

**Title:**

Sepsis in a Postpartum Patient - A Simulation Scenario for Interprofessional Education

**Target Audience:**

Medical Students (third and fourth year), Nursing Students (senior level), Physical Therapy Students (any year), Occupational Therapy Students (any year), Respiratory Therapy Students (senior level), Physician Assistant Students (any year)

**Learning Objectives:**

1. Identify roles and responsibilities during a high acuity patient scenario.
2. Collaborate with the interdisciplinary healthcare team using TeamSTEPPS™ tools.
3. Appropriately manage the care of a decompensating patient.
4. Recognize the importance of teamwork and communication in healthcare in improving patient safety.

**Learner Preparation:**

Prior to the simulation experience, participants engage in a faculty-led session that introduces them to other healthcare professions, the importance of teamwork and communication in improving healthcare quality and safety, and the concepts of TeamSTEPPS™ (teamwork and communication).

**Beginning Exercise:**

The goal of this exercise is to promote an awareness and understanding of the role and responsibilities of other healthcare team members. This section begins by asking students to list what they know about the other health professions on flip charts or white boards around the classroom. Information may include, the length of academic training, the types of clinical experiences they have, or their “image” of the other profession (i.e. caring, mean, arrogant). Participants may add information to any profession other than their own. The session continues with the participants returning to small, interdisciplinary groups and discussing their own profession with their colleagues. Participants use a form provided via email prior to class to develop “talking points” about their profession.

**Second Exercise:**

The goal of this exercise is to demonstrate the importance of teamwork and communication. Each person is provided a copy of a short story (4-5 sentences) that describes a situation involving a number of people. After reading the short story, each participant is provided a short quiz, which is taken individually. After recording their individual answers, each group must discuss their individual answers and reach a group consensus. The participants discover the various methods of reaching a group answer, the importance of each person’s voice in reaching an answer, and other teamwork and communication concepts during the debriefing of this exercise.

**Third Exercise:**

The goal of this exercise is to translate the importance of teamwork and communication out of the theoretical realm and into the practical environment. Each group reads a short newspaper articles about medical mistakes. The medical mistake articles are taken from well-known cases across the country and include the error that occurred, why it occurred, and what was done since the error to improve care.

**Fourth Exercise:**

The goal of this exercise is for participants to recognize barriers to patient safety and high quality care. This exercise begins by showing participants a short video clip (non-healthcare related. i.e. FAA re-enactment of Eastern Airlines Flight 401) that demonstrates some common reasons errors may occur. Participants then develop a list of barriers to safe patient care, taken from the video and from their clinical experiences. The answers should include a hierarchical command structure, ineffective communication, task fixation, and poor communication.

**Fifth Exercise:**

The goal of this exercise is to recognize and use the TeamSTEPPS™ concepts of leadership, communication, mutual support, and shared mental models to solve a healthcare scenario that may lead to patient harm. Each interdisciplinary group of participants prepares a short verbal case study that depicts a healthcare incident involving a previously identified barrier(s) to patient safety. Each case is then read aloud so the other groups can attempt to solve the case, using the previously discussed TeamSTEPPS™ tools.

**Sixth Exercise:**

Participants are presented with a simulation scenario during which, they need to effectively manage the care of a patient while using the concepts previously learned.

Orientation to the environment, equipment, and high fidelity manikin:

- How to interact with the environment  
Location of:
  - Basic hospital supplies: gloves, hand sanitizer, isolation gowns, water pitcher, cups, telephone and how to call for additional help/supplies, the medication cart, and the health record
- How to interact with the manikin
  - Including history taking and physical assessment
  - Auscultation of heart, lung, and abdominal sounds
  - Palpate pulses, including quality and recognizing they may change if the patient becomes hypotensive
- Skills that may be performed
  - IV cannulation
  - Indwelling catheter insertion

- Intubation
- Vital signs on the manikin
- Other features
  - Sweating and bleeding options
  - Seizures
  - Pupillary reaction
  - Temperature assessment both by the monitor and tactile sensation

**Roles/Actors:**

A team of providers is necessary for this case to be successful. The team must be comprised of at least 4 students. At minimum 2 nursing and 2 “provider level” students (medical student or PA student) are required. Given this minimum requirement, the role of physical therapist and/or respiratory therapist can be played by an actor/“confederate”, although it was designed and implemented with students in these roles.

*RN learner role:* Nursing student x 2

*Provider learner role:* Medical student (at minimum 1, maximum 2)

*PA learner role:* PA student (if available) – can be replaced by medical student

*RT role:* Respiratory therapy student (if available) – can be replaced by medical student or actor/“confederate”

*PT or OT role:* PT or OT student (if available) – can be played by actor/“confederate”.

**Scenario Background and Instructor Notes for Faculty:**

This scenario is designed to allow multiple providers to interact and determine an appropriate course of action for this patient. The patient, a 29 year-old female, is post-op day 2 after having a C-Section. The patient has allergies to “penicillin and sulfa.” The patient is receiving physical/occupation therapy due to her history of multiple sclerosis. The scenario that develops leads to a patient suffering from sepsis secondary to operative delivery.

The scenario begins with a physical therapy, occupational therapy, or a nursing student reviewing the chart of the patient they are about to encounter. (Authors note: We implemented this scenario both with 1 student entering the room by themselves and pairing a PT/OT student with a nursing student. We found little difference in the students experience with this change. However, sometimes students felt more comfortable having someone to rely upon for assistance, although having this support may have delayed their request for additional assistance). The student is summoned into the room by the patient inquiring about “her daily exercises.” The remaining team members (nursing students and medical students) are initially kept isolated, away from the simulation and observation areas, so they are not exposed to the clinical case before being called for. Upon entering the room to provide range of motion exercises for the patient, the patient states, “I’ll try, but I really don’t feel well.” The patient’s monitor will display the vital signs, including temperature, which shows the patient to be febrile. The patient will state, “I feel warm, especially my back and my neck.” The patient will continue to express

their feeling of “not feeling well” and eventually state she is lightheaded and feeling very weak. If the students do not assess her abdomen, she complains of stomach pain, which reveals a red, inflamed wound on her lower abdomen. If a fundal exam is performed, students are advised that the fundus is firm, with no rebound tenderness, and is located midline 2cm below the umbilicus (a normal exam). This helps rule out uterine causes of the presenting problem.

### **Scenario Background for Learners: In chart**

<i>HPI:</i>	A 29 year-old female was admitted to the L&D unit 2 days ago for operative delivery. A baby boy was delivered without complications and is currently in the nursery.
<i>PMHx:</i>	Multiple sclerosis
<i>PSHx:</i>	C-Section
<i>Meds:</i>	Pre-natal vitamins (Avonex before pregnancy)
<i>Allergies:</i>	Penicillin and sulfa
<i>Alcohol/drugs/tobacco:</i>	Denies
<i>Social Hx:</i>	Married, lives with husband and young child – 2 years old

The above information is located in a chart along with other information (both pertinent and distracting). This other information should include, a transfer note to post-partum, nursing shift assessments (for the shifts after delivery), vital signs flowsheet, which can show a gradual trending of vital signs, leading to the last temperature recorded 7 hours prior as HR 108, B/P 116/70, RR 18, SpO2 97%, and temperature 99.0F.

### **Optimal Management Pathway:**

The PT/OT/RN first in the room will need to:

- Identify that the patient is in distress
- Assess the patient’s condition (verbal history)
- Assess the patient’s physical condition (lung sounds, skin assessment)
- Request additional assistance (other team members sent in when help is requested)
- Handoff patient care to arriving team
- Communicate effectively with other team members by using SBAR
- Communicate effectively with the patient by using clear, concise language
- Assist responding team to effectively manage the decompensating patient

### **The arriving team members will need to:**

- Identify roles and responsibilities
- Identify a team leader
- Communicate effectively with the provider(s) already in the room
- Assess the patient’s condition (verbally and physically)
- Identify the cause of the patient’s current condition
- Implement appropriate treatments
  - Oxygen via non-rebreather at 8-10 LPM, IV fluid resuscitation, antibiotic (Gentamycin, Clindamycin, Vancomycin) treatment, antipyretic (Tylenol)

- Communicate effectively with the patient
- Advise the patient of the course of treatment

If the learners identify the cause of the patient's condition (sepsis) and implement care via the optimal pathway, the vital signs and patient status will improve.

**Potential Complication Pathways:**

If the learners do not follow the optimal management pathway, the patient status will continue to deteriorate. The individual playing the role of the patient will try to direct the participants to identify the cause of the signs and symptoms through continuing to state she is hot and lightheaded and that her stomach hurts. Eventually, the ICU provider (a confederate) can come and receive handoff from the team managing the patient before transferring the patient to the ICU, if the learners are unsuccessful in their management. Potential complications also include not identifying the allergies and/or ordering inappropriate IV antibiotics. If an antibiotic is ordered that is contraindicated, the "pharmacy" should catch the error and phone the provider to advise of a potential allergy.

**Equipment:**

High fidelity manikin – In this particular scenario the manikin has been moulaged by placing a 6-inch incision on the lower abdomen. Around the incision, the area is made to look red and inflamed.

Patient monitor – with temperature displayed

IV fluid – Normal saline

IV medications – IV bags with patient and drug name on them, available from "Pharmacy" or located in the simulation environment in a medication cart.

ID bracelet

Phone

Gloves

Hand Sanitizer

Diaphoresis – spray bottle or manikin controlled

Febrile – we used a large chemical heating pad placed under the sheet to simulate a febrile patient

Oxygen delivery devices – nasal cannula, non-rebreather, BVM, intubation equipment

Patient Chart

Admission Sheet

MAR

Physician Order Sheet

Delivery Record

Transfer Reports (Delivery to Postpartum)

## Initial presentation of patient

HR 120 sinus tachycardia, B/P 100/60, RR 20, SpO<sub>2</sub> 92%, Temp 101.4F, warm, diaphoretic

No  
treatment  
given

BP = 90/50  
HR = 130  
SpO<sub>2</sub> = 85%  
Increased  
difficulty  
breathing,  
agitation,  
complaints of  
abdominal pain,  
lightheadedness,  
lethargy

O<sub>2</sub> Only

BP = 90/50  
HR = 125  
RR = 12  
SpO<sub>2</sub> = 93%  
Continues  
complaining of  
not feeling  
well, and  
abdominal pain

IV fluids  
only

BP = 110/65  
HR = 115  
RR = 22  
SpO<sub>2</sub> = 89%

**Optimal  
Management:**  
O<sub>2</sub>, IV fluids,  
antibiotic  
treatment

Returns to  
baseline

**Alternate  
Pathway**

Accidental  
allergic  
antibiotic  
given

BP = 90/50  
HR = 130  
SpO<sub>2</sub> = 85%  
Increased  
difficulty  
breathing,  
shortness of breath  
agitation, itchiness

## Scenario Checklist

	Critical Actions	Criteria	Time 1 (Initial Provider)	Time 2 (After help additional help arrives)	Score	Total Score
1	Introduce Self/Team	Does NOT introduce self/team			0	
		Introduces self/team			2	
<b>Vital Signs/Physical Assessment</b>						
2	Recognizes abnormal vital signs	Does NOT obtain/recognize vital signs			0	
		Obtains vital signs partially or inaccurately			1	
		Obtains initial vital signs completely and accurately and recognizes abnormal values: HR 120 BP 100/60 RR 20 SpO2 92% Temp 101.4F			2	
3	Assesses Wound	Does NOT assess wound verbally or physically			0	
		Assess wound verbally or physically			2	
<b>Communication and Teamwork</b>						
4	Calls for help early	Delays calling for additional assistance			0	
		Recognizes need for and activates additional assistance early in case			2	
5	Team Leader	Does not identify team leader verbally			0	
		Identifies team leader verbally			2	
6	Team Member Roles	Does NOT maintain clearly defined team member roles			0	
		Maintains clearly defined team member roles - Leader - Chart review/documenta tion - Airway - Medication/order			2	

		fulfillment				
7	Uses closed-loop communication among healthcare team: 1 <sup>st</sup> team member call out request/action; 2 <sup>nd</sup> team member uses a check-back to confirm request/action, then 2 <sup>nd</sup> team member confirm request fulfilled/action performed.	Does NOT use closed-loop communication			0	
		Uses closed-loop communication some of the time			1	
		Uses closed-loop communication all the time			2	
8	Uses SBAR: <b>Situation</b>	Does NOT communicate Situation to provider			0	
		Partially communicates Situation to provider			1	
		Communicates Situation to provider completely and accurately			2	
9	Uses SBAR: <b>Background</b>	Does NOT communicate Background to provider			0	
		Partially communicates Background to provider			1	
		Communicates Background to provider completely and accurately			2	
10	Uses SBAR: <b>Assessment</b>	Does NOT communicate Assessment to provider			0	
		Partially communicates Assessment to provider			1	
		Communicates Assessment to provider completely and accurately			2	
11	Uses SBAR: <b>Recommendations</b>	Does NOT communicate Recommendations to provider			0	
		Partially communicates Recommendations to provider			1	
		Communicates Recommendations to provider completely and accurately			2	



12	Discusses Interventions with Patient	Does NOT discuss interventions with patient			0	
		Discusses interventions with patient partially			1	
		Discusses interventions with patient			2	
<b>Implementing orders/interventions</b>						
13	Administers Oxygen	Does NOT administer oxygen correctly			0	
		Administers oxygen correctly - via non-rebreather at 10-12 LPM - via assisted ventilation with BVM – in sync with respirations - intubated, if necessary			2	
14	Identifies patient's allergies	Does NOT identify allergies			0	
		Identifies allergies			2	
16	Orders appropriate antibiotic from pharmacy	Does NOT order appropriate antibiotic			0	
		Orders appropriate antibiotic			2	
16	If antibiotic arrives from pharmacy	Does NOT administer antibiotic correctly (administers wrong antibiotic)			0	
		Administers antibiotic correctly			2	
17	Continually re-assesses patient and vital signs throughout simulation	Does NOT re-assess patient and vital signs			0	
		Re-assess patient some of the time			1	
		Re-assesses patient and vital signs continually			2	
Total Score: Highest Possible Score: 36						

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **Debriefing Plan:**

A. In groups, with video and peer observers

B. Debriefing Materials

- i. How do they feel?
- ii. What do you think went well?
- iii. What did you have difficulty with?
- iv. Is there anything you would have changed/done differently?

C. Rules

- i. Safe learning environment -communicate to learners that
  - a. They should maintain respect for each other
  - b. Their questions and concerns will be acknowledged
  - c. They will receive honest feedback without being judged
- ii. Confidentiality
- iii. Non-punitive

D. Questions to Facilitate the Debriefing

A structured debriefing that includes a reactions phase, description of the event, an understanding of successful/correct actions and areas for improvement, followed by a summary phase should be followed. Questions to assist are listed below:

- i. What situation did they walk into (first provider and the team)?
- ii. What was the patient experiencing upon their arrival?
- iii. What “clues” could they have picked up on?
- iv. How did the arriving team feel when they walked into the room?
- v. Did the responding team receive all of the necessary information from the provider in the room?
- vi. What information was important to be relayed to responding team?
- vii. Was there a clearly identifiable leader?
- viii. Were roles easily identifiable? If yes, how did they assign themselves? If not, how could they improve?
- ix. Was communication clear and was all information relayed in a closed-loop fashion?
- x. What are the first line treatments for sepsis?

## E. Answers to Debriefing Questions

- i. First provider - Patient experiencing tachycardia, hypotension, and febrile  
Team – Personnel already in room summoned help for a patient in acute distress
- ii. General malaise, fever, abdominal pain
- iii. Abdominal pain – red, swollen incision site, lethargy, chart documentation of trending vital signs
- iv. Common answers include: nervous, uncertain, confused – often learners state this is due to a lack of information about the patient (they weren't the one to review the chart, they don't know the patient)
- v. See below for important information
  - a. If answered no, identify a TeamSTEPPS™ tool (SBAR, I PASS THE BATON), that could assist in providing a clear, concise handoff of patient information
- vi. Important information should include:
  1. Situation – a 29 y/o female, 2 days post c-section complaining of:
    - a. Fever
    - b. Lethargy
    - c. Abdominal pain
    - d. General malaise
    - e. Lightheadedness
  2. Background – 29 y/o female, with a history of multiple sclerosis was being evaluated for physical or occupational therapy (depending on student) and complained of the above signs and symptoms. Assistance was called for when the patient alarms advised the provider of the abnormal vital signs.
  3. Assessment – Vital signs should be provided as well a wound assessment if it was completed. Providers should mention the patient's allergies to the arriving team.
  4. Recommendation – pain medication, laboratory studies (including blood culture) oxygenation, and antibiotics can all be recommended
- vii. Additional questions - How was the leader identified? Was the leadership position assumed because of "title (MD)" or because they were most capable and knowledgeable (situational leader)? If no leader was identified, what team dynamics/actions resulted? Was there chaos? Were people looking for direction and not receiving any? Why wasn't a leader easily identified?
- viii. Additional questions - What was everyone's role/task? How did the person looking through the chart take on that responsibility? How did the nurse take on

the task of getting medications or implementing IV fluid resuscitation? If there were 2 nurses, how did they decide which tasks they would each do? Was this clearly discussed in a “briefing” before the simulation? Was there a “team huddle” during the case? Was non-verbal communication used?

- ix. Closed-loop communication helps with organization of the team, sharing of information, and patient safety by confirming what was said and heard and completed were all the same.
- x. First line treatments include:
  - 1. Provide aggressive fluid management.
  - 2. Begin cardiac monitoring
  - 3. Administer oxygen
  - 4. Antibiotic therapy
  - 5. Intensive care consultation should be requested
  - 6. Infectious disease consultation can be considered.

### **Pilot Testing:**

This scenario was implemented as part of an interprofessional education workshop that included nursing, medical, respiratory therapy, occupational therapy, physical therapy, and physician assistant students. Each class had up to 10 students and the scenario was implemented with one “team” of five students while the other five actively observed. During the pilot-testing phase of this workshop, a total of 25 students participated in this scenario. Both, students that participated and those that observed this scenario felt the case was realistic and challenging.

Because of the potential differential diagnoses, including post partum hemorrhage, the students were challenged to work together to appropriately identify the cause of the presenting signs and symptoms and develop a treatment plan. Often, with subtle prompting from the patient to assess her abdomen, the students identified sepsis as the clinical condition in a timely manner. However, once reaching the appropriate diagnosis, the implementation of care yielded additional opportunities for learning. These included, clinical skills such as the spiking of an IV bag, proper technique to assist ventilation, correct amount of oxygen for the delivery device selected (we recognized that students would routinely attach a non-rebreather to a patient at only 3-4LPM), and the importance of communication between providers as well as between providers and patient. Learners also had to work together to identify and “hand-off” the patient’s allergies and determine an appropriate antibiotic treatment. We found that often, the first person in the room (occupational therapy or physical therapy student), who had reviewed the chart, had this key piece of information and had to advise the medical student, who was ordering the antibiotics, of the allergies. Throughout the pilot testing period, the medical students had difficulty in ordering the correct antibiotics after being advised of the patient’s allergies. This again provided opportunities for discussion about the utility of drug reference materials (especially portable electronic drug libraries).

Responses to a follow-up survey indicated that the scenario was clinically relevant to each of the student populations present and it was realistic to the extent that they felt the scenario could occur in clinical practice as well as realistic in the sense that they felt immersed in the situation. Responses to

the workshop were all favorable and indicated that being immersed in this situation, while not too clinically challenging, allowed them to recognize the importance of working together and using the TeamSTEPPS™ tools to reach the appropriate diagnosis and treatment plan.

Responses from students revealed that they had a greater appreciation for their colleague's professions, that they had a great understanding of the importance of training and working together, and realized how large a factor communication plays in successful patient management. Anecdotal information was provided from clinical faculty who witnessed medical and nursing students interacting with each other regarding a patient, in the weeks following the simulation experience. When questioned, the students reported meeting each other in the simulation workshop and were now conversing about a patient they were mutually taking care of/learning about.

The faculty, were initially concerned that the physical therapy and occupational therapy students who participated may feel left out because of their limited involvement in critical care scenarios. However, we found that by starting the scenario with this provider in the room allowed them to feel part of the team and frequently they became the "runner" or chart reviewer for the rest of the team that was assessing and implementing orders. These students realized that they too play an important role on the team, regardless of their limited critical care skill set.

#### **References:**

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