

## Case Study #1

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**Fractured Hip with Postoperative Complications Difficulty: Intermediate Setting: Hospital**  
**Index Words:** fracture, pulmonary embolus (PE), assessment, crisis management, laboratory values, diagnostic tests, medications  
**Scenario** M.M., a 76-year-old retired schoolteacher, underwent open reduction and internal fixation (ORIF) for a fracture of his right femur. His preoperative control prothrombin time (PT) was 11 sec. He has been on bed rest for the first 2 days postoperatively. At 0600 his vital signs (VS) were 132/84, 80 with regular rhythm, 18 unlabored, and 37.2° C. He is awake, alert, and oriented (AAO) with no adventitious heart sounds. Breath sounds are clear but diminished in the bases bilaterally. Bowel sounds are present, and he is taking sips of clear liquids. An IV of D5½NS is infusing TKO (to keep open) in his left hand and should be saline locked in the AM if he is able to maintain adequate PO fluid intake. He has orders for oxygen (O2) to maintain SaO2 over 90%. His lab work shows Hct 34%, Hgb 11.3 mg/dl, K 4.1 mmol/L, PTT 44 sec. Pain is controlled with morphine sulfate 4 mg IV and promethazine (Phenergan) 25 mg IV q3h. He is also taking heparin 5000 units SC bid, taking docusate sodium, and wearing a nitroglycerin patch. At 2330 on the second postoperative day, you answer M.M.'s call light and find him lying in bed breathing rapidly and rubbing the right side of his chest. He is complaining of (C/O) right-sided chest pain and appears to be restless.

1. What are you going to do?

I would take the patient vital signs and determine if he is still awake alert and oriented. When doing the vital signs I would focus on finding pulse in each location to determine if blood flow is still getting to all the extremities. I would listen to the patient's lung sounds and determine if he is having any trouble breathing. If his SaO2 is less than 90% I would start him on O2 and then call the physician.

**CASE STUDY PROGRESS** He is slightly hypotensive, tachycardic, tachypneic, restless, and slightly confused. The pulse oximeter reads 86%, so you start him on 3 to 6 L O2 by nasal cannula (NC). You identify faint crackles in the posterior bases bilaterally; they were clear this morning. The monitor shows nonspecific T wave changes and tachycardia.

2. Based on your findings, you call the physician. What information are you going to give him or her?

Using the SBAR format I would tell the physician that; (Situation) my name is Arielle and that I'm a RN on the med/surg floor. I'm calling about my patient M.M. because I'm concerned about a change in their health status. They are currently hypotensive, tachycardic, tachypneic, restless and confused. Faint crackles can also be heard in the posterior bases bilaterally of the lungs that were not there before. I also started the patient on 3 to 5 L of O2 by nasal cannula because of his low pulse oximeter reading. (Background) M.M. a 76-year-old male who underwent open reduction and internal fixation for a fracture of his right femur. He has been on bed rest for the last 2 days post-op. Until this point the patient has been awake, alert, and

oriented with no adventitious heart sounds. (Assessment) most current set of vital signs, pulse oximeter 86%, lung sounds and other relevant assessment data. I think the problem is the patient has fluid building up in his lungs or a pulmonary embolism. (Recommendation) I would recommend that we continue the patient on O<sub>2</sub> and run test to determine the cause of the problem such as ABGs, chest x-ray etc.

3. The physician orders that the patient be transferred to ICU and have blood coagulation studies, arterial blood gases (ABGs) on room air, continuous pulse oximetry, STAT chest x-ray (CXR), and STAT 12-lead ECG. What information will the physician gain from each of the above?

Arterial blood gases are taken to show if the lungs are moving oxygen into the blood and removing carbon dioxide from the blood properly. It will show if the patient is having any problem breathing. Pulse oximetry is another way to measure oxygen levels. It shows how well the oxygen is getting to the furthest parts of the body from the heart. A chest x-ray cannot always show if a pulmonary embolism is present but it will help rule out other conditions. An ECG can show if areas of the heart are not functioning properly or optimally.

4. Why would the physician order ABGs on room air as opposed to with supplemental O<sub>2</sub> ?

If the patient was using supplemental oxygen it would change to results of the ABG because the blood oxygen levels would be higher with the use of O<sub>2</sub>. Room air would be a better indicator for how the patient blood oxygen levels really are doing.

**CASE STUDY PROGRESS The ABGs return as follows: pH 7.55, PaCO<sub>2</sub> 24 mm Hg, HCO<sub>3</sub> 24 mmol/L, and PaO<sub>2</sub> 56 mm Hg at sea level. SaO<sub>2</sub> is 86% on room air. CXR shows a small right infiltrate. VS are 150/92, 110, 28, 37.2° C.**

5. What is your interpretation of the ABGs, and what do you think the physician will order next?

The patient pH is high, PaCO<sub>2</sub> is low, HCO<sub>3</sub> is within normal range, PaO<sub>2</sub> is low, and SaO<sub>2</sub> is low. These lab values indicate that the patient is experiencing hypoxemia. I think the physician would continue the patient on O<sub>2</sub> and increase them on warfarin or heparin.

6. The V/Q is performed, and the interpretation reads “strongly suggestive of a PE.” What are the most likely sources of the embolus?

The patient had many risk factors that could have led to a pulmonary embolism. These include the patient’s fracture, surgery, and limited mobility post-op.

7. Before the latest PTT/INR results are back, the physician orders a heparin bolus of 5000 units IV followed by an infusion of 1200 units/hr. The lab calls with a critical value—the PTT is 120 sec. Based on these results, what action would you take?

The PTT for a person who isn’t on heparin is between 25 to 35 seconds. 120 seconds is way above this normal level. I would immediately call the physician and see what they wanted me to do. If a heparin maintenance dose system is in place I would look at that before calling the

physician. With a PTT of 120 seconds the rate the heparin is being administered needs to be decreased or temporarily stopped.

**CASE STUDY PROGRESS The PTT 4 hours later is 29 sec.**

8. The next day the physician's orders read, "Coumadin 2.5 mg, PT/INR in am; DC [discontinue] heparin." What is wrong with these orders?

The physician did not give any information on expected PT/INR when taking Coumadin. There is also no dosing schedule listed.

9. Thrombolytics, such as alteplase and urokinase, have been beneficial in the treatment of PE. Why would these medications be contraindicated in M.M.'s case?

These drugs can increase the effectiveness of heparin and warfarin so it would not have made sense to use them when the PTT was so high. These drugs need to be used cautiously after any major surgery.

10. List three priority problems related to (R/T) the care of M.M. in his current situation.

Nursing diagnosis:

Ineffective breathing pattern related to pulmonary embolism as evidence by SaO<sub>2</sub>, restlessness, confusion, vital signs.

Impaired gas exchange related to decrease pulmonary perfusion associated with obstruction as evidence by confusion, SaO<sub>2</sub>, ABG.

Pain related to surgery and complications as evidence by chest pain and being treated with morphine sulfate

11. Several days later you hear M.M. asking his son to bring in a "decent razor" because he is tired of the stubble left by the unit's shaver. How would you address this issue?

If the patient is still on any kind of anticoagulant then they need to be cautious about shaving. It's important to teach the patient that they may bleed and bruise more easily while on this medication. An alternative they could use is an electric shaver.