Transfusion of 2 Units PRBC's, Vital Signs unstable, Suspicious for DIC

Why does this matter?

https://www.nhlbi.nih.gov/health/blood-bone-marrow-treatments

Why does this matter?



Risks factors for postpartum hemorrhage

- Prolonged oxytocin use
- High parity
- Intraamniotic infection/Chorioamnionitis
- General anesthesia
- Multi fetal gestation
- Macrosomia
- Polyhydramnios
- Cesarean delivery
- Fibroids
- AMA

Postpartum hemorrhage trends

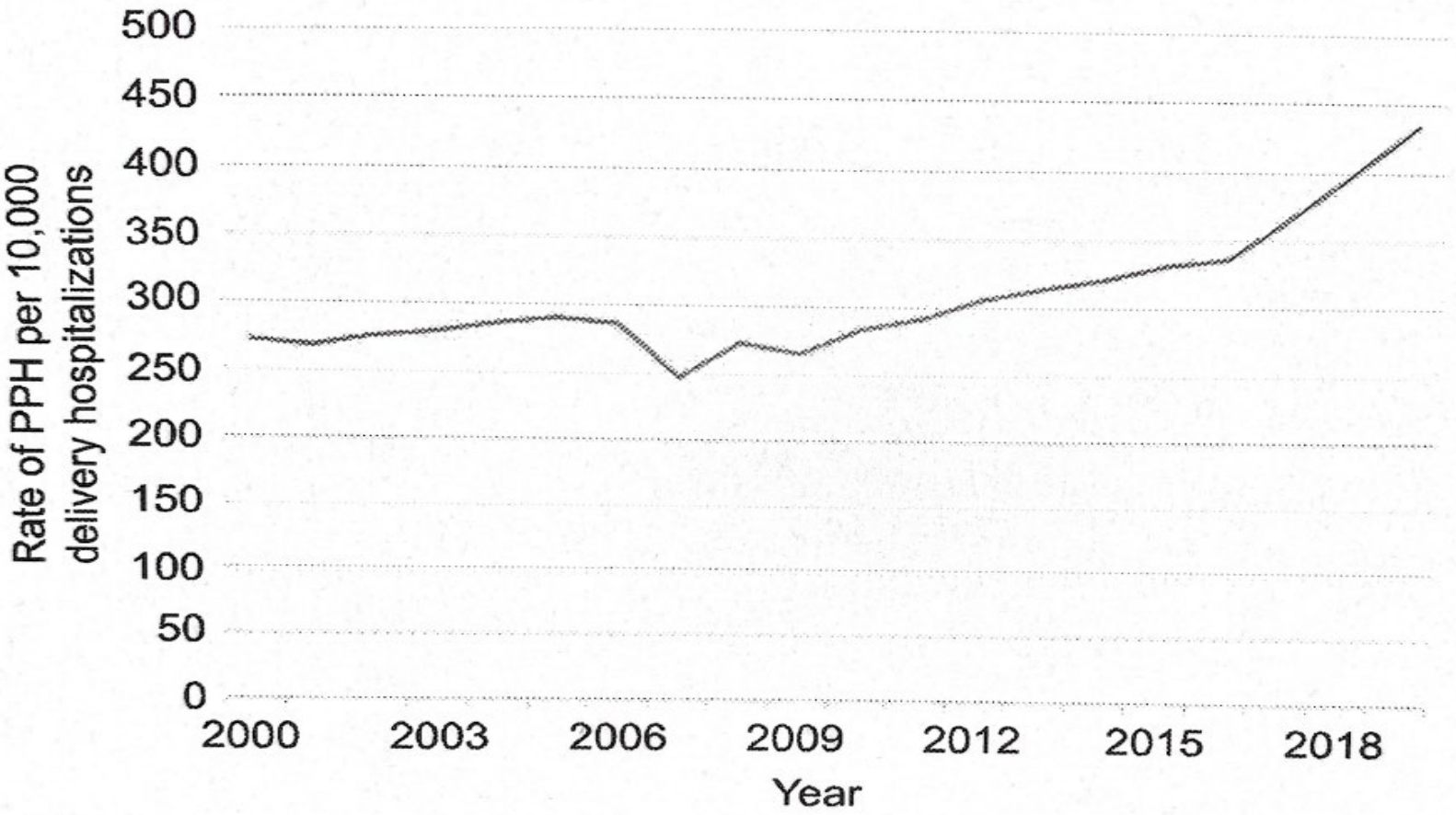
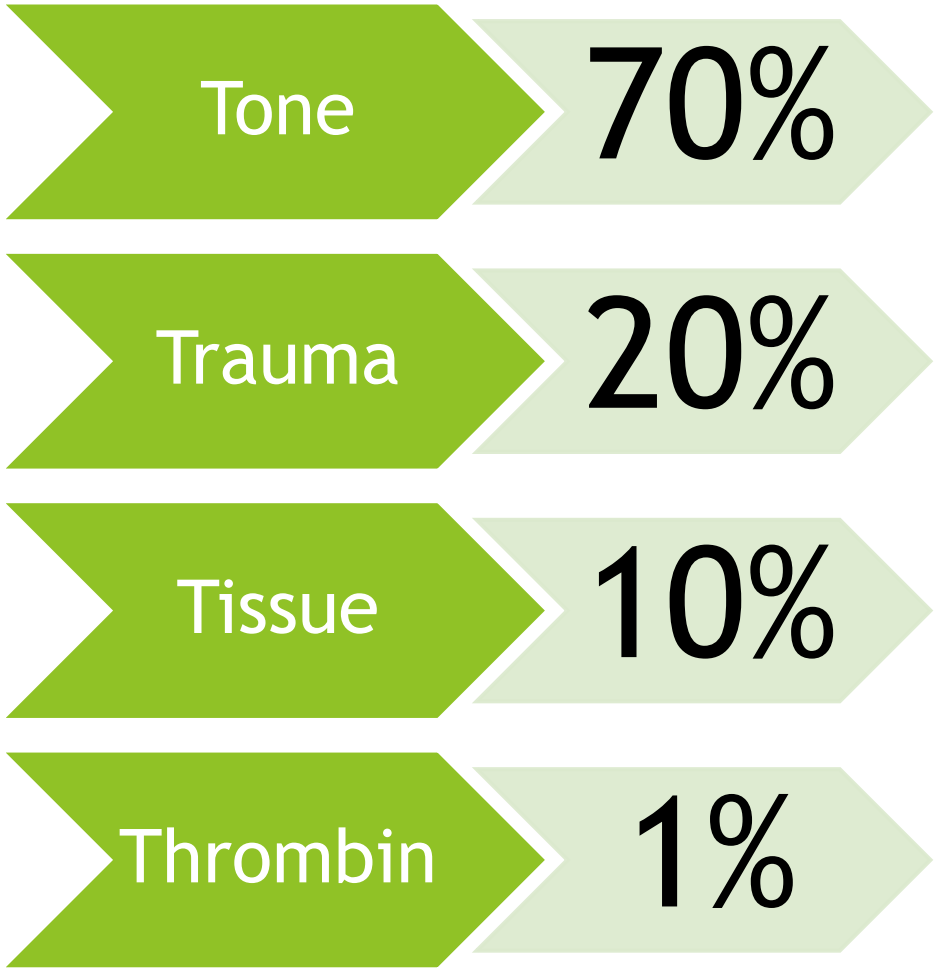


Fig. 2. Trends in postpartum hemorrhage (PPH) per 100,000 delivery hospitalizations by year over the 20-year study period.

Corbetta-Rastelli. Postpartum Hemorrhage Trends and Outcomes. Obstet Gynecol 2023.

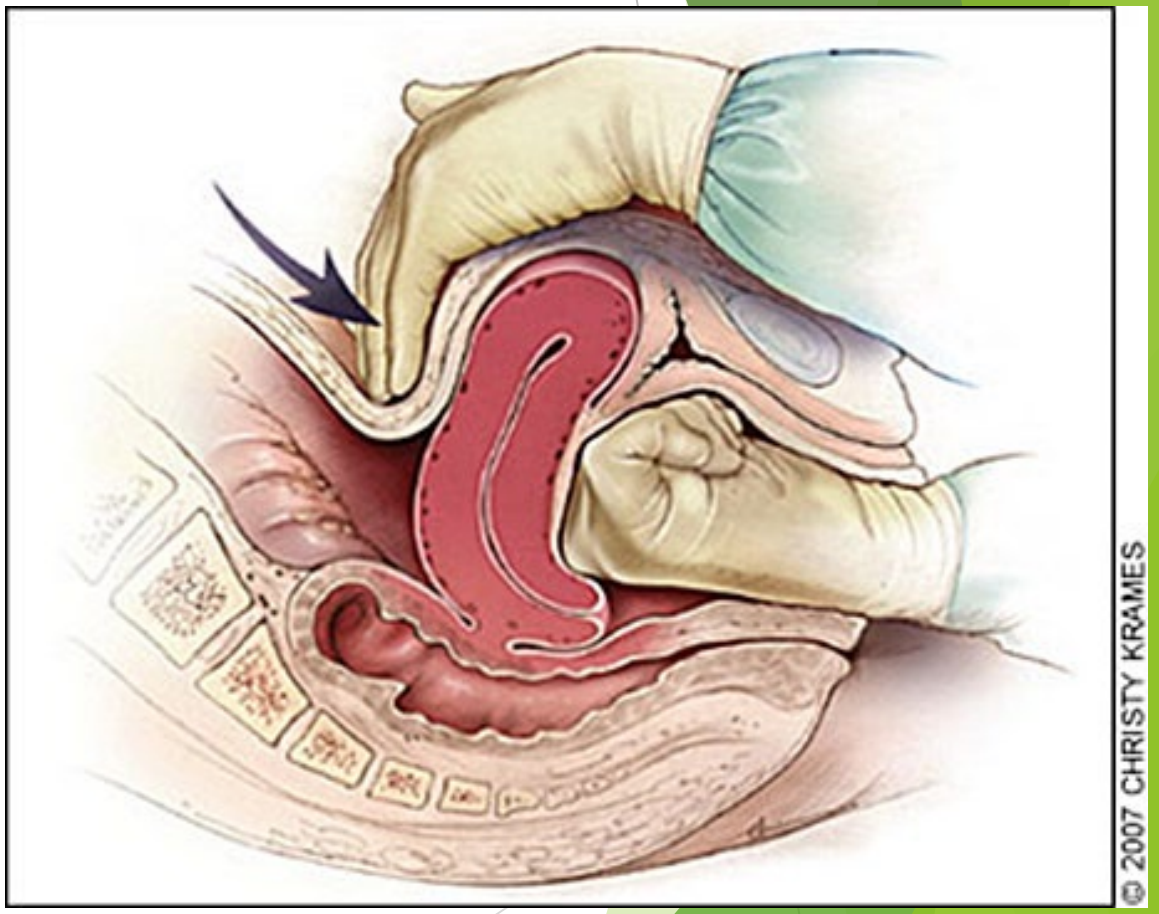
Cause of postpartum hemorrhage 4 T's



Advanced life support in Obstetrics 5th edition 2014

Treatment of postpartum hemorrhage

- ABC's
- Call for help
- Alert additional team members
- Ensure IV access
- Fluid resuscitation
- Evaluate patient to determine etiology
- Foley catheter
- Blood work
- Consider blood product administration



Anderson J, Etches D, Smith D. Postpartum hemorrhage. In: Baxley E. Advanced Life Support in Obstetrics course syllabus. 4th edn. Leawood, KS: American Academy of Family Physicians, 2001

Treatment of PPH- Uterotonics

https://www.mcguffmedical.com/pitocin-oxytocin-10uml-mdv-10mlvial

https://www.henryschein.com/us-en/medical/p/pharmacy/rx/methylergonovine-sdv-1ml/1154735

https://www.drugstorenews.com/long-grove-intros-generic-hemabate

https://wtmj.com/ap-news/2023/04/22/supreme-court-preserves-access-to-abortion-pill-for-now/

Treatment of postpartum hemorrhage

Cochrane Library

Cochrane Database of Systematic Reviews

Uterotonic agents for first-line treatment of postpartum haemorrhage: a network meta-analysis (Review)

Parry Smith WR, Papadopoulou A, Thomas E, Tobias A, Price MJ, Meher S, Alfirevic Z, Weeks AD, Hofmeyr GJ, Gülmezoglu AM, Widmer M, Oladapo OT, Vogel JP, Althabe F, Coomarasamy A, Gallos ID

Treatment of postpartum hemorrhage

- Take home points from this Cochrane review
  - Oxytocin is probably more effective than misoprostol and has less side effects
  - Misoprostol plus oxytocin likely does not improve effectiveness
  - Evidence for most available drugs used as first line in treatment of postpartum hemorrhage is limited.

Smith et al. Uterotonic agents for first-line treatment of postpartum haemorrhage: a network meta-analysis, 2020

Treatment of postpartum hemorrhage

Treatment of postpartum hemorrhage

- Primary outcome was uterine tone on 0-10 scale at 10 minutes after administration.

- **Primary conclusion: NO difference in uterine tone scores 10 minutes after administration of either study drug indicating either agent is acceptable.**

Treatment of postpartum hemorrhage

- Fibrinolysis inhibitor
- Contraindications
  - Active thromboembolic disease

https://armaspharmaceuticals.com/products/tranexamic-acid/

Treatment of postpartum hemorrhage

Effect of early tranexamic acid administration on mortality, hysterectomy, and other morbidities in women with post-partum haemorrhage (WOMAN): an international, randomised, double-blind, placebo-controlled trial

*WOMAN Trial Collaborators**

Lancet 2017; 389: 2105–16

Treatment of postpartum hemorrhage

- Take home points from the WOMAN trial
  - Death due to bleeding was significantly reduced in patients given tranexamic acid (especially when given within 3 hours)
  - Hysterectomy was not reduced with tranexamic acid
  - Adverse events (including thromboembolic events) did not differ significantly in the tranexamic acid versus placebo group.

Treatment of postpartum hemorrhage

ORIGINAL ARTICLE

Tranexamic Acid for the Prevention of Blood Loss after Vaginal Delivery

Loïc Sentilhes, M.D., Ph.D., Norbert Winer, M.D., Ph.D., Elie Azria, M.D., Ph.D., Marie-Victoire Sénat, M.D., Ph.D., Camille Le Ray, M.D., Ph.D., Delphine Vardon, M.D., Franck Perrotin, M.D., Ph.D., Raoul Desbrière, M.D., Florent Fuchs, M.D., Ph.D., Gilles Kayem, M.D., Ph.D., Guillaume Ducarme, M.D., Ph.D., Muriel Doret-Dion, M.D., Ph.D., Cyril Huissoud, M.D., Ph.D., Caroline Bohec, M.D., Philippe Deruelle, M.D., Ph.D., Astrid Darsonval, Pharm.D., Jean-Marie Chrétien, M.Sc., Aurélien Seco, M.Sc., Valérie Daniel, Pharm.D., and Catherine Deneux-Tharaux, M.D., Ph.D., for the Groupe de Recherche en Obstétrique et Gynécologie*

- No difference between groups in primary outcome of blood loss of 500 mL or more

N engl j med 379;8. August 23, 2018

Treatment of postpartum hemorrhage

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

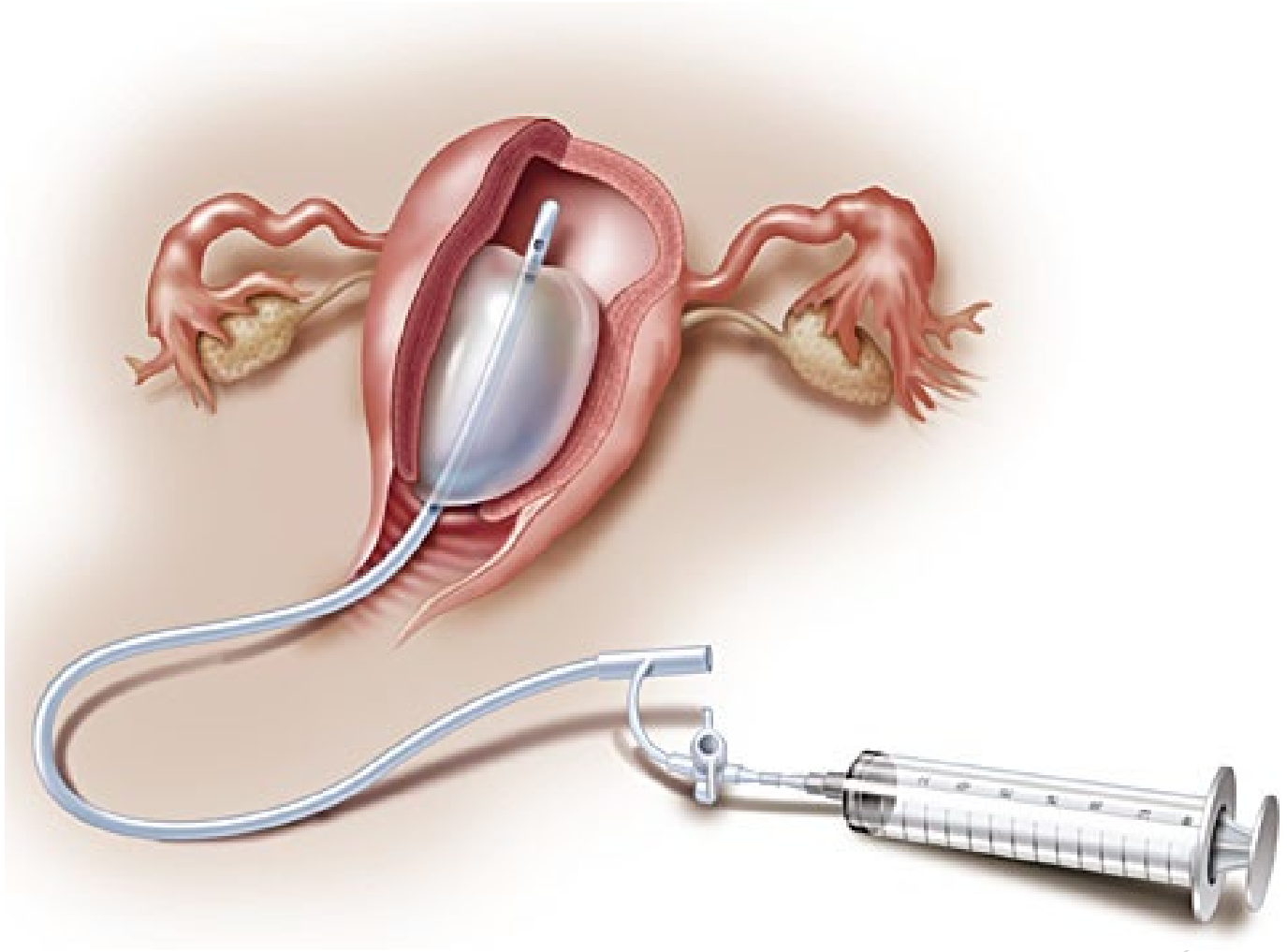
Tranexamic Acid to Prevent Obstetrical Hemorrhage after Cesarean Delivery

L.D. Pacheco, R.G. Clifton, G.R. Saade, S.J. Weiner, S. Parry, J.M. Thorp, Jr., M. Longo, A. Salazar, W. Dalton, A.T.N. Tita, C. Gyamfi-Bannerman, S.P. Chauhan, T.D. Metz, K. Rood, D.J. Rouse, J.L. Bailit, W.A. Grobman, H.N. Simhan, and G.A. Macones, for the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal–Fetal Medicine Units Network*

- "Prophylactic use of tranexamic acid during cesarean delivery did not lead to a significantly lower risk of a composite outcome of maternal death or blood transfusion than placebo"

N engl j med 388;15. April 13, 2023

Treatment of postpartum hemorrhage



Bakri balloon. From Posner GD, Jessica DY, Black A, Jones, GD. Human Labour & Birth, 6th edn.[45] www.obgyn.mhmedical.com. Copyright © McGraw-Hill Education. All rights reserved.

Treatment of postpartum hemorrhage

https://www.empr.com/home/news/fda-clears-updates-to-jada-system-a-device-to-control-postpartum-hemorrhage/

Treatment of postpartum hemorrhage

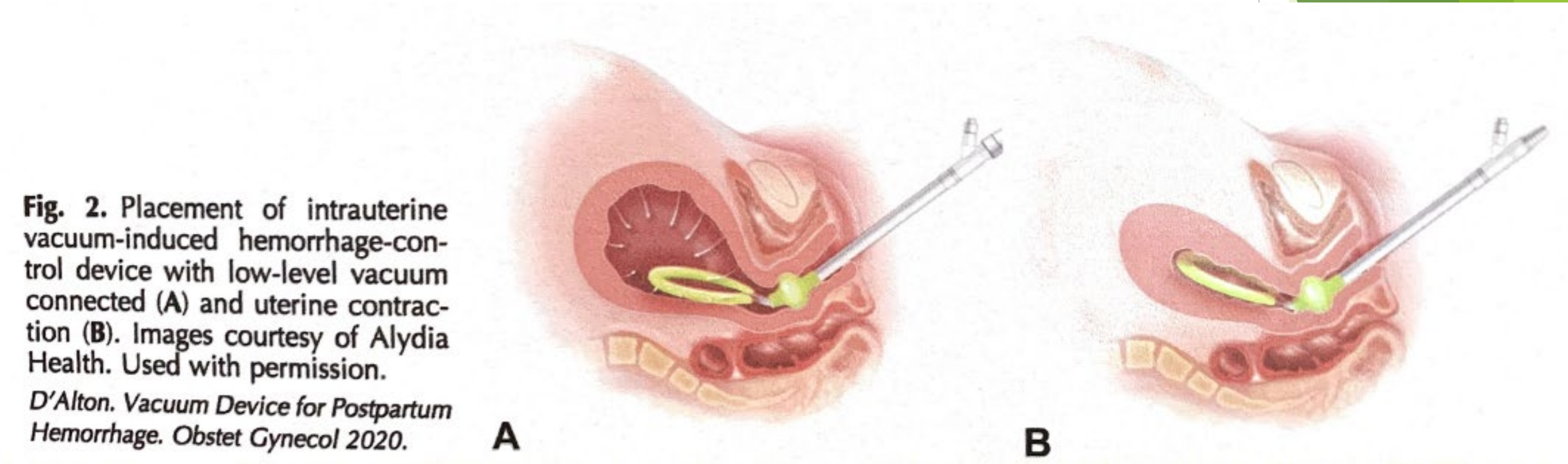


Fig. 2. Placement of intrauterine vacuum-induced hemorrhage-control device with low-level vacuum connected (**A**) and uterine contraction (**B**). Images courtesy of Alydia Health. Used with permission.

D'Alton. Vacuum Device for Postpartum Hemorrhage. Obstet Gynecol 2020.

Treatment of postpartum hemorrhage

- The PEARLE study

Intrauterine Vacuum-Induced Hemorrhage-Control Device for Rapid Treatment of Postpartum Hemorrhage

Mary E. D'Alton, MD, Kara M. Rood, MD, Marcela C. Smid, MD, Hyagriv N. Simhan, MD, MS, Daniel W. Skupski, MD, Akila Subramaniam, MD, Kelly S. Gibson, MD, Todd Rosen, MD, Shannon M. Clark, MD, Donald Dudley, MD, Sara N. Iqbal, MD, Michael J. Paglia, MD, PhD, Christina M. Duzyj, MD, MPH, Edward K. Chien, MD, Karen J. Gibbins, MD, Kathryn D. Wine, MPH, Nana Ama A. Bentum, MD, Michelle A. Kominiarek, MD, Methodius G. Tuuli, MD, and Dena Goffman, MD

Treatment of postpartum hemorrhage

- The PEARLE study

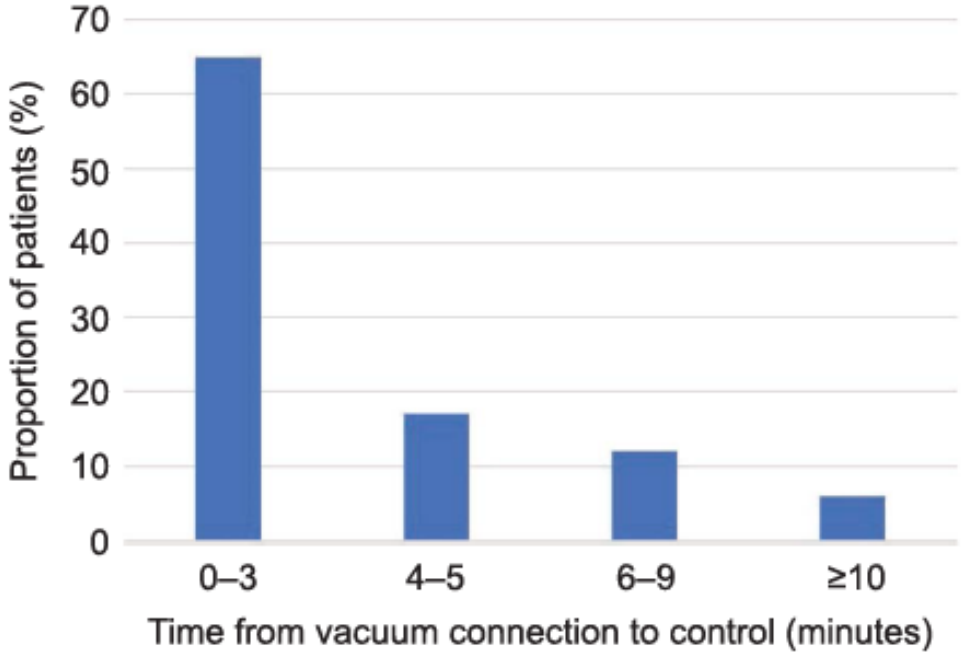


Fig. 4. Time to control abnormal bleeding or postpartum hemorrhage (minutes).

D'Alton. Vacuum Device for Postpartum Hemorrhage. Obstet Gynecol 2020.

Postpartum bleeding controlled in 100/106 patients (94%)

Treatment of postpartum hemorrhage

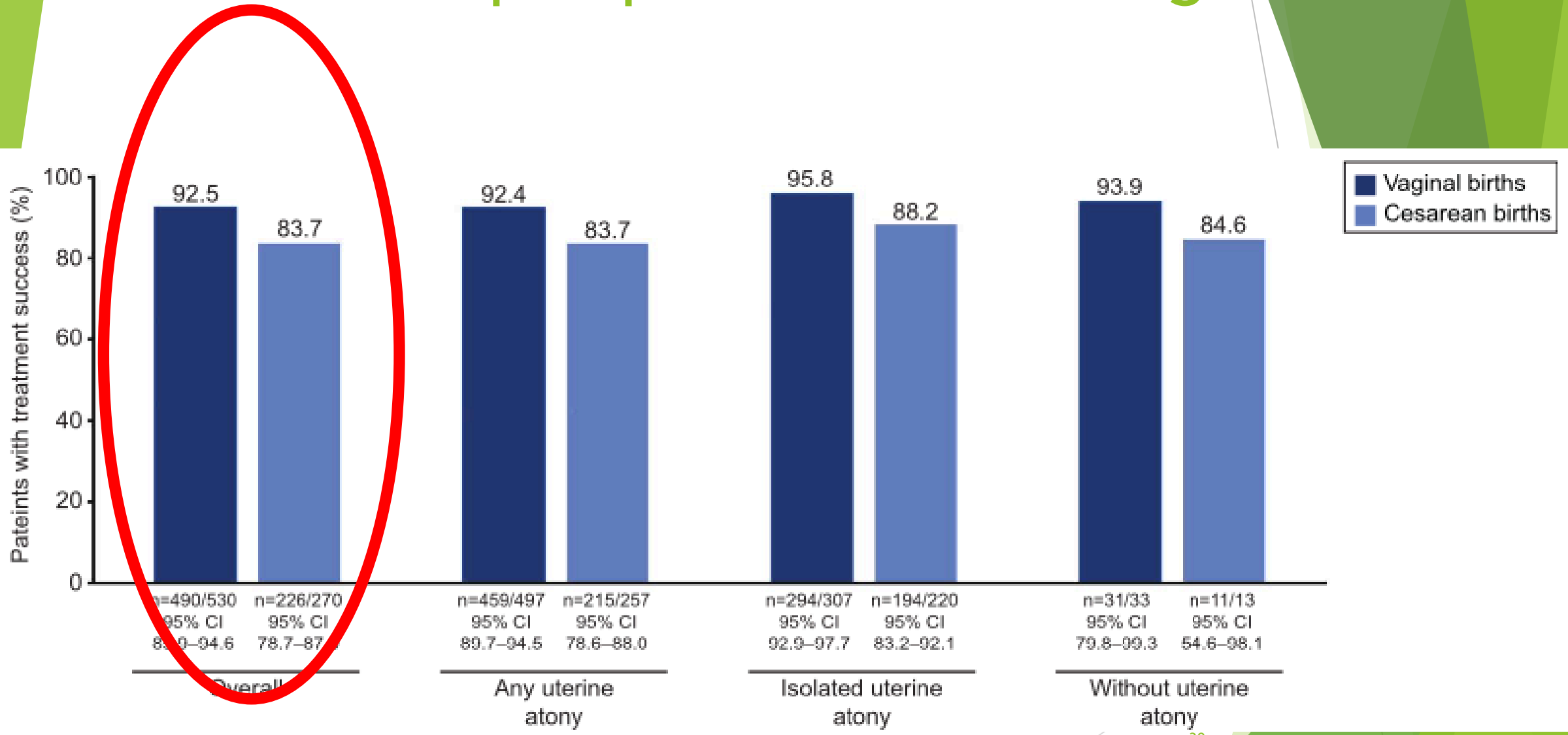
The RUBY Study

Original Research

Real-World Utilization of an Intrauterine, Vacuum-Induced, Hemorrhage-Control Device

Dena Goffman, MD, Kara M. Rood, MD, Angela Bianco, MD, Joseph R. Biggio, MD, MS, Paul Dietz, MD, Kelly Drake, MSN, RNC, Erica Heilman, MD, Maeve Hopkins, MD, Monique De Four Jones, MD, Tyler Katz, MD, Courtney Martin, DO, Mona Prasad, MD, Marcela C. Smid, MD, Kathryn D. Wine, MPH, Robert Ryan, MS, Candice Yong, PhD, Patricia I. Carney, MD, and Hyagriv N. Simhan, MD, MS

Treatment of postpartum hemorrhage



Goffman et al Vacuum-Induced PPH Control Device . Obstet Gynecol. 2023

Treatment of postpartum hemorrhage

Original Research

Effectiveness of the Intrauterine Balloon Tamponade Compared With an Intrauterine, Vacuum-Induced, Hemorrhage-Control Device for Postpartum Hemorrhage

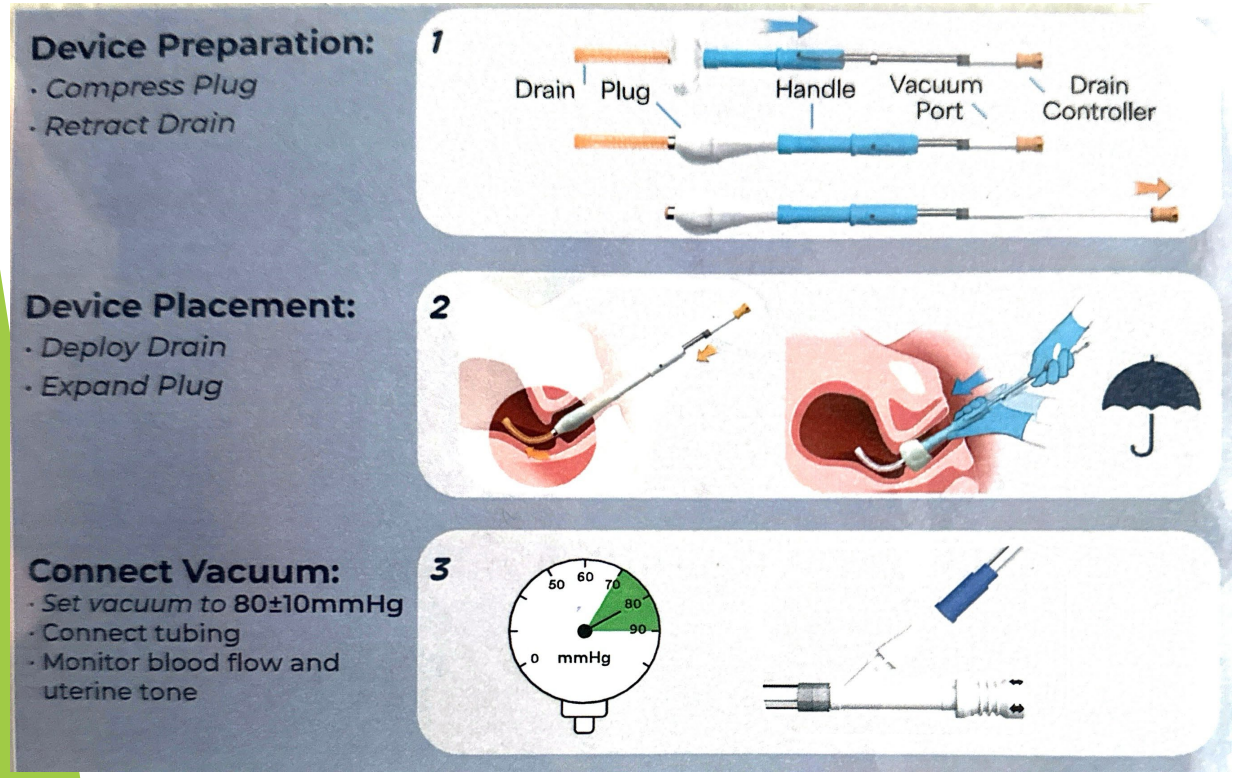
Laurence E. Shields, MD, Catherine Klein, MSN, RN, Jennie Torti, MPH, Mindy Foster, MSN, RN, and Curtis Cook, MD

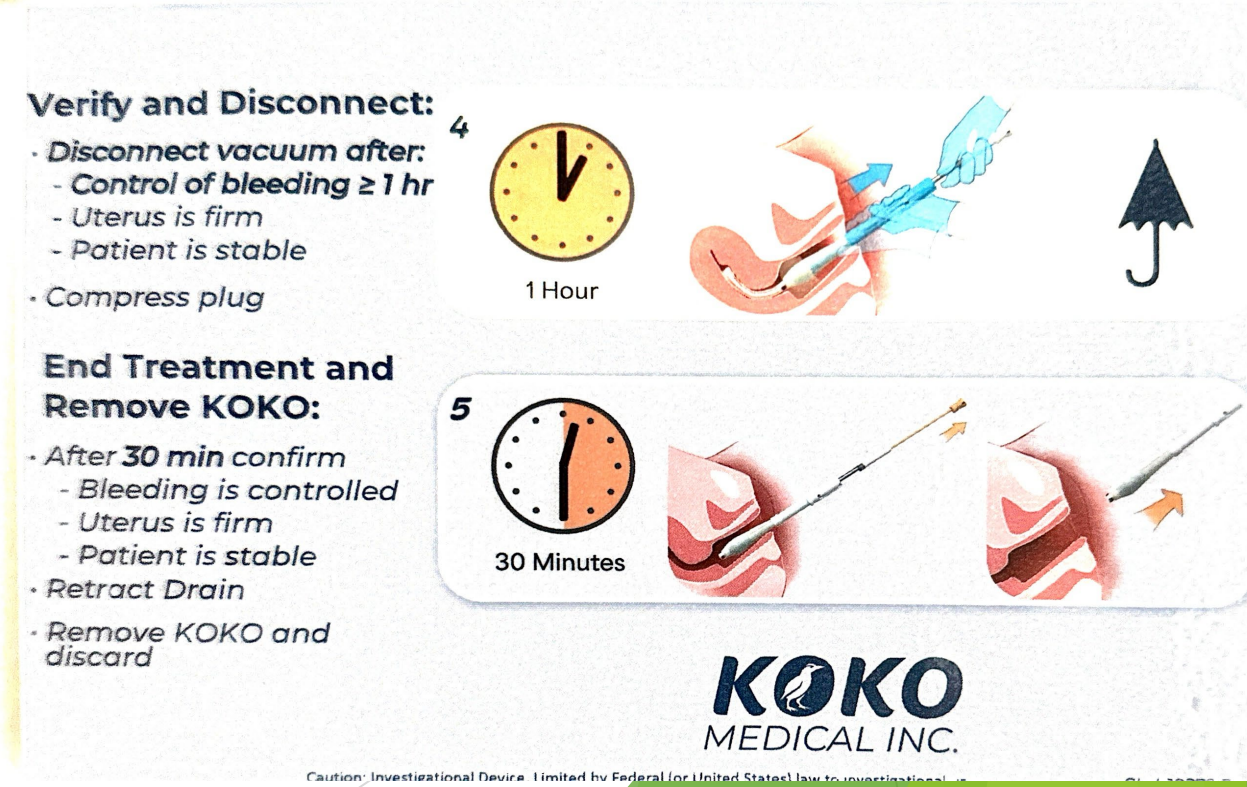
Treatment of postpartum hemorrhage

- Primary outcomes:
  - QBL after device placement
  - Rate of PRBC transfusion
  - Use of 3 units PRBC's or more
  - Device failure
- Results:
  - All primary outcomes were similar between devices
  - Earlier usage of devices reduced device failure and blood transfusion rate

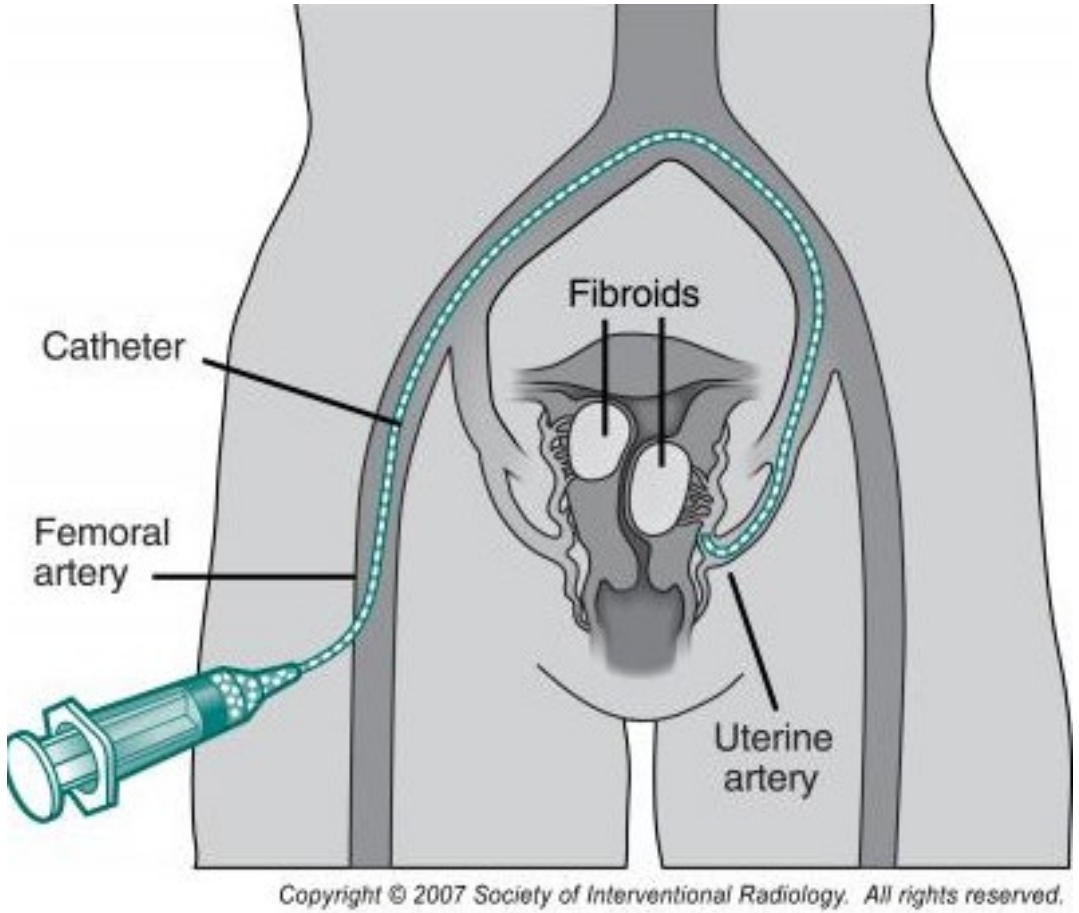
Treatment of postpartum hemorrhage- Investigational Device

- SERENE Study utilizing KOKO Device





Treatment of postpartum hemorrhage
Uterine artery embolization



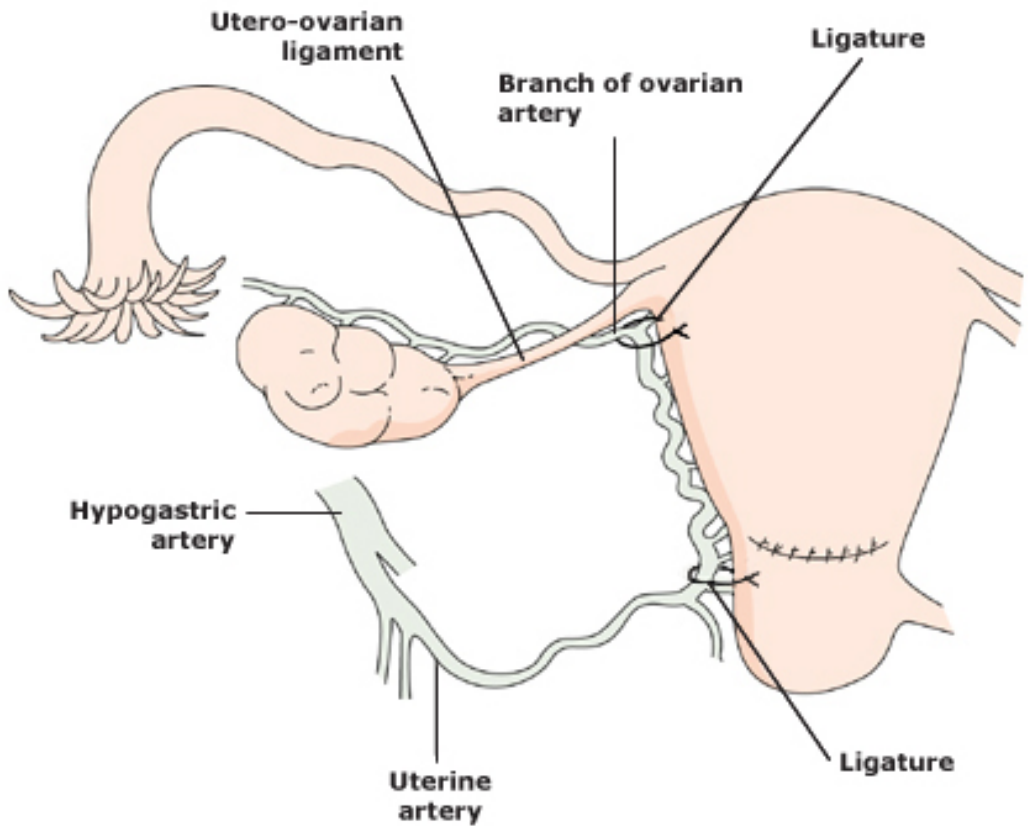
Success rate of 89% (range 58-98%)

Likis et al. Management of postpartum hemorrhage. 2015.

Treatment of postpartum hemorrhage

- Surgical management
  - Uterine compression sutures
    - B Lynch & O'Leary
  - Vascular ligation
  - Hysterectomy

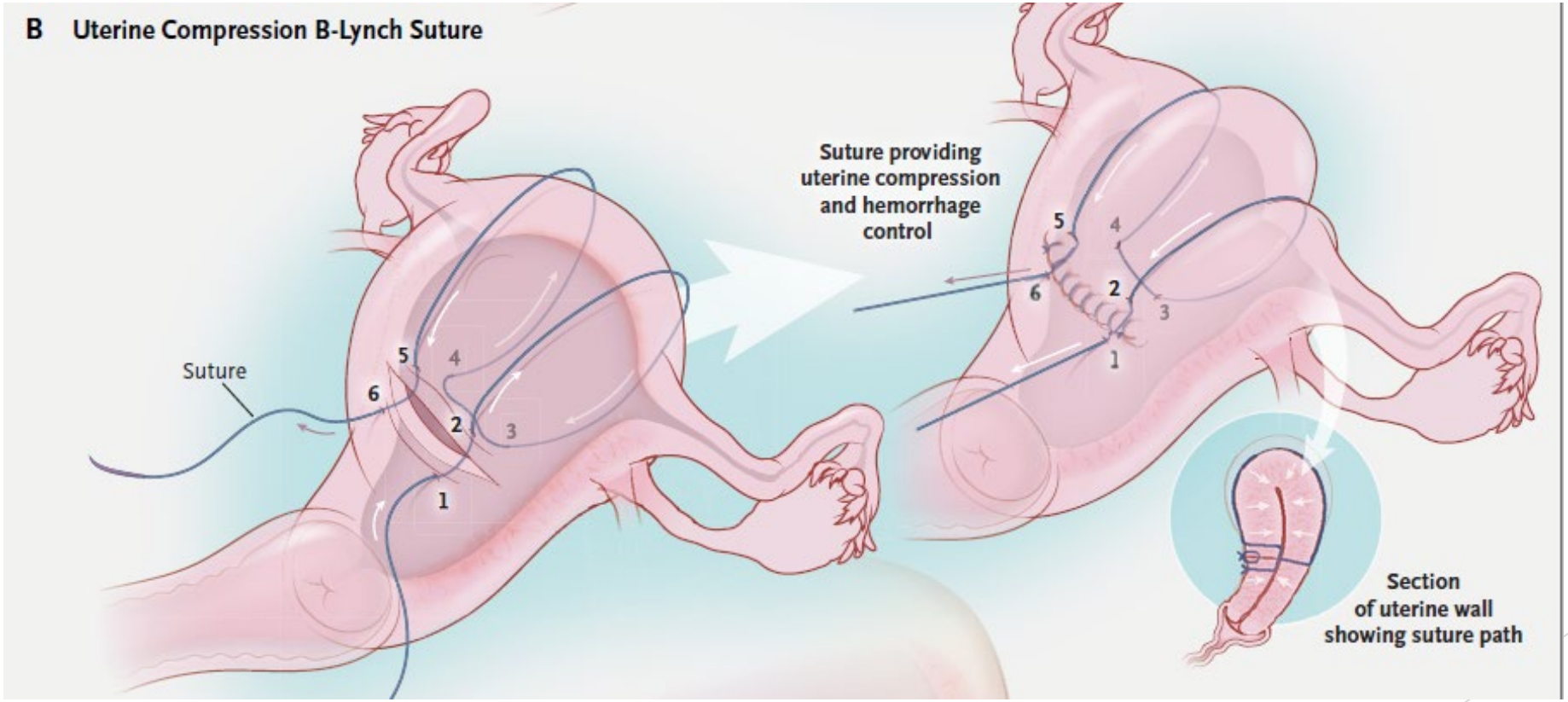
Uterine artery ligation



Sutures are placed to ligate the ascending uterine artery and the anastomotic branch of the ovarian artery. The procedure should be performed on each side.

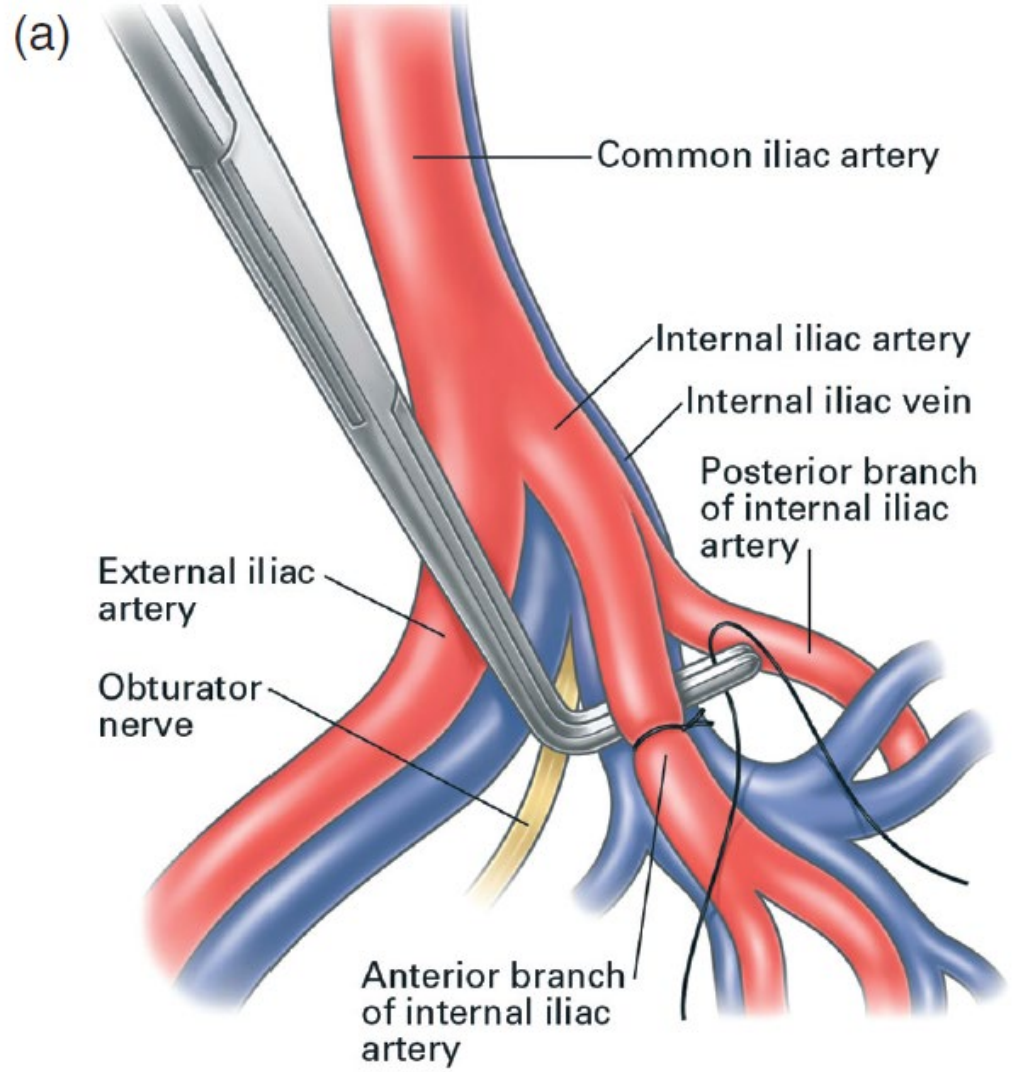
UpToDate®

Treatment of postpartum hemorrhage



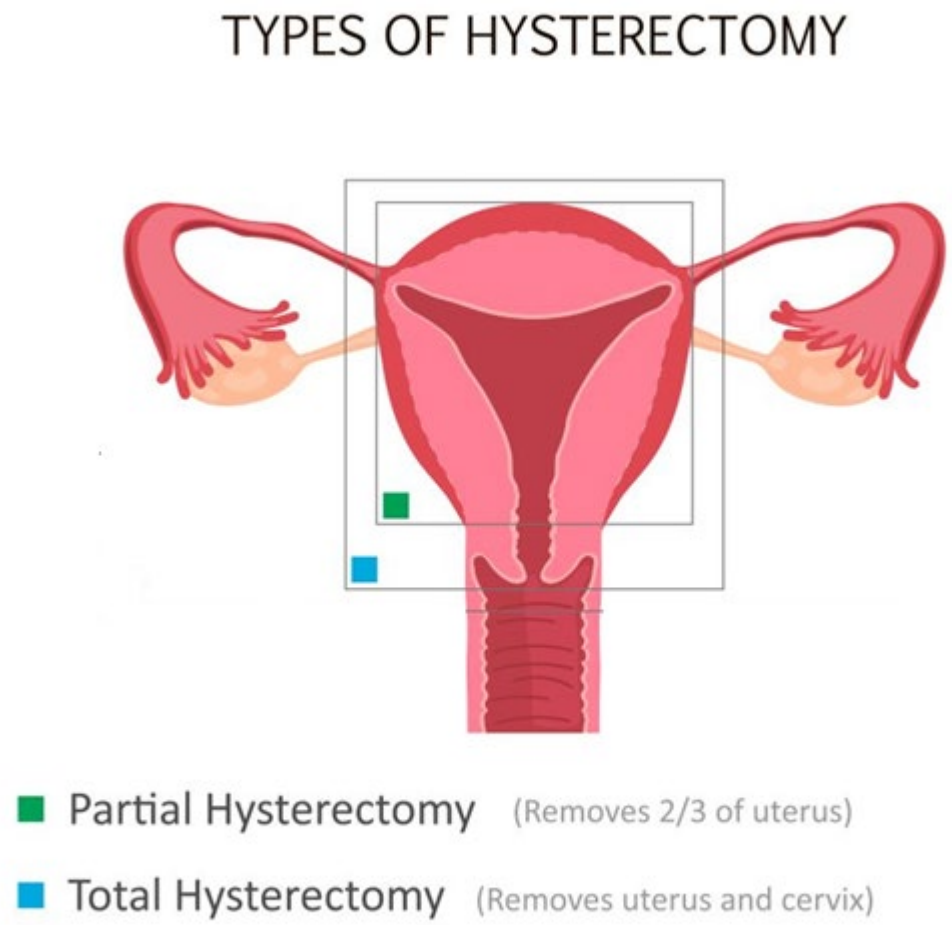
Bienstock et al. Postpartum hemorrhage. N Engl J Med 2021; 384:1635-1645

Treatment of postpartum hemorrhage



Internal Iliac (Hypogastric) Artery Ligation *C. B-Lynch, L. G. Keith and W. B. Campbell.* **PPH second edition 2012.**

Treatment of postpartum hemorrhage



https://cherokeewomenshealth.com/services/hysterectomy/

Summary

- Postpartum hemorrhage is the number one cause of maternal mortality worldwide
- Oxytocin is the first line treatment for management of uterine atony and hemorrhage
- Second line uterotonic medications should be used as indicated
- Tranexamic acid reduced maternal death due to bleeding when administered during hemorrhage
- Uterine tamponade and vacuum induced antihemorrhagic devices are available
- Surgical management with uterine artery embolization, vascular ligation, and hysterectomy can be utilized if hemorrhage persists

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