**Maryland Next Gen NCLEX Test Bank Project**

**January 25, 2023**

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| **Case Study Topic and standalone bowtie** | Heart Failure | **Author:** | Lisa Seldomridge, PhD, RN, CNE  Jennifer Hart, DNP, FNP-BC  Molly Dale, DNP, FNP-BC  Salisbury University |

**Case Summary**

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| Client with heart failure presents to outpatient clinic appointment with exacerbation of right and left sided heart failure. Provider stops digoxin’ orders ACEI/ARB combination drug but does not discontinue ACEI. Orders fluid restriction and daily weights. Client returns home on new regimen, symptoms resolve temporarily. Two weeks later, client develops urgent symptoms of heart failure. Learner should recognize s/s of heart failure, red flags for emergent care, interpret lab data and intervene, detect error in medication order, educate client about changes to treatment plan. |

**Objectives**

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| 1. Recognize signs and symptoms of heart failure.  2. Interpret lab data and intervene as appropriate.  3. Identify signs and symptoms of worsening condition.  4. Educate client about medications and treatment plan.  5. Recognize red flags that indicate a need for emergent care. |

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| **Case Study Link** | **Case Study QR Code** |
| <https://umaryland.az1.qualtrics.com/jfe/form/SV_exrTWnuPE9DeFKe\> |  |
| **Bowtie QR Code** | **Bowtie Link** |
|  | <https://umaryland.az1.qualtrics.com/jfe/form/SV_5uPYXN24sOC1qMm> |

**Case References**

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| 1. Ignatavicius, D. D., Workman, M. L., Rebar, C. R., & Heimgartner, N. M. (2022). *Medical-surgical nursing: Concepts for interprofessional collaborative care* (10th ed.). Elsevier. 2. Burcham, J., & Rosenthal, L. (2022). *Lehne’s pharmacology for nursing care* (11th ed.). Elsevier Saunders. |

**Case Study Question 1 of 6**

The nurse cares for a 68-year-old male client who presents for a routine clinic appointment.

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| **Clinic Notes** | |
| Day 1 – 1000: A 68-year-old male client presents for a routine clinic appointment. Reports “tiring easily when out shopping or for walks.” Has been staying home reading and watching television. Reports difficulty sleeping, awakens with shortness of breath in the middle of the night. Reports 8-pound weight gain over past two weeks since last appointment. States normal appetite. Denies chest pain and back pain. States he is “anxious” about his condition. No known allergies. Current medications: enalapril 20 mg/twice a day PO, hydrochlorothiazide 25 mg/twice a day PO, digoxin 0.125 mg/once a day PO. Assessment as follows: Alert & oriented X 4, appears slightly anxious; HR regular @ 102 & 4+ pitting pedal and pretibial edema; RR unlabored, crackles in bases bilaterally; abdomen soft, non-tender, bowel sounds active; skin warm, dry & intact; frequent urination, small amts clear yellow urine. | | | |
| **Vital Signs** | |
| Time | 1000 | |
| T ◦F/ ◦C | 98.6 F/37 C | |
| P | 102 | |
| RR | 22 | |
| B/P | 170/100 | |
| Pulse oximeter | 93% (room air) | |
| Weight | 215 lb (97.7 kg) | |

* Which 4 findings are most concerning?
* States he is anxious
* 4+ pitting pedal & pretibial edema\*
* Crackles in bilateral lung bases\*
* Frequent urination
* Appetite
* Awakening at night with shortness of breath\*
* Weight gain\*
* Heart rate

**Scoring rule: 0/1**

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| Rationale: The client is exhibiting signs of worsening heart failure (HF). Crackles in lung bases, awakening at night with shortness of breath, and weight gain are associated with left-sided HF; lower extremity edema is associated with right-sided HF but still a concern. Stating he is anxious, appetite (states as normal) and frequent urination is not a priority concern relative to signs/symptoms of worsening HF. Heart rate is only slightly elevated at present. |

**Case Study Question 2 of 6**

The nurse cares for a 68-year-old male client who presents for a routine clinic appointment.

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| **Clinic Notes** | |
| Day 1 – 1000: A 68-year-old male client presents for a routine clinic appointment. Reports “tiring easily when out shopping or for walks.” Has been staying home reading and watching television. Reports difficulty sleeping, awakens with shortness of breath in the middle of the night. Reports 8-pound weight gain over past two weeks since last appointment. States normal appetite. Denies chest pain and back pain. States he is “anxious” about his condition. No known allergies. Current medications: enalapril 20 mg/twice a day PO, hydrochlorothiazide 25 mg/twice a day PO, digoxin 0.125 mg/once a day PO. Assessment as follows: Alert & oriented X 4, appears slightly anxious; HR regular @ 102 & 4+ pitting pedal and pretibial edema; RR unlabored, crackles in bases bilaterally; abdomen soft, non-tender, bowel sounds active; skin warm, dry & intact; frequent urination, small amts clear yellow urine. | | | |
| **Vital Signs** | |
| Time | 1000 | |
| T ◦F/ ◦C | 98.6 F/37 C | |
| P | 102 | |
| RR | 22 | |
| B/P | 170/100 | |
| Pulse oximeter | 93% (room air) | |
| Weight | 1. Lbs (97.7 kg) | |

Drag the most appropriate words from the choices to fill in the blanks of the following sentence.

The 2 problems the client is at most risk for developing are

and .

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| **Word Choices** |
| Electrolyte imbalance\* |
| Anemia |
| Dehydration |
| Heart attack |
| Fluid volume overload\* |
| Diabetes mellitus |
| Hyperkalemia |
| Thrombophlebitis |

**Scoring rule: 0/1**

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| Rationale: The client has worsening heart failure and is at risk for fluid volume overload and electrolyte imbalances from hemodilution. He is also taking hydrochlorothiazide and may become hypokalemic if he is not including enough potassium in his diet. He is not at risk /low risk for hyperkalemia, dehydration, anemia, heart attack, DM and thrombophlebitis. |

**Case Study Question 3 of 6**

The nurse cares for a 68-year-old male client who presents for a routine clinic appointment.

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| **Clinic Notes** | |
| Day 1 – 1000: A 68-year-old male client presents for a routine clinic appointment. Reports “tiring easily when out shopping or for walks.” Has been staying home reading and watching television. Reports difficulty sleeping, awakens with shortness of breath in the middle of the night. Reports 8-pound weight gain over past two weeks since last appointment. States normal appetite. Denies chest pain and back pain. States he is “anxious” about his condition. No known allergies. Current medications: enalapril 20 mg/twice a day PO, hydrochlorothiazide 25 mg/twice a day PO, digoxin 0.125 mg/once a day PO. Assessment as follows: Alert & oriented X 4, appears slightly anxious; HR regular @ 102 & 4+ pitting pedal and pretibial edema; RR unlabored, crackles in bases bilaterally; abdomen soft, non-tender, bowel sounds active; skin warm, dry & intact; frequent urination, small amts clear yellow urine. | | | | |
| **Vital Signs** | |
| Time | 1000 | |
| T ◦F/ ◦C | 98.6 F/37 C | |
| P | 102 | |
| RR | 22 | |
| B/P | 170/100 | |
| Pulse oximeter | 93% (room air) | |
| Weight | 215 lb (97.7 kg) | |
| **Laboratory Report** | |
| Lab | | Results | | Reference range |
| Cholesterol | | 248 mg/dL | | <200 mg/dL normal  200-239 mg/dL borderline; >240 mg/dL high |
| BUN | | 10 mg/dL | | 10-20 mg/dL |
| Creatinine (Serum) | | 1.5 mg/dL | | 0.9 to 1.4 mg/dL |
| Hematocrit | | 34.6% | | Males: 42-52%; Females: 35-47% |
| Hemoglobin | | 13.5 g/dl | | Males: 13-18 g/dL; Females:12-16 g/dL |
| Potassium(serum) | | 2.8 mEq/L | | 3.5 to 5 mEq/L |
| Sodium (serum) | | 135mEq/L | | 135 to 145 mEq/L |
| Chloride (serum) | | 95 mEq/L | | 96 to 106mEq/L |

* Which abnormal lab finding should the nurse address first?
* Potassium\*
* Cholesterol
* Hematocrit
* Creatinine

**Scoring rule: 0/1**

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| Rationale: The serum potassium level must be addressed first. It is dangerously low and can precipitate digitalis toxicity. While cholesterol is high, it is not an issue that can be addressed urgently, and hematocrit is slightly low, partly to hemodilution. Creatinine is within normal limits but on higher range of normal which bears watching but not urgent concern compared to potassium level. |

**Case Study Question 4 of 6**

The nurse cares for a 68-year-old male client who presents for a routine clinic appointment.

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| **Clinic Notes** | |
| Day 1 – 1000: A 68-year-old male client presents for a routine clinic appointment. Reports “tiring easily when out shopping or for walks.” Has been staying home reading and watching television. Reports difficulty sleeping, awakens with shortness of breath in the middle of the night. Reports 8-pound weight gain over past two weeks since last appointment. States normal appetite. Denies chest pain and back pain. States he is “anxious” about his condition. No known allergies. Current medications: enalapril 20 mg/twice a day PO, hydrochlorothiazide 25 mg/twice a day PO, digoxin 0.125 mg/once a day PO. Assessment as follows: Alert & oriented X 4, appears slightly anxious; HR regular @ 102 & 4+ pitting pedal and pretibial edema; RR unlabored, crackles in bases bilaterally; abdomen soft, non-tender, bowel sounds active; skin warm, dry & intact; frequent urination, small amts clear yellow urine. | | | | |
| **Vital Signs** | |
| Time | 1000 | |
| T ◦F/ ◦C | 98.6 F/37 C | |
| P | 102 | |
| RR | 22 | |
| B/P | 170/100 | |
| Pulse oximeter | 93% (room air) | |
| Weight | 215 lb (97.7 kg) | |
| **Laboratory Report** | |
| Lab | | Results | | Reference range |
| Cholesterol | | 248 mg/dL | | <200 mg/dL normal  200-239 mg/dL borderline; >240 mg/dL high |
| BUN | | 10 mg/dL | | 10-20 mg/dL |
| Creatinine (Serum) | | 1.5 mg/dL | | 0.9 to 1.4 mg/dL |
| Hematocrit | | 34.6% | | Males: 42-52%; Females: 35-47% |
| Hemoglobin | | 13.5 g/dl | | Males: 13-18 g/dL; Females:12-16 g/dL |
| Potassium(serum) | | 2.8 mEq/L | | 3.5 to 5 mEq/L |
| Sodium (serum) | | 135mEq/L | | 135 to 145 mEq/L |
| Chloride (serum) | | 95 mEq/L | | 96 to 106mEq/L |

* What should the nurse include in the teaching plan for this client? **Select all that apply**.
  + Weigh yourself every day at the same time and in the same clothes\*
  + Increase intake of oral fluids to stay hydrated
  + Limit sodium in the diet to no more than 2 grams per day\*
  + Immediately report 1 lb. weight gain in 1 day or 3 lbs. in 1 week
  + Limit exercise and physical activity
  + Take prescribed medication every day, even if feeling better\*
  + Eat foods high in potassium\*

**Scoring rule: +/-**

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| Rationale: The client is experiencing an exacerbation of heart failure and must be taught self-care measures including daily weights, limiting dietary sodium intake, increasing potassium-rich foods in his diet, and taking medication as prescribed. |

**Case Study Question 5 of 6**

The nurse cares for a 68-year-old male client who presents for a routine clinic appointment.

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| **Clinic Notes** | |
| Day 1 – 1000: A 68-year-old male client presents for a routine clinic appointment. Reports “tiring easily when out shopping or for walks.” Has been staying home reading and watching television. Reports difficulty sleeping, awakens with shortness of breath in the middle of the night. Reports 8-pound weight gain over past two weeks since last appointment. States normal appetite. Denies chest pain and back pain. States he is “anxious” about his condition. No known allergies. Current medications: enalapril 20 mg/twice a day PO, hydrochlorothiazide 25 mg/twice a day PO, digoxin 0.125 mg/once a day PO. Assessment as follows: Alert & oriented X 4, appears slightly anxious; HR regular @ 102 & 4+ pitting pedal and pretibial edema; RR unlabored, crackles in bases bilaterally; abdomen soft, non-tender, bowel sounds active; skin warm, dry & intact; frequent urination, small amts clear yellow urine.  1030: Order to discontinue digoxin and begin sacubitril/valsartan 49/51 mg PO daily along with nutrition/dietitian consult. Begin low sodium diet and fluid restriction to 1500 ml/24 hours; instructed to weigh himself daily and record. Return to clinic in 3 weeks for follow-up. | | | | |
| **Vital Signs** | |
| Time | 1000 | |
| T ◦F/ ◦C | 98.6 F/37 C | |
| P | 102 | |
| RR | 22 | |
| B/P | 170/100 | |
| Pulse oximeter | 93% (room air) | |
| Weight | 215 lb (97.7 kg) | |
| **Laboratory Report** | |
| Lab | | Results | | Reference range |
| Cholesterol | | 248 mg/dL | | <200 mg/dL normal  200-239 mg/dL borderline; >240 mg/dL high |
| BUN | | 10 mg/dL | | 10-20 mg/dL |
| Creatinine (Serum) | | 1.5 mg/dL | | 0.9 to 1.4 mg/dL |
| Hematocrit | | 34.6% | | Males: 42-52%; Females: 35-47% |
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| Potassium(serum) | | 2.8 mEq/L | | 3.5 to 5 mEq/L |
| Sodium (serum) | | 135mEq/L | | 135 to 145 mEq/L |
| Chloride (serum) | | 95 mEq/L | | 96 to 106mEq/L |

* Which of the following actions should the nurse take in response to the change in the medical orders? **Select all that apply.**
* Question the new medication order\*
* Educate client about stopping digoxin\*
* Instruct client to start the new medication today
* Tell client to take an additional dose of diuretic today
* Request that the provider order a potassium supplement\*
* Ask the dietitian to meet with the client\*
* Determine if the client owns a scale\*

**Scoring rule: +/-**

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| Rationale: The new medication order for sacubitril/valsartan should be questioned as the client is already taking enalapril. The client also needs education about stopping the digoxin. A consultation with a clinical dietitian is needed to teach the client about his fluid restriction and potassium-rich foods to add to his diet. |

**Case Study Question 6 of 6**

The nurse cares for a 68-year-old male client who presents for a routine clinic appointment.

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| **Clinic Notes** | |
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| **Vital Signs** | |
| Time | 1000 | |
| T ◦F/ ◦C | 98.6 F/37 C | |
| P | 102 | |
| RR | 22 | |
| B/P | 170/100 | |
| Pulse oximeter | 93% (room air) | |
| Weight | 215 lb (97.7 kg) | |
| **Laboratory Report** | |
| Lab | | Results | | Reference range |
| Cholesterol | | 248 mg/dL | | <200 mg/dL normal  200-239 mg/dL borderline; >240 mg/dL high |
| BUN | | 10 mg/dL | | 10-20 mg/dL |
| Creatinine (Serum) | | 1.5 mg/dL | | 0.9 to 1.4 mg/dL |
| Hematocrit | | 34.6% | | Males: 42-52%; Females: 35-47% |
| Hemoglobin | | 13.5 g/dl | | Males: 13-18 g/dL; Females:12-16 g/dL |
| Potassium(serum) | | 2.8 mEq/L | | 3.5 to 5 mEq/L |
| Sodium (serum) | | 135mEq/L | | 135 to 145 mEq/L |
| Chloride (serum) | | 95 mEq/L | | 96 to 106mEq/L |

On day 14 the nurse calls the client to follows up.

* For each finding, click to specify if the finding indicates that the client’s status has improved, worsened, or is unchanged from his condition at the clinic visit two weeks prior.

|  |  |  |  |
| --- | --- | --- | --- |
| Finding | Improved | Worsened | Unchanged |
| Sleeping in recliner |  | * X |  |
| Nagging cough |  | * X |  |
| Pink-tinged sputum |  | * X |  |
| Difficulty catching breath |  | * X |  |
| Pulse | * X |  |  |
| Lack of appetite |  | * X |  |
| Getting up at night to urinate |  | * X |  |
| Thirst |  |  | * X |

**Scoring rule: 0/1**

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| Rationale: Nagging cough, difficulty catching breath, sleeping in recliner, pink-tinged sputum are signs of worsening left-sided HF that require immediate intervention. Lack of appetite and getting up at night to urinate are also signs that the client’s heart failure is worsening and his status is declining. He has reported previously that he was “anxious” about his condition but now reports being “worried” about his health so this indicates a decline in status. Thirst is not related to heart failure. Pulse is slightly improved from clinic visit and within normal limits. |

**Bow-Tie**

The nurse is caring for a 68-year-old client who is admitted to the medical unit from an outpatient clinic.

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| **Clinic Notes** | |
| **Day 1 1100:** Client reports that his primary care provider sent him to the hospital after his follow-up appointment today because of a nagging cough, pink-tinged sputum, and difficulty “catching” his breath. States he is sleeping in a recliner because of difficulty breathing when laying down in bed. Reports lack of appetite, thirst, and getting up twice per night to urinate. States feeling “worried” about health. NKDA. | | | |
| **History & Physical** | |
| **Cardiac** | | Regular rhythm, tachycardia, +4 pitting pedal & pretibial edema | |
| **Respiratory** | | Unlabored, crackles in bases bilaterally | |
| **Neurologic** | | Oriented to time, place, person, and situation; anxious | |
| **Gastrointestinal** | | Abdomen soft non-tender, bowel sounds active | |
| **Skin** | | Warm, dry, intact | |
| **GU** | | Frequent urination, small amounts, clear yellow, no foul odor | |
| **Vital Signs** | |
| Time | 1100 | |
| T ◦F/ ◦C | 98.6 F/37 C | |
| P | 110 | |
| RR | 22 | |
| B/P | 170/110 | |
| Pulse oximeter | 93% (room air) | |
| Weight | 215 lb (97.7 kg) | |

* Complete the diagram by dragging from the choices below to specify what condition the client is most likely experiencing, 2 actions the nurse should take to address that condition, and 2 parameters the nurse should monitor to assess the client’s progress.

|  |  |  |
| --- | --- | --- |
| Action to take |  | Parameter to monitor |
|  | Condition most likely experiencing |  |
| Action to take |  | Parameter to monitor |
|  |  |  |
| **Actions to take** | **Potential conditions** | **Parameters to monitor** |
| Administer IV diuretic \* | COPD exacerbation | WBC |
| Place Foley catheter | Pneumonia | Weight \* |
| Administer IV antibiotic | Urinary Tract Infection | Pulse oximeter |
| Place client on fluid restriction \* | Heart Failure \* | Heart sounds |
| Administer Normal Saline at 100 mL/hr |  | Lung sounds \* |

**Scoring rule: 0/1**

|  |
| --- |
| Rationale: Nagging cough, pink-tinged sputum, and orthopnea are symptoms of worsening heart failure. Appropriate actions are administering an IV diuretic and placing the client on a fluid restriction to prevent worsening of symptoms. Weight and lung sounds are important to monitor to determine effectiveness of interventions. There is no indication that the client has an infection so administering IV antibiotics and monitoring WBC is not appropriate. Administering normal saline is contraindicated in this patient due to fluid overload. Placing a Foley catheter is not indicated as the client is voiding frequently, although small amounts. Pulse oximeter and heart sounds are stable upon assessment. |