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### Detection of Postpartum Hemorrhage

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Detection of Postpartum Hemorrhage Benchmark Study  
A Paper Submitted in Partial Fulfillment of the Requirements  
For NURS 5382: Capstone  
In the School of Nursing  
The University of Texas at Tyler  
by  
Hannah Mccown  
December 5, 2021

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### **Acknowledgments**

This research project could not have been accomplished without the support, and assistance, and care from many wonderful people whom I have crossed paths with on this journey. From different professors, colleagues, peers, and mentors, I am grateful for the guidance, support, and feedback I have received. Since my first semester in graduate school in Fall of 2019 this project has been in the works, and I am glad to finally be on the tail end of things now.

### **Executive Summary**

Postpartum hemorrhage (PPH) can be defined as cumulative blood loss of greater than or equal to 1000mL or signs and symptoms of hypovolemia within 24 hours after the birth process (ACOG, 2017). With PPH being defined using a set amount of blood loss, accurate calculation post-delivery should be mandatory in the hospital setting. Visual estimation, historically used for vaginal deliveries, is associated with a significant underestimation of actual blood loss. Calibrated drapes have been developed to help objectively quantify blood loss (Watkins and Stem, 2020). Shown in a study after simulated vaginal delivery, there was a 16% underestimation in visual calculation at 300 ml loss, whereas, this increases to 41% underestimation at 2000 ml blood loss (Rani and Begum, 2017). Visualization of blood loss based upon physicians' eye was deemed highly inaccurate (Hancock et al., 2015). Physicians continuously estimated lower volumes of blood loss than what the actual blood loss volume was (Gabel & Weeber, 2012). My project focuses on implementation of calculated blood loss calculation drapes to accurately measure blood loss post-vaginal delivery. This will lead to earlier detection before patients start showing symptoms which will lead to treatment and improve patient outcomes.

### **Quantitative Blood Loss in the Detection of Postpartum Hemorrhage**

Implementation of calculated blood collection drapes in vaginal deliveries will lead to accurate blood loss calculations. Accurate blood loss calculations can lead to improved patient outcomes. Outcomes will improve by providing a diagnosis and intervention before patients start showing life threatening symptoms.

### **Rationale for the Project**

Patients should care about this project because as a patient she is not having to do anything differently. The nurses, midwives and physicians will have to change the way they practice. These minor changes can lead to major improvements in patient care, safety, and satisfaction.

### **Literature Synthesis.**

The key words blood loss calculation and postpartum hemorrhage (PPH) were used to search databases for studies that relate to inaccuracy of calculation of blood loss leading to PPH. Atukunda et al., 2016; Bohren et al., 2021; Evensen et al., 2017; Gabel and Weeber, 2012; Hancock et al., 2015; Kahr et al., 2018; Marshall et al., 2017; McIntock, 2020; Rani and Begum, 2017; Shields et al., 2017; Smith et al., 2019; and Watkins and Stem, 2020., all conducted studies in which they found support for the use of calculated drapes versus visualization by physicians to determine amount of blood loss. Visual estimation, historically used for vaginal deliveries, is associated with a significant underestimation of actual blood loss. Calibrated drapes have been developed to help objectively quantify blood loss (Watkins and Stem, 2020). Shown in a study after simulated vaginal delivery, there was a 16% underestimation in visual calculation at 300 ml loss, whereas, this increases to 41% underestimation at 2000 ml blood loss (Rani and Begum,

2017). Visualization of blood loss based upon physicians' eye was deemed highly inaccurate (Hancock et al., 2015). Physicians continuously estimated lower volumes of blood loss than what the actual blood loss volume was (Gabel & Weeber, 2012 ). ACOG (2017) recommendations for best practice include PPH bundles. These protocols are necessary to treat patients diagnosed with postpartum hemorrhage consistently as well as rapidly. The literature supports use of calculated drapes in every delivery, vaginal as well as cesarean to calculate blood loss accurately. This project focused solely on vaginal deliveries.

### **Project Stakeholders**

Stakeholders for this project start with the Chief nursing officer, practicing physicians, and midwives. Secondly stakeholders include clinical nurse manager, and supervisors. Thirdly stakeholders include registered nurses, newly hired nurses, and scrub technicians. Lastly the patients, newborn babies, and their family are stakeholders in this project.

### **Implementation Plan**

Step 1. Purchasing of calculated blood collection drapes for use in all term vaginal deliveries. Step 2. Schedule mandatory staff (labor and delivery nurses and scrub techs) education on how to use new blood collection drapes. Step 3. Schedule a round of checkoffs for staff to prove competency in use of new collection drapes. Step 4. Implement the use of the new collection drapes in all term vaginal deliveries. Step 5. Track and monitor trends in compliance of use of new drapes and calculation methods. Step 6. Track and monitor trends in postpartum hemorrhage occurrences. How to calculate quantitative blood loss:

Use in Vaginal Delivery: under-buttocks calculated drape

Begin quantification following delivery (i.e., prior to placental delivery). Most fluid prior to delivery include amniotic fluid, urine, and feces

Record total fluid volume

Subtract preplacental fluid from post placental fluid volume | Most fluid following delivery is blood

Calculate blood volume from soaked items by subtracting weight of wet item from that of dry (1 g additional weight equals 1 ml blood loss)

Cumulative volume: Calculated blood volume from weighted soaked items plus drape volume (ACOG, 2020)

### **Timetable/Flowchart**

The timeframe for this project is approximately 12 weeks. The start of the project will start with education for all nurses and scrub techs which will take approximately 1 week. 4 weeks will be given for initial implementation of calculated blood drapes giving room for newness and error. The next 8 weeks will be crucial for data collection. In the final week statistics will be taken and compared to initial statistics to deem results.

### **Data Collection Methods**

Data that will need to be collected will start with collecting past PPH occurrences for a visualization of future improvement. Secondly after the education class a post-test given to the staff will be obtained as well as a skills check-off to show use of the new drape and blood calculation system. After implementation of the project chart audits will need to be obtained to see that staff and doctors and physicians are charting the quantitative blood loss with each delivery. This will track trends to be used later for statistical purposes. Conducting staff interviews can help to see thoughts and ideas for better implementation coming from the staff who is doing the actual work. After a proper amount of time has passed with the use of the new drapes statistics on PPH can be compared to see positive or negative results.



### **Cost/Benefit Discussion**

Cost of this project was analyzed in terms of human resources, and supplies. Supplies such as the calculated collection drapes average \$15 each. Estimated number of vaginal deliveries per month is 150 which equals \$2,250 per month for calculated blood collection drapes. The clinical Educators salary is averaged at \$45/hr. for 1 week (40 hours) to equal \$1800. We are budgeting for 30 RNs in need of education as well as 5 scrub technologists. One 8-hour class will be sufficient for education. This is calculated to cost \$7200 for the nurses and \$800 for the scrub technologists. The weekly hourly wages for the RNs as well as scrub technologists are not projected in this project, only the extra 8-hour class is included. This cost analysis is based on the 4-week project implementation stage. After the implementation stage another 8 weeks of statistics will need to be collect. This cost will include an additional 2 months of blood calculation drapes costing \$4,500 as well as staffing cost but this is not included in this study as we are not adding any addition staff thus not creating any additional cost for the hospital.

### **Discussion of Results**

As I am not currently working in an area able to provide this type of care, I had to do a benchmark project. COVID-19 hospital restrictions restrict visitors and as a student I was not able to find a hospital willing to have me implement this project currently. Anticipated results if I were to implement my project would be prompt diagnoses of PPH based on calculated blood loss, prompt initiation of PPH bundles, and improved patient outcomes when diagnosed with PPH. This project will need to run for at least a 12-week period to yield adequate results.

### **Conclusions/Recommendations**

In conclusion, the implementation of the use of calculated blood collection drapes and weighing of pads postpartum will aid in identifying patients at risk of postpartum hemorrhage

(PPH). When a patient is identified as having a PPH, the hemorrhage protocol will be set into place to have a quick plan of treatment to minimize adverse events. Recommendations for each hospital will be to have calculated blood loss collection drapes in use in each delivery. The clinical staff such as nurses and scrub techs will be educated on the use of drapes. After each delivery, a quantitative blood loss amount will be charted in the patient's record by both the nurse as well as the doctor and or midwife working the case. According to the American College of Obstetrics and Gynecology (ACOG, 2017), postpartum hemorrhage can be defined as cumulative blood loss of greater than or equal to 1000mL or signs and symptoms of hypovolemia within 24 hours after the birth process, if this number is calculated the hemorrhage protocol will be started promptly to improve patient outcomes.

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Appendix A  
Flowchart



