

GO MOMS

Global Outreach - Mobile Obstetrics Medical Simulation And Gynecologic Surgery

GO MOMS
HANDBOOK

Provided by OBSIM FROM THE JOHNSON CENTER FOR PREGNANCY
AND NEWBORNS AT LUCILE PACKARD CHILDREN'S HOSPITAL

Dear Colleagues:

Did you know that studies suggest communication failures between the multiple teams on L&D Wards are the single most common cause (>70%) of maternal and neonatal morbidity and mortality? (JCAHO Sentinel event #30 2004)

The world of Labor and Delivery is truly a team sport. Everyone in the room has some valuable piece of information that they should share with others in order to improve patient safety. Yet we still work and study in our separate 'silos'.

In many industries, athletic endeavors, and musical performances, a large percentage of the participants' time is spent practicing as a team. So, how can we 'practice' as a team on L&D? The answer: **OBSim** – a simulation-based, obstetric crisis-oriented team training course. In fact, simulation training is a technique already used extensively by NASA, the aviation & nuclear industries, to improve group performance.

The workshop you are participating in is called *GO MOMS* [Global Outreach - Mobile Obstetrics Medical Simulation].

GO MOMS was originally created by a group of practicing obstetricians from Northern California (Stanford University and Kaiser Permanente Hospital) with a desire to bring the latest effective treatments for obstetrical emergencies from the developed world to the developing world. The workshop relied heavily on simulation training as a teaching technique. While performing these workshops overseas the *GO MOMS* team began to see the astounding success of simulation for team performance.

GO MOMS - USA was developed for training labor and delivery teams here in the USA. We are particularly interested in obstetric crisis simulation because it allows team members to understand the needs of others in an emergency and to practice effective communication during these stressful times. Having the opportunity to "practice" emergencies before they occur has a profound effect on team performance.

To maximize learning, participants must train in an environment that fosters camaraderie, is supportive and non-judgmental, safe (no potential of patient harm), and fun – yes, fun! Learners must be allowed to talk freely and ask questions during the training with the confidence to know that they will not be judge nor will anyone's performance be discussed after the workshop. To accomplish this goal, we will ask all of you to sign a confidentiality agreement before beginning the course. Our motto is "**What happens in sim , Stays in sim**".

This handbook was created to accompany the online training course as you begin your own simulation program at your hospital.

We look forward to seeing you.

Sincerely,
GO MOMS team

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Learning objectives for PPH scenario aligned with steps in PPH checklist:

Step 1 Objectives:

1. Know who and how to call for help
2. Use closed-loop communication when asking for tasks to be completed
3. Delegate roles and identify team leader or leaders
4. Use recaps to make sure all team members are on the same page

Step 2 Objectives:

1. Perform an exam for genital tract laceration
2. Assess for retained products and coagulopathy
3. Understand the medications used by
 - a) Ensuring correct dosing
 - b) Being aware of contraindications for this specific patient
 - c) Using closed-loop communication for medication requests and administration
4. Confirm other steps are performed as indicated by the checklist

Step 3 Objectives:

1. Perform aggressive and early management based on the clinical situation and/or vital signs
2. Quantify blood loss using ebl or qbl
3. Place intrauterine balloon or b lynch suture
4. Order the appropriate labs and blood products

PPH scenario example

Provide this information to the entire team before beginning simulation

18 yo G1 P1 s/p NSVD 15 minutes ago.

- Past medical history– noncontributory
- Labor course:
 - Induction of labor for past the due date
 - Labor lasted 14 hours and pushed x 4 hours
 - baby weight = 3800gram
- Baby to NICU for chorioamnionitis
- Placenta is undelivered at start of simulation
- Epidural in situ
- VS BP 100/65, HR 95, RR 20, SaO2 98% on room air
- Predelivery Hct = 32

Simulation begins

Primary nurse and ob provider in the room with the patient

- Allow the physician/midwife to deliver placenta
- Begin bleeding after placenta delivered. If using a mannequin that bleeds have gradual blood loss to a total of 1500-2000 or if using nonbleeding model can use a red cloth for blood with a sim instructor pulling the cloth through the vagina
- VS to be done ‘on the fly’ or as the blood loss increases during the scenario by a simulation instructor
 - Begin with raising HR before drop in BP
 - Respond to therapy given
 - Uterotonics given/Uterine balloon tamponade placed(UBT)/blood given-> stable VS
 - No treatment-> VS worsen
- Have a simulation instructor in the room to assist with locating supplies if needed (speculum exam/ultrasound and D&C/foley)
- Anesthesiologist/CRNA will not have a difficult airway if they choose to intubate
- End the scenario when any of the following occur:
 - Use of at least 2 uterotonics and placement of UBT
 - Adequate resuscitation with blood and fluids
 - If 30 minutes has elapsed

Simulation Set Up Tasks Example

Tasks to be done:

1. Paperwork
 - a. Sign in sheet
 - b. Confidentiality
 - c. Video consent forms
 - d. Completed surveys after session
2. Set up for didactic, skills stations
3. Simulation room set up
 - a. Set up VS
 - b. Equipment for simulation
 - c. Rapid infuser or blood pump and warmer
 - d. Review list of simulation supplies and medications
 - e. Mannequin or task trainer preparation
 - f. Patient voice if needed
 - g. Debriefing room set up as needed

Simulation Instructor Roles (Some instructors will have multiple roles)

1. Present briefing
2. Set up and clean up simulation room
3. Present didactics/assists learners at skills stations
4. Sim room Orientation
5. During simulation
 - Director (starts and stops scenario)
 - Pt voice
 - Vital signs
 - Timekeeper
 - Family member (optional)
 - Provide equipment and bring blood into the room
 - Bleeding of the mannequin
6. Debrief and co debriefer

Equipment and room set up

1. Mannequin with 2000 cc of blood or red cloth
2. Placenta
3. Monitor to display vital signs
4. Under buttocks drape
5. Epidural in place
6. Amp and gent hanging
7. Dry IV bag marked with oxytocin added
8. Additional dry IV bags
9. Delivery set
10. Placenta bowl
11. O2 sat monitor
12. Bp cuff
13. Blood for transfusion available outside simulation area. Brought to room 6 min after requested
14. Anesthesiology set up for general anesthesia with meds for resuscitation
15. Have available on request
 - UBT and supplies
 - Foley
 - PPH medications
 - Oxytocin
 - Methylergonovine maleate
 - Misoprostol
 - Carboprost
 - Tranexamic acid
 - Blood transfusion forms
 - Simulated blood products available to hang
 - Blood draw supplies and tubes
 - O2 mask
 - Belmont or pressure bag/warmer for rapid blood infusion
 - Stat lab results to display if needed
 - Large bore IVs (needles removed)and blood tubing
16. If performing simulation on the units add the following
 - Yellow vest for all participants
 - Signage for in situ simulations

Sample Agendas for Training

	Monday 8:30 – 11:00 am	Tuesday 5:00 – 7:30 pm	Thursday 1:00 – 3:30 pm
5 min arrival time	8:30 – 8:35	5:00 – 5:05	1:00 – 1:05
25 min for briefing and didactics	8:35 – 9:00	5:05 – 5:30	1:05 – 1:30
30 min total for task training	9:00 – 9:30	5:30 – 6:00	1:30 – 2:00
10 min orientation for sim	9:30 – 9:40	6:00 – 6:10	2:00 – 2:10
25 min for simulation	9:40 – 10:05	6:10 – 6:35	2:10 – 2:35
10 min team debrief or system issues discussion if desired	10:05 – 10:15	6:35 – 6:45	2:35 – 2:45
45 min for debrief	10:15 – 11:10	6:45 – 7:40	2:45 – 3:30
10 min for post course survey and lessons learned	11:00 – 11:10	7:30 – 7:40	3:30 – 3:40

Briefing:

1. Introductions - everyone including simulation team members and all participants should introduce themselves
2. Statement "We start with the basic assumption that everyone participating in this simulation training is intelligent, well-trained, cares about doing their best and wants to improve patient safety."
3. Explanation of the need for a safe zone and signing of confidentiality form
4. Describe the day's events
 - a. Orientation to the room
 - b. Didactic if you are including that before the simulation
 - c. Skills station if you are including that before the simulation
 - d. Simulation
 - e. Debriefing
 - f. Post course survey if desired

Debriefing Principles

Begin by restating confidentiality assurance: "What happens in SIM stays confidential and the debrief is about discussing the challenges of the work and the system we work in. We will not discuss individual's performance "

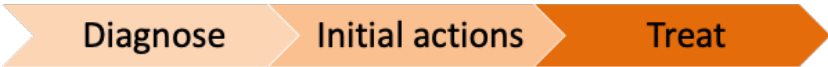
- Start the debrief within 5 minutes of the end of the scenario
- Debriefs should be 2x longer than the simulation
- Be sure to include everyone in the debrief not just the primary responder
- Allow them to link the sim experience to real life occurrences
- Keep it positive, but not hand holding
- Stress behavioral or team skills
- Correct any incorrect medical treatment
- You should be talking "30%" of the time and the participants "70%"
- The facilitators job is to facilitate discussion
- Allow the team to come up with solutions by asking open ended questions,
- Samples of questions to ask based on checklist and learning objectives are included below

Sample Debriefing Questions

(You may not use all these questions in one debrief)

- 1. Have the first responder set the scene and tell everyone in a few sentences what happened initially**
- 2. Calling for help**
 - a. What prompted the team to call for help?
 - b. What help does the team need? How were tasks assigned when help arrived?
- 3. Review communication**
 - a. What information needs to be communicated as new staff arrives?
 - b. Was closed loop communication used? What impact did closed loop communication have on patient care? If closed loop communication was not used, how did that impact patient care?
 - c. How was the plan of care communicated to the team? How was the team made aware of changes in patient status? Was it effective? If not effective, what could be done differently?
 - d. What was communicated well by the team? What would the team communicate differently?
- 4. Leadership questions**
 - a. Who was the leader(s)?
 - b. How was the leader role assumed and communicated?
 - c. If there were two leaders, how did the two leaders communicate with each other? With the other team members?
 - d. How many tasks did the leader have?
 - e. Did the leader role change hands? What prompted the change and how did that change impact the team?
- 5. Anticipating and planning**
 - a. How did a change in patient status impact the plan of care?
 - b. How did the team respond to changes in patient status?
- 6. End the debrief with the question: Lessons learned**
 - a. What did you learn that you will use in your practice?
 - b. Have everyone share their thoughts
- 7. Restate confidentiality assurance**
- 8. Close with gratitude:** "Thank you all for participating in the sim and the discussion. Your time is appreciated."

Acute-onset, Severe Hypertension Checklist



<p>STEP 1: DIAGNOSE</p> <ul style="list-style-type: none"> <input type="checkbox"/> SBP ≥ 160 mm Hg, and/or DBP ≥ 110 mm Hg (either, >15 min) <input type="checkbox"/> Plan treatment options (e.g. drugs) 	<p>STEP 2: CALL FOR HELP</p> <ul style="list-style-type: none"> <input type="checkbox"/> Call for assistance <input type="checkbox"/> Assign nursing roles
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STEP 3: TREAT

- Administer antihypertensive medication (as soon as possible, and within **30 min** of diagnosis)
- Send stat labs: CBC, LFTs, Creatinine, Uric acid, INR, Fibrinogen
- Vitals q5 min
- 2 wide-bore IVs (16-18g)
- Fluid restrict
- Monitor urine output (hourly)
- Monitor FHT
- RECAP**

MEDICATION	LABETALOL (Not if maternal HR < 60 bpm)	HYDRALAZINE	NIFEDIPINE – Immediate release (if no IV access)
Initial dose	Labetalol 20 mg IV bolus	Hydralazine 5-10 mg IV bolus	Nifedipine 10 mg PO
Recheck BP q5 min, and if BP remains elevated, continue down treatment columns	After 10 min; labetalol 40 mg IV bolus After 10 min; labetalol 80 mg IV bolus (+ inform anesthesiologist) After 10 min; hydralazine 10 mg IV bolus	After 20 min; hydralazine 10 mg IV bolus After 20 min; labetalol 20 mg IV bolus (+ inform anesthesiologist) After 10 min; labetalol 40 mg IV bolus	After 20 min; nifedipine 20 mg PO After 20 min; nifedipine 20 mg PO (+ inform anesthesiologist) After 20 min; labetalol 20 mg IV bolus

→ Call **OB Rapid Response** and Consult **MFW/ICU/Internal medicine** if applicable

STEP 4: SEIZURE PROPHYLAXIS

Magnesium sulfate:

- Bolus dose = **4-6 g** IV bolus (over 20 min)
- Maintenance dose = **1-2 g/h** IV infusion

If magnesium sulfate is contraindicated:

- Administer **fosphenytoin 1,250 mg** PE IV infusion (over 10 min, at 125 mg/min)

- Assess deep tendon reflexes
- Auscultate lungs + assess respiratory rate
- Check serum magnesium levels
- Consider doing a **RECAP**

1) Gestational hypertension and preeclampsia. ACOG Practice Bulletin No. 222. American College of Obstetricians and Gynecologists. Obstet Gynecol 2020;135:e237-60
 2) Preeclampsia Toolkit: Improving Health Care Response to Preeclampsia (California Maternal Quality Care Collaborative Toolkit to Transform Maternity Care). 2014

Eclampsia Checklist

Call for help

Initial actions

Treat

STEP 1: CALL FOR HELP

- OB Rapid Response
- Assign nursing roles

STEP 2: PROTECT AIRWAY

- Turn patient to side + slight Trendelenburg
- Support airway (BLS) + suction available
- 100% oxygen via non-rebreather face mask

STEP 3: TREAT

- Vitals q5 min
- 2 wide-bore IVs (16-18g)
- Administer seizure prophylaxis:
 - During or post-seizure:
 - If not on **magnesium sulfate**, administer **6 g IV bolus** (over 20 min)
 - If already on **magnesium sulfate**, administer **2 g IV bolus** (over 3-5 min)
 - Maintenance dose = **1-2 g/h** IV infusion
 - If magnesium sulfate is contraindicated:
 - Administer **fosphenytoin 1,250 mg PE** IV infusion (over 10 min, at 125 mg/min)

- Monitor FHT
 - o OB and the Anesthesiologist to discuss if/when delivery is required
 - o Try and **avoid immediate delivery**, allow time for FHR to return to baseline
 - o Deliver only for **prolonged bradycardia** after termination of seizure

- Administer seizure treatment (if non-terminating):
 - Administer **midazolam 2 mg IV bolus** (or lorazepam 4 mg IV bolus)
 - Anesthesiologists: consider **propofol 20-40 mg IV bolus**
 - If seizure continues, consider:
 - a) **Fosphenytoin 1,250 mg PE** IV infusion (over 10 min, at 125 mg/min)
 - b) Modified rapid sequence induction + intubation

- Only intubate if:
 - o Remains unconscious post-seizure
 - o Non-terminating seizure
 - o Signs of aspiration
 - o Hypoxic

- Administer antihypertensive medication (if SBP \geq 160 and/or DBP \geq 110 mm Hg):

MEDICATION	LABETALOL	HYDRALAZINE	NIFEDIPINE (if no IV access)
Initial dose	Labetalol 20 mg IV bolus	Hydralazine 5-10 mg IV bolus	Nifedipine 10 mg PO
Recheck BP q5 min, and if BP remains elevated, continue down treatment columns	After 10 min; labetalol 40 mg IV bolus After 10 min; labetalol 80 mg IV bolus (+ inform anesthesiologist)	After 20 min; hydralazine 10 mg IV bolus After 20 min; labetalol 20 mg IV bolus (+ inform anesthesiologist)	After 20 min; nifedipine 20 mg PO After 20 min; nifedipine 20 mg PO (+ inform anesthesiologist)
	After 10 min; hydralazine 10 mg IV bolus	After 10 min; labetalol 40 mg IV bolus	After 20 min; labetalol 20 mg IV bolus
→ Consult: MRM/ Anesthesiology/ICU/Internal medicine			

- Send stat labs: CBC, LFTs, Uric acid, INR, Fib
- Fluid restrict
- Consider doing a **RECAP**

1) Gestational hypertension and preeclampsia. ACOG Practice Bulletin No. 222. American College of Obstetricians and Gynecologists. Obstet Gynecol 2020;135:e237-60
 2) Preeclampsia Toolkit: Improving Health Care Response to Preeclampsia (California Maternal Quality Care Collaborative Toolkit to Transform Maternity Care). 2014

CONFIDENTIALITY AGREEMENT

During your participation in training in a simulated medical environment at you will be both an active participant in realistic scenarios and an observer of others immersed in similar situations (either in real time or on videotape). The objective of this training program is to train individuals to better assess and improve their performance in difficult medical situations. It is to be understood that the scenarios to which you and your colleagues will be exposed are designed to exacerbate the likelihood of lapses and errors in performance. Because of these issues you are asked to maintain strict confidentiality regarding both your performance and the performance of others, whether witnessed in real time or on videotape. Failure to maintain confidentiality may result in unwarranted and unfair defamation of character of the participants. This could cause irreparable harm to you and your colleagues and would seriously impair the effectiveness of this simulation-based training program.

While you are free to discuss in general terms the technical and behavioral skills acquired and maintained during training, you are required to maintain strict confidentiality regarding the specific scenarios to which you are both directly and indirectly exposed.

The bottom line: All that takes place in the simulator stays in the simulator.

By signing below, you acknowledge having read and understood this statement and agree to maintain the strictest confidentiality about the performance of individuals and the details of scenarios to which you are exposed.

Signature

Print Name

Date

CONFIDENTIALITY AGREEMENT

During your participation in training in a simulated medical environment at Stanford you will be both an active participant in realistic scenarios and an observer of others immersed in similar situations (either in real time or on videotape). The objective of this training program is to train individuals to better assess and improve their performance in difficult medical situations. It is to be understood that the scenarios to which you and your colleagues will be exposed are designed to exacerbate the likelihood of lapses and errors in performance. Because of these issues, you are asked to maintain strict confidentiality regarding both your performance and the performance of others, whether witnessed in real time or on videotape. Failure to maintain confidentiality may result in unwarranted and unfair defamation of character of the participants. This could cause irreparable harm to you and your colleagues and would seriously impair the effectiveness of this simulation-based training program.

While you are free to discuss in general terms the technical and behavioral skills acquired and maintained during training, you are required to maintain strict confidentiality regarding the specific scenarios to which you are both directly and indirectly exposed. The development of challenging scenarios is extremely labor intensive and any foreknowledge by participants of what is to be presented to them will defeat the purpose of this type of training.

The bottom line: All that takes place in the simulator stays in the simulator.

By signing below, you acknowledge having read and understood this statement and agree to maintain the strictest confidentiality about the performance of individuals and the details of scenarios to which you are exposed.

AUTHORIZATION AND CONSENT TO PHOTOGRAPH AND PUBLISH

The undersigned hereby authorizes the staff of the OBSim program at Stanford University Medical Center to photograph or permit other persons to photograph:

While participating in its training programs, the undersigned agrees that the staff of the may use and permit other persons to use the negatives, prints, videotape or films prepared from such photographs for the purposes and manner as either may deem appropriate. The undersigned agrees the photographs may be used for purposes including, dissemination to the hospital staff, physicians, health professionals, members of the public for educational, treatment, research, scientific, public relations, advertisement, promotional and/or fund-raising purposes, and that such dissemination may be accomplished in any manner. Such use is subject only to the following limitations:

The undersigned has entered into this agreement, in order to assist scientific treatment, education, public relations, promotional and/or fund-raising goals and hereby **waives any right to compensation** for these uses by reason of forgoing authorizations. The undersigned and his or her successors, hereby hold the staff and their successors, harmless from and against any claim for injury or compensation resulting from the activities authorized by this agreement.

The term “photograph” as used in this agreement, shall mean motion picture or still photography in any format, as well as videotape, videodisc and any other mechanical means of recording and reproducing images.

Yes, you may use my video

No, you may not use my video

Date: _____

Signature _____

Print Name _____

Sample Metrics Form for PPH

Metric	Measurement	Comments
Calling for help	Time called: _____ Time arrives: _____	
Calling for help	SBAR (Situation, Background, Assessment, Recommendation) format used. Yes/No	
Nursing roles assigned upon arrival in room	Yes/No	
Fundal massage	Yes/No	
PPH meds	Time requested/ given: ____/____; ____/____; ____/____;	
Vital signs taken every 1-2 min	Yes/No	
Second IV started using a large bore	Yes/No	
PPH Cart	Time requested: Time in room:	
Urinary catheter placed	Yes/No	
Oxygen placed	Yes/No	
Recaps	Number done: ____, ____, ____, ____	
Labs sent	Yes/No	
Blood Products	Time ordered: Time arrive in room: Time first unit hung:	
Uterine balloon	Time requested: Time placement completed:	

Post Course Survey sample

1. I am an: Anesthesiology provider OB provider (CNM/DO/MD) RN OR/OB Tech (circle one)

2. Was the **length of the drill** appropriate? (Please circle)

Yes/No

If No: Too long/Too short

3. Was the **length of the debrief** appropriate? (Please circle)

Yes/No

If No: Too long/Too short

4. After this simulation course, there will be (circle one):

a. No change in my management of PPH (or whatever you simulated that session)

b. A small improvement in my management of PPH

c. A large improvement in my management of PPH

5. What did you learn from the simulation session that you will use in your practice (top 1-3)?

- _____
- _____
- _____

6. Please help us understand what we can do to make it accessible to you and what would prevent you from attending a simulation like this in the future?

a. The sessions are too short/long I would prefer _____ hours

b. The sessions are at the wrong time, a better time would be _____

c. Other suggestions _____

7. What suggestions do you have to make the simulation feel more “real”?

8. Which sim scenarios would you like to do in the future?

Additional optional questions to consider

1. On a scale of 1-10, did the drill help you **improve your communication skills** (includes using closed loop communication, performing a recap, speaking up etc.)?

Circle one (1 = Did not improve, 10 = Improved substantially)

1 2 3 4 5 6 7 8 9 10

2. On a scale of 1-10, did the drill help you become a **better team player** (includes role delegation, anticipating the needs of other team members, problem solving etc.)?

Circle one (1 = No help, 10 = Helped substantially)

1 2 3 4 5 6 7 8 9 10

3. How can we improve the debrief so that it makes a more positive impact on your practice?

Sample of in situ signage for patients



Lucile Packard
Children's Hospital
at Stanford



Please Excuse the Interruption

We are running patient safety drills.

The unit may seem busy and noisy at times, but these safety drills let our teams practice emergency care skills.

Thank you for your understanding

Disculpen la interrupción

Estamos realizando un simulacro de seguridad. Puede ser que a ratos haya mucha actividad y ruido en la unidad, pero estos simulacros permiten que los equipos de atención médica practiquen las destrezas necesarias para dar cuidados de emergencia.

Gracias por su comprensión.

The *Why, Who, What and Where* – a practical approach to initiating or expanding an obstetric and gynecologic simulation program

Introduction

This chapter will provide you with a practical approach to initiating or expanding an obstetric and gynecologic simulation program. The paper will be divided into the “*Why who what and where*” of implementation of a simulation program. This chapter can by no means cover all the various possibilities for the use of simulation but reflects this author’s experience and observations. Talking to others who have gone through this process is invaluable and taking the time to visit and observe in person other simulation programs is time well spent.

The first question that must be answered is:

Why- why do you want to implement a simulation program in your institution? There are a variety of answers depending on your institution. As this is a crucial step, take the time to really consider what is (are) the goal(s) for your program.

Here are some considerations:

Residency training

The July 2016 requirements from the Accreditation Council for Graduate Medical Education (ACGME) for obstetrics and gynecology states “Acceptable simulation includes a range of options from low to high fidelity. The Review Committee does not expect each program to have a simulation center; however, incorporation of simulation in residency education is required.” [1] With this in mind, many residency programs are starting or broadening their simulation programs. The use of simulation for residency training offers a variety of options including but not limited to

- Simulation task training to introduce new skills that are better perfected on a mannequin than in a live person, such as laparoscopic technique or shoulder dystocia maneuvers
- Improving resident performance in often seen events such as postpartum hemorrhage (PPH), stat cesarean deliveries and severe preeclampsia
- The opportunity to expose residents to rare events that they may not have a chance to experience in their 4 years of residency for example maternal cardiac arrest, vaginal breech.

Team training of Labor and Delivery or Postpartum/Ante partum Units

In 2004 the Joint Commission released a sentinel event alert titled *Preventing infant death and injury during delivery*. that stated, “Communication issues topped the list of identified root causes (72 percent)” The Joint commission went on to recommend that organizations:

1. Conduct team training in perinatal areas to teach staff to work together and communicate more

effectively.

2. For high-risk events such as shoulder dystocia, emergency cesarean delivery, maternal hemorrhage, and neonatal resuscitation conduct clinical drills to help staff prepare for when such events actually occur and conduct debriefings to evaluate team performance and identify areas for improvement.” [2]

Following the release of this sentinel event, attention was directed toward the development of training of teams to reduce these communication errors and improve outcomes. This led to the adaptation of crew resource management (CRM) from the aviation field and development by the military of Team Stepps [3,4]. Use of simulation is the perfect setting to introduce, reinforce and practice effective team performance.

Simulation can be a powerful tool to assist in identifying the causes of and lowering of malpractice cases. Data suggests that programs with active simulation programs have been able to decrease their malpractice exposure. [5,6].

Uncovering system errors on your unit / readying a new unit for patient care/planning for a complicated procedure

Simulation can be used to identify either preexisting system errors in your unit [7] or to explore the potential system errors in a new unit before opening for patient care. When the Women and infants Hospital in Rhode Island opened a new NICU, it was 5-fold larger than their previous unit and extended over 2 floors. To accomplish a successful transfer, simulation sessions were scheduled which made possible the correction of problems before the patient move-in date. This endeavor “substantially elevated the perception of the value of simulation within the institution”[8]. In centers that have procedures that require multiple teams of various disciplines to participate, the opportunity to do a “dress rehearsal” can correct vulnerable areas beforehand. As reported by August et al the use of simulation to rehearse a rare and difficult surgical procedure EXIT to ECMO was successful because simulation enabled the interdisciplinary teams (MFM, pediatric surgeon, anesthesiologist, pediatric cardiology, nursing and pediatric perfusion specialists) to identify and correct potential problems before the surgery [9]. These uses of simulation can produce the most concrete examples of the value of simulation and aid to garner support from both the staff and hospital administration.

Nursing education

Simulation drills are a highly effective modality to introduce new policies or standard algorithms to the unit. New nurses to the unit or travelers are especially important to acquaint in a simulation fashion to the rapid workflow of an acute unit such as labor and delivery [10,11].

Once the **WHY** has been answered the **WHO** can now be identified. The **WHO** is multilayered. Who are your learners, who will be your simulation team and who in administration will be

supporting your program?

Who (learners)

Residency training:

Introduction of simulation for residency training should start early in the 4 year curriculum. Many institutions have put in place with great success “*Intern Boot Camp*”. This intensive education program given at the start of intern year has been invaluable for allowing the interns to come to the ward prepared and ready to be truly helpful members of the team. Simulation is incorporated in many of these programs and in Israel; they now have a national mandate for all programs to provide a simulation based pre internship workshop [12,13]. Although the intern boot camp is most often done as a resident only training, an effort should be made later in residency not to remain in the silo of resident-only training. Advancing the resident simulation experience to include multidisciplinary or intraprofessional team training is crucial.

Team training – Multidisciplinary or intraprofessional simulation training is a more complicated and time-consuming endeavor, yet the rewards of improving the entire team’s performance cannot be understated. Team training should be envisioned as including not only all medical providers but all personnel who work on the unit – scrub techs, clerks etc.

Barriers to having all disciplines present are numerous. Possible solutions to personnel attendance include

- MD/DO/CNM attendance -Various institutions have successfully involved theirattending providers using the following approaches:
 - Providing financial compensation for participation
 - Participants receive discount on the malpractice premiums for yearlyparticipation
 - Providing MOC 4 or CME credit for participation
 - Require provider attendance to maintain hospital privileges
- Resident attendance
 - Resident involvement can be done as a mandatory attendance during their protected teaching time
 - To maximize learning, each simulation should include no more than 3 residents at a time. This will allow each resident to take an active role andbe in the “hot seat” as the primary responder.
- Nurse Participation
 - Require RN attendance
 - Providing CEU credit
 - Transitioning the present nursing education program to be a simulation-based education program

Who (simulation team members)

Residency training

Providing resident only simulation training will be easy to schedule as it can be done during resident protected teaching time. Your faculty should include not only the core simulation team but also specific content experts, for example when teaching Fundamentals in Laparoscopic Surgery (FLS) enlist your minimal invasive surgery (MIS/MIGS) faculty as additional faculty trainers.

Team training

When the goal is team training, both the planning sessions and the simulation sessions can be a challenge to schedule but worth the effort. Ensure that a representative from each discipline who works on the unit (OB, Anesthesia, Nursing, OR staff, Pediatrics, Nurse educator/Management) are involved with the discussion and decision of the scenario chosen. Allowing creation of the learning objectives to be done jointly will ensure that each discipline has relevant teaching points for their specialty. When possible, have a member from each discipline available for the debriefing process providing subject matter expertise. Example of learning objectives created for full team simulation scenario [Table 1]

Uncovering system errors on your unit / readying a new unit for patient care/planning for a complicated procedure will be of the greatest benefit if all relevant team members are present. This may include nonmedical personnel – clerks who make the emergency call or off unit personnel such as the blood bank or the hospital code team if they are part of the simulation scenario.

Who (engaging the institution)

Garnering long-term support for simulation program requires an appreciation for the institutions' priorities. The following parties have a vested interest in the simulation program for distinct reasons and should be engaged early in the planning process

Nursing administration

The priority for nursing will often be nurse education and employee satisfaction. Most hospitals have active nursing education departments. Simulation programs should actively engage the yearly learning objectives of the hospital's nursing administration as part of the scenario. Ensuring that a nursing educator or manager is at the planning meeting will facilitate this goal.

Risk management

Decreasing medical claims through improved clinical practice and patient - provider communication is one of the major priorities of risk management. Invite a representative from risk management to the simulation debrief and allow them to educate your providers on proper documentation and optimal communication techniques with patients when untoward events have occurred. Reviewing active or past malpractice cases, root cause analysis (RCA) or sentinel events, risk management can identify needed areas for improvement specific for your

organization. These issues can then be incorporated into the simulation scenario.

Patient safety/Quality improvement committee

Identification and correction of system errors is a crucial goal of all QI programs. Simulation is an excellent methodology to uncover system errors in a very tangible way. Having video to show a suboptimal workflow or a glaring system error is a powerful driver for change. Spending time in the debriefing sessions to exclusively discuss system errors as seen by the front-line providers is invaluable. To maximize effectiveness a system must be in place to engage the QI committee so that the changes uncovered in simulation can be addressed and corrected.

What (curriculum/equipment)

What you will be simulating depends on your goals as previously determined

Residency training

If the goal is primarily residency training of procedures and techniques, there are many tools at your disposal for task training [14].

Team training

Determining the curriculum can be accomplished by gathering local data: sentinel events RCAs/near misses. Also including staff input as what issues they can identify on the unit can allow you to create a tailored library of scenarios that can be used to ensure the teams are better prepared for the next such event. If local data is not available, using national data for malpractice suits can be used effectively.

Equipment

What equipment is needed for the simulation will be determined by 2 factors, the learning objectives of the scenario and the site of the simulation. For example, if one of the learning objectives is to highlight teamwork, communication, and concerns when performing general anesthesia, having a full body model would be crucial to allow the anesthesiologist to be perform intubation.

The site of the scenario will also be a determining factor for the equipment used. If the course is performed in a simulation lab, heavy computer driven full body mannequins that do not need to be moved can be used. However, if the simulation site is labor and delivery, lightweight non-computer run mannequins or task training models with standardized patients that are easily movable are best and can easily be adapted.

Uncovering system errors on your unit / readying a new unit for patient care/planning for a complicated procedure

Curriculum and equipment are dependent on the stated goal. Simulation has the potential to both

uncover present latent system errors or to identify potential difficulties. Using simulation allows you to determine the optimal crisis management for your unit.

During a crisis, the usual routine cannot be examined, nor can there be a randomized trial during an emergency due to ethical and logistic restraints. Yet using simulation to create and review the process can be revealing. Lipman et al performed a simulation study that examined where was the best location to perform a perimortem cesarean delivery on their unit. Teams were given the simulation of a maternal code in the LDR and were randomized to either perform the cesarean delivery in the OR or in the LDR. All teams were aware of the desired delivery within 5 minutes of the arrest. The simulations were timed, and the team discussed and analyzed the pros and cons of each location in the debrief. Despite the lack of room in the LDR for all the necessary staff (NICU, Code team, surgeons) the effects of moving to the OR - which was only across the hall revealed providers performed suboptimal CPR when moving to the OR and there was a consistent delay in actual delivery with the median times of 7:53 minutes with the move to the OR In contrast to the median time of delivery of 4:25 min if performed in the LDR . Therefore, the simulation allowed that OB unit to agree that any perimortem delivery should be done in the LDR [15].

Where: Simulation lab versus in situ versus classroom versus tabletop

The choice of where to do the simulation is dependent on

1. Goal of the simulation
2. Time allotted for the participants
3. Availability of the site

Simulation labs offer the opportunity to have undisturbed time away from the unit. Simulation centers are the optimal site to learn new information that require in depth discussion i.e., ACLS, NRP or tasks that are time intensive for clean-up such as demonstrating quantitative blood loss. The limitations of a simulation center include the time needed to travel to the center, the lack of verisimilitude of the environment, which makes it difficult for some participants to optimize their learning. In addition, system errors cannot be identified.

In situ or labor and delivery simulations are at the vicissitudes of the workload of the unit and the potential for not having a room available is very real. However, working in the real environment allows participants to incorporate more easily what they learn in simulation into their daily routine. System error identification is an easy by product of in situ drills. To mitigate the consequence of not being able to do an in-situ simulation an alternative spot close to the unit should be identified as a backup site and equipment to turn a waiting room or classroom into an “OR” available.

Classrooms can easily be used for task training simulations and tabletop or “talking simulations”. Tabletop simulations allow an opportunity to discuss complex patient scenarios and talking through what the providers would do allowing for valuable educational moments

Other considerations are:

Creation of a safe zone when doing simulation

It is paramount for learning that your participants feel secure in the knowledge that they will not be judged during the simulation and that no reporting of their performance is planned. Rudolph et al explains that creating a safe environment for simulation and debriefing “creates a setting where learners can practice new or familiar skills without the burden of feeling that they will be shamed, humiliated, or belittled” [16]. There are a variety of ways to accomplish this important goal including a briefing that includes setting expectations and assuring confidentiality. You can also consider having all participants sign a confidentiality form prior to participating and reiterating that “what happens in simulation, stays in simulation”. This will all help to maximize learning.

Do you want to record and use video during the debrief?

Video playback can be a compelling teaching tool. Learners can more easily see their effectiveness as communicators. Viewing team skills with the use of video playback allows a more realistic assessment of performance. However, for some learners, video can be a distracting and even a disquieting experience. Learners must be reassured that the video will be kept confidential or even destroyed after the viewing. The use of video playback should be used judiciously and wisely.

Is there time to offer a task-training portion before the full simulation?

Combining a short pre simulation period of task training i.e., learning how to do a b-lynch or place a uterine tamponade balloon before a full team training for postpartum hemorrhage, allows the participants to practice a skill before using it in a full simulation. This format can be a powerful learning experience.

Should the “in situ” simulations be announced or unannounced?

Although “mock codes” have been used for years on medical wards, and unannounced drills guarantee medical personnel are present to participate, starting a new simulation program with unannounced codes may create resistance. Introducing simulation initially in a relaxed planned format will have better long-term acceptance. Unannounced drills if desired can be introduced in the future

Summary

In summary, a well-planned and thoughtful introduction will allow simulation to become an

integral and valued component of a comprehensive patient safety program. Begin with defining **why** you are embarking on a simulation program. Is it for residency training only, team training or to improve the workflow on your unit? Why is followed by the *who, what and where*. **Who** will be your learners, and who do you need on your simulation team? Understanding **who** are the stakeholders and including them early in the planning is crucial for sustainability of the program. **What** refers to the curriculum and the equipment needed to accomplish your learning goals. Customizing your program for the unique gaps experienced in your institution will create buy in from your learners and team members. Curriculum should include the concept of a safe zone allowing learners to practice difficult and new skills without judgment. **Where** can vary between a simulation lab, or “in situ” on the ward or in a classroom for a tabletop simulation. “In situ” setting for simulation offers the benefit of reviewing the workflow of the unit allowing latent system errors to be revealed. Simulation is of proven benefit and should be incorporated for teaching, team training and improving care delivered in any institution.

Table 1

Example Clinical Question, Learning Objectives, and Metric for Obstetric Simulation
<p><i>Clinical Question:</i></p> <ul style="list-style-type: none">• What are the tasks required of each subspecialty for timely, efficient, and safe transfer of a patient from the labor room to the operating room for a STAT cesarean delivery? <p><i>Nursing Learning Objectives:</i></p> <ul style="list-style-type: none">• Demonstrate verbal acknowledgement of obstetrician's decision for STAT cesarean• Demonstrate clear communication to charge nurse about STAT cesarean so they can notify anesthesiologist of emergency and have technicians prepare operating room• Demonstrate rapid preparation of patient lines (fetal monitors, intravenous lines, foley catheter, epidural catheter, etc.) and physically transfer patient without delay <p><i>Obstetrics Learning Objectives:</i></p> <ul style="list-style-type: none">• Demonstrate clear communication of decision for STAT cesarean• Demonstrate compassionate communication with family member without delaying transfer• Assist bedside nurse with physical transport to operating room <p><i>Anesthesia Learning Objectives:</i></p> <ul style="list-style-type: none">• Evaluate patient stability and support airway, breathing, circulation as needed for transport• Demonstrate rapid preparation of operating room for STAT cesarean including STAT general anesthesia medications and airway management equipment or STAT spinal in appropriate• Utilizes all available resources including other anesthesiologists and anesthesia technician <p><i>Technician Learning Objectives:</i></p> <ul style="list-style-type: none">• Anesthesia technician demonstrates rapid preparation of operating room including checking emergency and advanced airway equipment and readiness to assist anesthesiologist with moving patient onto table, attaching monitors, and starting pre-oxygenation or other tasks as required• Operating room technician demonstrates rapid preparation of operating room equipment <p><i>Team Learning Objective:</i></p> <ul style="list-style-type: none">• Team demonstrates efficient, rapid, and safe transfer of patient from labor room to operating room for STAT cesarean <p><i>Metrics:</i></p> <ul style="list-style-type: none">• How many seconds elapse between decision for STAT cesarean and arrival in operating room?• What barriers exist and how long of a delay do they cause when transferring patient from labor room to operating room for STAT cesarean?

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Sample patient script for PPH scenario:

Goal:

Engage the participants as a patient would in real life so team members can draw on their own experiences with patients who have experienced a PPH.

These are suggested dialogues:

Beginning of scenario

Setting: the patient is chatting with the participants. She feels well but is worried because they took the baby to the nursery

Suggested dialogue :

- Is the baby, ok? What will they do to her in the nursery?
- When can I see her?

As the doc asks the patient to push the patient should

- make pushing sounds
- ask “Is it out?”

As bleeding increases

- “I am feeling a lot of liquid down there - is everything ok?”
- At 1200 cc blood loss say “I don’t feel well. is this normal ?”
- At 1500 cc say “I feel really dizzy, I feel like I am going to faint”
- At 2200 cc patient is not talking in full sentences, moans and are responsive. ***Do not let them think the patient is unconscious***

As blood pressure comes back up

- Start to use full sentences again “What is happening?”
- As they explain what is happening say “Am I going to be, OK?”

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