# Emmanuel Case Study

Emmanuel and his mother live in an urban community housing complex. The building is worn down and dirty from the urban dust, cockroaches, and mold. Emmanuel is 5 years of age and has suffered from asthma for the last 2 years. One evening, his mother poured him some milk and put him to bed. Shortly afterward, Emmanuel woke up wheezing and coughing. As he gasped for air, he became more and more anxious. His mother ran for his inhaler, but he was too upset and restless to use it. Emmanuel’s skin became moist with sweat, and as he began to tire, his wheezing became quieter. His mother called 911 and waited anxiously for the ambulance to arrive.

1. Emmanuel uses a corticosteroid inhaler for the management of his asthma. What is the mechanism of action of this drug? How is its action different from the β2-agonist inhalants?
2. Why does someone with severe asthma become physically fatigued during a prolonged attack? What are the physiological events that occur during an attack?
3. One of the complications of respiratory fatigue is the development of hypercapnia. How does the body compensate for an increase in CO2? What are the effects of hypercapnia on the central nervous system?