

An Introduction to the Management of Labour and Delivery - A Simulation-Based Obstetrics Workshop for Medical Students

Instructor's Guide

Resource Files:

Obstetrics Simulation Workshop - Student Handout.docx
Obstetrics Simulation Workshop - PrePost.doc
Obstetrics Simulation Workshop – Test Answers.doc
Obstetrics Simulation Workshop – Full Curriculum doc.docx
Obstetrics Simulation Workshop – Instructors Guide.docx

Use of Resource Files:

The full curriculum document is a complete description of the workshop including needs assessment, rationale, and explicit instructions for implementation; intended as a resource for the director of the workshop

The pre- and post-test is intended as a form of evaluation that could be modified for your centre. The answers are addressed in the Test Answers document.

The Student Handout is intended to be given to the students after the session so that they do not feel compelled to take notes during the session.

Overall Goals of the Curriculum

The ultimate goal of the program is to expose the new clerkship students to the fundamentals of obstetrics in an interactive and hands-on manner, so as to maximize interest, knowledge retention, and skill development. The main points covered will be:

Objectives

Students participating in this simulation session will be able to:

- A. Take a focused history from an obstetrical patient presenting in labour
- B. Perform a focused physical exam on an obstetrical patient in labour
- C. Synthesize the findings on history and physical so as to confirm or rule-out a diagnosis of labour
- D. Define labour, and all of its stages,
- E. Decide whether or not to admit a patient in labour to the case room
- F. Take a focused history from a patient with hypertension, related to the diagnosis of pre-eclampsia
- G. Perform a focused physical exam on a patient with suspected pre-eclampsia
- H. Order appropriate investigations for a patient with pre-eclampsia
- I. Describe the options available to augment labour (e.g., artificial rupture of the membranes, oxytocin infusion)

- J. Describe the non-pharmacologic and pharmacologic pain control options available to patients in labour and when they are appropriate (e.g., narcotics, nitrous oxide, epidural, massage, Jacuzzi, birthing ball)
- K. Demonstrate the technique of artificial rupture of membranes and placement of an internal fetal monitor
- L. Interpret the fetal heart rate monitor tracing, including baseline, variability, accelerations and decelerations
- M. Discuss the management of the second stage of labour
- N. Demonstrate the proper technique of spontaneous vaginal delivery and management of the third stage of labour
- O. Describe the indications and criteria for operative vaginal delivery, and be able to demonstrate the technique of forceps or vacuum delivery on a mannequin
- P. Demonstrate the maneuvers required to manage shoulder dystocia
- Q. Describe the indications for cesarean section

Educational Strategies

Workshop Schedule

This workshop takes 2-2.5 hours to implement and is best run with a maximum of 12 students at a time, so as to maximize hands-on experience.

Teaching Methods

The session will begin with introductory remarks about the goal and objectives of the session. The students will complete their pre-test and then come into the simulation room and take their seats around the mannequin, Noelle. Noelle will be preloaded with a baby and dilated to 2-3 cm. The case will then be presented to the students:

"A 25 year old woman presents to the OAU stating that she thinks she is in labour. Take a focused history from this patient."

The students will ask questions in a round-table format, and will be answered by the manikin. The relevance of each question will be discussed, and clinical ramifications explored.

Patient History (to be provided as asked by the students)

- She is gravida 1, para 0, 40 weeks plus 3 days
- No medical problems, no medications, and no allergies
- Uneventful pregnancy, no GDM, no HTN, normal ultrasounds
- No bleeding, no ROM, fetal movement present
- Contracting q 4-5 minutes x 30 seconds over last 2 hours
- Lives 15 minutes from the hospital
- She was examined in Dr. Posner's office yesterday and was 1 cm dilated; he was unable to strip the membranes

What is the next step in the evaluation of the patient to decide on whether she should be admitted to a case room?

Elements of the physical exam relevant to the obstetrical patient should be overviewed. Students should be given the opportunity to examine her and decide on her dilatation (2 cm). Students are asked whether they feel that she should be admitted, and discussion ensues. Topics for consideration could include patient vitals, how far patient lives from the hospital, patient anxiety, fetal well-being, etc.

Instructor should review FHR interpretation with students, including samples of abnormal tracings and their possible etiology (e.g., placental insufficiency, cord compression)

Physical Exam

- 2 cm dilated
- FHR reactive/normal tracing

Patient is sent walking and returns for examination in two hours.

Students are given a second opportunity to examine Noelle, who is now 3-4 cm and contracting q 3-4 minutes x 45-60 seconds.

Should Noelle be admitted now?

Students should arrive at the decision that the patient should be admitted.

Noelle's nurse comments that her BP is 130/90. Is this pre-eclampsia or anxiety?

Students should be given the opportunity to ask Noelle questions relevant to the diagnosis of pre-eclampsia.

History Findings

- No headache
- No scotoma or other changes in vision
- No epigastric or RUQ pain
- Normal swelling

What signs of pre-eclampsia may be noted on a physical exam? What laboratory investigations should be ordered for the hypertensive pregnant patient?

Physical Exam

- Normal swelling
- Normal reflexes

Laboratory Investigations

- Urine dip normal
- Blood work is normal

When should we exam the patient again?

Instructor should discuss the frequency of patient examinations.

Noelle asks the students, "What can you give me for the pain?!?!?!?"

Ask the students about the various non-pharmacologic and pharmacologic pain control options available to patients in labour and when they are indicated (e.g., narcotics, nitrous oxide, epidural, massage, Jacuzzi, birthing ball). The instructor may wish to extend the conversation to include alternative birthing positions and locations, and the legal restrictions placed on obstetricians working in hospitals if relevant.

Noelle opts to have an epidural, but it is then noted that her labour progress has slowed. What options might you consider to augment her labour if she fails to progress?

Instructor should lead a discussion on the methods for augmenting labour, including the rupture of membranes and oxytocin administration. Students may be shown the technique for artificial rupture of membranes and have the opportunity to practice hand movements on a balloon in the pelvis. Instructor should demonstrate the technique for the placements of an internal monitor, with the instrument passed around for students to examine.

Noelle is fully dilated. When should she start pushing?

Students should be lead through a discussion on the management of the second stage of labour, including indications for operative vaginal delivery. If possible, it is helpful to have a sample of forceps and/or vacuum to pass around for students to look at.

After two hours of pushing, you are called to the delivery.

From start to finish, the steps of a spontaneous vaginal delivery are reviewed, from the time you arrive in the room.

- Put on gloves
- Set-up tray
- +/- support perineum
- Control the head
- Watch for restitution
- Check for cord
- Deliver anterior shoulder
- Deliver posterior shoulder
- Baby onto bed or onto mom
- Clamp and cut cord
- Cord samples
- Place green towel on mom
- Support uterus and apply gentle traction on cord
- Deliver placenta
- Administer oxytocin (or with anterior shoulder)

- Check placenta
- Check lacerations
- Repair lacerations (+/- local anesthetic)
- Check uterine fundus one last time
- Clean up

Once the instructor has demonstrated the steps to a vaginal delivery, students should be given the opportunity to practice. It is helpful if the instructor is able to provide one-on-one guidance for each student as they practice. After the students have had sufficient time to practice, the instructor may discuss shoulder dystocia and its management techniques (e.g., McRobert's, Corkscrew, Post Arm). If time permits, the demonstration of an operative vaginal delivery could be performed. Briefly, the indications for cesarean section should be overviewed.

Materials Necessary for Workshop

Noelle® (Gaumard) or SimMom™ (Limbs & Things) simulator (or reasonable facsimile)*, loaded with baby
 Tablet PCs for Noelle or your delivery simulator
 Monitors for mom and fetal monitor for fetus
 Chairs for students in simulation room
 Gloves
 Ventouse
 Forceps
 ARM hook
 Internal monitor (scalp clip)
 Stool for McRobert's maneuver
 Baby blankets
 White board and dry markers (instructor preference)
 Delivery tray used in your institution
 Standard board with cervical dilation for comparison

*See *Modifying the Workshop* section for suggestions on how to implement this workshop without a high-fidelity manikin

Evaluation

The effectiveness of the session will be evaluated using the comparison of the pre- and post-tests. The students' attitudes towards the session will be evaluated using the standard evaluation form used by the Faculty of Medicine.

Recommendations to the Instructor

The success of this workshop as a teaching tool during the third year Obstetrics and Gynecology rotation has led to its continued use in subsequent years at the University of Ottawa. The following are recommendations based on student feedback that the developers feel warrant consideration in future delivery of this workshop, and in the development and implementation of future simulation workshops. Additionally provided is positive feedback from students about aspects of the simulation that they felt were effective teaching tools. We would encourage instructors to include their own measure of student feedback following the workshop, whether formal or informal, to determine whether the simulation had met/not met student expectations, its strengths, and how it could be

improved in the future. Lastly, we have included a list of topics that instructors may choose to incorporate into their workshop, as either simulation or didactic points, as time allows.

Areas for Improvement

Development of a handout or summary

- Many students identified that having a handout provided at the end of the workshop, whether in powerpoint or as a word document, would have been valuable. Students indicated that the set-up of the simulation (i.e., no desks) did not facilitate individual note-taking (nor was this expected by the instructor) and felt that having something to take away from the workshop would have been a valuable tool to reinforce and consolidate their recent learning, hence this was created.
- Other relevant information could be included in this handout, including a list of learning objective, management algorithms specific to the learning centre, drug formulary information, recent publication in obstetrics, and OSCE tips

Timing of the workshop in the curriculum

- Some students that began their 12-week Surgery and Obstetrics/Gynecology block with surgery expressed concerns that the workshop came too early, as it took place on the first academic day in the block. Similarly, some students that began the 12-week block in the labour and delivery component of Obstetrics and Gynecology indicated that it would have been more beneficial to have the workshop prior to their time on the labour and delivery floor. Given the current clerkship curriculum at the University of Ottawa, it is impossible to change the timing of the workshop to address these concerns, however it may be helpful for others to consider the timing of the workshop such that the maximum number of students benefit.

Including tips/pointers on patient communication

- In addition to teaching the students specific techniques, the instructor should take care to share what they say to patients during a particular exam or vaginal delivery. This could be accomplished by having the instructor demonstrate a technique on the manikin as if they were performing the technique on a human patient. Similarly, students could be briefed on phrases that should not be used in front of the patient (e.g., "fetal distress") and how to explain medical issues (e.g., pre-eclampsia, risks of epidural analgesic) in lay terms.

Expanding on the Workshop

- Assessing other components of cervical change in addition to dilation (e.g., effacement, station, position)
- Induction of labour\cervical ripening (e.g., methods, indications)
- Determining baby's position (Leopold's maneuvers, head position using fontanelles)
- Non-surgical management of fetal malpresentation (e.g., manual rotation, maternal positioning, breech delivery)

Modifying the Workshop

For those institutions that do not have access to a high-fidelity obstetrical manikin like Noelle® or SimMom™, there are several alternatives that would still allow for the implementation of this curriculum into an OBGYN or Family Medicine clerkship rotation. These include, but are certainly not limited to, the use of standardized patients, pelvic models, or both as a hybrid patient.

The use of standardized patients (i.e., hired or volunteer community members trained to simulate patient encounters) is common in undergraduate medical curricula. For this simulation, the ideal standardized patient would be a woman at some stage of pregnancy. While some aspects of the module could not be applied (e.g., assessing cervical dilation, vaginal delivery), less invasive exams could be practiced (e.g., fundal height, Leopold's maneuvers). While the use of non-pregnant standardized patient would allow for less aspects of the physical examination to be demonstrated in a realistic manner, they could easily be incorporated into the curriculum. For example, a standard patient provides students an opportunity to practice communication skills and history taking, as well as an opportunity to obtain valuable feedback from both observers and the standardized patient.

Currently, obstetric simulators range from part-task trainers to high-fidelity mannequins (for a comprehensive list of obstetric simulators and features, please refer to Gardner & Raemer, 2008, p105). Obstetric simulators vary in their capabilities, even among high-fidelity models. While this workshop was developed with capabilities of Noelle® in mind, centres with other high-fidelity simulators should be able to adapt this workshop to their particular mannequin with minimal difficulty provided the simulator is equipped with a motor capable of expelling a model fetus.

In the absence of a high-fidelity mannequin, institutions might consider use of pelvic models to simulate more sensitive aspects of the workshop. Pelvic models are often used to teach medical students skills involved in the gynecologic exam, including Pap testing and the bimanual exam. While they would be less realistic in their simulation of the stages of labour, they would still provide students and opportunity to practice the technique of a vaginal delivery. Instructors might also consider a hybrid approach and have a standardized patient lying with a pelvic model between their knees so that students can practice simultaneous patient communication and hands-on technique. The best hybrid option would incorporate a standardized patient and a part-task trainer birthing pelvis.

Unfortunately the most realistic obstetrical simulation is also the most expensive option. However with some creativity, instructors should be able modify this workshop using the resources available to them so that it can be incorporated it into an existing curriculum.