

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 a long-term low-dose inhaled corticosteroid and a long-acting beta₂-agonist. The patient's current symptoms include increased sputum production, increased dyspnea, and a change in sputum color to yellow-green. The patient's vital signs are stable, and there are no signs of systemic infection. The patient's oxygen saturation is 92% on 2L of oxygen. The patient's chest exam shows hyperinflation, decreased breath sounds, and a prolonged expiratory phase. The patient's arterial blood gas (ABG) shows a pH of 7.38, a partial pressure of carbon dioxide (P_aCO₂) of 45 mmHg, a partial pressure of oxygen (P_aO₂) of 80 mmHg, and a bicarbonate (HCO₃⁻) of 28 mEq/L. The patient's chest X-ray shows hyperinflation and a flattened diaphragm. The patient's sputum culture is pending.

Parameter	Normal Range	Patient Value
pH	7.35-7.45	7.38
P _a CO ₂	35-45 mmHg	45 mmHg
P _a O ₂	80-100 mmHg	80 mmHg
HCO ₃ ⁻	22-28 mEq/L	28 mEq/L

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 a long-term low-dose inhaled corticosteroid and a long-acting beta₂-agonist. The patient's current symptoms include increased sputum production, increased dyspnea, and a change in sputum color to yellow-green. The patient's vital signs are stable, and there are no signs of systemic infection. The patient's oxygen saturation is 92% on 2L of oxygen. The patient's chest exam shows hyperinflation, decreased breath sounds, and a prolonged expiratory phase. The patient's arterial blood gas (ABG) shows a pH of 7.38, a partial pressure of carbon dioxide (P_aCO₂) of 45 mmHg, a partial pressure of oxygen (P_aO₂) of 80 mmHg, and a bicarbonate (HCO₃⁻) of 28 mEq/L. The patient's chest X-ray shows hyperinflation and a flattened diaphragm. The patient's sputum culture is pending.

ANSWER

The patient's ABG shows a pH of 7.38, a P_aCO₂ of 45 mmHg, a P_aO₂ of 80 mmHg, and a bicarbonate of 28 mEq/L. This is a compensated respiratory acidosis. The patient's chest X-ray shows hyperinflation and a flattened diaphragm, which is consistent with COPD. The patient's sputum culture is pending, but the change in sputum color to yellow-green suggests a bacterial infection. The patient's symptoms of increased sputum production, increased dyspnea, and a change in sputum color are consistent with an acute exacerbation of COPD. The patient's vital signs are stable, and there are no signs of systemic infection. The patient's oxygen saturation is 92% on 2L of oxygen, which is within the normal range for a patient with COPD. The patient's chest exam shows hyperinflation, decreased breath sounds, and a prolonged expiratory phase, which are also consistent with COPD. The patient's long-term low-dose inhaled corticosteroid and long-acting beta₂-agonist therapy are appropriate for the patient's COPD. The patient's acute exacerbation is likely due to a bacterial infection, and the patient may require a course of antibiotics. The patient's compensated respiratory acidosis is likely due to the patient's chronic hypercapnia. The patient's chest X-ray findings of hyperinflation and a flattened diaphragm are also consistent with the patient's chronic hypercapnia. The patient's sputum culture is pending, and the results will help to identify the causative organism and guide antibiotic therapy. The patient's symptoms and physical exam findings are consistent with an acute exacerbation of COPD, and the patient may require a course of corticosteroids and a long-acting beta₂-agonist to manage the exacerbation. The patient's oxygen saturation is 92% on 2L of oxygen, which is within the normal range for a patient with COPD. The patient's chest exam shows hyperinflation, decreased breath sounds, and a prolonged expiratory phase, which are also consistent with COPD. The patient's long-term low-dose inhaled corticosteroid and long-acting beta₂-agonist therapy are appropriate for the patient's COPD. The patient's acute exacerbation is likely due to a bacterial infection, and the patient may require a course of antibiotics. The patient's compensated respiratory acidosis is likely due to the patient's chronic hypercapnia. The patient's chest X-ray findings of hyperinflation and a flattened diaphragm are also consistent with the patient's chronic hypercapnia. The patient's sputum culture is pending, and the results will help to identify the causative organism and guide antibiotic therapy. The patient's symptoms and physical exam findings are consistent with an acute exacerbation of COPD, and the patient may require a course of corticosteroids and a long-acting beta₂-agonist to manage the exacerbation.

3. 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 a long-term low-dose inhaled corticosteroid and a long-acting beta₂-agonist. The patient's current symptoms include increased sputum production, increased dyspnea, and a change in sputum color to yellow-green. The patient's vital signs are stable, and there are no signs of systemic infection. The patient's oxygen saturation is 92% on 2L of oxygen. The patient's chest exam shows hyperinflation, decreased breath sounds, and a prolonged expiratory phase. The patient's arterial blood gas (ABG) shows a pH of 7.38, a partial pressure of carbon dioxide (P_aCO₂) of 45 mmHg, a partial pressure of oxygen (P_aO₂) of 80 mmHg, and a bicarbonate (HCO₃⁻) of 28 mEq/L. The patient's chest X-ray shows hyperinflation and a flattened diaphragm. The patient's sputum culture is pending.

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