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| **Maryland Next Gen NCLEX Test Bank Project**  **September 1, 2022** | | |
| **Case Study Topic**:  (& Standalone trend) | Chronic obstructive pulmonary disease | **Author:** Suzana Jarquin, MSN, RN, CNEcl  Frederick Community College |

**Case Summary**

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| The 74-year-old client presents to the emergency with a COPD exacerbation. Learners should recognize alterations in client’s baseline, differentiate COPD from other respiratory problems, prioritize care (airway, breathing, circulation), and administer ordered treatments based on priority. Once the client is stabilized, the learner should evaluate if the client’s condition has improved, declined, or not changed. |

**Objectives:**

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| 1. Recognize changes in condition in a client with a history of COPD and intervene as needed. 2. Differentiate COPD from pneumonia, pulmonary embolism, and asthma. 3. Manage care of a client with impaired oxygenation. 4. Administer medications to improve oxygenation. 5. Evaluate outcomes of administering medication to improve oxygenation. |

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| **Case Study Link** | **Case Study QR Code** |
| <https://umaryland.az1.qualtrics.com/jfe/form/SV_cAMTval8GPKlwOO> |  |
| **Trend QR Code** | **Trend Link** |
|  | <https://umaryland.az1.qualtrics.com/jfe/form/SV_3L7cdfGhXZL4Z7g> |

**Case Reference:**

|  |
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| Honan, L. (2012). *Lippincott CoursePoint for Honan: Focus on Adult Health*. [CoursePoint]. Retrieved from https://coursepoint.vitalsource.com/#/books/9781975136963/ |

**Case Study Question 1 of 6**

A 74-year-old female is admitted to the Emergency Room with increasing dyspnea, productive cough, and fatigue.

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| **Nurses’ Notes** | |
| 1000: Client arrives in Emergency Department with worsening shortness of breath over the past week, strong productive cough with green-tinged sputum, and fatigue. Client has a history of chronic obstructive pulmonary disease -emphysema; has been using their “relief” inhaler at home with no relief of symptoms. Client lives independently at home and states they smoke approximately 1 pack of cigarettes per day. Ambulatory, alert and oriented x 4. Has coarse crackles auscultated in bilateral lower lung fields with a barrel chest appearance, using accessory muscles, expiratory wheeze on auscultation. Client states they have “less room” to take a deep breath. Clubbing noted in all digits bilaterally. | | | | |
| **Vital Signs** | | | |
| Time | | 1000 | | |
| Oral Temp | | 99.0 F (37.2C) | | |
| Pulse | | 104 | | |
| Respiratory Rate | | 27 | | |
| Blood Pressure | | 157/86 | | |
| Pulse oximeter | | 91% Room air | | |
| Pain | | 0 | | |

The nurse reviews the client’s initial assessment.

* Which priority findings require immediate follow-up. Select all that apply.

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| * Accessory muscle use\* |
| * Bilateral digital clubbing |
| * Coarse crackles\* |
| * Current tobacco smoker |
| * Green-tinged sputum\* |
| * Medication noncompliance |
| * Temp: 99.0 F(37.2C) |
| * Tachypnea\* |

**Scoring Rule: +/-**

**Rationale:** An impairment in gas exchange, as evidenced by the client exhibiting tachypnea, accessory muscle use, coarse crackles and green-tinged sputum are all priority findings. The client is afebrile with a temp of 99.0 F (37.2C). Digital clubbing is a common finding in client’s with a history of COPD, and the client’s smoking history along with medication non-compliance are less acute and non-urgent findings that do not require priority nursing intervention.

**Case Study Question 2 of 6**

A 74-year-old female is admitted to the Emergency Room with increasing dyspnea, productive cough, and fatigue.

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| **Nurses’ Notes** | |
| 1000: Client arrives in Emergency Department with worsening shortness of breath over the past week, strong productive cough with green-tinged sputum, and fatigue. Client has a history of chronic obstructive pulmonary disease -emphysema; has been using their “relief” inhaler at home with no relief of symptoms. Client lives independently at home and states they smoke approximately 1 pack of cigarettes per day. Ambulatory, alert and oriented x 4. Has coarse crackles auscultated in bilateral lower lung fields with a barrel chest appearance, using accessory muscles, expiratory wheeze on auscultation. Client states they have “less room” to take a deep breath. Clubbing noted in all digits bilaterally. | | | | |
| **Vital Signs** | | | |
| Time | | 1000 | | |
| Oral Temp | | 99.0 F (37.2C) | | |
| Pulse | | 104 | | |
| Respiratory Rate | | 27 | | |
| Blood Pressure | | 157/86 | | |
| Pulse oximeter | | 91% Room air | | |
| Pain | | 0 | | |

* For each client finding, click to indicate if the finding is consistent with asthma, chronic obstructive pulmonary disease (COPD), pneumonia, or pulmonary embolism. Each finding may support more than one type of respiratory condition.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Findings | Asthma | COPD | Pneumonia | Pulmonary embolism |
| Dyspnea | * \* | * \* | * \* | * \* |
| Productive cough | * \* | * \* | * \* |  |
| Barrel chest appearance |  | * \* |  |  |
| Digital clubbing |  | * \* |  |  |
| Expiratory Wheezing | * \* | * \* | * \* |  |

Note: Each column must have at least 1 finding.

**Scoring Rule: +/-**

**Rationale:** Clinical manifestations of COPD include dyspnea, cough, increased A/P diameter (barrel chest), digital clubbing, and expiratory wheezing. Both an increased A/P diameter and digital clubbing are not clinical manifestations of pneumonia, or asthma, or pulmonary embolism. Wheezing is rare with pulmonary embolism and the cough is dry or blood tinged.

**Case Study Question 3 of 6**

A 74-year old female is admitted to the Emergency Room with increasing dyspnea, productive cough, and fatigue.

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| **Nurses’ Notes** | |
| 1000: Client arrives in Emergency Department with worsening shortness of breath over the past week, strong productive cough with green-tinged sputum, and fatigue. Client has a history of chronic obstructive pulmonary disease -emphysema; has been using their “relief” inhaler at home with no relief of symptoms. Client lives independently at home and states they smoke approximately 1 pack of cigarettes per day. Ambulatory, alert and oriented x 4. Has coarse crackles auscultated in bilateral lower lung fields with a barrel chest appearance, using accessory muscles, expiratory wheeze on auscultation. Client states they have “less room” to take a deep breath. Clubbing noted in all digits bilaterally. | | | | |
| **Vital Signs** | | | |
| Time | | 1000 | | |
| Oral Temp | | 99.0 F (37.2C) | | |
| Pulse | | 104 | | |
| Respiratory Rate | | 27 | | |
| Blood Pressure | | 157/86 | | |
| Pulse oximeter | | 91% Room air | | |
| Pain | | 0 | | |

Which condition is the client most likely experiencing?

* Acute asthma attack
* COPD exacerbation\*
* Pneumonia
* Pulmonary embolism

**Scoring Rule: 0/1**

**Rationale**: The client has a known history of COPD –emphysema; they are hypoxic and using accessory muscles to breathe. The client also verbalizes worsening shortness of breath. Based on the client’s presenting signs, symptoms, and clinical manifestations, this client is most likely experiencing a COPD exacerbation.

**Case Study Question 4 of 6**

A 74-year old female is admitted to the Emergency room with increasing dyspnea, productive cough, and fatigue.

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| **Nurses’ Notes** | |
| 1000: Client arrives in Emergency Department with worsening shortness of breath over the past week, strong productive cough with green-tinged sputum, and fatigue. Client has a history of chronic obstructive pulmonary disease -emphysema; has been using their “relief” inhaler at home with no relief of symptoms. Client lives independently at home and states they smoke approximately 1 pack of cigarettes per day. Ambulatory, alert and oriented x 4. Has coarse crackles auscultated in bilateral lower lung fields with a barrel chest appearance, using accessory muscles, expiratory wheeze on auscultation. Client states they have “less room” to take a deep breath. Clubbing noted in all digits bilaterally. | | | | |
| **Vital Signs** | | | |
| Time | | 1000 | | |
| Oral Temp | | 99.0 F (37.2C) | | |
| Pulse | | 104 | | |
| Respiratory Rate | | 27 | | |
| Blood Pressure | | 157/86 | | |
| Pulse oximeter | | 91% Room air | | |
| Pain | | 0 | | |

The nurse anticipates the provider’s orders and considers possible nursing interventions.

* Select the orders from each of the categories the nurse should include in the plan of care at this time. Each category may have more than one order.

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| Categories | Orders |
| Nursing | * Administer oxygen via a high-flow oxygen face mask |
| * Place client in a high-fowlers position\* |
| * Encourage client use of incentive spirometer \* |
| Medications | * Ondansetron |
| * Ipratropium bromide and albuterol \* |
| * Methylprednisolone\* |

**Scoring Rule: +/-**

**Rationale:** The client is experiencing a COPD exacerbation. Placing the client in a high fowler’s position and encouraging the use of the incentive spirometer will assist in maximizing the client’s lung expansion and improving ventilatory efforts. Administering ipratropium bromide and albuterol and methylprednisolone can assist in alleviating airway narrowing and inflammation caused by the client’s exacerbated symptoms. Placing a client with a known history of COPD on high-flow oxygen can induce carbon dioxide narcosis. Administering ondansetron is not indicated unless in this case since the client does not have nausea and/or vomiting.

**Case Study Question 5 of 6**

A 74-year old female is admitted to the Emergency room with increasing dyspnea, productive cough, and fatigue.

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| **Nurses’ Notes** | | |
| 1000: Client arrives in Emergency Department with worsening shortness of breath over the past week, strong productive cough with green-tinged sputum, and fatigue. Client has a history of chronic obstructive pulmonary disease -emphysema; has been using their “relief” inhaler at home with no relief of symptoms. Client lives independently at home and states they smoke approximately 1 pack of cigarettes per day. Ambulatory, alert and oriented x 4. Has coarse crackles auscultated in bilateral lower lung fields with a barrel chest appearance, using accessory muscles, expiratory wheeze on auscultation. Client states they have “less room” to take a deep breath. Clubbing noted in all digits bilaterally.  1015: Client has increasing dyspnea, prefers to be sitting up in the chair. Requesting “rescue inhaler.” The provider has been notified. IV started. Ipratropium bromide and albuterol nebulizer treatment started. | | | | | | |
| **Vital Signs** | | | |
| Time | | 1000 | | | | 1015 |
| Oral Temp | | 99.0 F (37.2 C | | | | 99.0 F (37.2 C |
| Pulse | | 104 | | | | 108 |
| Respiratory Rate | | 27 | | | | 30 |
| Blood Pressure | | 157/86 | | | | 159/88 |
| Pulse oximeter | | 91% room air | | | | 90% room air |
| Pain | | 0 | | | | 0 |
| **Provider ordered Medications (ER):** | |
| Medication | | | | Dosage/Frequency/ Route | | |
| Ipratropium bromide and albuterol | | | | 3mL(0.5mgipratropium bromide2.5 mgalbuterol) nebulizer treatment 4 x a day. First dose now. | | |
| Acetaminophen | | | | 500 mg x 1 PO PRN for moderate to severe back pain | | |
| Methylprednisolone sodium succinate | | | | 40 mg IV push x 1 dose now | | |
| Amoxicillin/clavulanate | | | | **875 mg/ 125 mg PO every 12 hours** | | |
| Albuterol sulfate | | | | 2.5 mg/3 ml nebulizer every 4 hours PRN | | |

The ipratropium bromide albuterol treatment is given.

* Which medication should the nurse give next?
* Acetaminophen
* Methylprednisolone sodium\*
* Albuterol
* Amoxicillin/clavulanate

**Scoring Rule: 0/1**

**Rationale:** IV methylprednisolone is ordered now and will help reduce inflammation to improve ease of breathing. The antibiotic should be given after the neb treatment. Albuterol was just givenfor Q4 you can make , the client would need to be reassessed to determine if another dose is needed. The client is verbalizing 0 out of 10 pain, so acetaminophen is not necessary at this time.

**Case Study Question 6 of 6**

A 74-year old female is admitted to the Emergency room with increasing dyspnea, productive cough, and fatigue.

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| **Nurses’ Notes** | | |
| 1000: Client arrives in Emergency Department with worsening shortness of breath over the past week, strong productive cough with green-tinged sputum, and fatigue. Client has a history of chronic obstructive pulmonary disease -emphysema; has been using their “relief” inhaler at home with no relief of symptoms. Client lives independently at home and states they smoke approximately 1 pack of cigarettes per day. Ambulatory, alert and oriented x 4. Has coarse crackles auscultated in bilateral lower lung fields with a barrel chest appearance, using accessory muscles, expiratory wheeze on auscultation. Client states they have “less room” to take a deep breath. Clubbing noted in all digits bilaterally.  1015: Client has increasing dyspnea, prefers to be sitting up in the chair. Requesting “rescue inhaler.” The provider has been notified. IV started. Ipratropium bromide and albuterol nebulizer treatment started.  1045: Administration of ipratropium bromide and albuterol nebulizer and IV methylprednisolone complete. Assisted client onto bed and placed client in high-fowlers position. Breath sounds noted to have coarse crackles in bilateral upper and lower lung fields, no expiratory wheezing noted. Client continues to state they feel “severe” shortness of breath. | | | | | | | |
| **Vital Signs** | | | |
| Time | | 1000 | | | | 1015 | 1015 |
| Oral Temp | | 99.0 F (37.2 C | | | | 99.0 F (37.2 C | 99.0 F (37.2 C |
| Pulse | | 104 | | | | 108 | 117 |
| Respiratory Rate | | 27 | | | | 30 | 34 |
| Blood Pressure | | 157/86 | | | | 159/88 | 167/94 |
| Pulse oximeter | | 91% room air | | | | 90% room air | 88% room air |
| Pain | | 0 | | | | 0 | 0 |
| **Provider ordered Medications (ER):** | |
| Medication | | | | Dosage/Frequency/ Route | | | |
| Ipratropium bromide and albuterol | | | | 3mL(0.5mgipratropium bromide2.5 mgalbuterol) nebulizer treatment 4 x a day. First dose now. | | | |
| Acetaminophen | | | | 500 mg x 1 PO PRN for moderate to severe back pain | | | |
| Methylprednisolone sodium succinate | | | | 40 mg IV push x 1 dose now | | | |
| Amoxicillin/clavulanate | | | | **875 mg/ 125 mg PO every 12 hours** | | | |
| Albuterol sulfate | | | | 2.5 mg/3 ml nebulizer every 4 hours PRN | | | |

The nurse administers the ordered medications and reassesses the client at 1045.

* For each client finding, click to specify if the finding indicates that the client’s status has improved, declined, or is unchanged.

|  |  |  |  |
| --- | --- | --- | --- |
| Finding | Improved | Declined | Unchanged |
| Respiratory rate |  | \* |  |
| Heart Rate |  | * \* |  |
| Pulse oximetry |  | * \* |  |
| Blood Pressure |  | * \* |  |
| Wheezing | * \* |  |  |
| Breath sounds |  | * \* |  |
| Temperature |  |  | * \* |

**Scoring Rule: 0/1**

**Rationale:** The client’s respiratory rate, breath sounds, heart rate, oxygen saturation, and blood pressure have all declined despite the nurse administering ordered medications. The client is no longer exhibiting expiratory wheezing upon auscultation. The client’s temperature remains unchanged. The nurse should promptly alert the provider as the client’s respiratory symptoms are rapidly deteriorating.

Trend

A 74-year old female with a history of chronic obstructive pulmonary disease is admitted to the Emergency room with increasing dyspnea.

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| **Nurses’ Notes** |
| 1000: Client arrives in Emergency Department with worsening shortness of breath over the past week, strong productive cough with green-tinged sputum, and fatigue. Client has a history of chronic obstructive pulmonary disease -emphysema; has been using their “relief” inhaler at home with no relief of symptoms. Client lives independently at home and states they smoke approximately 1 pack of cigarettes per day. Ambulatory, alert and oriented x 4. Has coarse crackles auscultated in bilateral lower lung fields with a barrel chest appearance, using accessory muscles, expiratory wheeze on auscultation. Client states they have “less room” to take a deep breath. Clubbing noted in all digits bilaterally. T 99.0 F (37.2 C), HR 104, RR 27, B/P 157/86, pulse oximeter 91% on room air.  1015: Client has increasing dyspnea, prefers to be sitting up in the chair. Requesting “rescue inhaler.” T 99.0 F (37.2 C), HR 108, RR 30, B/P 159/88, pulse oximeter 90% on room air. The provider has been notified. IV started. Ipratropium bromide and albuterol nebulizer treatment started.  1045: Administration of ipratropium bromide and albuterol nebulizer and IV methylprednisolone complete. Assisted client onto bed and placed client in high-fowlers position. Breath sounds noted to have coarse crackles in bilateral upper and lower lung fields, no expiratory wheezing noted. Client continues to state they feel “severe” shortness of breath. T 99.0 F (37.2 C), HR 117, RR 34, B/P 167/94, pulse oximeter 88% on room air. | |

At 1045, the nurse reassesses the client’s vital signs after administering the ordered Ipratropium bromide and albuterol nebulizer treatment.

* For each finding, click to specify if the finding indicates that the client’s status has improved, declined, or is unchanged after the administered nebulizer treatment.

|  |  |  |  |
| --- | --- | --- | --- |
| Finding | Improved | Declined | Unchanged |
| Respiratory rate |  | \* |  |
| Heart Rate |  | * \* |  |
| Pulse oximetry |  | * \* |  |
| Blood Pressure |  | * \* |  |
| Wheezing | * \* |  |  |
| Breath sounds |  | * \* |  |
| Temperature |  |  | * \* |

**Scoring Rule: 0/1**

**Rationale:** The client’s respiratory rate, breath sounds, heart rate, oxygen saturation, and blood pressure have all declined despite the nurse administering ordered medications. The client is no longer exhibiting expiratory wheezing upon auscultation. The client’s temperature remains unchanged. The nurse should promptly alert the provider as the client’s respiratory symptoms are rapidly deteriorating.