|  |  |  |  |
| --- | --- | --- | --- |
| **Maryland Next Gen NCLEX Test Bank Project**  **September 1, 2022** | | | |
| **Case Study Topic**:  (Stand-alone bow-tie) | Acute Asthma | **Author:** | Angela Davis, RN, MS, CM/DN Morgan State University |

**Case Summary**

|  |
| --- |
| A 23-year-old male is seen in the Emergency Department with acute onset of shortness of breath, and chest tightness with coughing following exposure to second-hand smoke. He was diagnosed with an acute asthma attack, given nebulizer treatments and corticosteroids, and ultimately discharged home. |

**Objectives**

|  |
| --- |
| 1. Recognize risk factors and clinical manifestations of asthma.  2. Plan care for a client with onset of shortness of breath and coughing.  3. Educate client about the medical treatment plan for asthma.  4. Understand purpose of diagnostic treatment/therapeutic intervention for a client with asthma.  6. Evaluate outcomes of the treatment plan and client instruction. |

|  |  |
| --- | --- |
| **Case Study Link** | **Case Study QR Code** |
| <https://umaryland.az1.qualtrics.com/jfe/form/SV_8x0s6wRvRQcf6ey> |  |
| **Bow-tie QR Code** | **Bow-tie Link** |
|  | <https://umaryland.az1.qualtrics.com/jfe/form/SV_9uiQixa19GrcIzI> |

**Case References**

|  |
| --- |
| Ignatavicius, Workman, Rebar, Heimgartner (2020). Medical Surgical Nursing. 10th ed |

**Case Study Question 1 of 6**

The nurse cares for a 23-year-old male in the Emergency Department who is experiencing acute onset of shortness of breath.

|  |
| --- |
| **Nurses’ Notes** |
| 1100. Client reports shortness of breath and chest tightness that has progressively worsened for the past 2 to 3 days. He has a history of seasonal allergies, is a non-smoker, and lives at home with his mother who is a current smoker. Denies fever or vomiting. Describes feeling fatigued and has a dry cough at night.  1115. Audible and expiratory wheezing auscultated throughout lung fields bilaterally. Increased respiratory rate noted, capillary refill < 3 seconds, skin warm to touch. Chest wall is symmetrical with no deformity. Client sits upright and leans forward resting his hands on his knees in tripod position and speaks only a few words between breaths. Tenderness on palpation of chest wall. Trachea is midline with no deviation. Labs drawn. CXR ordered. | | | |
| **Vital Signs** | |
| Time | | 1115 |
| Temp | | 97.8 F(36.C) |
| P | | 98 |
| RR | | 26 |
| B/P | | 114/78 |
| Pulse oximeter | | 95% |

The nurse assesses the client on admission.

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

* Shortness of breath\*
* Chest tightness\*
* Respiratory rate\*
* Dry cough\*
* Audible and expiratory wheezing\*
* Tripod position\*
* Speaks only a few words between breaths\*
* Blood pressure
* Tenderness of chest wall

**Scoring Rule: +/-**

**Rationale**: The nurse should recognize pertinent objective data (tachypnea, cough, wheezing, tripod position, and speaking in short phrases) and subjective data (shortness of breath and tightness in the chest) indicate respiratory distress associated with bronchoconstriction of the airways. The clients blood pressure and tenderness of chest wall do not require immediate follow-up.

**Case Study Question 2 of 6**

The nurse cares for a 23-year-old male in the Emergency Department who is experiencing acute onset of shortness of breath.

|  |
| --- |
| **Nurses’ Notes** |
| 1100. Client reports shortness of breath and chest tightness that has progressively worsened for the past 2 to 3 days. He has a history of seasonal allergies, is a non-smoker, and lives at home with his mother who is a current smoker. Denies fever or vomiting. Describes feeling fatigued and has a dry cough at night.  1115. Audible and expiratory wheezing auscultated throughout lung fields bilaterally. Increased respiratory rate noted, capillary refill < 3 seconds, skin warm to touch. Chest wall is symmetrical with no deformity. Client sits upright and leans forward resting his hands on his knees in tripod position and speaks only a few words between breaths. Tenderness on palpation of chest wall. Trachea is midline with no deviation. Labs drawn. CXR ordered. | | | |
| **Vital Signs** | |
| Time | | 1115 |
| Temp | | 97.8 F(36.C) |
| P | | 98 |
| RR | | 26 |
| B/P | | 114/78 |
| Pulse oximeter | | 95% |

* For each potential finding, click to specify if the finding is a risk factor or not a risk factor for asthma.

|  |  |  |
| --- | --- | --- |
| Potential finding | Risk factor | Not a Risk factor |
| Family History | \* |  |
| Allergies | \* |  |
| Betablockers | \* |  |
| Edema |  | \* |
| Viral Infections | \* |  |
| Smoking | \* |  |
| Overweight | \* |  |
| Diabetes |  | \* |

**Scoring Rule: 0/1**

**Rationale:** The nurse should identify risk factors for asthma. Risk factors for asthma include family history, allergies, use of medications such as NSAIDS, betablockers and aspirin. With asthma **non-cardio selective beta-blockers block the effects of beta 2 (lung) receptors. This blocks the ability of airways to expand for easier breathing.** Smoking cigarettes, exposure to second-hand smoke, viral infections, a history of GERD, and being overweight are also risk factors. Edema and history of diabetes are not risk factors for asthma.

**Case Study Question 3 of 6**

The nurse cares for a 23-year-old male in the Emergency Department who is experiencing acute onset of shortness of breath.

|  |  |
| --- | --- |
| **Nurses’ Notes** | |
| 1100. Client reports shortness of breath and chest tightness that has progressively worsened for the past 2 to 3 days. He has a history of seasonal allergies, is a non-smoker, and lives at home with his mother who is a current smoker. Denies fever or vomiting. Describes feeling fatigued and has a dry cough at night.  1115. Audible and expiratory wheezing auscultated throughout lung fields bilaterally. Increased respiratory rate noted, capillary refill < 3 seconds, skin warm to touch. Chest wall is symmetrical with no deformity. Client sits upright and leans forward resting his hands on his knees in tripod position and speaks only a few words between breaths. Tenderness on palpation of chest wall. Trachea is midline with no deviation. Labs drawn. CXR ordered. | | | | | | |
| **Vital Signs** | | |
| Time | | | 1115 | |
| Temp | | | 97.8 F(36.C) | |
| P | | | 98 | |
| RR | | | 26 | |
| B/P | | | 114/78 | |
| Pulse oximeter | | | 95% | |
| **Laboratory Report** | |
| Lab | | | | Results | | Reference range |
| Hematocrit | | | | 48% | | Males: 42-52%  Females: 35-47% |
| Hemoglobin | | | | 15 g/dL | | Males: 13-18 g/dL; Females:12-16 g/dL |
| WBC | | | | 8,000 cell/mm3 | | 4.5 – 10.5 x 103 cells/mm3 |
| Potassium(serum) | | | | 4.0 mEq/L | | 3.5 to 5 mEq/L |
| Sodium (serum) | | | | 138 mEq/L | | 135 to 145 mEq/L |
| **Diagnostic Reports** |  | | | | | |
| Chest-X Ray results show hyperinflation of lungs with flattened bases at the diaphragm | | | | | | |

The labs and chest-Xray return.

* Complete the sentence from the list of drop-down options.

|  |  |  |  |
| --- | --- | --- | --- |
| The nurse should recognize that the client is most likely experiencing | |  | | --- | | Pneumonia  Pulmonary edema  Acute asthma onset\*  Pneumothorax | | Sleep Apnea | |
| as most evidenced by the | |  | | --- | | Vital signs | | Shortness of breath | | Expiratory wheezing\* | | Orthopnea |   Fatigue |

**Scoring Rule: Rationale**

**Rationale:** The presenting assessment most suggests acute onset asthma evidenced by expiratory wheezing. Wheezing is a high-pitched whistling sound produced during breathing. It is a sign of bronchoconstriction, a narrowing of the airways of the lungs (bronchi) that impedes the flow of air to and from the lungs. Wheezing is often the first sign of asthma or an impending asthma attack.

**Case Study Question 4 of 6**

The nurse cares for a 23-year-old male in the Emergency Department who is experiencing acute onset of shortness of breath.

|  |  |
| --- | --- |
| **Nurses’ Notes** | |
| 1100. Client reports shortness of breath and chest tightness that has progressively worsened for the past 2 to 3 days. He has a history of seasonal allergies, is a non-smoker, and lives at home with his mother who is a current smoker. Denies fever or vomiting. Describes feeling fatigued and has a dry cough at night.  1115. Audible and expiratory wheezing auscultated throughout lung fields bilaterally. Increased respiratory rate noted, capillary refill < 3 seconds, skin warm to touch. Chest wall is symmetrical with no deformity. Client sits upright and leans forward resting his hands on his knees in tripod position and speaks only a few words between breaths. Tenderness on palpation of chest wall. Trachea is midline with no deviation. Labs drawn. CXR ordered. | | | | | | |
| **Vital Signs** | | |
| Time | | | 1115 | |
| Temp | | | 97.8 F(36.C) | |
| P | | | 98 | |
| RR | | | 26 | |
| B/P | | | 114/78 | |
| Pulse oximeter | | | 95% | |
| **Laboratory Report** | |
| Lab | | | | Results | | Reference range |
| Hematocrit | | | | 48% | | Males: 42-52%  Females: 35-47% |
| Hemoglobin | | | | 15 g/dL | | Males: 13-18 g/dL; Females:12-16 g/dL |
| WBC | | | | 8,000 cell/mm3 | | 4.5 – 10.5 x 103 cells/mm3 |
| Potassium(serum) | | | | 4.0 mEq/L | | 3.5 to 5 mEq/L |
| Sodium (serum) | | | | 138 mEq/L | | 135 to 145 mEq/L |
| **Diagnostic Reports** |  | | | | | |
| Chest-X Ray results show hyperinflation of lungs with flattened bases at the diaphragm | | | | | | |

The client is diagnosed with onset acute asthma.

* Which of the following interventions should the nurse anticipate including in the plan of care? Select all that apply

|  |  |
| --- | --- |
| * Administer 2L of oxygen for pulse oximetry < 93% as needed. \* | |
| * Administer albuterol nebulizer treatment every 4 hours as needed\* | |
| * Place the client in supine position | |
| * Administer low-dose aspirin mg by mouth once a day | |
| * Administer labetalol by mouth two times a day | |
| * Administer Ibuprofen by mouth every 6 hours as needed for pain | |
| * Raise the head of the bed \* | |
| * Administer solumedrol mg IV Stat once \* | |
| * Offer oral fluids by mouth | |
|  |

**Scoring Rule: +/-**

**Rationale:  Maintaining airway patency and preventing the occurrence of reversible complications are priorities in acute asthma care. T**he emergent plan of care involves giving short-acting Beta 2 agonist (Albuterol), cholinergic antagonist (Ipratropium), oxygen, and corticosteroids to reduce inflammation in the lungs. **The nurse should raise the head of the bed to decrease the work of breathing and monitor the pulse oximeter readings.** **Beta-blockers, like labetalol, are not indicated because they block the effects of beta 2 (lung) receptors and the ability of airways to expand for easier breathing. NSAIDS and aspirin can induce bronchospasms. Tachypnea seen in asthma, increases insensible water loss from the lungs that can lead to dehydration. Increase work of breathing will decrease fluid intake by mouth. Oral fluids can be encouraged once breathing is no longer labored.**

**Case Study Question 5 of 6**

The nurse cares for a 23-year-old male in the Emergency Department who is experiencing acute onset of shortness of breath.

|  |  |
| --- | --- |
| **Nurses’ Notes** | |
| 1100. Client reports shortness of breath and chest tightness that has progressively worsened for the past 2 to 3 days. He has a history of seasonal allergies, is a non-smoker, and lives at home with his mother who is a current smoker. Denies fever or vomiting. Describes feeling fatigued and has a dry cough at night.  1115. Audible and expiratory wheezing auscultated throughout lung fields bilaterally. Increased respiratory rate noted, capillary refill < 3 seconds, skin warm to touch. Chest wall is symmetrical with no deformity. Client sits upright and leans forward resting his hands on his knees in tripod position and speaks only a few words between breaths. Tenderness on palpation of chest wall. Trachea is midline with no deviation. Labs drawn. CXR ordered. | | | | | | |
| **Vital Signs** | | |
| Time | | | 1115 | |
| Temp | | | 97.8 F(36.C) | |
| P | | | 98 | |
| RR | | | 26 | |
| B/P | | | 114/78 | |
| Pulse oximeter | | | 95% | |
| **Laboratory Report** | |
| Lab | | | | Results | | Reference range |
| Hematocrit | | | | 48% | | Males: 42-52%  Females: 35-47% |
| Hemoglobin | | | | 15 g/dL | | Males: 13-18 g/dL; Females:12-16 g/dL |
| WBC | | | | 8,000 cell/mm3 | | 4.5 – 10.5 x 103 cells/mm3 |
| Potassium(serum) | | | | 4.0 mEq/L | | 3.5 to 5 mEq/L |
| Sodium (serum) | | | | 138 mEq/L | | 135 to 145 mEq/L |
| **Diagnostic Reports** |  | | | | | |
| Chest-X Ray results show hyperinflation of lungs with flattened bases at the diaphragm | | | | | | |
| **Orders** | |
| * Monitor pulse oximeter continuously. Administer 2L of oxygen as needed by nasal cannula to maintain 02 levels > 93% * **Albuterol** 2.5 mg **inhalation nebulizer treatment** every 1 -4 hours as needed for shortness of breath. * Ipratropium 250 mcg inhalation nebulizer treatment every 6 hours as needed for shortness of breath. May give with albuterol * Place peripheral IV and administer solumedrol 125 mg IV stat once. * Instruct client on peak flowmeter use for at least two times daily. | | | | | | |

The nurse reviews the physician’s orders and considers needed teaching.

* For each action, click to specify if the nurse should implement the action immediately, within the next hour, or before the end of the shift.

|  |  |  |  |
| --- | --- | --- | --- |
| Actions | Immediately | Within the hour | Before the end of the shift |
| Instruct client on peak flowmeter use |  |  | \* |
| Administer 2L of oxygen by nasal cannula | \* |  |  |
| Administer solumedrol | \* |  |  |
| Administer albuterol and Ipratropium nebulizer treatment | \* |  |  |
| Instruct on pursed lip breathing exercises |  | \* |  |
| Instruct client on home meds |  |  | \* |
| Apply continuous pulse oximeter | \* |  |  |

**Scoring Rule: 0/1**

**Rationale:** When asthma is suspected, the emergent plan of care is giving short-acting Beta 2 agonist (Albuterol), cholinergic antagonist (Ipratropium), oxygen, and corticosteroids to reduce inflammation in the lungs. It is best to teach pursed lip breathing exercises when the patient is sitting upright and feeling relaxed. Pursed lip breathing is a simple technique for slowing down a person’s breathing and getting more air into their lungs. Ineffective inhaler use can lead to asthma exacerbation. Peak flow meters measure peak expiratory flow rate (PEFR), a small device used to monitor lung function. Clients should be instructed to perform three peak flow meter readings regularly at least 2 to 4 times daily, when asthma symptoms are decreased or not present. Once the client is stabilized the nurse can instruct the client how to use albuterol rescue inhalers appropriately.

**Case Study Question 6 of 6**

The nurse cares for a 23-year-old male in the Emergency Department who is experiencing acute onset of shortness of breath.

|  |
| --- |
| **Nurses’ Notes** |
| 1100. Client reports shortness of breath and chest tightness that has progressively worsened for the past 2 to 3 days. He has a history of seasonal allergies, is a non-smoker, and lives at home with his mother who is a current smoker. Denies fever or vomiting. Describes feeling fatigued and has a dry cough at night.  1115. Audible and expiratory wheezing auscultated throughout lung fields bilaterally. Increased respiratory rate noted, capillary refill < 3 seconds, skin warm to touch. Chest wall is symmetrical with no deformity. Client sits upright and leans forward resting his hands on his knees in tripod position and speaks only a few words between breaths. Tenderness on palpation of chest wall. Trachea is midline with no deviation. Labs drawn. CXR ordered.  1330. Nebulizer treatments & solumedrol given. Denies shortness of breath or difficulty breathing. Lung breath sounds are improving. Client can speak in full sentences and tolerates activity of daily living well. No reports of fatigue. | | | | |
| **Vital Signs** |
| Time | 1115 | 1130 | | 1330 | |
| Temp | 97.8 F(36.C) | 98.2F (36.8C) | | 98.5(36.9C) | |
| P | 98 | 108 | | 88 | |
| RR | 26 | 25 | | 18 | |
| B/P | 114/78 | 122/72 | | 116/78 | |
| Pulse oximeter | 95% | 91% on room air | | 98% on room air | |
| **Laboratory Report** |
| Lab | Results | | Reference range | |
| Hematocrit | 48% | | Males: 42-52%  Females: 35-47% | |
| Hemoglobin | 15 g/dL | | Males: 13-18 g/dL; Females:12-16 g/dL | |
| WBC | 8,000 cell/mm3 | | 4.5 – 10.5 x 103 cells/mm3 | |
| Potassium(serum) | 4.0 mEq/L | | 3.5 to 5 mEq/L | |
| Sodium (serum) | 138 mEq/L | | 135 to 145 mEq/L | |
| **Diagnostic Reports** |  | | | |
| Chest-X Ray results show hyperinflation of lungs with flattened bases at the diaphragm | | | | |
| **Orders** |
| * Monitor pulse oximeter continuously. Administer 2L of oxygen as needed by nasal cannula to maintain 02 levels > 93% * **Albuterol** 2.5 mg **inhalation nebulizer treatment** every 1 -4 hours as needed for shortness of breath. * Ipratropium 250 mcg inhalation nebulizer treatment every 6 hours as needed for shortness of breath. May give with albuterol * Place peripheral IV and administer solumedrol 125 mg IV stat once. * Instruct client on peak flowmeter use for at least two times daily. | | | | |

The nurse reassesses the client at 1330 after implementing the physician orders.

* Complete the following sentence by choosing from the list of options.

|  |  |
| --- | --- |
| The nurse determines the client’s status is | improving\*  deteriorating  unchanged |
| The nurse should now | Prepare client for discharge to home \*  Resume the breathing treatment  Continue to monitor the clients breathing |

**Scoring Rule: 0/1**

**Rationale**: The client’s shortness of breath has resolved, and the oxygen level has increased. Since the symptoms improved with corticosteroids, short-acting beta 2 agonist (Albuterol), Ipratropium and oxygen treatment, the nurse should now prepare the client for discharge to home.

**Bowtie**

The nurse cares for a 23-year-old male in the Emergency Department who is experiencing acute onset of shortness of breath.

|  |  |
| --- | --- |
| **Nurses’ Notes** | |
| 1100. Client reports shortness of breath and chest tightness that has progressively worsened for the past 2 to 3 days. He has a history of seasonal allergies, is a non-smoker, and lives at home with his mother who is a current smoker. Denies fever or vomiting. Describes feeling fatigued and has a dry cough at night.  1115. Audible and expiratory wheezing auscultated throughout lung fields bilaterally. Increased respiratory rate noted, capillary refill < 3 seconds, skin warm to touch. Chest wall is symmetrical with no deformity. Client sits upright and leans forward resting his hands on his knees in tripod position and speaks only a few words between breaths. Tenderness on palpation of chest wall. Trachea is midline with no deviation. Labs drawn. CXR ordered.  1230. Ordered bronchodilators and corticosteroid therapy treatment is completed. Client is experiencing extreme labored breathing, confusion, and increased heart rate. Blue tinged lips, prolonged expiratory wheezing with chest tightness on assessment. Reports having difficulty catching a breath when lying down. | | | | | | |
| **Vital Signs** |
| Time | 1100 | | | 1130 | 1230 |
| Temp | 97.8F (36.6C) | | | 98.2F (36.8C) | 98.9 F(37.1C) |
| P | 98 | | | 108 | 128 |
| RR | 20 | | | 25 | 38 |
| B/P | 114/78 | | | 122/72 | 142/88 |
| Pulse oximeter | 95% on room air | | | 93% on room air | 85% on room air |
| **Orders** | | |
| * Monitor pulse oximeter continuously. Administer 2L of oxygen as needed by nasal cannula to maintain 02 levels > 93% * **Albuterol** 2.5 mg **inhalation nebulizer treatment** every 1 -4 hours as needed for shortness of breath. * Ipratropium 250 mcg inhalation nebulizer treatment every 6 hours as needed for shortness of breath. May give with albuterol * Place peripheral IV and administer solumedrol 125 mg IV stat once. * Instruct client on peak flowmeter use for at least two times daily. | | | | | | |

The nurse assesses the client after implementing the treatment plan.

* 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** |
| Obtain sputum culture | Anaphylactic reaction | Temperature |
| Suction airway | Bronchiolitis | Pulse oximetry\* |
| Administer epinephrine\* | Status Asthmaticus\* | Respirations \* |
| Administer high flow oxygen\* | Pulmonary Edema | Troponin |
| Administer a diuretic |  | Urine |

**Scoring Rule: 0/1**

**Rationale:** The client’s condition has advanced to status asthmaticus. Status asthmaticus is a severe life-threatening acute episode of airway obstruction that does not respond well to standard treatment of bronchodilators and corticosteroid therapy. When status asthmaticus is suspected, high flow supplemental oxygen is delivered by partial or nonrebreather mask, and epinephrine is given to clients who have not rapidly responded to beta 2 agonist (albuterol). The nurse would monitor the oxygen saturation with a pulse oximetry during the initial treatment of status asthmaticus. When the oxygen levels are low in the blood, less oxygen goes to the brain, which can cause headaches and confusion as well. Increased work of breathing(respirations) may lead to muscle fatigue and life-threatening respiratory failure. If the condition is not reversed the client can develop a pneumothorax, cardiac or respiratory arrest. When the oxygen levels are low in the blood, it means less oxygen in the brain, which can cause not only headaches but confusion.