

Using Simulation for Protocol Development: Impacted Fetal Head

Jessica Sheeran MD, Phillip Callihan MD PhD, Alicia Shifflett RN, Sunny Chiao MD, Ashley Garneau MD, Christopher Ennen MD, University of Virginia



Background:

- Simulation-based education is associated with improved fetal outcomes for obstetric emergencies such as shoulder dystocia. ¹
- Impacted fetal head (IFH) occurs in 1.5% of all cesareans, and up to 25% of intrapartum cesareans. ²
- There are many maternal and fetal complications of IFH including hysterotomy extensions, bladder injury, hemorrhage/hematomas, endometritis, wound infection, low Apgar scores, NICU admissions, and injury to the fetus. ²
- Our goal was to have an interdisciplinary education and simulation program for IFH, and for it to aide the development of a protocol for cesarean with suspected IFH.

1. Shaddeau, et al. Simulation and Shoulder Dystocia. *Clin Ob and Gyn*. 59(4) 853-858. 2021.

2. Cornthwaite K, et al. Impacted fetal head: A retrospective cohort study of emergency cesarean section. *Eur J Obstet Reprod Biol*. 261, 85-91. 2021.

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Methods:

- **PREPARED**
- Prepare the team – discuss risk for IFH
- Review the plan – vaginal hand, fetal pillow or reverse breech extraction
- Explain to the patient – extra time for delivery and treatment of the newborn
- Pillow – insert fetal pillow
- Addjust – OR table & patient (modified lithotomy if potential vaginal hand)
- Relax the uterus – nitroglycerin preparation
- Extend incisions
- Deliver baby – review planned maneuvers
- Interprofessional education/simulation sessions included members of the entire team (obstetricians, obstetric anesthesiologists, and labor and delivery nurses) to create a shared mental model for management of these patients and to have all stakeholders involved in developing the protocol.
- In a 1 hour session, we reviewed IFH and its management using the acronym PREPARED, followed by an in-situ simulation in the OR using the protocol with a simulated patient preparing to undergo cesarean for arrest of dilation.
- This was followed by time for debriefing and insights from team members for protocol modifications. We had 5 sessions involving 31 participants.



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Outcomes:

- We used input from the debriefing to modify the preoperative protocol. Additions suggested by our participants included: posting the acronym on the wall of the OR for reference, reviewing key points during check-in rather than waiting until time-out to ensure all supplies are in the room, having nursing communicate elapsed time after hysterotomy until delivery of the fetus, and discussing uterine relaxant and uterotonic plan prior to incision.
- These changes were made before implementation of this protocol and participants rated this experience highly.
- Simulation is often used for staff training of finalized protocols. Our experience suggests simulation may also be used for protocol modification during the development stage.