

Teenager with Dangerously High Cholesterol Levels Saved by Apheresis Technology

By Michelle Brubaker | November 08, 2013

On a Tuesday morning, Joebert Rosal, 17, should be in biology with the rest of his high school classmates. However, this day he is sitting in a hospital chair at UC San Diego Health for nearly four hours with a needle inserted into each arm, connected to a life-saving machine that will prevent him from developing cardiovascular disease.

Rosal's medical journey began at around four-years-old, when he started to have small bumps grow under his skin.

"The bumps were on the back of my knees, elbows and buttocks," said Rosal. "At first they did not cause any issues, but as the years went on, the bumps grew and became painful."

Several doctor visits and screenings later, it was determined Rosal's skin irritations were actually cholesterol deposits, called xanthomas. While in the fourth grade, Rosal was diagnosed with familial hypercholesterolemia (FH), a rare genetic disorder characterized by high levels of low-density lipoprotein cholesterol (LDL), or bad cholesterol. If untreated, 50 percent of FH patients can experience cardiac and vascular illness by the age of 55 or potentially much younger for more severe cases.

Physicians prescribed him a variety of medications but none were effective in lowering his LDL cholesterol to normal levels. Over-the-counter treatments, such as the vitamin niacin, caused severe hot flashes.



After much frustration, the now teenager and honor student was referred to UC San Diego Health where he was introduced to Joseph Witztum, MD, professor at UC San Diego School of Medicine in the Division of Endocrinology and Metabolism.

“Because the continual buildup of cholesterol in the arteries would eventually lead to heart disease, it was imperative to significantly lower Joebert’s LDL levels,” said Witztum, who encourages parents who have a history of high cholesterol to have their children tested.

Rosal was placed on maximum doses of cholesterol-lowering agents, which did produce some benefit. This type of medication regulates LDL receptors that clear LDL from the blood. However, because the LDL receptors are defective in Rosal’s case, the therapies were only partially effective, and he still had very high LDL cholesterol levels.

Rosal’s LDL cholesterol level was 356 mg/dl, and his total cholesterol level was 437 mg/dL while on maximum doses of cholesterol-lowering medications. A normal LDL level in a teenager should be less than 120 mg/dl, so Rosal had three times the normal amount. Witztum and his team decided to treat Rosal with a non-surgical apheresis therapy used to treat patients with exceedingly high LDL.

An apheresis procedure is much like dialysis for cholesterol and requires a specialized group of nurses and physicians who are trained in procedures that remove specific elements from the blood. Through the process, blood leaves the body intravenously and then passes through a filter, which separates the lipid-rich plasma from the blood cells. The plasma is then passed through a special column that removes all of the LDL cholesterol molecules while returning the plasma and other important proteins and cells back into the patient’s body.



UC San Diego Health has the only outpatient therapeutic apheresis program in San Diego County, performing more than 3,000 procedures annually, including LDL apheresis. The program is one of the largest outpatient apheresis programs in the nation.

“Cholesterol levels can be treated with a healthy diet and medications, but some people are genetically predisposed to having very high levels of cholesterol, and for these patients, diet and medication may not be enough,” said [Amber Sanchez, MD](#), associate medical director for the therapeutic apheresis program at UC San Diego Health.

Studies have shown that apheresis can lower LDL cholesterol approximately 70 to 83 percent after a single treatment. The liver will continue to produce LDL following treatment, so in order to maintain the lowest possible LDL levels over time, patients will typically require treatment every two weeks.

Rosal has been receiving the therapy twice a month for about a year.



“I’m very busy with school and I’m on the speech and debate team. My school and the medical team at UC San Diego Health have really tried to accommodate my schedule as much as possible so my daily life is not interrupted,” said Rosal.

Rosal’s LDL cholesterol at the end of an apheresis treatment is as low as 50 mg/dl and now around 120 mg/dl on average.

“I also eat a healthy diet and exercise on a regular basis, but the apheresis machine has truly decreased my risk of cardiovascular disease,” said Rosal. “I’m so grateful to UC San Diego Health for the treatment I’m receiving.”

“Joebert is a fit and ambitious student who is responding well to treatment and continuing to pave the way to a bright future without heart disease,” said Sanchez.

Since being diagnosed, Rosal has made it his mission to spread awareness about FH and apheresis treatment to the community. Recently, he earned one of four spots in a national speech contest where he discussed his genetic disorder and the current treatment he is undergoing at UC San Diego Health.

“I want others who may be dealing with a similar health issue to know there is hope,” said Rosal. “My experience has definitely put things in perspective. I may have a genetic disorder that needs medical attention, but it is not stopping me from achieving my goals in life.”

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