Stockton Graduate Receives Patent-Pending Certificate for Method of Measuring Limb Volume in Lymphedema Patients

Cancer Survivor Catherine Rosenberg Worked with Dr. Eric Chang and Stockton Professors to Improve Medical Measurements Using Math

For Immediate Release; Photos on Flickr

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—the mathematical formula used to calculate the volume of fluid in her swollen leg.

Rosenberg, who was diagnosed with synovial sarcoma at 3 years old, conquered cancer, but the radiation treatments led to her developing lymphedema, a condition that causes severe swelling in the limbs.

Immediately after seeing the formula, her knowledge of numerical analysis told her that th are much more accurate ways to calculate the volume of fluid bui

In her presentation, Rosenberg presented the formula that she uses to calculate limb volumes, which filled an entire PowerPoint slide with numbers, variables and math operations. In simplified terms, a series of cross-sectional areas going up the limb are mathematically integrated over an interval to measure the volume of a limb.

At times, Rosenberg has had a 33 percent volume difference between her legs due to lymph fluid buildup. Lymph nodes damaged during cancer treatment result in a blockage of the lymphatic system, part of the immune system, preventing lymph fluid from draining.

For 25 years, Rosenberg managed lymphedema, wearing compression wraps on her leg and undergoing manual drainage. As time went on, the condition worsened, as did her hip, which suffered from extensive radiation, eventually leading her to have a hip replacement. Following hip surgery, a dislocation of the hip led her to Dr. Eric Chang, a surgeon at Fox Chase Cancer