

QUESTION

1. A patient with a long history of chronic obstructive pulmonary disease (COPD) is admitted to the hospital with an acute exacerbation. The patient is currently on long-term therapy with a long-acting beta₂-agonist (LABA) and an inhaled corticosteroid (ICS). The patient's current symptoms include increased sputum production, dyspnea, and wheezing. The patient's oxygen saturation is 88% on room air. The patient's arterial blood gas (ABG) shows a pH of 7.35, a partial pressure of carbon dioxide (P_aCO₂) of 45 mmHg, a partial pressure of oxygen (P_aO₂) of 60 mmHg, and a bicarbonate (HCO₃⁻) of 28 mEq/L. The patient's chest X-ray shows hyperinflation and flattened diaphragms. The patient's current medications include a LABA (salmeterol) and an ICS (fluticasone). The patient's current oxygen therapy is 2 L of oxygen via nasal cannula. The patient's current vital signs are: heart rate 100 bpm, blood pressure 120/80 mmHg, respiratory rate 20 breaths per minute, and temperature 37.5°C. The patient's current laboratory values are: white blood cell count (WBC) 12,000/mm³, hemoglobin (Hb) 12 g/dL, and hematology (Hct) 38%.

Medication	Dose	Frequency	Route
Salmeterol	50 mcg	Twice daily	Inhalation
Fluticasone	100 mcg	Twice daily	Inhalation
Oxygen	2 L	Continuous	Nasal cannula

2. A patient with a long history of chronic obstructive pulmonary disease (COPD) is admitted to the hospital with an acute exacerbation. The patient is currently on long-term therapy with a long-acting beta₂-agonist (LABA) and an inhaled corticosteroid (ICS). The patient's current symptoms include increased sputum production, dyspnea, and wheezing. The patient's oxygen saturation is 88% on room air. The patient's arterial blood gas (ABG) shows a pH of 7.35, a partial pressure of carbon dioxide (P_aCO₂) of 45 mmHg, a partial pressure of oxygen (P_aO₂) of 60 mmHg, and a bicarbonate (HCO₃⁻) of 28 mEq/L. The patient's chest X-ray shows hyperinflation and flattened diaphragms. The patient's current medications include a LABA (salmeterol) and an ICS (fluticasone). The patient's current oxygen therapy is 2 L of oxygen via nasal cannula. The patient's current vital signs are: heart rate 100 bpm, blood pressure 120/80 mmHg, respiratory rate 20 breaths per minute, and temperature 37.5°C. The patient's current laboratory values are: white blood cell count (WBC) 12,000/mm³, hemoglobin (Hb) 12 g/dL, and hematology (Hct) 38%.

ANSWER

1. The patient's current symptoms and ABG results indicate an acute exacerbation of COPD. The patient's oxygen saturation is 88% on room air, which is below the target of 90-92%. The patient's P_aCO₂ is 45 mmHg, which is above the normal range of 35-45 mmHg. The patient's P_aO₂ is 60 mmHg, which is below the normal range of 80-100 mmHg. The patient's HCO₃⁻ is 28 mEq/L, which is above the normal range of 22-28 mEq/L. The patient's chest X-ray shows hyperinflation and flattened diaphragms, which are characteristic of COPD. The patient's current medications include a LABA (salmeterol) and an ICS (fluticasone). The patient's current oxygen therapy is 2 L of oxygen via nasal cannula. The patient's current vital signs are: heart rate 100 bpm, blood pressure 120/80 mmHg, respiratory rate 20 breaths per minute, and temperature 37.5°C. The patient's current laboratory values are: white blood cell count (WBC) 12,000/mm³, hemoglobin (Hb) 12 g/dL, and hematology (Hct) 38%.

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