**OBJECTIVES**

- Why simulation training
- Application to obstetrics
- Are there any data?
- Simulation at PHC
- Future
- No financial disclosures
- Please chime in

**WHY SIMULATION**

Worldwide the US ranks 48th in maternal mortality and 57th in infant mortality according to the CIA’s report – the World Facebook.

By the mid 2000’s 1 in 12 labors resulted in either a maternal or neonatal adverse outcome [Nielsen et al. Obstet Gynecol 2007;109:48]

Suboptimal communication was found to be the root cause in 78% of RCA’s done around adverse obstetrical outcomes according to the Joint Commission and was found to be the most common root cause for infant death worldwide (King’s Fund, Adv Neonatal Care)

**HIGH RISK AND HIGH STAKES**

- Nuclear power
- Military
- Air traffic control
- Aviation
- All industries in which human error/communication error can lead to devastating outcomes and in which simulation training has been widely adopted
COMUNICATION

- Failures of communication among primary contributors to excess morbidity in obstetrical emergencies
- Simulation training has been shown to result in improved communication skills in obstetrical settings (Crofts et al. BJOG 2008;115:1303; Birch et al. Nurse Educ Today 2007;27:915)

HAS THE TIME COME

- IOM Committee on Quality of Healthcare in America 1999 – healthcare organization should develop team training programs utilizing methods developed in aviation such as CRM and simulation
- JCAHO
- ACOG – task force on simulation training 2007 – Simulation Consortium - 2012 – Quality patient care in labor and delivery: a call to action – recommended simulation training as a part of a comprehensive strategy to improve patient outcomes
- American Board of Anesthesiology – mandated simulation training in 2010

SIMULATION AND OBSTETRICS

- Skills training ie: invasive procedures (IUPC placement, intrauterine compression balloon), FHR interpretation
- Resident training
- Nurse training
- Surgical simulation
- Team training
- Emergency drills

SIMULATION CENTER

- Dedicated facility
- Didactic learning
- Skills training
- Low and high fidelity models
- Team training
IN SITU SIMULATION

- Interdisciplinary training which occurs in patient care areas in a fully integrated manner with all care givers in their usual roles
- Built around specific clinical scenarios
- Ideal for team training and communication
- Identification of problems with process and facility (non working telephones, narrow doorways)
- When fully integrated into clinical operations and systems is a way for health systems to be tested and improve in a risk free manner

Area in which most published work pertaining to obstetrical emergencies done

Center based simulation compared to in situ training – similar results in task completion, team work time sensitive situations

In situ training allows for identification of facility specific safety issues

Does not require a dedicated center

SIMULATE WHAT?

- Emergent: emergent cesarean (FHR patterns, cord prolapse, abruption/previa), eclampsia, shoulder dystocia, hemorrhage, vaginal breech, hypertensive emergencies, epidural related hypotension, maternal arrest/embolism
- Rare events do not lend themselves to broad clinical experience and thus do lend themselves well to simulation training
- Hemorrhage and hypertension remain among the leading causes of maternal death (along with embolism)
- Non-emergent: patient hand-offs, team work (most preventable errors in healthcare are associated with team behavior/communication – JCAHO), operative vaginal delivery, fourth degree laceration repair, amniocentesis, maternal medical complications i.e. thyroid storm

DOES IT WORK?

- Largest body of data relates to shoulder dystocia
- Draycott et al showed that when measuring the rate of brachial plexus injury prior to and after institution of regular clinical drills the rate dropped from 7.4% to 3.2% (Obstet and Gyn 2008; 112: 11)
- Scholfield et al implemented regular simulation training and demonstrated an 86% reduction in cases of Erb’s palsy when comparing time frames prior to and after implementation (Best Prac Res Clin Obstet Gyn 2007;21;593)
- Grobman et al showed a brachial plexus injury rate reduction from 10.1% to 4% after instituting a protocol for management and regular simulation training for shoulder dystocia (Am J Ob Gyn 2011; 205; 513)
- Crofts et al implemented bimonthly multidisciplinary 1 day intrapartum drills w 30 min for shoulder dystocia and showed a reduction in brachial plexus injury rate from 7.4 to 1.3 % with no cases of permanent palsy in the post training period (BJOG 2016; 123: 11)
DOES IT WORK?

- Cord Prolapse
  - Sassakos et al. in the UK implemented a simulation program for the management of umbilical cord prolapse and compared the diagnosis to delivery interval prior to and after training and showed a reduction in the mean time from 25 min to 14.5 min (p < 0.001) and they found an increase from 34% to 82% in the employment of maneuvers to alleviate cord compression (BJOG 2009; 116: 1089)

DOES IT WORK?

- Eclampsia
  - Ellis et al. demonstrated shorter times to administration of magnesium sulfate through implementation of simulation training for management of eclampsia (Ob Gyn 2008; 111: 723)

DOES IS WORK?

- Post Partum Hemorrhage
  - JCAHO recommends clinical drills and simulation training in management of PPH
  - Simulation training has been shown to result in improved accuracy in estimation of EBL, improved active management of the third stage of labor, earlier recognition of and intervention for PPH, and earlier transfer to the OR suite (Bose et al BJOG, Maslovitz Acta Obstet Gyn Scand)

PROVIDENCE

- Evidence that simulation training can reduce obstetrical morbidity generating system initiative
- PHS implementation of system wide simulation training with the mandate that all Providence facilities providing obstetrical care will complete simulation training in the areas of shoulder dystocia, post partum hemorrhage and neonatal resuscitation
- 2018
PHC summer – fall 2016
- PPH simulation training provided by the Gossman Advanced Healthcare Simulation Center (Swedish Medical Center)
- Sacred Heart July 2016
- Holy Family October 2016

PHC
- PPH simulation
  - Standardization of treatment of patients w PPH
  - Early recognition and treatment of PPH
  - Increased active management of third stage
  - Increased use of uterotonic agents
  - Increased use of intrauterine tamponade balloon
  - Earlier transfer to OR

PHC
- PPH simulation
  - Decrease in transfusion
  - Reduction in ICU admissions
  - Reduction in unplanned hysterectomies
  - Fewer readmissions for PPH associated morbidity

SHMC
- PPH simulation
  - Pre-brief educational session
  - Balloon orientation
  - Filmed multidisciplinary in-situ PPH simulation with transfer to OR
  - De-brief review with video and discussion involving all participants
  - Self-evaluation done pre and post simulation
SHMC – WHAT DID WE LEARN?

- Good
  - Nursing staff with high level of familiarity and comfort with PPH protocols in place
  - High level of communication and cooperation among nursing staff and CRNA staff
  - High level of provider engagement (despite a slow start)

- Less good
  - Low level of familiarity with PPH protocols among MDA group
  - Varying knowledge of PPH protocols among Ob providers
  - Broad variation in EBL estimation
  - Delay in transfer to OR
  - Need to develop system for clear communication around need for and carrying out of intubation
  - Access to blood products/blood bank
  - Generally poor understanding of hospital code system/opportunity to develop a code-type response to PPH

SHMC – WHAT DID WE LEARN?

- Process has clarified and confirmed our need for local program (process itself distracting pointing out the need for a high level of familiarity in order to maximize benefit)
- Demonstrated our current strengths and weaknesses
- Process had created greatly improved engagement in the provider community

FUTURE

- Program development group in place
- Stand along program serving PHC and the region
- Fully functional simulation center with full time coordinator in place on SHMC campus
- Fully integrated multidisciplinary in-situ training program providing scheduled and non-scheduled drills
FUTURE

- Regional application of in-situ simulation training
- Regional access to simulation center
- Regional input – help!

THAT ALL

- Thankyou!