



Case 1: Preeclampsia with Severe Features in a Full-Term Pregnancy

Learning Objectives:

- Recognize risk factors for preeclampsia
- Identify severe hypertension as an early warning sign for preeclampsia
- Identify preeclampsia with severe features and treat with appropriate medication(s)
- Demonstrate teamwork and communication skills during a simulated hypertensive emergency

Planned Completion Points:

- In order to successfully complete this scenario, the care team should do the following:
- Recognize severe hypertension
- Diagnose preeclampsia with severe features
- Administer antihypertensive medications correctly and in a timely manner
- Order/administer magnesium sulfate correctly and in a timely manner
- Counsel the patient regarding the diagnosis of preeclampsia with severe features and provide delivery recommendations

OR

- If 10 minutes have elapsed since the recognition of severe hypertension and the team has not initiated anti-hypertensive medications
- If 10 minutes have elapsed and magnesium sulfate has not been initiated

Expected Duration of Exercise

Approximately 30 minutes (10 minutes for simulation / 20 minutes for debriefing)

1.0 Simulation Setup:

- ▶ **Simulators to be used:** The simulator to be used will depend on what is available at your institution. Options for this may include a high-fidelity birthing simulator, a staff member playing the role of the patient. A wearable simulator or other props may be used to simulate a gravid abdomen.
- ▶ **Necessary personnel:** (Total number needed 1-3)
 - Mannequin Simulator or trained actor/staff member to portray the **standardized patient**
 - Trained faculty/hospital staff member can serve as the **Simulation Proctor**
 - Trained actor/staff member to portray the **family member** (optional role but encouraged if using a mannequin simulator)
- ▶ **Room Setup:** The delivery room should be stocked and in the same condition it would be for actual patients at your institution.
- ▶ **Simulator Setup:** The simulator / standardized patient should be in a patient bed with a gown on. The patient should have a gravid appearing abdomen. Fetal monitoring belts/apparatus should be applied to the patient's abdomen. A family member, if included in the simulation, should be located in a seat near the simulator/standardized patient.
 - An IV should be in place (taped to the arm) with a bag of IV fluids hanging.
 - A blood pressure cuff should also be on the patient/simulator's arm.
- ▶ **Vital Signs:** If your simulator has the ability to show maternal vital signs on a monitor, you can use this during the scenario. If not, you can use the provided vital signs cards to report the values during the case.
- ▶ **Fetal Monitoring:** If your simulator has the ability to show tocometer and external fetal heart rate tracing, you can use this during the scenario. If not, you can use provided fetal heart rate tracing cards or metronome app, to report changes in fetal status during the case.
- ▶ **Simulation Pre-Brief:** Gather the care team together and perform the Pre-Simulation Briefing/Orientation.

2.0 Pre-Simulation Briefing/Orientation:

Prior to the simulation, you should brief the team on the drill. Begin by orienting them to the simulator and its capabilities and limitations. Then, explain the following:

- Emphasize that the drill is meant for training and it is not a test.
- Treat the simulator/standardized patient as they would a real patient.
- If the team needs additional supplies or instruments, they should go and obtain them.
- Call for assistance and other providers (anesthesia, etc.) as they would in a real emergency.
- If they feel they need to take the patient to the operating room, they should physically move the "patient" to that location.

- Medications, if needed, should be obtained in the normal manner, but not opened or used during the drill.
- All simulation staff and participants should follow expected infection control measures per protocol for routine patient care at your institution.

3.0 Basic Scenario Management and Tips:

Beginning the Simulation Scenario:

- ▶ After you have conducted your pre-simulation briefing/orientation, have the participant who will be the primary OB nurse come with you to the simulated patient's room.
- ▶ To begin the scenario, read the scenario to primary OB nurse and then have them enter the room. At this point, the actor person playing the role of **patient** or **family member** should tell the nurse about the patient's complaint of a headache.
- ▶ Patient's blood pressure will remain elevated in the severe range until two doses of an antihypertensive medication are given. Once the team orders serial blood pressure measurements, you may display a new blood pressure every 2 minutes. Allow time for team to discuss initiating anti-hypertensive therapy and answer patient/family questions.
- ▶ Once an antihypertensive medication is given, the faculty proctor will need to do the following:
 1. State that "15 minutes have elapsed"
 2. Display a new blood pressure in order to prompt additional discussion by the team and at that time they should order/administer another dose of an antihypertensive medication.

Initial laboratory values are available for the team to review.

- ▶ The scenario should end when the team has done the following:
 - Recognized severe hypertension as an early sign of pre-eclampsia and notify provider
 - Treat hypertensive emergency in a timely fashion with at least two doses of an appropriate antihypertensive medication
 - Diagnose preeclampsia with severe features and order/initiate magnesium sulfate
 - Counsel the patient regarding preeclampsia and provide delivery recommendations

OR

- If the team does not correct the hypertension or fails to recognize preeclampsia with severe features and initiate magnesium sulfate within 10 minutes

4.0 Case Scenario:

CASE:

Patient: Heidi P. Tension

Patient Information:

- The patient is a 27y/o G2P1001 37+4wks.
- Her first pregnancy was complicated by preeclampsia at 36wks gestation.
- The patient complains of a frontal headache that is a 7 out of 10 in severity.
- She has had an uncomplicated prenatal course and has no known drug allergies
- BMI: 32.5

Laboratory Data

- Hemoglobin: 12.2 g/dL
- Hematocrit: 36.6 %
- WBC: 12,000 K/uL
- Platelets: 218,000
- Serum creatinine: 0.68 mg/dL
- AST- 23 IU/L
- ALT- 18 IU/L
- Urine Protein/Creatinine ratio – 0.18

Clinical Information includes:

- First Blood pressure 188/115 and repeat will be 180/110, RR 18, O2 Sat 96% on room air.
- The patient has an IV line in place with NS running.
- FHR: Baseline 150s, moderate variability, accelerations present, no decelerations.
- Tocodynamometer: Contractions approximately every 10 min.

Family Member/Patient Instructions:

- ▶ **Standardized Patient:** The headache woke you from sleep 6 hrs ago. It is frontal in location, constant, and different from prior headaches with regard to character and intensity (7 out of 10). Prior headaches respond well to acetaminophen, but the current headache did not improve after taking this today. You have a history of preeclampsia and are worried about recurrent diagnosis. Your blood pressures were previously normal in the office. You do not have a home blood pressure cuff because you could not afford one. You are anxious and worry if anxiety or your position in the bed can affect your blood pressure reading. You would prefer to not be induced for preeclampsia again with the current pregnancy but will agree to it if this plan if necessary.
- ▶ **Family Member (optional):** The family member may pretend to be the patient's partner, mother, relative or friend. This person may ask questions during the scenario including things like:
 - "Why is her blood pressure so high?"
 - "Her urine protein was negative so that means it isn't preeclampsia, right?"
 - "Can we just wait to see if her blood pressure gets better instead of delivering?"
 - "Why didn't her blood pressure improve after the medication you gave her?"

Answers to frequent questions that come up:

- The team can order labs during the simulation, but they will not return during the simulation
- The patient has a history of preeclampsia in her first pregnancy
- The patient does not have asthma
- If asked additional questions, try to redirect and not answer specifics so as to avoid topics that might complicate the scenario (i.e., do not say that the patient has migraines)

5.0 Case Flow/Algorithm with branch point and completion criteria:

Simulation facilitator will introduce the scenario to the team outside the room and then bring the participant who will be the initial provider (OB Nurse) into the patient's room. The patient and/or family member will greet the nurse and express concern regarding a headache and that her BP is high (188/115)



The OB nurse will assess the patient and may obtain a repeat blood pressure or call for assistance.

The proctor will produce the repeat blood pressure (180/110)
The OB nurse should identify severe hypertension and call for assistance.



OB Provider/team as called enters room and is briefed by OB Nurse. The patient continues to complain of a headache.

(*Magnesium sulfate may be ordered/given at any time but will not affect BP readings.)



The patient should be examined by the team and an antihypertensive should be ordered. The patient or family member should have questions about the medication and about the plan of care.

After the first dose of an antihypertensive is given. The proctor will:

- Inform the team that time has elapsed*

*The amount of time you tell the team has elapsed depends on the medication given:
Labetalol: 10 minutes
Hydralazine: 20 minutes
Nifedipine: 20 minutes

- Display a new blood pressure (BP range 175/115).



Team should recognize continued severe range hypertension and administer a second dose of antihypertensive medication.



After the second dose antihypertensive is given. The proctor will display a new blood pressure (BP range 145/95).



VITAL SIGNS
START
BP 188/115 HR- 98 O2 sat 96% RR-18
REPEAT VITAL SIGNS
BP 180/110 HR- 101 O2 sat 96% RR-20
REPEAT VITAL SIGNS BELOW UNTIL HYPERTENSIVE DOSE #1 IS GIVEN
BP 175/110 HR 95 O2 sat 96% RR- 19
ANTIHYPERTENSIVE DOSE #1 GIVEN
BP range Systolic- 175 Diastolic- 115 HR- 95 O2 sat 96% RR- 19
ANTIHYPERTENSIVE DOSE #2 GIVEN
BP range Systolic- 145 Diastolic- 95 HR- 95 O2 sat 96% RR- 19

Prompt the team to discuss diagnosis of preeclampsia with severe features to the patient and confirm a delivery plan with the patient.

Scenario ends when the team has done the following:

Recognized and treated severe hypertension with two doses of an appropriate antihypertensive medication

Diagnose preeclampsia with severe features and order magnesium sulfate

Counsel the patient regarding preeclampsia and provide delivery recommendation

OR

If the team does not correct the hypertension or fails to recognize preeclampsia with severe features and initiate magnesium sulfate within 10 minutes

At the end of the scenario, clearly state the simulation is over and then gather the team for the review and debriefing.