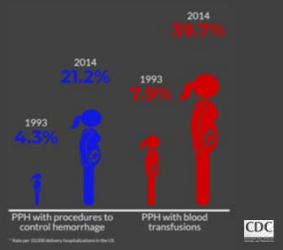
“Code Blue”: Applying Trauma Principles in the Obstetric Ward

P Vuong MD; **ME Zimmermann** BSN, TCRN; **S Stankiewicz** BS; **M Rachwalski** PA; **P Saldinger** MD; **J Sample** MD | **New York Presbyterian Queens** | **Weill Cornell Medical College**

BACKGROUND

Postpartum hemorrhage (PPH) is a major cause of maternal morbidity and mortality worldwide. In line with national rates, we noticed an increasing incidence of major obstetric hemorrhage at our institution in the last two decades.[1-3]



In response, our institution implemented systematic changes to improve our response to and the outcomes of the women involved. This included a protocol to reorganize the obstetric rapid response team to include trauma personnel via the “Code Blue”.

PURPOSE

To improve the morbidity and mortality of women with major obstetric hemorrhage by utilizing trauma team resources and applying trauma principles in their management

References:
1. Skupski DW, Brady D, Lowenwirt IP, Sample J, Lin SN, Lohana R, Eglinton GS. Improvement in outcomes of major obstetric hemorrhage through systematic change. Obstet Gynecol. 2017 Oct;130(4):770-777.
2. Kramer MS, Berg C, Abenhaim H, Dahhou M, Rouleau J, Mehrabadi A, Joseph KS. Incidence, risk factors, and temporal trends in severe postpartum hemorrhage. Am J Obstet Gynecol. 2013 Nov;209(5):449.e1-7.
3. Kuriya A, Piedimonte S, Spence AR, Czuzoj-Shulman N, Kezouh A, Abenhaim HA. Incidence and causes of maternal mortality in the USA. J Obstet Gynaecol Res. 2016 Jun;42(6):661-8.

Resources

Since 2005, the obstetric rapid response team (ORRT) consisted of an obstetrician, anesthesiologist, nurse anesthetist, obstetrics resident, nurse, nurse manager, and neonatologist.

With the institution of the “Code Blue” in 2014, the trauma consult resident, a PGY3-4 general surgery resident, responds to the Obstetrics ward. This resident checks in with the ORRT and calls the trauma attending if additional trauma resources are warranted. As the trauma team is inhouse, the only additional resource expenditure is the response time of the trauma resident and the trauma team if critical care support or operative intervention is needed.

Code Blue Protocol

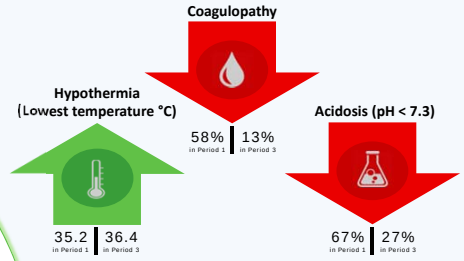
CODE BLUE CRITERIA:
- **Glasgow Coma Scale less than 8 or respiratory compromise**
- **Requirement of blood transfusion to maintain vital signs**
- **If the obstetrician, nurse anesthetist, or anesthesiologist suspects uncontrolled hemorrhage**

Overhead code is activated by the Anesthesiologist or Obstetrician

Trauma team consult resident (PGY3 or PGY4) responds to the Obstetric ward with the Obstetrics Rapid Response Team

Trauma resident calls trauma attending surgeon if additional critical care support or operative intervention is warranted.

Effectiveness



Morbidity significantly improved among women who experienced massive hemorrhage from period 1 to period 3 during which the “Code Blue” was initiated. As seen above, all end points of the trauma triad of death were improved.[1]

Barriers

and lessons learned

- Upon initiation of the protocol, the entire trauma team including trauma surgeon responded to Obstetric ward
- As with traumas, we had overactivation which was time and resource intensive
- By limiting the initial response to the trauma resident, the issue of overactivation was less disruptive to the trauma team work flow

Moving forward

Current trauma centers:
Institutional focus on the benefits of trauma principles in the obstetric ward can start with protocols such as the use of the massive transfusion protocol and an obstetrics rapid response team.

For non-trauma centers:
It is a major endeavor to achieve trauma verification, but we believe that beyond the primary improved quality of care to severely injured patients, patients with nontraumatic hemorrhage such as PPH should be included in the assessment of the benefits of trauma designation.

Conclusions

Women with severe postpartum hemorrhage are similar to the complex multi-injured patient in many ways. As trauma teams are experienced in the care of the exsanguinating patient with little physiologic reserve, the life-saving principles of trauma can be used to improve the chances of survival in these patients. As such, systematic collaboration and coordination of the trauma team with the obstetrics team can lead to better communication, effective care, and ultimately, lives saved.