Laerdal®
helping save lives

Recreating the Reality of Birth:

Choosing the Right Level of Fidelity for Your Simulation Training

The "see one, do one" approach to learning can be especially challenging for trainees in labor and delivery. Caring for two patients, the mother and the baby, creates double the possibility for complications and requires double the amount of patient monitoring. The learning curve in labor and delivery can be a never-ending one, and simulation is being used more often to prepare clinicians for low frequency, high risk events. Continuous practice helps staff recognize and potentially mitigate adverse events.[1]

Risk is a major impetus for the use of simulation. Seventy-six percent of obstetrics/gynecology professionals have been sued at least once and they have one of the highest malpractice insurance rates of any medical profession.[2] The most common clinical causes of medical litigation in obstetrics and gynecology are cases involving fetal distress, uterine rupture after a vaginal birth in a woman with a previous cesarean section, and shoulder dystocia.[3]

Consider that adverse obstetric events occur in approximately nine percent of all deliveries in the United States, and it is estimated that fifty percent of these events are preventable.[4] It is no surprise that the Doctor's Company, a national physician-owned medical malpractice insurer, advises using checklists and thorough documentation including care provided and the outcomes of care to reduce risk of litigation.[5]

In this article, we examine a range of simulation methods. Building on expert observations, we share how each can support the needs of your learners and help reduce risk in maternal and newborn care. Methods discussed include:

- Task Trainers
- Standardized Patients
- Hybrid Simulation
- High Fidelity Simulators

They also recommend considering multidisciplinary simulation drills for maternal hemorrhage, respiratory arrest in mother and newborn, shoulder dystocia, placental abruptions, ruptured uterus, and other unexpected complications.

Simulation practice can help to address risk and other concerns surrounding maternal care. The wide variety of simulation fidelity options (options for approximating reality) gives educators an array of tools to support experiential learning at all levels, from simple task trainers to sophisticated full-body manikins. This article examines the different advantages and limitations of using task trainers, standardized patients (SPs), hybrid simulation and manikins in various obstetrics and gynecology training situations. Each method can meet a particular need and amplify the learner's competence within the different segments of the Circle of Learning. This cyclic, objectives-based tool provides context for planning and executing educational programs, with each segment addressing specific learner needs.

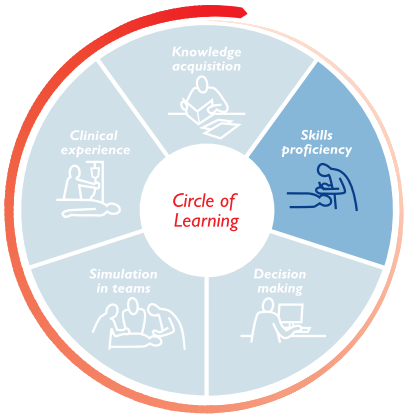
76% ***of obstetrics/gynecology professionals have been sued at least once and these doctors have one of the highest malpractice insurance rates of any medical profession.***[2]

Task Trainers: Practice Makes Permanent

Using a task trainer, students receive hands-on practice performing psychomotor skills independently and at their own pace. Typically, the focus will be on one specific task, such as pelvic exams, umbilical catheterization, or complicated deliveries.

Situations that require repeated practice are best suited for use of a task trainer. Learners are able to gain skills proficiency through supervised, tactile application. In a study evaluating the training of shoulder dystocia using a birthing simulator, learners saw a forty-four percent improvement in the mean scoring of their emergency procedure, including:[6]

- Assessment
- Call for help
- Positioning
- Suprapubic pressure
- Episiotomy assessment
- Internal rotation
- Delivery of posterior arm



There was also a trend showing reduction in peak force used and a shorter delivery duration following the training. This is where "practice makes permanent" shows its true benefit. Wherever available, it's worth considering use of a task trainer that can provide real-time assessment.

John's Hopkins Medicine cites proper patient care as one primary benefit of task trainers.[7] "It is understood that clinicians-in-training will treat patients; however, from an ethical perspective, harm to patients as a byproduct of training or lack of experience is justified only after maximizing approaches that do not put patients at risk".[8] Task trainers help by providing you with the ability to confirm that learners have, in fact, mastered a skill before allowing them to perform on real patients.

With less patient interaction and feedback, such as pain measurements and changes in vital signs, the use of a task trainer can be limited. Susan Galloway, a doctoral student in the Graduate School of Nursing at the Uniformed Services University of the Health Sciences in Bethesda, MD, stated that there is a "lower level of ability to suspend disbelief in a simulation scenario due to the single task purpose of the trainer".[9]

At a lower price-point, task trainers in isolation may exponentially increase learner comprehension. If your learners require clinical attention to detail and hands-on, repetitive practice, a task trainer might be your saving grace.

Task Trainer Points Worth Considering

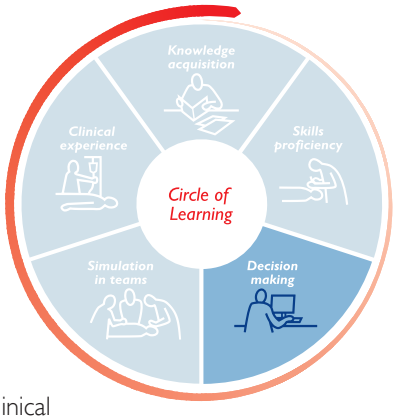
Benefits:

- Allows for hands-on, repeated practice
- Standardization of skills practice
- Portability
- Increased skills proficiency with no harm to patients

Things to Consider:

- No opportunity for interaction
- Decreased suspension of disbelief

Standardized Patients: Real People, Real Interaction



Realistically portraying a scenario, SPs interact with learners to create a low-risk, reduced-stress learning experience. Because SPs are able to verbalize symptoms and communicate what they are physically experiencing, they can be useful in gathering patient history and diagnosing symptoms. For example, a female SP can state that she has pain in her abdomen, followed by blurred vision and fainting, which may indicate pre-eclampsia. There is also opportunity for SPs to play the part of family members, providing history about the patient while adding realism to the scenario.

Additionally, learners can read the SP's body language and incorporate that information into their clinical assessments. One scenario was developed by the University of Washington Medical Center Labor and Delivery Unit to represent an obstetrical bleeding emergency. A standardized patient was used to provide critical triggers and prompts to the team; as the scenario progressed and the patient's condition worsened, the female SP became more anxious and concerned with her clinical status.[10] Learners can use this type of interactive practice to improve their observational and relational skills.

SPs allow learners to practice communication skills, establishing what questions need to be asked or how to relay bad news. Allowing the opportunity to recall didactic lessons and put acquired knowledge into action may lead to higher levels of engagement and self-awareness for learners.

There are some important factors to assess when considering the use of a standardized patient:[11]

- Educators must develop the patient by creating a problem, a history and a script to guide SPs during interactions with learners.
- SPs typically undergo hours of training to accurately and consistently portray a patient.
- Interactions with SPs take place in a clinical setting, with the SP providing learners with verbal and written feedback.

Through the use of a SP, learners gain clinical experience while practicing patient-centered and respectful care in a low-risk environment. Rehearsing patient interactions with a "real" patient can make the simulation come to life and allow for fine-tuning of interpersonal and professional skills. If you are interested in facilitating an engaging learning process, using a standardized patient may be a great place to start.

Standardized Patient Points Worth Considering

Benefits:

- Assists students in developing communication skills as well as clinical proficiency
- Creates the opportunity to read the patient's body language
- Helpful in the diagnostic process
- Assists students in working through difficult emotional situations in a safe environment

Things to Consider:

- SPs must be recruited and trained, extending the lead time necessary for planning and executing a simulation
- Difficulty maintaining consistency
- Cannot be used for complex physiological monitoring

Hybrid Simulation: Bridging the Gap

Simulation can be as creative as the educator and the learners allow. Hybrid simulation is when two or more simulation modalities are used in the same simulation session. Typically, a task trainer or partial simulator is realistically affixed to a SP, allowing for teaching and assessment of technical and communication skills in an integrated fashion.[12]

According to a recent study, learners had increased interactions with standardized patients compared to manikins, and their behaviors were more akin to what one would expect in real, clinical practice. However, they were inclined to use procedural touch more frequently with manikins, lending more effective hands-on training.[13] Hybrid simulation combines both forms of practice for learners – communications and clinical treatment.

The use of a SP and birthing simulator may be able to effectively teach the complexities associated with birth, while ensuring that learners communicate and monitor the patient as well. The interaction with a "real" patient combined with hands-on clinical practice can reinforce competent decision making and develop critical thinking skills. Learners can then apply these skills to actual patient encounters, confidently ascertaining the best course of treatment.

"

What Students Say about Hybrid Simulation

"It puts you closer to a real-life situation – need more of it!"

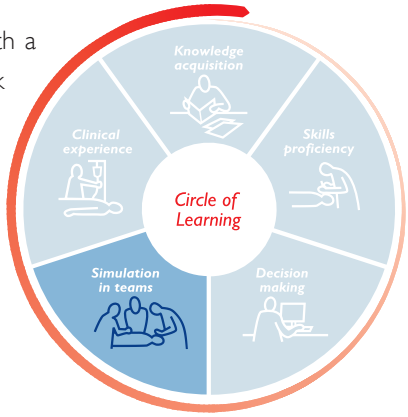
"Actors made the simulation more realistic and required you to think critically"

"The delivery progressed more naturally and hands-on experience is always better than lecture."

"It gets you thinking more about real-life experience..."[14]

Hybrid simulation offers a bridge between simulation methods in that learners can work with a real patient and perform clinical skills. Even so, it can be limited by the technology of the task trainer or simulator in use. Similarly, facilitating a hybrid simulation includes both training a SP and setting up the task trainer or simulator. Even partial simulators can be high-fidelity and preparing for a simulation session can include scenario preparation and maintenance.

Hybrid simulation deserves attention when determining how to reinforce your learning objectives. It offers interpersonal and palpable practice for your learners. To help learners develop their decision-making competency, you may want to consider expanding your simulations to incorporate both standardized patients and task trainers.



Hybrid Simulation Points Worth Considering

Benefits:

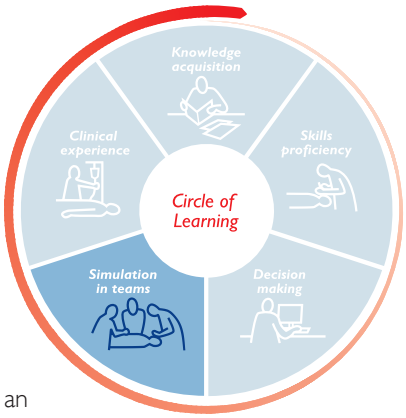
- Helps students develop communication skills and clinical practice
- Provides a life-like experience for the student
- Ability to simulate some invasive procedures
- Allows students to evaluate body language

Things to Consider:

- SPs must be recruited and trained, extending the lead time necessary for planning and executing a simulation scenario
- Equipment maintenance in addition to training SP
- Attention needed to maintain consistency
- Cannot be used for complex physiological monitoring

> *"It is understood that clinicians-in-training will treat patients; however, from an ethical perspective, harm to patients as a byproduct of training or lack of experience is justified only after maximizing approaches that do not put patients at risk".*[10]
>
> Johns Hopkins Medicine

Simulators: Optimizing Fidelity



Today's technologically advanced manikins and accompanying systems offer an unprecedented level of fidelity. They provide a valuable means for educating interdisciplinary teams–developing their knowledge and clinical skills while protecting patients from unnecessary risk.

Simulators are particularly well-suited for simulations involving traumatic or emergency scenarios. Obstetrics is a key area where manikins have been instrumental in simulating emergencies during labor and delivery. Due to the nature of the emergencies and patient age, educators count on manikins to provide a realistic physiology where SPs cannot.[15]

In addition, team dynamics are critical when faced with an emergency situation. Dr. Salvatore Politi, an Associate Professor in Radiology at University of Massachusetts Medical School, states, "A formalized activation system, good leadership, and good organization of team members, with each member well trained in the management of obstetric emergencies, helps facilitate a smooth delivery of the fetus".[16] He also recommends, "Despite its infrequent occurrence, all healthcare providers attending pregnancies must be prepared with a high level of awareness and training to handle vaginal deliveries complicated by shoulder dystocia".[17] One solution can be simulation with a simulator, which can provide learners with the ability to practice simulation in teams, reacting to physiological changes in real time, and rehearsing real world scenarios.

The capability for weighing and enacting a clinical pathway is one thing that other methods of simulation cannot deliver. Use of a simulator allows for administration of medication and physiological monitoring, so that learners can grasp the reality of their actions. Additionally, scenarios allow for evidence-based decision making, using clinical procedure in tandem with real human factors and behaviors. As scenarios follow the same treatment logic as an actual case, the patient will respond according to the clinical interventions taken. This becomes especially important when training for situations as complex as labor and delivery emergencies.

At Laerdal, our clients appreciate when we remind them that simulation is not about the simulator. As with simulations using SPs, manikin-based simulations require pre-work and investment of resources in the development of the simulation scenario itself. Pre-programmed scenarios will require time to download and perform testing before the scheduled simulation session. Simulator-based scenarios also require "suspension of disbelief" among learners and teachers alike.

With the right technology and environment, learners can work to develop and hone a particular skill until they've mastered it — without concern for real patient harm. If you feel your learners are ready to take part in full-fledged, high-fidelity simulation, your next steps may lead to a simulator.

Simulator Points Worth Considering

Benefits:

- Consistent, easy repeatability allows learners to develop precise behaviors and skills that match your goals
- Results can be measured for immediate feedback
- Ability to perform invasive procedures

Things to Consider:

- The best gains come when there is a commitment to simulation as a preparatory process for clinical practice
- Leaders will achieve the best results by having a strong basis in how to use high fidelity simulation to meet their training objectives
- Gains can be maximized and costs often reduced by conducting simulations in situ, i.e. at the actual point of care location.

"A formalized activation system, good leadership, and good organization of team members, with each member well trained in the management of obstetric emergencies, helps facilitate a smooth delivery of the fetus".[16]

Dr. Salvatore Politi
Associate Professor in Radiology at University of Massachusetts Medical School

The Right Fidelity for the Job

While the learning curve will always exist in medicine, learners are afforded the opportunity to advance and gain competency through the use of simulation. Addressing topics like problem-solving, crisis-management, and hands-on procedures, each means of simulation provides deliberate practice of cognitive and psychomotor skills. Obstetrics and gynecology injuries are estimated to be involved in forty-three percent of malpractice claims exceeding five million dollars.[18] With this in mind, it's worth weighing the various ways to reduce the risk of patient harm and litigation.

In a randomized, controlled trial, the effectiveness of multi-professional training for eclampsia was measured in both local hospitals and a regional simulation center. At the hospitals, standardized patients were used in lower-fidelity simulation and, at the simulation center, a high-fidelity, full-body simulator was used. According to the British Journal of Midwifery, ***"there were equal improvements in both settings; it was the training itself, rather than the location or the simulation equipment used, that appeared to be the key to success"***.[19]

Task trainers, standardized patients, hybrid simulation, and manikins have all proven to be enduring and invaluable training tools. When considering the best option for your needs, it comes down to identifying your desired educational outcome and understanding which model would best achieve your goal (knowledge acquisition, skills proficiency, decision-making, or simulation in teams). Regardless of the choice you make, you may improve your team's skill levels so that they are better-prepared when real patient lives are at stake.

If you would like guidance on which level of fidelity will best meet your education and training needs, please contact us. We are here to help.

References

1. Le Morvan, P. & Stock, B. (2005). Medical learning curves and the Kantian ideal. ***Journal of Medical Ethics,*** 31(9); 513-518.

2. Adinma, J. (2016). Litigations and the obstetrician in clinical practice. ***Annals of Medical and Health Sciences Research***, 6(2); 74-79. doi: 10.4103/2141-9248.181847

3. Mavroforou, A., Koumantakis, E., & Michalodimatrakis, E. (2005). Physician's liability in obstetric and gynecology practice. ***Med Law***, 24(1); 1-9.

4. Institute for Healthcare Improvement. (2012, May 30). Expedition: Preventing obstetrical adverse events. Retrieved from http://www.ihi.org/education/WebTraining/Expeditions/PreventingObstetricalAdverseEvents/Pages/default.aspx

5. The Doctor's Company. (2017). Tips for reducing medical malpractice claims in obstetrics. Retrieved from http://www.thedoctors.com/KnowledgeCenter/PatientSafety/articles/Tips-for-Reducing-Medical-Malpractice-Claims-in-Obstetrics

6. Fialkow, M.F., Adams, C.R., Carranza, L., Golden, S.J., Benedetti, T.J., & Fernandez, R. (2014). An in situ standardized patient based simulation to train postpartum hemorrhage and team skills on a labor and delivery unit. ***Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare,*** 9(1): 65-71. doi: 10.1097/SIH.0000000000000007

7. John's Hopkins Medicine. (n.d.). Partial task models. Retrieved from http://www.hopkinsmedicine.org/simulation_center/training/manikin_based_simulations/partial_task_models.html

8. Ibid

9. Galloway, S. (2009). Simulation techniques to bridge the gap between novice and competent healthcare professionals. ***American Nurses Association Periodicals***, 14(2). Retrieved from http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Vol142009/No2May09/Simulation-Techniques.html#Galloway

10. Flynn, K. (2012). The use of standardized patients to minimize anxiety in undergraduate nursing students in the clinical setting. Retrieved from http://sophia.stkate.edu/cgi/viewcontent.cgi?article=1057&context=ma_nursing

11. Crofts, J.F., Winter, C., & Sowter, M.C., (2011). Practical simulation training for maternity care – where we are and where next. BJOG: An International Journal of Obstetrics & Gynaecology. 118(3): 11-16. doi: 10.1111/j.1471-0528.2011.03175.x

12. Lopreiato, J.O. (2016). Healthcare simulation: Dictionary. Rockville, MD: Agency for Healthcare Research and Quality

13. Coffey, F. Tsuchiya, K., Timmons, S., Baxendale, B., Adolph, S., & Atkins, S. (2016). Simulated patients versus manikins in acute-care scenarios. Clin Teach, 13(4): 257-61. doi: 10.1111/tct.12425

14. Laerdal Medical. (n.d.). Hybrid simulation for labor and delivery offers greater realism and enhances classroom learning. Retrieved from http://www.laerdal.com/distributors/UserStories/48118055/Hybrid-simulation-for-labor-and-delivery-offers-greater-realism-and-enhances-classroom

15. Abersold, M. & Tschannen, D. (2013). Simulation in nursing practice: The impact on patient care. OJIN: The Online Journal of Issues in Nursing, 18(2): Manuscript 6. doi: 10.3912/OJIN.Vol18No02Man06

16. Politi, S., D'Emidio, L., Cignini, P., Giolandino, M., & Giorlandino, C. (2010). Shoulder dystocia: An evidence-based approach. Journal of Prenatal Medicine, 4(3); 35-42.

17. Ibid

18. Beazley Group. (2013). High risk jurisdiction severity trends, Time to closure and obstetric claims trends. Aon/ASHRM Hospital and Physician Professional Liability 2013 Benchmark Analysis. Retrieved from https://www.beazley.com/documents/Healthcare/Beazley_2013_HPL_Benchmarking_Report.pdf

19. Crofts, J.F., Winter, C., & Sowter, M.C. (See ref #7)