



MATH, SCIENCE & HEALTH
PROFESSIONS

NURSING PROGRAM

ALTERATIONS IN HEALTH V

NRS 230

LAB MANUAL

SPRING 2016

Welcome to NRS 230! This will be an exciting course for you, because you will be building on the concepts that you already learned in the previous courses. NRS 230 is a continuation of the concepts of elimination, oxygenation and perfusion, emphasizing the concepts of elimination, oxygenation and perfusion across the lifespan. You also will continue to develop critical thinking and clinical judgment skills when caring for the adult and pediatric patient who experiences alterations in elimination, oxygenation and perfusion.

Please use this lab manual to prepare for class. The first section is a clinical skills check list. Please review these skills. If you are weak in any area, the simulation lab is an excellent resource for you to review these skills. Please be sure to let your lab instructor know. Also, you will see two simulation scenarios. Your lab instructor will decide who will be having simulation that week. Please be prepared for these simulations by researching the topics and the medications used for each simulation scenario that is provided. You will be graded on your reflection of this simulation in a journal format. Please see the grading rubric. Following the simulations found in the lab manual, you will see a week by week guide. Again, please be prepared to do drug calculations and case studies.

Have a great semester!

NRS 230 231 CLINICAL SKILLS ASSESSMENT CHECKLIST

STUDENT NAME _____

COURSE _____

IDENTIFIED SKILL	CONFIDENT	NEED ASSISTANCE	NEVER DONE	COMMENTS (# OF TIMES)
BLOOD PRESSURE (MANUAL)				
APICAL RATE				
PULSE				
RESPIRATIONS				
TEMPERATURE				
PULSE OXIMETRY				
WEIGHT				
PAIN AS THE 5 TH VITAL SIGN				
URINARY CATHETERIZATION				
CONTINUOUS BLADDER IRRIGATION (CBI)				
WOUND CARE				
STERILE DRESSING CHANGES				
PRESSURE ULCER CARE				
SKIN CARE				
MOUTH CARE				
BATHING COMPLETE				
BEDMAKING UNOCCUPIED				
BEDMAKING OCCUPIED				
RANGE OF MOTION				
ABG ANALYSIS				
OXYGEN THERAPY				

CONTINUED

IDENTIFIED SKILL	CONFIDENT	NEED ASSISTANCE	NEVER DONE	COMMENTS (# OF TIMES)
TRACHEOSTOMY CARE				
SUCTIONING				
HANGING IV'S				
CHANGING IV DRESSINGS				
INFUSIPOINT MANAGEMENT				
PICC LINE MANAGEMENT				
CENTRAL LINE MANAGEMENT				
IV PUMPS				
PCA AND EPIDURAL PUMPS				
TPN ADMINISTRATION				
ADMINISTER ORAL MEDS				
IM INJECTIONS				
SQ INJECTIONS				
GLUCOMETER				
INSERTING NG TUBE				
TUBE FEEDINGS PEG				
TUBE FEEDINGS NG TUBE				
DRAINS (JP, HEMOVAC)				
OSTOMY CARE				
CHEST TUBE CARE				
POSTMORTEM CARE				
ISOLATION PROCEDURES				
DYSRHYTHMIAS				
SBAR REPORTING				
DIALYSIS CATHETER				
DELEGATION SKILLS				

Simulation for Urinary elimination and Pyelonephritis (Weeks 1-4)

Name: Nanna Krause

Gender: female

Age: 21

Weight: 125 __lb

Height: _5.5_ft/in

Religion: none

Major Support: friends

Allergies: none

Immunizations: not sure

Attending Physician/Team

Doctor: Dr. Smith Attending ER physician

PMH: 3 urinary Tract infections

2 Cranberry Capsules BID

Vitamin C 1 Tablet BID

Phenazopyridine unsure of dose and how many times a day she takes

History of Present Illness: Nanna states she experienced burning sensation with urination, mild abdominal pain, and had frequent urination. Nanna awoke this morning with a high fever, vomiting, and severe abdominal pain. Nanna further adds that she had moderate bilateral flank pain.

Social History:

Nanna smokes a few cigarettes on the weekends “when she goes out”. She drinks 5 to 6 beers on Friday and Saturday nights. She has frequent sexual activity with no use of protection or birth control.

Brief Overview of Scenario:

Nanna came to the Emergency Department about 1100. She states she experienced burning sensation with urination, mild abdominal pain, and had frequent urination. She states “I seriously had to go every 10 minutes.” She has been having these signs and symptoms for 5 days now. Nanna was advised by her good friend to take cranberry pills, vitamin C and phenazopyridine. She began taking the medication after she researched them on the Internet because “they seemed to be what I needed”. Nanna awoke this morning with a high fever, vomiting, and severe abdominal pain. Nanna further adds that she had moderate bilateral flank pain. Nanna reports that she began having frequent urinary tract infections about the time she began college. She states “I know what they feel like”.

Simulation for Cardiogenic Shock (Weeks 1-4)

Name: Charles Case

Gender: male

Age: 65

Weight: 95.5/kg 210 lb

Height: 6 ft/in

Religion: none

Major Support: 2 children

Allergies: none

Immunizations: unsure

Attending Physician/Team

Doctor Pressman Attending Cardiologist

PMH:

Stable exertional angina for 7 years

Type 2 DM

HTN

History of Present Illness: Chest pain unrelieved with rest and nitroglycerin x 3 doses SL

Social History:

Smoked for 45 years 1.5-2 packs a day

No use of recreational drugs

Brief Overview of Scenario:

Charles Case is a 65 year old man who was admitted to the Coronary Care Unit with a diagnosis of acute anterior wall MI. Mr. Case is complaining of severe sub sternal chest pain lasting over 6 hours that was accompanied by a "choking feeling" severe SOB, and diaphoreses. He described the pain as a deep pressure that was unrelieved by rest, antacids, and 3 sublingual nitroglycerin tablets. Mr. Case drove himself to the emergency room.

Guidelines for Written Assignments:

*Mercer County Community College
NRS 230 Simulation Journaling Activity
Grading Rubric and Guidelines*

The purpose of journaling is to give the student the opportunity to reflect back on the simulation event and consider what was learned, what was successful or done well and what areas of content/skills are weak and could use more practice or study. **Each student is required to submit this journal, by email in a word document, within 24 hours of the completion of the lab.** Students will receive feedback from the instructor each week. This journaling activity represents 5% of your course grade and is evidence of having met the day’s/week’s lab simulation objectives. It is important that you take it seriously spending the appropriate amount of time in this activity and truly reflect on the learning that has occurred.

GRADING RUBRICS FOR REFLECTION JOURNAL ENTRIES

REFLECTION JOURNAL RUBRIC		
Category	Description	Point Value
Mechanics Well written, clear organization, uses standard English grammar, contains minor, if any, spelling errors, uses APA format.	Well-written and well-organized	2
	Inadequate due to lack of organization, grammar, and/or major spelling errors, errors in APA format	1
MECHANICS – TOTAL POSSIBLE		2
Evidence of Critical Thinking Critical thinking includes application, analysis, synthesis and evaluation. Arguments are clear and show depth of insight into theoretical issues, originality of treatment, and relevance. May include unusual insights. Arguments are well supported.	Demonstrates critical thinking and the ability to apply concepts	3
	Demonstrates some critical thinking and application of concepts	2
	Shows minor or incorrect application of concepts	1
CRITICAL THINKING – TOTAL POSSIBLE		3
Development of Ideas Well-developed thoughts, ideas, and details, which shows evidence of reflection, new ideas, and grasp of concepts.	Well-developed; shows evidence of reflection and/or metacognition; new ideas introduced and reflects a good grasp of concepts presented.	3
	Shows some evidence of reflection, but not well-developed; few new ideas	2

	introduced but reflects a grasp of concepts presented.	
	Not much thought or detail; shows little evidence of reflection or grasp of concepts; no new ideas introduced.	1
DEVELOPMENT OF IDEAS – TOTAL POSSIBLE		3
Timeliness	Submitted within 24 hours of deadline	2
Submitting by stated due date	Submitted no more than 24 hours after deadline	1
	Submitted more than 24 hours after deadline or not submitted	0
TIMELINESS – TOTAL POSSIBLE		2
OVERALL TOTAL POSSIBLE FOR REFLECTION JOURNAL		10

Below are some suggestions on topics to be considered (but not limited to) in the journal writing.

- Was there anything during the lab experience that was confusing to you? What was it? How did you handle that situation? Was there anything you could have done to better prepare yourself?
- Was there any time during the lab when you didn't know what to do? How did you feel? What would you do differently having had this experience?
- Was there anything about the lab experience that troubled or disturbed you? What was it? What will help make it easier for you to deal with this experience in the future?
- Was there anything about the lab experience that made “the light bulb come on” - something that made the content clearer to you? What was it and explain what happened to illuminate your understanding?
- Do you still have questions about the topic/content? What are they? How will you resolve these questions?
- How did today's experience assist you in meeting the course/topic/program objectives?

Week 1

NRS 230 will also focus on titrating of critical medications. Please calculate the following medications.

- 1) The physician ordered Norepinephrine (Levophed) for a patient who is septic with a low blood pressure. The levophed is mixed 4mg in 250mL D5W. Levophed is to be started at 10mcg/min. Please calculate the rate of flow. _____ mL/hr.
- 2) Ordered is amiodorone. It is mixed 900mg in 500mL D5W. The physician wants the medication started at 0.5mg/min. Calculate the rate of flow. _____ ml/hr.
- 3) Ordered is Dopamine. The physician wants the medication started at a renal dose which is 5mcg/kg/min. The medication is prepared 400mg/250 mL D5W. The patient weighs 150lbs. Calculate the rate of flow. _____ ml/hr.
- 4) A patient was admitted to the ICU with a dopamine drip infusing. The patient is receiving Dopamine 400mg/250mL D5W. You notice the infusion pump set at 46mL/hr. The patient weighs 150 lbs. How many mcg/kg/min is the medication actually infusing?
- 5) Heparin is to be infused at 960 units/hr. The medication is prepared 25,000/250 mL D5W. Calculate the rate of flow _____ mL/hr.

CASE STUDY

URINARY TRACT INFECTION

Shelly Homes is a 4 y/o preschooler who lives with her parents and younger brother. She and her brother attend a local daycare center during the week while their parents are at work. In the evenings, she and her brother take a bath. After the bath, their parents read to them before bedtime at 8:00pm. Shelly's daycare class includes many children her age and she enjoys playing outside with them. Although snack times are planned, Shelly would rather play and does not always finish her beverages.

Shelly's mother calls the pediatric clinic in town and tells the nurse that Shelly has been running a fever of 101 F for the past 2 days. Although her temperature decreased to 99 F with Tylenol, it returns to 101 F within 4 hours of each dose. Furthermore, her mother also has noticed that Shelly complains that it hurts when "I go pee-pee". Shelly's mother also has noticed that her daughter seems to be in the bathroom every hour. She makes an appointment to see the pediatrician this afternoon.

1. What is the significance of Shelly's clinical manifestations?
2. What other assessment data would be helpful for the nurse to have to prepare Shelly's care plan?
3. What are Shelly's anatomic risk factors for developing a UTI?
4. What are the relationship between Shelly's hygiene habits and her risk for developing a UTI?
5. How does Shelly's level of growth and development places her at risk for the developing a UTI?
6. Shelly's urine culture is positive for Escherichia coli. What is the significance of this finding?
7. What are the priorities for Shelly's care?
8. Shelly is prescribed trimethoprim-sulfamethoxazole 60mg every 12 hours for 10 days. What is this drug and is her prescribed dose safe? Shelly weighs 33 lbs.
9. What are the teaching priorities for Shelly and her mother prior to her leaving the clinic?
10. Shelly is scheduled for a return visit to the clinic in 2 weeks. What is the purpose of this appointment?

CASE STUDY

Acute Pyelonephritis Case

Mrs. Reese is a 27 year old female who had a sudden onset of abdominal pain at 2:00am. The pain became so severe that she went to the ER. Upon her arrival to the ER, she described her pain as a constant ache in her lower right quadrant of her abdomen that radiates across the flank of her lower back. She rates her pain a 9 out of 10 on a 0-10 pain scale. She is also complaining of nausea and has vomited 3 times prior to arrival. She is febrile and complaining of chills.

Assessment:

Mrs. Reese's vital signs are BP 118/60, HR 108, RR 24, and temp. 40 C (104.1F) Her oxygen saturation is 100% on room air. The nurse asks Mrs. Reese if she has noticed any recent changes in her voiding, such as burning, frequency, or feeling as if she is unable to empty her bladder completely. The nurse also asks Mrs. Reese if she has had a fever in the days prior to coming to the hospital. Mrs. Reese states, "Now that I think about it, I have been going to the bathroom more often than usual, and it smelled a little funny. The other day I noticed a dull pain in my lower back. I figured it was from picking up my daughter. Yesterday I remember thinking I felt warm, but my daughter was getting into something and I got distracted and never took my temperature."

Upon physical examination, Mrs. Reese's skin is warm, and her face is flushed. Her abdomen is slightly distended and tender on palpation. Her bowel sounds are hypoactive in all four quadrants. She is admitted with a suspected diagnosis of acute pyelonephritis. Mrs. Reese will be hospitalized for a few days. She expressed concern to the nurse stating, "I need to hurry up and get better. My husband works two jobs, and my parents can only stay at my house for a day or two to care for my daughter. I need to get home as soon as possible. My daughter needs me."

Intravenous (IV) fluids are prescribed as ½ normal saline (1/2 NS) at 100 mL per hour. Diagnostic tests include a complete blood count with differential (CBC with diff), comprehensive metabolic panel (CMP), urinalysis with culture and sensitivity (U/A C& S), X-ray of the kidneys, ureters, and bladder (KUB) with intravenous pyelography (IVP), and blood cultures X 2 sites. Medications prescribed include ketorolac tromethamine, ondansetron hydrochloride, and levofloxin.

Results of the CBC include a white blood cell (WBC) count of 14,200 cells/mm³. Her CMP results are all within normal limits. The urinalysis reveals the presence of a large amount of occult blood, protein 30mg/dL, 6-10 WBCs, 21-30 red blood cells, moderate mucous and

moderate amount of bacteria. The urine culture and sensitivity is positive for Escherichia coli (E. coli) bacteria. The KUB with IVP shows normal urinary structures without the presence of stones or obstructions.

1. While in the ER, the nurse asks Mrs. Reese if she has noticed any recent changes in her voiding or a fever in the days prior to hospitalization. Explain how the assessment data relates to Mrs. Reese's admitting diagnosis?
2. Women are more likely to experience a UTI up until age 50 years, when the risk is similar in both genders. Explain why women are at increased risk and why older men experience more UTI's than younger men do?
3. Discuss the pathophysiology of acute pyelonephritis and identify the most common organism causing this infection?
4. Identify the risk factors that placed Mrs. Reese at greater risk for the development of acute pyelonephritis.
5. What are the characteristic clinical manifestations of pyelonephritis?
6. Mrs. Reese has a KUB with IVP. Explain this diagnostic test. How do the results help the health care provider to confirm the admitting diagnosis?
7. Mrs. Reese has no known allergies. She has been prescribed the following medications, ketorolac tromethamine, ondansetron hydrochloride, and levofloxin. Provide a rationale for why each medication has been included as part of her medical management and any potential contraindication(s) of her taking these medications.
8. The nurse is designing Mrs. Reese's plan of care. Identify three priority nursing diagnoses for inclusion in the plan.
9. The nurse places highest priority on the nursing diagnosis acute pain r/t inflammation and irritation of urinary tract. State an outcome goal appropriate for Mrs. Reese and at least two nursing interventions to help achieve the goal.
10. Two days later, Mrs. Reese is afebrile and her nausea and vomiting have resolved. She is being discharged on an oral antibiotic. Provide the patient with education about her prescribed antibiotic and symptoms that warrant notification of her health care provider.
11. While the nurse is discontinuing the IV access, Mrs. Reese asks, "My doctor said that there is a chance I could get sick with this infection again. Is there anything I can do to help prevent that?" Offer Mrs. Reese at least five health promotion behaviors to help prevent a UTI and recurrent acute pyelonephritis.

12. Mrs. Reese asks the nurse, “I heard if you drink cranberry juice it can cure a urinary tract infection. Is this true?” How will the nurse respond and what are three other complimentary therapies that the nurse might suggest?

CASE STUDY

Chronic Renal Failure

Mr. Rossi is a 58 year old male diagnosed with diabetic nephropathy 10 years ago. He is now in end stage renal failure and has recently started continuous ambulatory peritoneal dialysis (CAPD) in his home.

On a snowy day in February, the visiting nurse has come to see Mr. Rossi and his wife to reinforce instructions regarding the proper technique for peritoneal dialysis and to assess how the Rossi’s are coping. When the nurse arrives, Mr. Rossi is resting comfortably in a reclining chair with a bottle of diet cola on the tray next to his chair. The nurse has concerns about Mr. Rossi’s diet, and during the home visit, the nurse observes several behaviors that indicate a need for further teaching.

1. Briefly discuss how Mr. Rossi’s past medical history increased his risk of developing renal failure.
2. Describe the physiologic changes in the kidneys that lead to chronic renal failure (CRF).
3. What is glomerular filtration rate (GFR)? How is GFR measured and what is the normal range in a healthy adult?
4. According to the national Kidney Foundation’s five- stage classification system of chronic kidney disease, which stage of CKD is Mr. Rossi in, and what would you anticipate his GFR to be?
5. Briefly describe the changes in urine output characteristic of ESRD.
6. Briefly explain how peritoneal dialysis clears the body of excess water and waste products of metabolism. Describe three main types of peritoneal dialysis.
7. What are some advantages of peritoneal dialysis as compared to hemodialysis? Discuss why peritoneal dialysis is more favorable for Mr. Rossi than the hemodialysis treatment option.
8. Mrs. Rossi shows the nurse where they have cleared a clean space in their garage to store the supplies for Mr. Rossi’s dialysis. What should the nurse remind the Rossis to do before attaching the dialysate to Mr. Rossi’s peritoneal catheter?
9. The nurse asks Mrs. Rossi about the last few meals she prepared for her husband. Mrs. Rossi indicates the following meals:
 - a. Whole grain cereal with milk, orange juice, and a banana

- b. A roast beef sandwich with cheese and mayonnaise
- c. White bread toast, apple juice, and tea
- d. A peanut butter and jelly sandwich with diet cola

Clarify to Mrs. Smith which of these meals was the most appropriate for Mr. Rossi regarding his renal diet and your concerns about the other meals she prepared.

10. The Nurse notices that by the reclining chair where Mr. Rossi sits is a 2 liter bottle of diet cola. Why is the nurse concerned?
11. Who should the visiting nurse arrange to meet with the Rossis to provide additional teaching regarding appropriate food and beverage choices for a patient with renal failure?
12. Mrs. Rossi asks the nurse, "Someone at church said I should watch that my husband does not fall. They said he could break his hip very easily because people with bad kidney disease have very brittle bones. Is that true?" Help the nurse explain why patients with renal failure develop changes in their bones and offer some examples of renal osteodystrophy that may develop.
13. Identify 5 priority nursing diagnoses for Mr. Rossi.
14. The nurse reminds Mr. Rossi that he is at risk of becoming anemic. Briefly explain to him why he is at risk and what are the signs and symptoms he should report to his health care provider.
15. The nurse notices a napkin on the kitchen table with two calcium carbonate (Tums) tablets on it. When the nurse asks Mr. Rossi if he is taking his Tums with every meal, he replies, "Sometimes I remember. Sometimes I forget. I figure it is not a problem if I forget once in a while. I don't have any symptoms of heart burn anyway." In lay terminology, how might the nurse explain to Mr. Rossi the importance of taking his Tums with every meal?
16. Mrs. Rossi calls the visiting nurse to report that "When my husband's solution was drained out of his belly today, I noticed it was cloudy looking and he has a fever of 102 F (38.9 C)." Briefly discuss the common complication of peritoneal dialysis that Mr. Rossi appears to have developed. What should the nurse tell the Rossis to do?
17. Discuss the lifestyle changes imposed upon the patient who is on peritoneal dialysis and how these changes may affect the patient's quality of life.

Week 2

Practice Problems:

1. Dopamine 400 mg in 250 mL D₅W to infuse at 5 mcg/kg/min. The patient's weight is 200 pounds. How many mL/hour would this be on an infusion pump?
2. A Dopamine drip (400mg in 250 cc of IV fluid) is infusing on your 80 kg patient at 20 mL/hour. How many mcg/kg/min are infusing for this patient?
3. A Nitroglycerin drip is ordered for your patient to control his chest pain. The concentration is 100 mg in 250 mL D₅W. The order is to begin the infusion at 20 mcg/min. What is the rate you would begin the infusion on the infusion pump?
4. A Nitroglycerin drip (100mg in 250 cc D₅W) is infusing on your patient at 28 mL/hour on the infusion pump. How many mcg/min is your patient receiving?
5. A procainamide drip is ordered (2gms in 250 mL D₅W) to infuse at 4 mg/min. The patient weighs 165 pounds. Calculate the drip rate in mL/hour for which the infusion pump will be set at.
6. A Lidocaine drip is infusion on your 90 kg patient at 22 mL/hour. The Lidocaine concentration is 2 grams in 250 cc of D₅W. How many mg/min is your patient receiving?

Case Study

The Client with Heart Failure

A 74-year-old woman is admitted to the hospital with heart failure. She had been growing progressively weaker and had ankle edema, dyspnea on exertion, and three-pillow orthopnea. On admission, she is severely dyspneic and can answer questions only with one-word phrases. She is diaphoretic, with a heart rate of 132 beats/min, and blood pressure 98/70. She is extremely anxious.

The nurse performs a physical assessment of the client with heart failure and defers questions until the client has gained some relief as a result of emergency interventions. The priority assessments are as follows:

1. Considering the process of congestive heart failure, explain the symptoms she is having.

Your client's presenting symptoms are as follows:

2. Based on assessment, identify nursing diagnoses for this client.
3. The physician orders the following items for this client. (Start an IV, then give dobutamine 3 mg/kg/hr IV; Furosemide (Lasix) 40 mg IV stat; Digoxin 0.5 mg PO stat, then 0.125 every 6 hours for three doses, with ECG before doses 3 and 4; Morphine 2 mg IV stat and then 2 mg IV every 1 to 2 hours prn; Oxygen 4 L/min per nasal cannula; Schedule for an echocardiogram; No added salt diet; Weigh daily and monitor input and output) Explain the rationale for these medications and treatments.

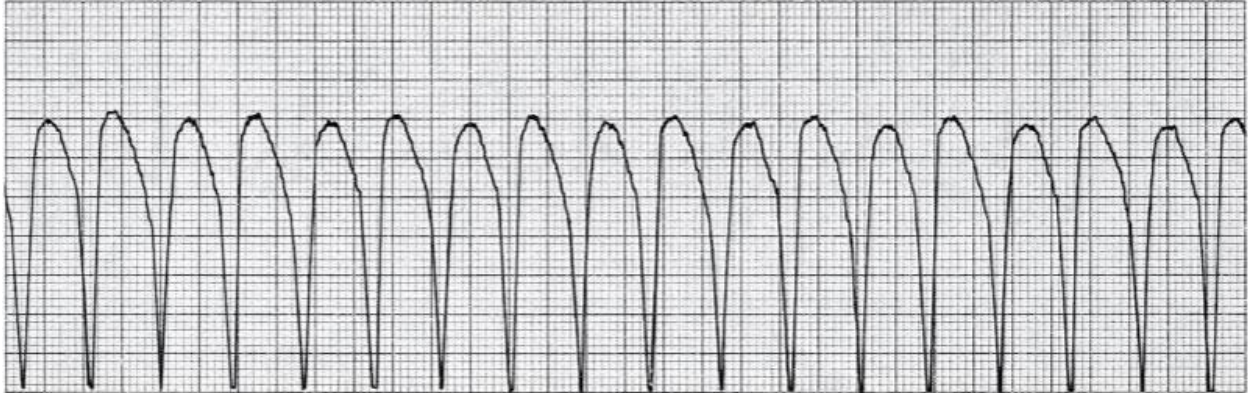
Case Study

The Patient with a Dysrhythmia

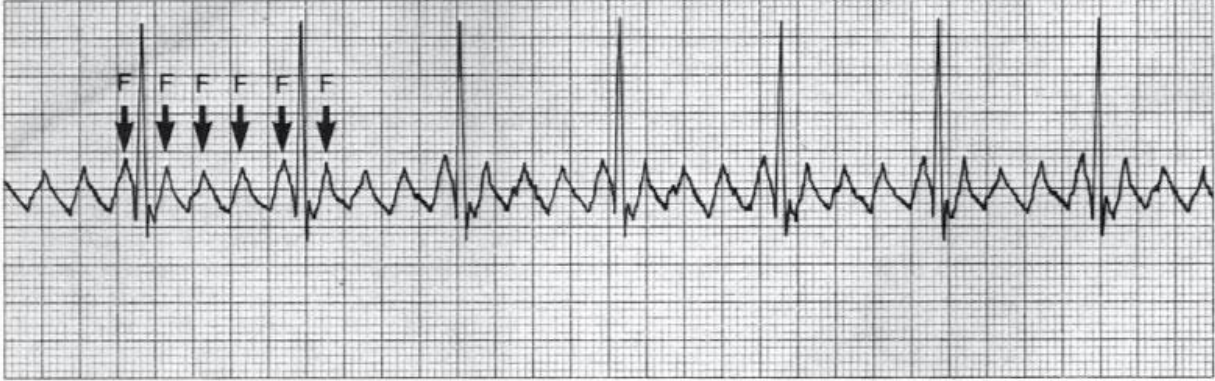
A 78-year-old woman is admitted to a telemetry unit directly from her physician's office for evaluation and management of congestive heart failure. She has a history of systemic hypertension and chronic moderate mitral regurgitation. Her medication orders include furosemide (Lasix) 80 mg PO four times a day, digoxin 0.125 mg PO daily, and diltiazem (Cardizem) 60 mg PO three times a day. Your initial assessment of the client reveals a pulse rate that is rapid and very irregular. The client is restless, her skin is pale and cool, she states she is dizzy when she stands up, and she is slightly short of breath. Her blood pressure is 106/88. She is short of breath and anxious. Her ECG monitor pattern shows uncontrolled atrial fibrillation, with a rate ranging from 150 to 170 beats per minute. Her oxygen saturation level is 90%.

1. Given the assessment findings, what should you do first?
2. What additional physical assessment techniques would you perform?
3. Because the length of time the client has been in atrial fibrillation is unknown, what potential complication may occur if cardioversion is attempted?
4. Based on your answer for number 3, what should be done before elective cardioversion is attempted?
5. What other medical therapy might this client receive before elective cardioversion is done?
6. Later that evening, the client calls the nurse because she feels "like something terrible is going to happen." She complains of chest pain, has increased shortness of breath, and has coughed up blood-tinged sputum. What do you suspect? What is the first thing the nurse should do, and what further assessments should be performed at this time?

Please identify the rhythms and how to treat them.



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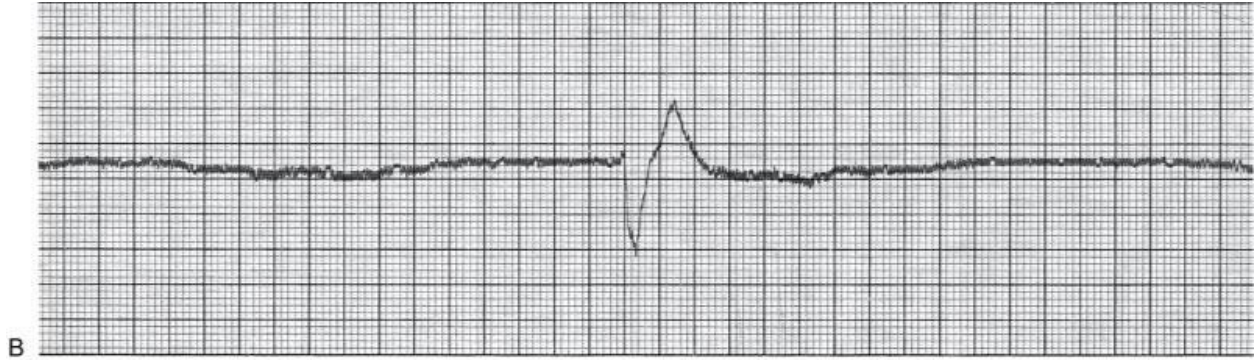
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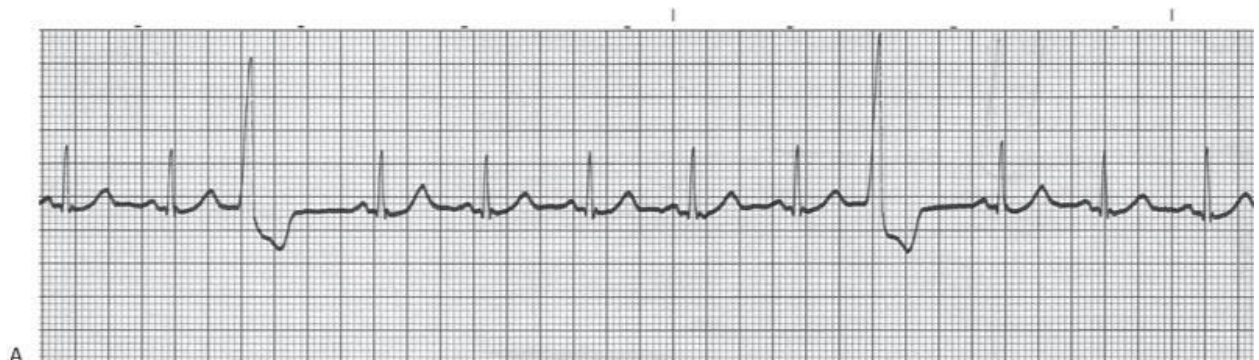
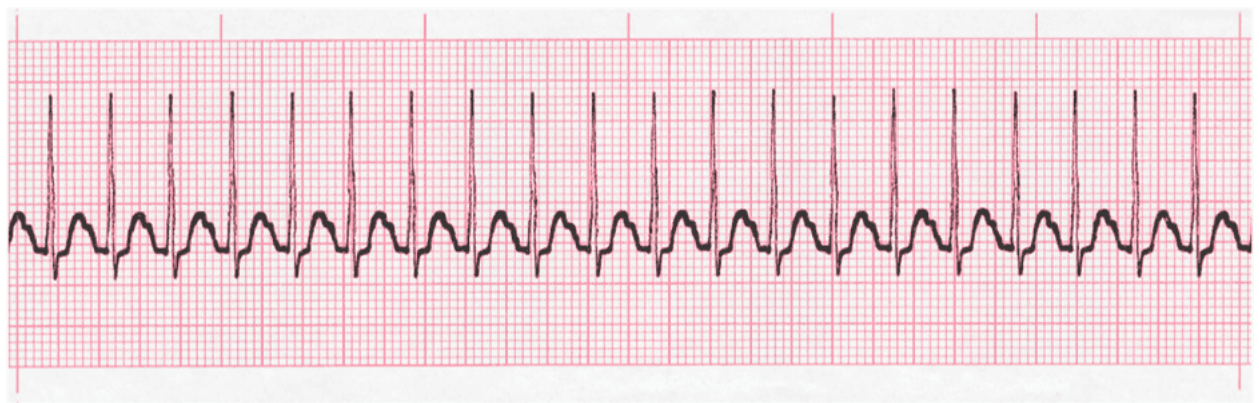
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Week 3

Practice problems

1. Order-Dexamethasone 1 mg
Drug available-Dexamethasone 0.5 mg per tablet

2. Order-Tagamet 0.6g
Drug available-Tagamet 300 mg per tablet

3. Order-Phenobarbital 60 mg
Drug available-Phenobarbital 15 mg per tablet

4. Order-Ampicillin 0.5g
Drug available-Ampicillin 250 mg per 5 mL

5. Order-Dicloxacillin 125 mg
Drug Available-Dicloxacillin 62.5 mg per 5 mL

6. Order-Medrol 75 mg IM
Drug Available-Medrol 125 mg per 2 mL

Practice Problems: Calculate how many drops per minute.

7. Order-1000 mL over 6 hrs IV set 15 gtts/mL
8. Order- 50mL over 20 min. IV set 15 gtts/mL
9. Order-100 mL over 20 min. IV set is 60 gtts/mL

CASE STUDY Chest Trauma and Acute Respiratory Distress Syndrome

A 36-year-old woman is brought to the hospital following a head-on car accident. She was unrestrained and sustained a blunt injury to the chest from hitting the steering wheel. Initially, she is asymptomatic. Initial orders include a stat chest x-ray, arterial blood gases, and oxygen at 4 L/minute via Venturi mask.

1. What other assessments should be made when she arrives in the ED?
2. Gradually over the next 24 hours, she develops difficulty breathing, hypoxemia, and secretions increase. The nurse notifies the physician who orders an arterial blood gas and a chest x-ray. The chest x-ray obtained in the ED showed no abnormalities; however, the repeat x-ray now shows a hazy opacity in the lobes and the physician makes a diagnosis of pulmonary contusion. What physical assessments will accompany this diagnosis?
3. Arterial blood gas results show: Pao₂ 68 mm Hg, Paco₂ 32 mm Hg, and pH 7.53. What do these values suggest?
4. What interventions should be implemented based on the laboratory results?
5. The patient temporarily responds to the high-flow oxygen therapy, but later the nurse notes that the patient demonstrates hyperpnea, grunting respiration, cyanosis, pallor, and intercostal and substernal retractions, with a change in mental status. The nurse suspects ARDS and calls the physician to obtain an order for which primary laboratory study used to establish this diagnosis?
6. Discuss the pathophysiology of ARDS.
7. The patient is intubated for respiratory failure. Describe how the nurse would secure the ET in place.
8. The patient is placed on a respirator with PEEP. Why is PEEP necessary?
9. Explain the rationale for the use of corticosteroids, antibiotics, and colloids in the management of the patient with ARDS.

Interventions for Critically Ill Patients with Respiratory Problems

CRITICAL THINKING CHALLENGE

The client is a 36-year-old woman who had a laminectomy yesterday for a ruptured lumbar disk. She has had pain for several months and has been unable to participate in her usual exercise program. She smokes one pack of cigarettes per day and drinks about two glasses of wine per week. Her other medications include oral contraceptives, ibuprofen PRN for joint and muscle pain, and sumatriptan(Imitrex) several times a month for migraine headaches. When you go to assess her this morning, she tells you that she is nauseated and having some chest pain.

1. What risk factors does she have for a pulmonary embolism?
2. For what other clinical manifestations should you assess?
3. Is oxygen by mask appropriate for this client? Why or why not?
4. What other actions should you initiate?

CRITICAL THINKING CHALLENGE 2

A patient with a PE is going home. She will continue warfarin therapy for at least 1 month.

1. What will you tell this client about warfarin therapy?
2. Is this client still at risk for a PE? Why or why not?
3. How can this client reduce her risk for PE?

NCLEX AND DECISION-MAKING CHALLENGES

You are assigned to care for a 60-year-old woman who is in the medical intensive care unit (MICU) for community-acquired pneumonia requiring mechanical ventilation. She is a 1 pack per day (ppd) smoker and does not use alcohol or recreational drugs. Before admission, she had several days with shortness of breath (SOB), a productive cough, and generalized fatigue. While in the MICU, she was on strict bedrest because of mechanical ventilatory support. Her drugs include erythromycin for community-acquired pneumonia, hydromorphone (Dilaudid) as needed for pain, and acetaminophen (Tylenol) as needed for fever. Two hours ago, she was extubated, and the mechanical ventilation discontinued. As you begin your morning physical assessment, you notice that she is agitated, confused, and tachycardic, and has tachypneic breathing at 35 times per minute; her oxygen saturation by pulse oximetry is 86%.

1. What should be your first action?
2. What risk factors does she have for a pulmonary embolism?
3. For what other manifestations should you assess?
4. Is oxygen by mask appropriate for this patient? Why or why not?
5. What other actions should you take?

Week 4

Math Practice (Find the mL/hr)

- 1) Cardizem 250mg in 250ml of 0.9% NaCl to infuse at 10mg/hr

- 2) Heparin 25,000 units in 500ml 0.9% NaCl to infuse at 1150units/hr

- 3) Insulin 200 units in 100ml of 0.9% NaCl to infuse at 4units/hr

- 4) Lasix 200mg in 100ml of 0.9% NaCl to infuse at 2mg/hr

- 5) Dopamine 800mg in 250ml of D5%W to infuse at 10mcg/kg/min. The patient weighs 83kg.

- 6) Dobutamine 250mg in 250ml of D5%W to infuse at 10mcg/kg/min. The patient weighs 62kg.

- 7) Lidocaine 1G in 250ml of D5%W to infuse at 2mg/min

- 8) Nitroglycerine 50mg in 250ml D5%W to infuse at 10mcg/min

Case Study

Hypovolemic Shock Case Study

Andrew Jones is a 34 year old convenience store clerk who sustained a gunshot wound to the right chest during a robbery. When the paramedics arrive, his BP was barely palpable at 50 mmHg. His heart rate was 130, and his RR was 35. His skin was pale, cold, and clammy with delayed capillary refill, his radial pulse was weak and thready, and he was unresponsive. His respirations were deep and rapid and supplemental O₂ was give via a 100% NRB. Two 14 gauge peripheral IV lines were started and LR was started wide open.

Upon arrival in the ED, Mr. Jones' SBP was 90 mmHg systolic , HR 120, and RR 26. He was restless and responded only to pain. His skin was pale and cool, and his capillary refill had a defined delay. His chest expansion was unequal and his breath sounds were grossly diminished on the right side. Chest Xray confirmed a right pneumothorax. Labs and a type and cross were drawn and sent.

A 36F chest tube was inserted in the right 8th intercostal space in the mid axillary line. Fifteen hundred ml of blood immediately evacuated, with continued bloody drainage up to 2500ml in 30 minutes.

Mr. Jones admission ABG (on 100% NRB mask) and CBC were as follows:

pH 7.21	Hgb 8.2
PaCO ₂ 45	Hct 24.1
PaO ₂ 91	Platlets 263
SaO ₂ 95%	RBC 2.17
HCO ₃ 15	WBC 5.8

A foley catheter was inserted and 100ml clear yellow urine was drained. LR continued wide open and patient had received 6 liters IVF and 4 units of O- blood was rapidly infused over 30 minutes prior to going to the OR.

In the OR a right thoracotomy with right pneumonectomy was performed, with repair to the right axillary artery. Mr. Jones received 14L of crystalloid, 20 units of PRBC, 6 units of FFP, and 10 units of Platelets. He was transferred to the CTCU.

Upon arrival to the unit Mr. Jones is still sedated and intubated. He is hemodynamically stable with a BP 110/70, HR 96, and CVP of 10. His vent settings are AC 12, TV 700, FiO₂ 80%, Peep 5. He is not assisting ventilation at this time. His skin is warm and dry, pulses are palpable, and

capillary refill is normal. The nurse notes that his thoracotomy dressing is blood-soaked and diffuse oozing is apparent from all insertion sites. Significant clinical data are as follows:

PT 18.7	Hgb 10.1	Platelets 108
PTT 71.9	Hct 32	RBC 4.6
Fibrinogen 78	WBC 6	

1. Define hypovolemic shock.
2. Was Mr. Jones in hypovolemic shock when the paramedics arrived? What clinical manifestations of hypovolemic shock did he exhibit?
3. Why was LR the fluid of choice for Mr. Jones' initial fluid resuscitation?
4. What other fluids might be considered in initial resuscitation of hypovolemic shock?
5. What is the preferred route of vascular access for fluid resuscitation in hypovolemic shock?
6. A CVP line is inserted in the patient's right subclavian vein during surgery. What are the potential complications of a CVP insertion?

Four hours after admission to the CTCU, Mr. Jones' BP dropped to 72/50, his HR rose to 120, and his CVP was 3mmHg. He received 2 L of LR over the next hour, at which time his BP was 86/60, HR 112, and CVP 5mmHg. His urine output for the last hour was 15 ml. A Pulmonary Artery Catheter was inserted.

7. Placement of a pulmonary artery catheter allows for accurate and detailed cardiopulmonary assessment. What hemodynamic alterations would be expected in hypovolemic shock?

Mr. Jones initial hemodynamic profile revealed the following:

CVP 2	CI 1.8
PAP 20/10	SVR 1420
PAWP 2	BP 88/66
CO 4	

8. What therapy would be appropriate at this point?
9. During the initial resuscitative period, Mr. Jones received 4 units of PRBC. WHY?
10. What is autotransfusion? Would it be useful in this case?
11. What factors in Mr. Jones' case indicate a coagulopathy?
12. What are other complications of massive blood transfusions?
13. When Mr. Jones arrived in the ED, his pH was 7.21, PaCO₂ 45, PaO₂ 91, and HCO₃ 15. What was his acid-base status? What was the etiology of the acid-base balance?
14. List the major compensatory mechanisms in hypovolemic shock and briefly explain each:
 - a. Sympathetic Response
 - b. Renin-Angiotensin-Aldosterone System
 - c. Synthesis of Antidiuretic Hormone
 - d. Body Fluid Shifts from Interstitial Spaces into the Intravascular Space
 - e. Reverse Stress-Relaxation of Circulatory System
15. Mr. Jones hypovolemia resulted from hemorrhage. What are the common causes of hypovolemic shock?
16. What are the possible renal complications of hypovolemic shock?
17. What are the nursing diagnoses apply in this case?

CASE STUDY

Cardiogenic Shock Case Study

Mrs. Settles, a 50 year old woman, came to the emergency department at 0630 with complaining of being nauseous, achy, and just over all not feeling well for about 2 days. She decided to come to the ED because for the past 2 hours she has been is mildly diaphoretic, slightly short of breath, and she sates she is still nauseous. Upon, a quick assessment reveals bibasilar crackles, S₃ w/o a murmur, Sinus Tachycardia on the monitor and chest xray shows no abnormalities. VS are BP 156/98, HR 124, RR 34, O₂ sat 91 on RA, Temp is 37 C(98.6 F).

Mrs. Settles has a history of HTN, stable angina, dyslipidemia, TAH, 20 year history of smoking cigarettes, she quit 10 years ago and Cervical CA 10 years ago. However, she revealed that for the past 3 weeks, she had experienced substernal pain radiating to her back with any type of activity. The pain would last for an hour but was relieved by sublingual NTG and rest. There is a family history of a brother dying form an MI and a sister with a history of 3 MI's. Patient takes the following medications daily:

Aspirin 81mg daily

Propranolol hydrochloride (Inderal LA) 80mg daily

Isosorbide mononitrate (Imdur SR) 30 mg daily

Lisinopril (Zestril) 10mg daily

Upon arrive to the ED an 18g IV was started in her right AC and labs were drawn and sent stat, NTG IV 50mg in 250 ml of D5W was started and titrated to the patient's pain level and blood pressure and to start a heparin gtt IV 25,000 Units in 250ml D5W using the cardiac weight based protocol. She was given Morphine Sulfate 2 mg IV push stat, and oxygen at 6L NC was started. You titrated the NTG gtt to 20mcg/min and bolus her with 5000 units IV push heparin and start the gtt at 1000 units/hour Labs results are:

WBC 13.9	BUN 6	Cl 103
Glucose 117	Myoglobin 120	CK-MB 30
Hgb 15	K 4	CO ₂ 24
Hct 41.8	Troponin 0	
Creatinine 0.9	Na 141	

20 minute later Mrs. Settles denies any pain and states she is feeling better. It is a very busy day in the ED and a patient just arrived having a stroke. An hour in a half later you go and check on

Mrs. Settles. The EKG technician came and did her 12 lead EKG and placed it in the file bin. You note that the 12 lead EKG reveals early Q waves and massive ST segment elevation in leads V₁ thru V₄. You note that the patient is having frequent multifocal PVC's on the monitor. You reassess the patient and note that she still has S₃, is SOB at rest, VS BP 160/102, HR 140, RR 30, O₂ sats 89% on 6LNC. You update the ED physician. Stat cardiac enzymes and arterial blood gases are drawn and the interventional cardiologist is consulted. Labs are:

Myoglobin 150	CK-MB 36	Troponin 37	
pH 7.261	PO ₂ 60	PCO ₂ 52.1	HCO ₃ ⁻ 22.4

You and the ED physician call a code MI. You change her oxygen to 100% NRB mask VS are BP140/100, HR 148, RR 34, O₂ 93%. Dr. Heart and the cath lab team assess the patient. She is intubated with a #7 ETT 23 cm at the right lip by the anesthesiologist using propofol and etomidate. You start 2 more 18g IV. Mrs Settles is taken to the cardiac cath lab emergently.

In the cath lab Mrs. Settles did have sustained run of v-tach which required defibrillation twice. She received 3 drug eluting stents to her LAD which was 100% occluded. A right heart catheterization was performed and revealed the following. Mrs. Settles EF was 12%, CO 2.5, CI 1.5, SVR 1800, PCWP 22, BP 90/48, HR 90. A Pulmonary Artery Catheter is placed along with an intra aortic balloon pump 1:1 timing. Mrs. Settles remained intubated. Upon arrival to the CCU these were the following orders.

- Start an amioderone gtt 900mg/500ml D5W 1mg/min for 6 hours then 0.5mg/min for the next 18 hours
- Phenylephrine 10mg/250ml D5W titrate to maintain MAP greater then 60
- Versed gtt 50mg/50ml D5W titrate for a Ramsey score of 3
- Maintain Heparin gtt using cardiac weight based protocol
- Lopressor 5mg IV push every 6 hours hold for SBP <90 or HR <60
- Asprin 325mg NGT daily
- Plavix 75mg NGT daily
- Protonix 40mg IV daily
- Strict I&O
- Stat 12 lead EKG post procedure

1. What is the clinical presentation of a patient having an acute myocardial infarction? Identify Mrs. Settles clinical presentation to the ED. How may Mrs. Settles signs and symptoms differ from a man with the same diagnosis.
2. How is a diagnosis of AMI determined? Identify the results for Mrs. Settles that confirm the diagnoses of AMI.
3. What are the treatment goals for a patient with an AMI?
4. Discuss the role of thrombolytic therapy vs. interventional therapy for a patient having AMI.
5. Explain the use of Nitrates, Beta blockers, ACE inhibitors and anticoagulation in a patient with an AMI.
6. What complications are commonly seen after an MI? What are the most common complications seen with an anterior wall MI?
7. What significant 12 lead EKG changes are sometimes seen following an anterior wall MI? What 12 lead EKG changes occurred with Mrs. Settles? How often are EKG changes seen with a patient having an AMI?
8. Define cardiogenic shock and why it occurs after an anterior wall MI. What is the prognosis for a patient with cardiogenic shock?
9. What are the hemodynamic parameters seen in the patient with cardiogenic shock in comparison with normal hemodynamic parameters?
10. Discuss the goals of pharmacologic management in cardiogenic shock. Which medications were used for Mrs. Settles?
11. What type of mechanical support devices can be used for patients in cardiogenic shock and why? Which type was used for Mrs. Settles? Identify any specific nursing responsibilities for the devices chosen for Mrs. Settles.
12. What are the nursing diagnoses for the patient in cardiogenic shock after an anterior wall MI?
13. Identify what process may have been a contributor to Mrs. Settles going into cardiogenic shock. How would you deal with that as a nurse?

CASE STUDY

Septic Shock Case Study

Emergency Department

John Budd, a 72 year old arrived in the ED unconscious, with stab wounds to the upper right abdomen and lower right chest that were sustained in his home while fighting off a burglar. The paramedics secured 2 large bore IV sights in his right and left antecubital spaces and started LR wide open in both sites. An endotracheal tube was inserted, and ventilation with a resuscitation bag at 100% was begun. Medical anti shock trousers were in place. Pressure dressings to both wounds were secured.

A 5 cm stab wound to his right lower chest and a 7.5 cm stab wound to his upper right abdomen was inspected. Chest tubes were inserted into the upper right and lower right mid axillary regions. Immediately, 500ml of red drainage returned via the lower chest tube. His heart rate was 125, ST without ectopy, BP 70/50, and he was placed on the mechanical ventilator and O2 saturations are 95% on 100% O2. A Foley catheter resulted in draining of 400 ml clear dark yellow urine. After infusion of more than 2000ml of LR solution, Mr. Budd was sent to surgery within 50 minutes of sustaining his injuries, still in a hypotensive state. Preoperative body weight was 74kg.

Surgical Intervention

During surgery, a right thoracotomy and right abdominal laparotomy were performed. The right chest wound was explored, and a lacerated intercostal artery was ligated. Exploration of his upper-right abdominal wound revealed more extensive damage. The liver and the duodenum were lacerated. Extensive hemorrhage and leaking of intestinal contents were apparent after opening the peritoneum. Mr. Budd's injuries were repaired, the peritoneal cavity was irrigated with antibiotic solution, and incisional sump drains were placed in the duodenum.

During the 4 hour surgery, Mr. Budd received 6 units of PRBC and an additional 3 liters of LR. A pulmonary artery catheter and right radial a-line was inserted.

ICU after Surgery

Mr. Budd arrived to the ICU, he was on a mechanical ventilator settings were as follows.

Assist Control with a rate of 12

FiO2 60%

Tidal Volume 800ml

Vital Signs and hemodynamic parameters immediately after surgery were the following.

BP 92/52

HR 114

Temp 97.2

PAP 20/8

PCWP 6mmHg

CVP 4mmHg

CO 5

CI 2.9

SVR 1040

Arterial Blood Gases are normal. WBC is 13 and hemoglobin 10, Mr. Budd's other lab values are within normal limits.

Post op day 1

Mr. Budd remained drowsy and received vent support for 24 hours, then was extubated to 50% venti mask. His pain was controlled by morphine IV. The NGT continues to drain large amounts of green fluid, and an incisional duodenal sump tube drained large amounts of greenish brown fluid. His chest and abdominal dressings remained dry. Breath sounds were diminished on the right side but clear on the left. His chest tubes continued to drain small amounts of bloody fluid. Urine output was 40-60ml per hour. His abdomen was slightly firm and distended, and he had no bowel sounds.

Post op Day 2

Mr. Budd's condition remained stable until today. At this time he became difficult to arouse but did respond to commands. His RR was 28 shallow and labored. His urine output is 20 ml per hour. His skin became war, dry, and flushed. Other clinical data included the following:

BP 80/50

HR 132

Temp 97.2

PAP 14/7

PCWP 4mmHg

CVP 2mmHg

CO 8 L/min

CI 4.7L/min/m²

SVR 560

WBC 22

Glucose 270

Culture and sensitivity reports from wound drainage to indicated gram-negative bacilli. Intravenous antibiotics are administered, as well as IV hydrocortisone and naloxone (Narcan). A consult was placed for a nutritionist to formulate and calculate nutritional needs, and TPN was started. To prepare for the suspected hyperdynamic phase of septic shock, infusion of LR was increased to 150ml per hour, and dopamine at 7 mcg/kg/min was started with a concentration of 400mg/250 ml of D5W.

Post op day 6

By day 6, Mr. Budd's condition had deteriorated dramatically. His skin was cool, mottled, and moist. His sclera were yellow tinged. He no longer responds to stimuli. A norepinephrine (levophed) drip was infused at 6mcg per min. with a concentration of 4 mg/250ml of D5W, along with a dopamine drip at 2mcg/kg/min continued. His monitor showed sinus tachycardia with short runs of Vtach. ST segment elevation, T wave inversion, and the development of Q waves over most of the anterior V leads on his 12 lead EKG. A 75mg bolus of lidocaine was given followed by a drip of 2mg/min with a concentration of 2g/500ml of D5W. His breath sounds revealed crackles throughout his chest. Urine output was 5ml/hour and was grossly bloody. His abdomen was enlarged and firm. His abdominal suture lines had dehiscd, and the peritoneum could be seen. The duodenal sump and NGT drainage started to turn red. All arterial and venous puncture sites began oozing blood. Further clinical data included.

BP 70/52

HR 140

RR14

Temp 96.4

PAP 44/26

PCWP 24mmHg

CVP 8mmHg

CO 2L/min

CI 1.1L/min/m²

SVR 2000

pH 7.14

Pco2 49

Po2 46

SaO2 85

Lactic acid 14

Na 152

K 5.9

Creatinine 3.4

Amylase 290

Lipase 3.9

ALT 100

AST 82

FDP 39

Platelets 75

PT 22

PTT 98

Fibrinogen 130

CK 640

Troponin 50

Final Developments

Despite attempts to reduce the afterload with sodium nitroprusside (Nipride) and increase contractility with Dobutamine, Mr. Budd's hemodynamic status failed even further. When his cardiac rhythm deteriorated into Vfib, resuscitation efforts were unsuccessful. An autopsy revealed several small abscessed areas in the lung, acute hepatic failure, multiple hemorrhagic areas, and an acute MI.

1. Discuss the magnitude of bacteremia and sepsis in hospitalized patients and the relationship between these two diagnoses.
2. What are the risk factors for infection and development of septic shock? Identify those that applied to Mr. Budd.
3. Discuss the rationale for use of a PAC in monitoring Septic Shock.
4. What organism most commonly cause septic shock? In which sites is an infection most often seen?
5. What pathophysiologic process occurs with septic shock? What are the effects of these processes on the patient's vascular tank, volume, and pump?
6. Discuss clinical, lab, and therapy changes that occurred on Mr. Budd second postoperative day.
7. What is the rationale for each of the following therapeutic modalities ordered for Mr. Budd on the second postoperative day and calculate what the RN would set the IV pump at?

Increased IV rate

Dopamine

Steroids

Narcan

TPN

8. Discuss the clinical changes that occurred during Mr. Budd's 6th postoperative day.

9. What is the rationale for each of the following therapeutic modalities ordered for Mr. Budd on the sixth postoperative day? How many ML per hour should each drug be infused at?

Levophed 6mcg/min

Dopamine 2mcg/kg/min

Lidocaine 2mg/kg/min

10. What are the reasons for the changes in the following hemodynamic parameters on 6th postoperative day?

SVR

CO/CI

PCWP

11. Interpret Mr. Budd's ABG on the 6th post op day.

12. Why are the renal, liver, and pancreatic lab values reported on 6th post op day abnormal?

13. What complications do the hematologic lab values suggest?

14. What would account for the EKG changes described?

15. Mr. Budd's liver lacerated during the stabbing. What effect, if any, did this have on his eventual outcome?

16. How do elderly patients manifest symptoms of sepsis?

17. What antimicrobial and antiendotoxin therapies should be instituted in sepsis?

CASE STUDY

Pediatric Shock Case Study

Kevin is an 8 y/o school age child who lives with his parents and 2 older brothers, ages 14 and 16. Kevin's brothers take care of him after school until his parents come home about 5:30pm. Kevin plays outdoors with his friends after school each day in his back yard. His brothers are very responsible and keep close watch over their younger brother. Today is the awards presentation at school immediately following classes and his mother and brothers attend the ceremony. Because their mother is driving Kevin home, his brothers have the opportunity to spend time with their friends and their father will pick them up after work. As Kevin and his mother are driving home, a large truck runs a red light; hitting their vehicle in the side where Kevin is sitting and causing multiple traumas to Kevin. His mother receives some contusions and abrasions and is taken to the hospital by EMS with Kevin. Both were wearing seat restraints.

Kevin is admitted to the pediatric intensive care unit (PICU) in critical condition. After his brief admission assessment, he has an IV infusion of LR at 200ml per hour. His admitting diagnosis is multiple trauma and shock. He is placed on a cardiac monitor, is intubated and placed on a mechanical ventilator, a triple lumen catheter, an arterial line is placed, a NGT is placed and an indwelling urinary catheter is placed. His VS upon arrive to the PICU are:

Temp. 35 C (95 F)

HR 130

Resp 45

BP 110/50

CVP 4

1. What is the significance of Kevin's VS?
2. What is the pathophysiology of shock?
3. What are the different types of shock and what type and stage of shock do you think Kevin is experiencing and why?
4. What complications can occur as a result of shock?
5. What other assessment data would be helpful for the nurse to have to prepare Kevin's care plan?
6. What are the priorities of care for Kevin on admission?
7. Discuss the rationales for Kevin's IV fluid.
8. What is the rationale for placing Kevin on a Mechanical ventilator?
9. Discuss the purpose of the placement of Kevin's CVP line and Arterial line?

10. Discuss the rationale for both continuous pulse oximetry and arterial blood gases?
11. What is the health care provider's rationale for placing the NGT?
12. Kevin's parents stay at his bedside constantly. His mother says to you, "I am so afraid my baby is not going to make it and it's my entire fault. If I had just been watching the traffic closer, maybe this never would have happened." She weeps as her husband tries to console her. How can you therapeutically respond to Kevin's mother?
13. Kevin's brothers visit him regularly and even though he is not responsive, they talk to him about school and bring him cards and messages from his classmates. They bring in a CD player and play some of the current music he likes. Discuss the potential effects of his brothers' visit.
14. Kevin's mother actively participates in his ADLs including bathing, mouth care, and ROM. Discuss the importance of Kevin's mother participating in his care.
15. After 1 week in the PICU Kevin's MAP 90 mmHg and he is being weaned from the vent. His O₂ sats are 100% on 30%. Discuss the significance of these findings. How can Kevin's family assist during the time Kevin is being weaned from the vent?
16. Kevin's condition has stabilized and is being prepared for transfer to the pediatric surgical unit. He complains of being tired and according to his parents, "He has been so cranky lately even though he's been getting better." Discuss your impression of Kevin's behavior, why he is behaving that way, and suggestions for how his parents can deal with it.
17. On the nursing unit, referrals are made to the hospital school and recreation therapy for Kevin. Discuss the rationale for these referrals.

CASE STUDY

KIDNEY TRANSPLANT

Sandra Glinn is a 14 year old adolescent who lives at home with her mother, step father, and 2 younger siblings. When Sandra was 9 years old, she was involved in a motor vehicle accident and was severely injured. As a result, she developed acute renal failure that eventually progressed to chronic renal failure. She has been receiving peritoneal dialysis for the past 4 years. She is registered with the organ procurement agency in the city 30 miles from her home because her parents have been ruled out as potential donors.

Sandra is doing satisfactorily at home, receiving her peritoneal dialysis at night. This allows her to attend school and interact with her friends. She is anxious to receive her kidney transplant so she will not have to continue her dialysis. Sandra's parents receive a phone call a phone call from the hospital at 0200 telling them that the hospital has procured a kidney for Sandra as a result of a motor vehicle crash that killed a 10 year old boy. Her mother call Sandra's grandmother to babysit for the younger kids, and then Sandra's parents take her to the hospital, where they are met by the transplant team.

1. What is chronic renal failure and end-stage renal disease ESRD?
2. What is the possible connection between Sandra's MVA and her development of ESRD?
3. What are the incidence and etiology of CRF in children?
4. What are the complications associated with Sandra's diagnosis?
5. What are the priorities of care for Sandra's ESRD?
6. Why is Sandra receiving peritoneal dialysis?
7. Compare the advantages and disadvantages of peritoneal dialysis and hemodialysis in children?
8. Discuss the impact Sandra's diagnosis may have on her growth and development?
9. What other assessment data would be helpful for the nurse to have to prepare Sandra's care plan?
10. What is the impact of the phone call Sandra's parents received informing them of a kidney donor for Sandra?
11. What is the incidence of renal transplants in a child Sandra's age?

12. Two days following her surgery, Sandra is admitted to the pediatric transplant unit where she received her kidney transplant. What are the priority nursing interventions for Sandra?
13. Sandra weighs 49.9 kg (110 lbs.) and is prescribed prednisone 30mg PO QID, cyclosporine 100mg PO QID, and azathioprine 50mg PO QID. What are these medications? Why is she prescribed them, and are the doses safe?
14. One month following her discharge from the hospital, she develops a fever, has decreased urine output, and has gained 3.2 kg (7 lbs.). Her mother calls the transplant physician and is advised to bring Sandra to the hospital clinic. On arrival her vital signs are: temp. 100.4 F, blood pressure 140/86, HR 90, RR 30. Her BUN 24 mg/dL and creatinine is 4mg/dL. What is your impression of Sandra's condition?
15. Sandra is admitted to the hospital and prescribed prednisone 40 mg PO QID, cyclosporine 125mg PO QID, azathioprine 62.5mg PO QID. What is the relationship between Sandra's condition and the increase in her medications?
16. Sandra's acute rejection is successfully treated and she returns home. Three years later Sandra is doing well and her transplanted kidney is functioning well. Does Sandra need to continue her immunosuppressant therapy? If so how long?