

# What is the Effect of Prophylactic Administration of Pitocin in the Third Stage of Labor on Pregnant Women to Decrease Postpartum Hemorrhage and Maternal Death Rates?



Kasey Brill [kasey.brill@live.longwood.edu](mailto:kasey.brill@live.longwood.edu) & Maureen Dalton [maureen.dalton@live.longwood.edu](mailto:maureen.dalton@live.longwood.edu)

## Longwood University Nursing



### Abstract

This research suggests the development of a universal protocol for prophylactic administration of Pitocin in the third stage of labor in order to prevent postpartum hemorrhage and decrease maternal mortality rates (MMR). The United States MMR has increased from 16.9 per 100,000 live births in 1990 to 26.4 per 100,000 live births in 2015 (Zelop, 2018, p. 8). It is imperative that health care providers intervene at the third stage of labor to decrease the risk of death and complications.

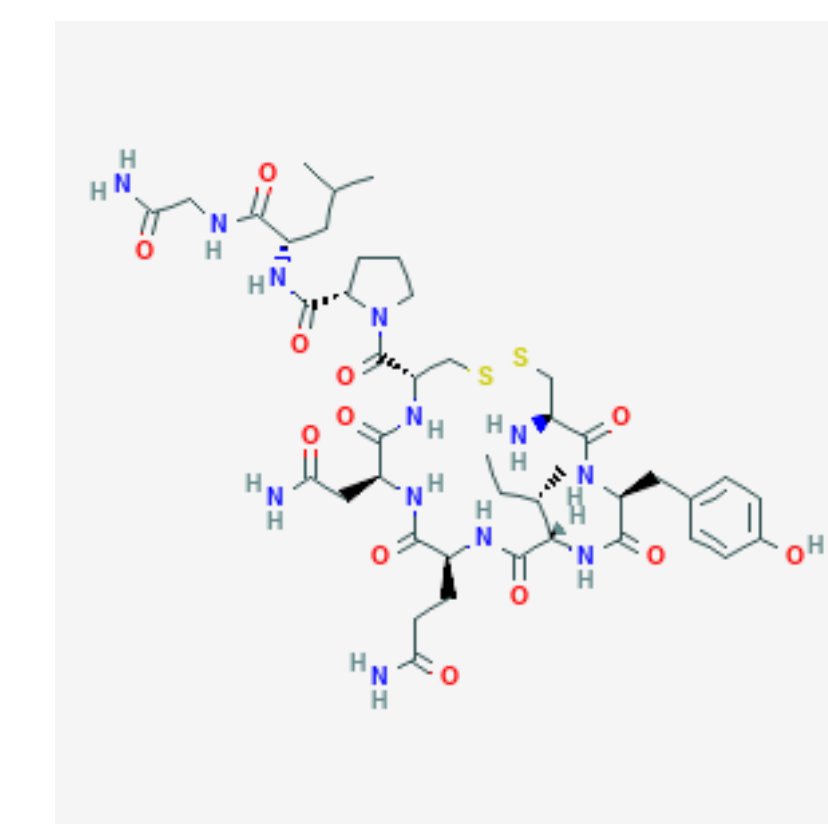
### Introduction

The title question was constructed using the PICO method. The “P” stands for the population of participants of interest in the clinical setting; pregnant and laboring women is the population for the purposes of this research. The “I” represents the intervention needed for practice and for this research project “prophylactic Pitocin administration protocols”. Within the PICO question the “C” stands for comparisons of interventions to determine the best intervention for practice. In this research, the “C” stands for no administration of Pitocin. Finally, the “O” stands for outcomes needed for practice and ways to measure the outcomes in practice. For the purposes of this research, “O” represents the decreased risk of postpartum hemorrhage and maternal deaths.

This research advises the prophylactic administration of Pitocin in order to prevent or decrease the risk of postpartum hemorrhages. Early intervention will decrease the MMR as 44.4% of maternal deaths occur in the 6 week time period after delivery of the fetus. (Zelop, 2018). The health system needs to be more proactive by “encompassing antepartum, intrapartum, postpartum and interconception care” (Zelop, 2018, p. 11). On a global scale, an average of one woman dies every 4 minutes as a result of postpartum hemorrhage complications (Moncneff, 2018). A postpartum hemorrhage is defined as a blood loss of  $\geq 500\text{mL}$  in a vaginal delivery or a blood loss of  $\geq 1,000\text{mL}$  in a cesarean delivery (Perry, S. E., et al., 2018).

### Methods

**Figure 1**  
Pitocin Molecular Build



Source (National Library of Medicine: PubChem, 2020).

Pitocin is the synthetic form of oxytocin and is used to stimulate uterine smooth muscle to contract the uterus in order to induce labor or to control bleeding postpartum (Davis Drug Guide, 2020). It is a vasopressor and antidiuretic; therefore, it is important to monitor the patient's blood pressure throughout administration (Davis Drug Guide, 2020).

Research suggests that the administration of prophylactic Pitocin in the third stage of labor intravenously or intramuscularly decreases the risk of postpartum hemorrhage by 40% (Cássia de Oliveira & Barbosa-Davim, 2019). The FDA (2020) recommends 40 units/ in 1,000 mL of lactated ringer's intravenously (IV) or 10 units of Pitocin intramuscular (IM) administration in the event that the patient is showing signs of PPH. However, there is no protocol for routine use in the third stage of labor and it is often up to physician discretion. The Queensland Clinic (2019), recommends the prophylactic administration of Pitocin on all pts beginning at 10 international units via IM injection for a vaginal birth and 5 international units via IV for a cesarean section.

**Table 1**  
Medication Used for Prevention and Treatment of Postpartum Hemorrhage

Medication	Dosage	Prevention	Treatment	Contraindications and cautions
<b>First-line agent</b> Oxytocin (Pitocin)	Prevention: 10 IU IM or 5 to 10 IU IV bolus Treatment: 20 to 40 IU in 1 L normal saline, infuse 500 mL over 10 minutes then 250 mL per hour	+	+	Overdose or prolonged use can cause water intoxication Possible hypotension with IV use following cesarean delivery

Source (Evensen, A., Anderson, J., & Fontaine, P., 2017)

### Evaluation and Analysis

In a study done that compares the blood loss and incidence of postpartum hemorrhage (PPH), there was a control group and an experimental group used. The control group did not receive the routine use of prophylactic oxytocin (RUPO), while the experimental group, or the RUPO group, did. The study shows that “the incidence of PPH  $\geq 1,000\text{ mL}$  was also significantly reduced from 14.0% in the control group to 6.1% in the RUPO group, despite the women in the RUPO group being more obese and having a longer first stage of labor, both of which are risk factors of excessive bleeding,” (Kuzume, Akiko, et al., para 16, 2017).

**Table 2**  
Risk Factors of PPH: The 4 Ts

<b>T-tone</b>	Uterine atony -advanced age -general anesthesia -prolonged third stage -history of postpartum hemorrhage
<b>T-trauma</b>	Lacerations, rupture, hematoma, inversion -episiotomy -caesarean section -operational vaginal delivery
<b>T-tissue</b>	Retained products -retained placenta -placenta accreta -retained blood clots
<b>T-thrombin</b>	Coagulation -thrombophilia A -HELLP syndrome -pre-eclampsia

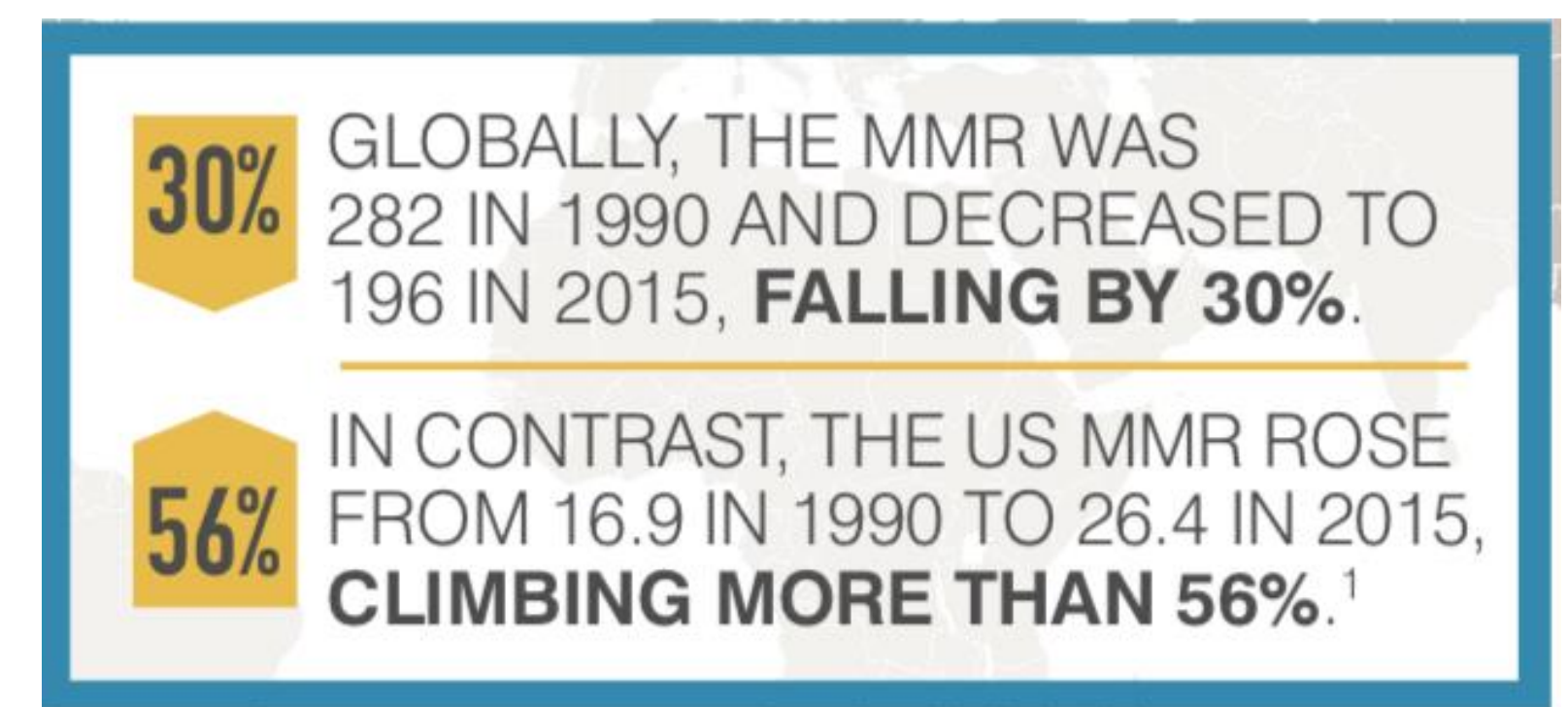
Source: (Moncrieff, 2018, p. 224).

### Conclusion

Overall, this research aimed to reveal that “there is a global concern to implement health actions that can adequately prevent and treat the complications of PPH, which in many cases causes maternal morbidity and mortality,” (Cássia de Oliveira & Barbosa-Davim, 2019). Prophylactic Pitocin is crucial in all patients in order to prevent and treat postpartum hemorrhages. Research show that “For clinical practice, providers might benefit from knowing 10 IU of IV bolus is a good, safe option for women after vaginal delivery,” (Charles, D. et al., p. 6, 2019).

### Recommendations for Future Research

**Figure 2**  
Maternal Mortality Rate



Source: (Zelop, 2019, p. 8).

Overall, there is a lack of research available addressing the significant rise of maternal morbidity in the United States. It is alarming that such a well developed country has such high maternal mortality rates, Therefore, more research needs to be done in order to provide quality and safe care of all laboring patients. In regards to future research, there needs to be more studies done in order to provide for all patient populations; for example, “current clinical practice guidelines for third stage oxytocin administration do not distinguish between women with prior oxytocin exposure and those without” (Bischoff, K., et al., p. 10, 2017). It’s “recommended that hospitals establish protocols to enable an optimal response to changes in maternal vital signs and clinical conditions. These protocols should be tested in drills, and systems problems that interfere with care should be fixed through their continual refinement,” (Evensen, A., Anderson, J., & Fontaine, P., p. 447, 2017).

### Sources

Bischoff, K., Nohacker, M., Lehane, C., Lang, B., Meerpohl, J. & Schmucker, C. (2017) Lack of controlled studies investigating the risk of postpartum haemorrhage in cesarean delivery after prior use of oxytocin: A scoping review. *BMC Pregnancy and Childbirth*, 1-13. Retrieved from <http://web.ebscohost.com.proxy.longwood.edu/ehost/pdfviewer/pdfviewer?vid=35&uid=7688736c-9264-4bc8-8ab5-edba263c1f86-4f4dc-y-essange03>

Cássia de Oliveira, R., & Barbosa-Davim, R. M. (2019). Prevention and treatment of postpartum hemorrhage. *Journal of Nursing UFPE*, 13(1), 236-248. Retrieved from <https://login.proxy.longwood.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=e8b&AN=134018762&site=ehost-live&scope=site>

Charles, D., Anger, H., Dabash, R., Darwish, E., Ramadan, M., Mansy, A., Salem, Y., Drabal, I., Byrnel, M., Breebaart, M., & Witnikoff, B. (2019). Intramuscular injection, intravenous infusion, and intravenous bolus of oxytocin in the third stage of labor for prevention of postpartum hemorrhage: A three-arm randomized control trial. *BMC Pregnancy and Childbirth*, 19(1), 1-8. Retrieved from <http://web.ebscohost.com.proxy.longwood.edu/ehost/pdfviewer/pdfviewer?vid=22&uid=7688736c-9264-4bc8-8ab5-edba263c1f86-4f4dc-y-essange03>

Davis Drug Guide (2020). Oxytocin. In *Davis Drug Guide Plus*. Retrieved from <https://davisplus.fadavis.com/2976/meddeck/pdf/oxytocin.pdf>

Evensen, A., Anderson, J., & Fontaine, P., (2017). Postpartum Hemorrhage: Prevention and Treatment. *American Family Physician*, 95(7), 442-449. Retrieved from <https://www.aafp.org/afp/2017/0401/p442.pdf>

Kuzume, A., Sugimi, S., Suga, S., Yamashita, H., & Yasui, I. (2017). The routine use of prophylactic oxytocin in the third stage of labor to reduce maternal blood loss. *Journal of Pregnancy*. Retrieved from [www.ncbi.nlm.nih.gov/pmc/articles/PMC5611883/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5611883/)

Moncrieff, G. (2018). Postpartum hemorrhage: A etiology and intervention. *British Journal of Midwifery*, 26(4), 224-231. Retrieved from <https://login.proxy.longwood.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=e8b&AN=128954859&site=ehost-live&scope=site>

National Library of Medicine: PubChem (2020). *Oxytocin (Compound)*. Retrieved from <https://pubchem.ncbi.nlm.nih.gov/compound/Oxytocin#infobox-Information-Source>

Perry, S.E., Lowdermilk, D.L., Cashion, K., Alden, K.R., Olshansky, E.F., Hockenberry, M.J., Wilson, D., & Rodgers, C.C., (2018). *Maternal Child Nursing Care* (6th Ed.). Mosby/Elsevier.

Queensland Clinic (2019). Primary postpartum haemorrhage. *Queensland Health*. Retrieved from [https://www.health.qld.gov.au/\\_data/assets/pdf\\_file/0015/140136/p-ph.pdf](https://www.health.qld.gov.au/_data/assets/pdf_file/0015/140136/p-ph.pdf)

Zelop, C. (2018). Introducing a new series on maternal mortality: With death rates rising, ob/gyns must dedicate themselves to protecting each mother. *Contemporary OB/GYN*, 63(1), 8-11. Retrieved from <https://login.proxy.longwood.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=e8b&AN=127421386&site=ehost-live&scope=site>