

Scenario 4: Sickle Cell

- 1) What is the relationship between fluid and oxygen therapy in the treatment of sickle cell anemia?
 - a. Fluid therapy increases the volume of plasma in the blood, which will lower the viscosity, or thickness, of the blood. This helps to prevent clotting and allow free passage of the blood cells through the vessels. For Brittany, a bolus of normal saline was given to decrease the blood viscosity and helped to reduce her symptoms in her sickle cell crisis.
 - b. When oxygen levels in the blood are low, the abnormal hemoglobin in sickle cell elongates and causes the abnormal cell shape that contributes to clotting. Oxygen therapy is important to keep oxygen saturation in an acceptable range and prevent the formation of the rods of defective hemoglobin and the complications that can follow. In Brittany's case, the doctor ordered for oxygen saturation to be kept above a certain level, so supplemental oxygen via nasal canula was administered to ensure this requirement was met.
- 2) What complications might Brittany Long face if her symptoms are not recognized and treated in a timely manner?
 - a. If symptoms of a sickle cell anemia are not promptly treated, Brittany could experience damage to organs, bones, or tissues due to a lack of oxygenation. She could also develop splenic sequestration, where blood flow to the spleen is blocked, or even stroke due to a clot developing in the brain. Sickle cell crisis, as she experienced in the ER, is also a complication that can occur and vary in severity, but there are ways to manage this pain at home if it is mild.
- 3) Document the patient teaching that you would provide for Brittany Long and her family before discharge, including disease process, nutrition, signs and symptoms of crises, prevention of infection and dehydration, and pain management.
 - a. I would be sure to educate to Brittany and her family the difference between sickle cell disease and sickle cell trait and explain that sickle cell disease is an inherited blood disorder characterized by an abnormal hemoglobin the red blood cells that causes crescent-shaped blood cells. This abnormal shape makes it difficult for the blood cells to travel through small vessels of the body and may cause blockages. Education on triggers to avoid, such as being around smoking, extreme hot or cold temperatures, and low oxygen environments, such as in the mountains, are important to help avoid complications.
 - b. Regarding nutrition, I want to be sure they understand that Brittany needs a well-balanced diet that is high in calcium and provide them with a list of high calcium foods to help them make good food choices. It is also important to drink plenty of fluids.

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Resources:

<https://www.cdc.gov/ncbddd/sicklecell/healthy-living-prevent-infection.html>

<https://www.webmd.com/a-to-z-guides/sickle-cell-crisis#2>

<https://www.sicklecelldisease.org/sickle-cell-health-and-disease/types/>

<https://sicklecellanemianews.com/2019/11/06/staying-hydrated-daily-water-intake-tips/>