

An Exploration of CRNA Education, Knowledge and Management of Postpartum Hemorrhage

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Presentation Outline



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Background

- Rates of severe maternal morbidity have been on the rise in the past 20 years.^{1,2}
- Postpartum hemorrhage (PPH) is the leading cause of maternal morbidity and mortality in the United States and worldwide.^{1,3}
- PPH defined:
 - EBL >500 mL with a vaginal delivery
 - EBL >1000 mL with a cesarean section⁴
- 60% of maternal deaths due to obstetric hemorrhage are preventable in the United States.⁷

Scope of Problem

- Evidence-based studies, standardized guidelines, and tools have been established
- Recommendations from The Joint Commission ^{11,12,13}
- Only 67% of academic obstetric anesthesiology units have adopted standardized PPH guidelines.¹
 - 93% of these units have a Massive Transfusion Protocol (MTP)¹
- Without the implementation of these guidelines, parturients are being managed with significant variability among providers even within a single institution.¹¹

ACOG Consensus Bundle

Box 1. Obstetric Hemorrhage Safety Bundle From the National Partnership for Maternal Safety, Council on Patient Safety in Women's Health Care

Readiness (Every Unit)

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

Recognition and Prevention (Every Patient)

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

Response (Every Hemorrhage)

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

Reporting and Systems Learning (Every Unit)

11. Establish a culture of huddles for high-risk patients and postevent debriefs to identify successes and opportunities
12. Multidisciplinary review of serious hemorrhages for systems issues
13. Monitor outcomes and process metrics in perinatal quality improvement committee

PPH Standardized Guidelines

AANA PPH Protocol

Recognition	Call for assistance (obstetric hemorrhage team) Designate: <ul style="list-style-type: none"> Team leader Checklist coordinator Primary RN Announce: <ul style="list-style-type: none"> Cumulative blood loss Vital signs Determine Stage 		Checklist: Stage 2 Continued bleeding with EBL up to 1500 mL OR >2 uterotonics with normal vital signs and lab values	Prepare OR, if clinically indicated (optimize visualization/examination)
Hemorrhage Cart	Vaginal Vaginal retractors, long weighted speculum, long instruments (needle holder, scissors, Kelly clamps, sponge (knives)) Intrauterine balloon Bario curette Bright task light Procedural instructions Cesarean/Laparotomy Hysterectomy tray #1 chromic or plain catgut suture and absorbable straight needles for B-Lynch suture Intrauterine balloon Procedural instructions (balloon, B-Lynch, arterial ligation)		Checklist: Stage 3 Continued bleeding with EBL > 1500 mL OR >2 units RBCs given OR Patient at risk for occult bleeding or coagulopathy OR Patient with abnormal vital signs/labs/organs	Initial Steps Mobilize additional help Place 2 nd IV (16-18g) Draw vitals (complete blood count, coagulation, fibrinogen) Prepare operating room Medications Continue Stage 1 medications Blood Bank Obtain 2 units red blood cells (do not ask for labs). Transfuse per clinical signs/symptoms Trace 2 units fresh frozen plasma Action Escalate therapy with goal of hemostasis Mobilize and move to Stage 3 if continued blood loss and/or abnormal VS
Checklist: Stage 1 Blood loss >60 mL vaginal OR Blood loss >100 mL cesarean with normal vital signs and lab values	Initial Steps Ensure 16G or 18G IV access increase IV fluid (crystallize without oxytocin) insert inflating urinary catheter Fundal massage Medications (see right box) increase oxytocin, additional uterotonics Blood Bank Type & crossmatch 2 units RBCs Action Determine etiology & treat	Medications: <ul style="list-style-type: none"> Oxytocin (Pitocin) = 10-40 units per 300-1000mL solution Methylergometrine (Methergine) = 0.2 milligrams IM (may repeat) 15-methyl PGF2α (Hemabate, Carboprost) = 250 micrograms IM (may repeat in q15 minutes, maximum 8 doses) Misoprostol (Cytotec) = 800-1000 micrograms PR = 800 micrograms PO or 800 micrograms PL 	Checklist: Stage 4 Cardiovascular collapse (massive hemorrhage, profound hypovolemic shock or anesthetic fluid embolism)	Initial Steps Mobilize additional resources Medications ACLS Blood Bank Simultaneous aggressive massive transfusion Action Immediate surgical intervention to resolve hemorrhage (hysterectomy)

Post-Hemorrhage Management	Determine disposition of patient (whether ICU required) Debrief with the whole obstetric care team Debrief with patient and family Document information in patient medical record
Published with permission of ACOG District II Safe Motherhood Initiative ¹⁷⁸	

Key Literature

- Effectiveness of Standardized Guidelines
 - multifacility (n=29) cohort study¹¹
 - **15% decrease in PRBC transfusions** 10 months post PPH guideline implementation
 - **26% reduction** in blood product use as a whole
- Barriers to Guideline Implementation
 - Prospective cross-sectional survey (n=38)¹²
 - multidisciplinary providers asked to identify inadequacies regarding the 13 elements of the established PPH guideline
 - **major barriers identified:**
 - medications not stored in the OR
 - electronic medical record limitations
 - infrequent debriefs due to staff shortages and shift limitations
 - surgical pads not being measured adequately
- Formal training
 - Case Series (n=113)¹⁹
 - comfort levels assessed before and after a multidisciplinary OB emergency simulation
 - Pre and post training mean comfort scores compared (**P<0.01**)

Problem and Purpose Statement

- Unknown implementation of standardized guidelines
- Limited research exploring to what degree these strategies are implemented in healthcare settings nationally
- **Purpose of this study:**
 - To investigate CRNA use of standardized practice guidelines in the management of PPH and any barriers preventing implementation.
 - To explore the PPH training and education CRNAs receive and its impact on provider comfort regarding the management of PPH.

Research Questions:

- 1. Do CRNAs utilize standardized practice guidelines for PPH?**
- 2. What are the barriers to standardized practice guideline utilization for PPH?**
- 3. Do CRNAs receive formal training on PPH management?**
- 4. Does formal training impact the perceived comfort level of CRNAs in managing PPH?**

Methodology: Study Design

Type: Exploratory, Descriptive Study

Method: National Survey deployed by AANA Research Department

An exploration of CRNA education, knowledge, and management of postpartum hemorrhage

De novo survey derived from existing PPH guidelines.

De novo survey components:

- Demographics
- Use of Standardized Guidelines
- Barriers to Implementation
- Formal Training
- Likert Scale Comfort Ratings

Methodology

Sample

- *Inclusion Criteria:* Actively-practicing CRNA members of the AANA who had not opted out of mass electronic-mail communication providing obstetric anesthesia services.
- *Exclusion Criteria:* Student Registered Nurse Anesthetists, inactive members, honorary members, and graduate AANA members.
- The survey deployed to **3,000 participants**

Response

- **125** CRNAs participated
- Response rate of **4.2%**
- However, 36 respondents did not participate in obstetric anesthesia services and were eliminated (n=89)

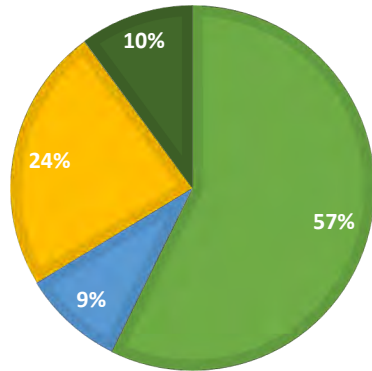
Protection of Human Subjects

- Georgetown University Institutional Review Board approval
- Collaborative Institutional Training Initiative Human Research Curriculum completion
- Informed Consent
- AANA Research Department Secured Database

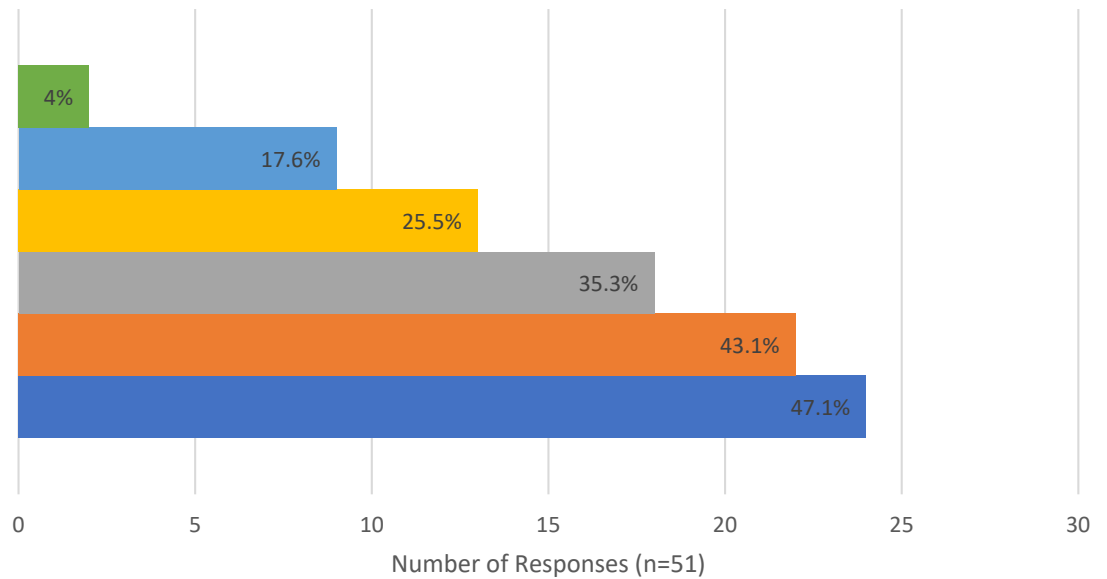
Results

AVAILABILITY OF PPH STANDARDIZED EMERGENCY GUIDELINE

■ Yes ■ No, but I'm using my own ■ No ■ Unsure



Utilization of Standardized PPH Guidelines

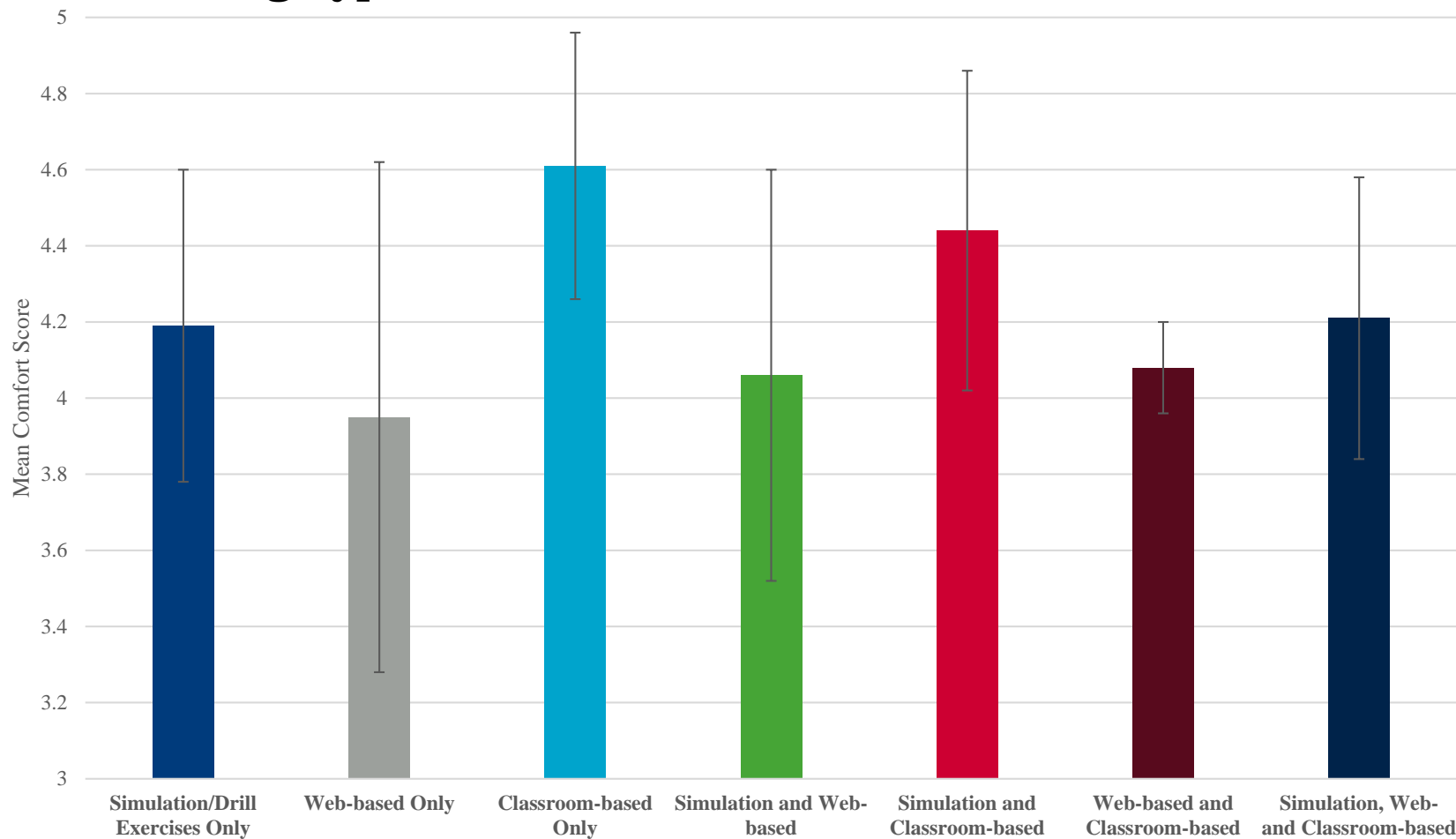


■ Other
 ■ Policy folder on the computer
 ■ Posted on wall in the OR
 ■ Available on my own personal electronic device
 ■ Available within the EMR
 ■ Printed material available in the OR

Percentages add to more than 100% because multiple responses were allowed.
 NOTE: Other included “posted in charting room and nursing station” and “state run PPH guidelines”

Results

PPH Training Type (n = 36) and Mean Comfort Level



Limitations

- Small Sample Size/Generalizability
- Validity of a de novo survey tool
- Survey Fatigue

Future Research Directions

- **Expand study** to achieve larger sample size
 - Include all members of anesthesia team (Anesthesia Residents, AAs, MDAs, etc.)
- Research conducted analyzing the **implementation of formal training program**
 - More insight into most beneficial education modality preparing providers for PPH emergencies
- Continue research on **barrier mitigation strategies**
 - Staffing
 - Blood bank
 - Resource Availability

Recommendations for Practice

How to integrate findings into obstetrical practice:

- Familiarize yourself with standardized guidelines
- Standardized Guideline accessibility
- Assess clinical environment for additional barriers
- Discuss barriers with leadership team
- Initiation of OB emergency formal training program
 - Simulation and/or classroom based

References

1. Higgins N, Patel SK, Toledo P. Postpartum hemorrhage revisited: new challenges and solutions. *Curr Opin Anaesthesiol.* 2019;32(3):278-284. doi:10.1097/ACO.0000000000000717
2. Goffman D, Ananth CV, Fleischer A, et al. The New York State Safe Motherhood Initiative: Early Impact of Obstetric Hemorrhage Bundle Implementation. *Am J Perinatol.* 2019;36(13):1344-1350. doi:10.1055/s-0038-1676976
3. Andrikopoulou M, D'Alton ME. Postpartum hemorrhage: early identification challenges. *Semin Perinatol.* 2019;43(1):11-17. doi:10.1053/j.semperi.2018.11.003
4. Analgesia and Anesthesia for the Obstetric Patient. American Association of Nurse Anesthetists. [https://www.aana.com/docs/default-source/practice-aana-com-web-documents-\(all\)/professional-practice-manual/analgesia-and-anesthesia-for-the-obstetric-patient.pdf?sfvrsn=be7446b1_8](https://www.aana.com/docs/default-source/practice-aana-com-web-documents-(all)/professional-practice-manual/analgesia-and-anesthesia-for-the-obstetric-patient.pdf?sfvrsn=be7446b1_8). Published November 2017. Accessed May 27, 2021.
5. Cooper N, O'Brien S, Siassakos D. Training health workers to prevent and manage post-partum haemorrhage (PPH). *Best Pract Res Clin Obstet Gynaecol.* 2019;61:121-129. doi:10.1016/j.bpobgyn.2019.05.008
6. Bohlmann MK, Rath W. Medical prevention and treatment of postpartum hemorrhage: a comparison of different guidelines. *Arch Gynecol Obstet.* 2014;289(3):555-567. doi:10.1007/s00404-013-3016-4
7. Quantitative Blood Loss in Obstetric Hemorrhage, *Obstetrics & Gynecology: December 2019 - Volume 134 - Issue 6 - p e150-e156.* doi:10.1097/AOG.0000000000003564
8. Feduniw S, Warzecha D, Szymusik I, Wielgos M. Epidemiology, prevention and management of early postpartum hemorrhage - a systematic review. *Ginekol Pol.* 2020;91(1):38-44. doi:10.5603/GP.2020.0009
9. Committee on Practice Bulletins-Obstetrics. Practice Bulletin No. 183: Postpartum Hemorrhage. *Obstet Gynecol.* 2017;130(4):e168-e186. doi:10.1097/AOG.0000000000002351
10. Ahmadzia HK, Grotegut CA, James AH. A national update on rates of postpartum haemorrhage and related interventions. *Blood Transfus.* 2020;18(4):247-253. doi:10.2450/2020.0319-19
11. Shields LE, Wiesner S, Fulton J, Pelletreau B. Comprehensive maternal hemorrhage protocols reduce the use of blood products and improve patient safety. *Am J Obstet Gynecol.* 2015;212(3):272-280. doi:10.1016/j.ajog.2014.07.012

References

12. De Tina A, Chau A, Carusi DA, Robinson JN, Tsen LC, Farber MK. Identifying Barriers to Implementation of the National Partnership for Maternal Safety Obstetric Hemorrhage Bundle at a Tertiary Center: Utilization of the Delphi Method. *Anesth Analg*. 2019;124(9):1045-1050. doi:10.1213/ANE.0000000000003451
13. Einerson BD, Miller ES, Grobman WA. Does a postpartum hemorrhage patient safety program result in sustained changes in management and outcomes? *Am J Obstet Gynecol*. 2015;212(2):140-144.e1. doi:10.1016/j.ajog.2014.07.004
14. Main EK, Goffman D, Scavone BM, et al. National partnership for maternal safety: consensus bundle on obstetric hemorrhage. *Obstet Gynecol*. 2015;126(1):155-162. doi:10.1097/AOG.0000000000000869
15. Kominiarek MA, Scott S, Koch AR, et al. Preventing Maternal Morbidity from Obstetric Hemorrhage: Implications of a Provider Training Initiative. *Am J Perinatol*. 2017;34(1):74-79. doi:10.1055/s-0036-1584274
16. Sharpe EE, Arendt KW. Anesthesia for Obstetrics. In: Gropper MA, Miller RD, eds. *Miller's Anesthesia*. Philadelphia, PA: Elsevier Churchill Livingstone; 2020:2006-2042. Accessed November 11, 2021. <https://www.clinicalkey.com#!/content/book/3-s2.0-B9780323596046000626>
17. Committee on Practice Bulletins-Obstetrics. Committee opinion no. 590: preparing for clinical emergencies in obstetrics and gynecology. *Obstet Gynecol*. 2014;123(3):722-725. doi:10.1097/01.AOG.0000444442.04111.c6
18. Certified Registered Nurse Anesthetists Fact Sheet. American Association of Nurse Anesthetists. [https://www.aana.com/docs/default-source/pr-aana-com-web-documents-\(all\)/crna-fact-sheet.pdf?sfvrsn=faeb4c2a_4](https://www.aana.com/docs/default-source/pr-aana-com-web-documents-(all)/crna-fact-sheet.pdf?sfvrsn=faeb4c2a_4). Published February 2021. Accessed August 10, 2021.
19. Lutgendorf MA, Spalding C, Drake E, Spence D, Heaton JO, Morocco KV. Multidisciplinary In Situ Simulation-Based Training as a Postpartum Hemorrhage Quality Improvement Project. *Mil Med*. 2017;182(3):e1762-e1766. doi:10.7205/MILMED-D-16-00030
20. Green M, Rider C, Ratcliff D, Woodring BC. Developing a Systematic Approach to Obstetric Emergencies. *J Obstet Gynecol Neonatal Nurs*. 2015;44(5):677-682. doi:10.1111/1552-6909.12729
21. Miner J. Implementing E-Learning to Enhance the Management of Postpartum Hemorrhage. *Nurs Womens Health*. 2020;24(6):421-430. doi:10.1016/j.nwh.2020.09.010