



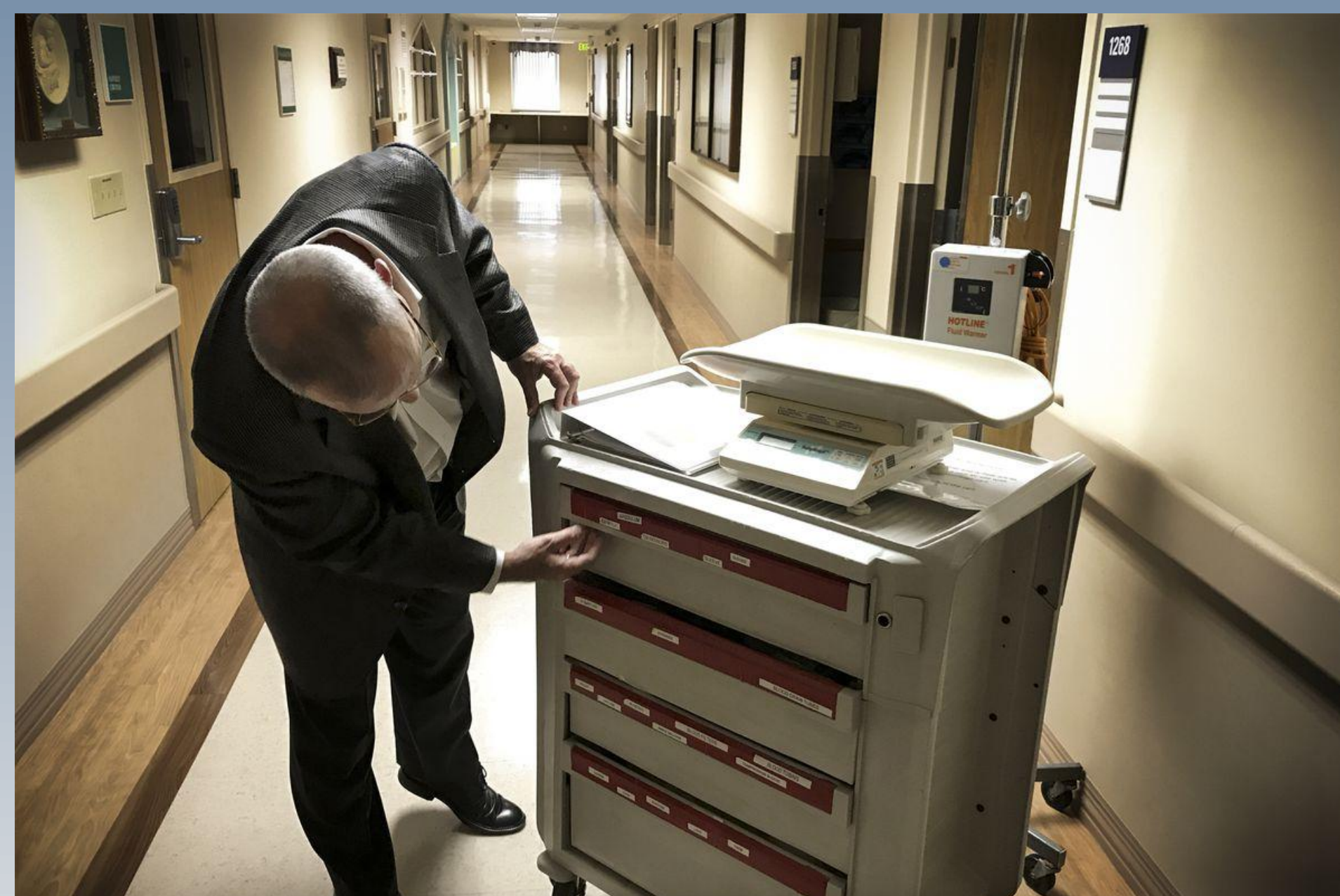
Effect of Postpartum Protocols on Maternal Outcomes

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Abstract

Objective: To determine whether postpartum hemorrhage protocols lead to decreases in maternal morbidity and mortality. **Design:** Systematic literature review. **Methods:** The clinical question investigated is whether the implementation of post-partum hemorrhage protocols have measurable impact on maternal morbidity and mortality. Searches were done through PubMed using the keywords: "maternal hemorrhage postpartum protocol." Studies were eliminated if they were more than 10 years old, conducted outside the United States, published in a non-English language, used other animal subjects besides humans, used non-female subjects, if they did not answer the clinical question, or were review articles. Eventually, three cohort studies were included for analysis. **Results:** Cohort studies by Shields *et al.* and Skupski *et al.* were chosen for analysis as they met the inclusion/exclusion criteria for the proposed clinical question. **Conclusions:** All of the studies clearly demonstrate an improvement across a variety of measures of maternal morbidity.



Introduction

- Obstetric hemorrhage (OH) is one of the leading causes of maternal mortality with a 27% prevalence worldwide¹.
- While developing countries carry the highest percentage of births affected by hemorrhage, developed countries are still affected with 16% of overall maternal deaths due to obstetric hemorrhage¹.
- Obstetric hemorrhage is considered to be one of the most preventable causes of maternal deaths².
- Postpartum Hemorrhage (PPH) is defined as "excessive bleeding, $\geq 1,000\text{mL}$, within the first 24 hours after birth, [and] up to 12 weeks postpartum"⁵.
- In 2010, the Joint Commission on the Accreditation of Healthcare Organizations recommended that protocols regarding PPH should be implemented.
- In 2013, the American Congress of Obstetricians and Gynecologists (ACOG) and the Society for Maternal Fetal Medicine (MFM) along with several other groups formed The National Partnership for Maternal Safety (NPMS) which also recommended the adoption of postpartum hemorrhage protocols⁶.
- In 2014, only 67% of academic obstetric anesthesia units had a PPH protocol⁶.

Methods

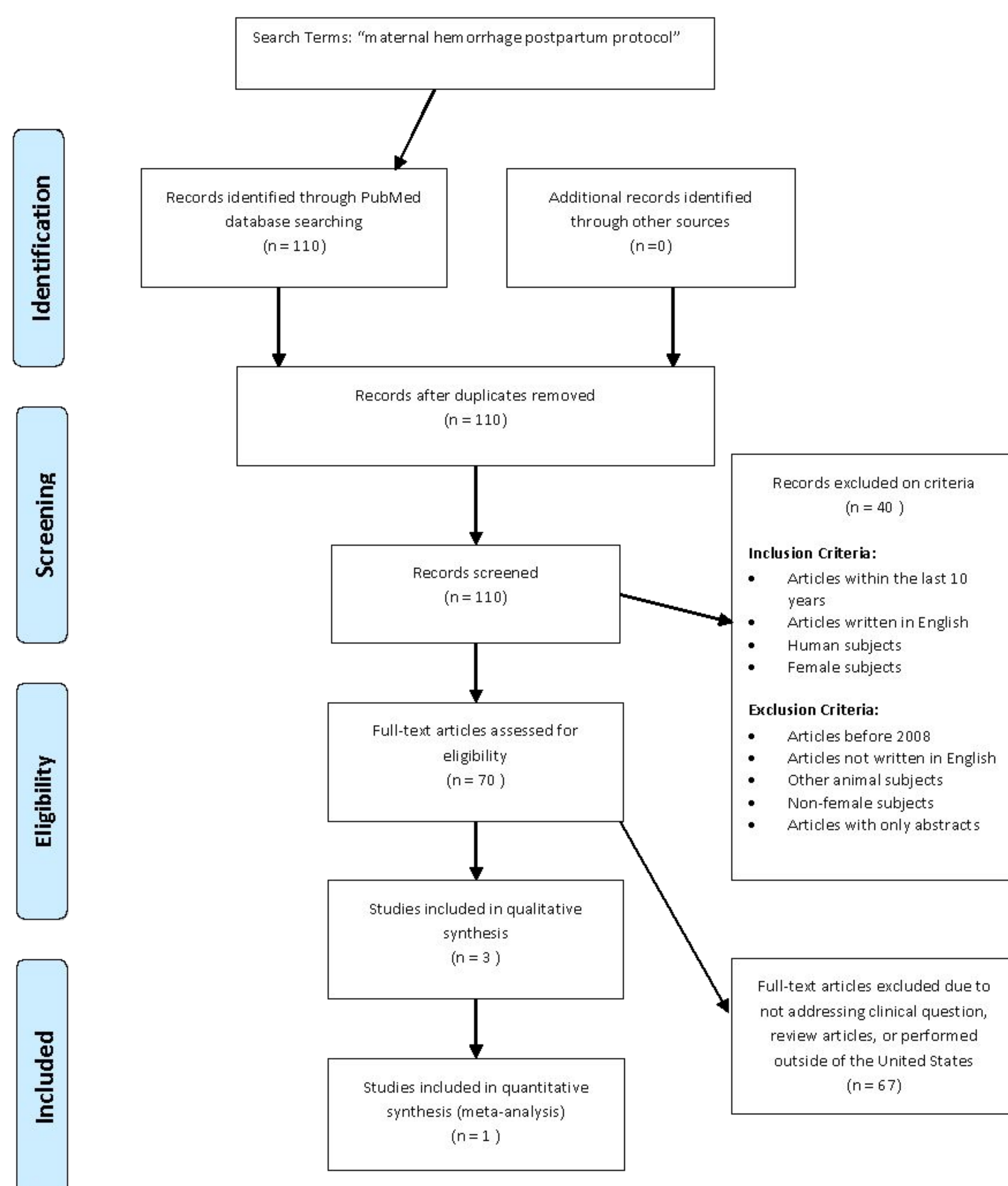
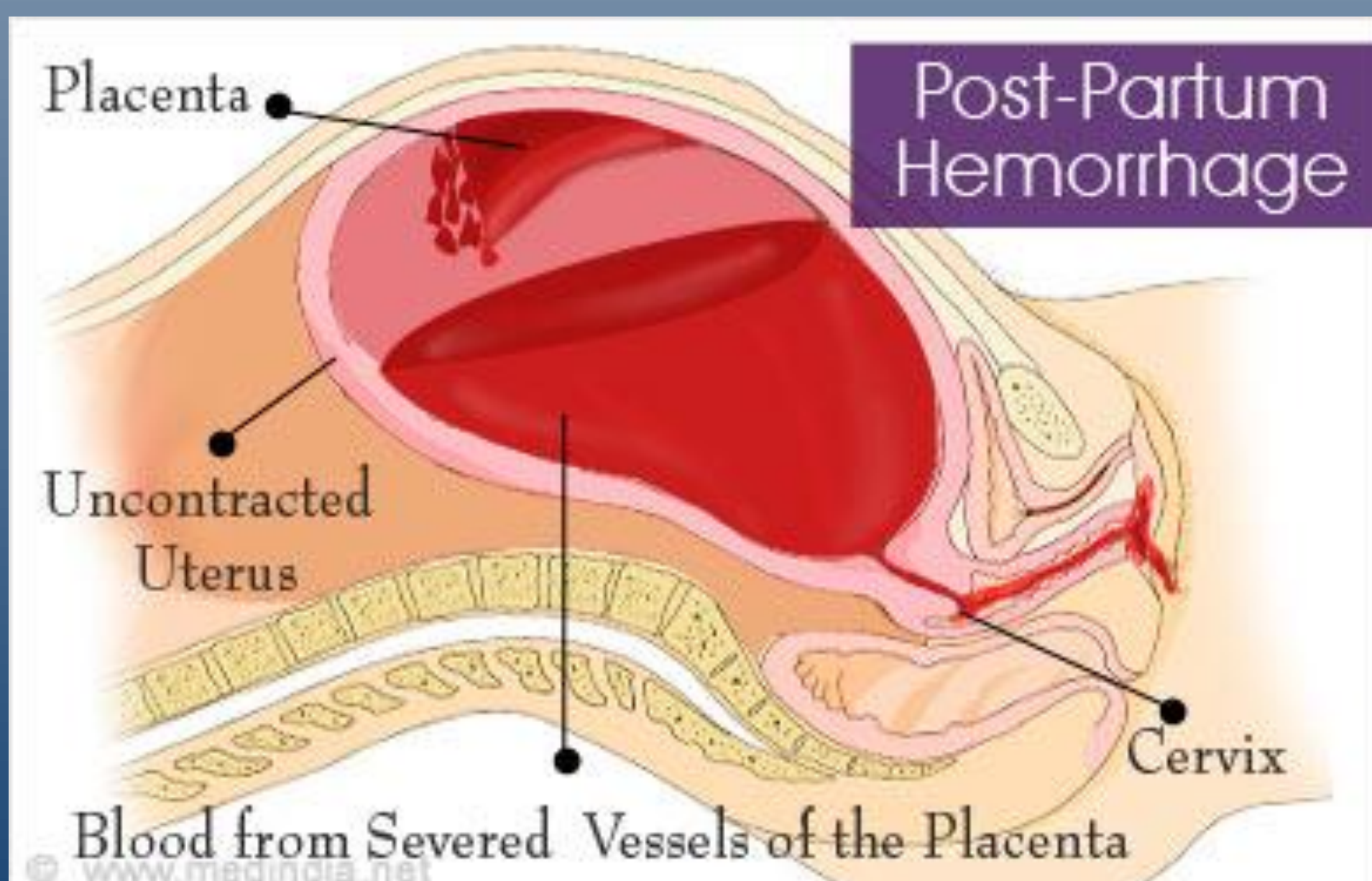


Figure 1. PRISMA Chart



Results

Study #1: Comprehensive maternal hemorrhage protocols improve patient safety and reduce utilization of blood products. Shields *et al.* (2011)

- **Study Type:** Retrospective & Prospective Cohort Study
- **Sample Size:** 5,813 deliveries
- **Length of Study:** 1 year
- **Objective:** To assess the effectiveness of instituting a comprehensive protocol for the treatment of maternal hemorrhage.
- **Conclusion:** Implementation of the protocol led to more patients successfully treated in the earliest stage of hemorrhage. There was a reduction in blood products used ($P < 0.01$). Disseminated intravascular coagulation was reduced by 64%.
- **Critique:** The study had a relatively small number of deliveries. Additionally, there were difficulties in estimating blood loss.

Study #2: Comprehensive maternal hemorrhage protocols reduce the use of blood products and improve patient safety. Shields *et al.* (2015)

- **Study Type:** Prospective Cohort Study
- **Sample Size:** 32,059 deliveries
- **Length of Study:** three 2-month time periods spread out over 1 year
- **Objective:** To evaluate the effectiveness of a comprehensive maternal hemorrhage protocol in reducing the use of perinatal blood products and unplanned hysterectomies during childbirth.
- **Conclusion:** Increased compliance of implementation from 54% to 80% was accompanied by a decrease in blood products of 25.9% ($P < 0.01$).
- **Critique:** Strengths included the large amount of research subjects. Limitations include difficulty with estimating blood loss and lack of compliance with the protocol.

Study #3: Improvement in Outcomes of Major Obstetric Hemorrhage Through Systematic Change. Skupski *et al.* (2017)

- **Study Type:** Retrospective Cohort Study
- **Sample Size:** 57,694 births
- **Length of Study:** 14 years
- **Objective:** To investigate the effect of a multiyear systematic institutional effort to improve the care of women with obstetric hemorrhage of $>1500\text{ mL}$.
- **Conclusion:** While the rate of obstetric hemorrhage increased over the course of the study, a decrease in measures of morbidity was found. Improvements included a decrease in cases of maternal hypothermia, acidemia, and coagulopathy when comparing the end of the study to the beginning ($P = < 0.001$ for all).
- **Critique:** Strengths included the long time period and high volume of data. Limitations included the fact that the study took place at a single hospital. Additionally, some planned components of their protocol were not in place during the time they reported data, including the implementation of quantitative blood loss techniques.

Discussion

- After reviewing all three articles, the results showed that PPH protocols reduced the maternal hemorrhage rates along with increasing the overall safety of the patient.
- Shields *et al.* (2011) found that after the implementation of a PPH protocol, there was a reduction in the total number of blood products transfused ($P < 0.01$). They also were able to successfully keep more patients in a lower acuity stage, finding a decrease of patients entering stage 2 ($P = 0.02$), as well as a decreased rate of DIC.
- Shields *et al.* (2015) found that as overall protocol compliance increased within a health care system, the use of blood products was reduced by 25.9% ($P < 0.01$).
- Skupski *et al.* (2017) reported that despite an increase in rates of obstetric hemorrhage over a period of 14 years, a decrease in measures of morbidity and mortality was found over this same time span as a PPH protocol was implemented in a large tertiary care center.
- Overall, each study showed statistically significant improvements in a wide range of maternal peripartum health markers.

Conclusion

PPH protocols are effective and efficient interventions with low risk of complication and proven safety benefits. This sort of stepped-care plan has the potential to improve quality of care in a wide variety of hospital settings, including both low-volume rural hospitals and large tertiary care centers in urban areas.

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