CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)
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Project Number
J0307

Project Title
Exploring the Mechanical Strength of Stent Samples with Different Patterns and Strut Widths

Abstract

Objectives/Goals
The purpose of this study is to evaluate the mechanical strength of each stent, the strength needed to compress it, based upon varied patterns and struts width.

Methods/Materials
I tested the mechanical strength of stent samples with different patterns and struts widths. I used stainless steel tubes and a laser cutter to create my stent samples and a force gauge to measure the mechanical strength of each stent sample.

Results
Several stent samples were tested to find out whether the mechanical strength of the stent will change when the struts width and pattern is changed. The greater the struts width and the larger the number of rings, the more the mass that the stent has. The 10 rings performed much better than the 6 ring stents and the 10 ring 500 micrometer struts width stent performed the best of them all proving that mass affects the mechanical strength of stent samples.

Conclusions/Discussion
The repeated trials of testing the mechanical strength of the stent samples proved that the 10 ring 500 micrometer struts width stent samples performed the best of them all. Every time the size of struts width was at its thickest and the number of rings was at its most, the mechanical strength of the stent sample was the highest and this directly related to the mass of a stent. Therefore, I concluded from my experiment that the mass of a stent does affect the mechanical strength of a stent sample.

Summary Statement
Through my trials I found that, every time the size of struts width was at its thickest and the number of rings was at its most, the mechanical strength of the stent sample was the highest and this directly related to the mass of a stent.

Help Received
I designed the stents then had them cut. I performed all of the trials, research, and analysis of the findings, independently. My mom, Joan Bei, get them cut and my teacher, Ms. Furtado, helped me understand my research and findings better.