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### **Research Area: Computational Sciences and Engineering**

Abdominal aortic aneurysms (AAAs) are an often asymptomatic occurrence when the aorta, the largest artery in the body, becomes abnormally large and is at risk of rupturing. Current surgical treatment may include insertion of an endograft to keep the artery from swelling further. Post-surgery surveillance must continue in order to detect any later complications, such as endoleaks. Research in computer science at ORNL is being done in conjunction with physicians at University of Tennessee Medical Center with the idea that, by having access to computer analyzed medical information that shows comorbidities of abdominal aortic aneurysms and endoleaks, better diagnosis and further disease prevention related to these conditions can be accomplished. Past research showed strong statistical evidence that endoleaks occurring after AAA surgery are correlated to patients having the condition sigmoid diverticulosis. However, it was unclear if the evidence was that of causality or correlation. This summer, the data mining software "Piranha" developed by ORNL will be used in order to analyze patient medical information relating to AAA. Through specific topic and word searches and clustering, an examination will be done to see if there is causality between endoleaks and sigmoid diverticulosis, as well as to seek more correlations with additional medical data such as, but not limited to, medication, high blood pressure, physical conditions, and gall stones. The research will be done in hopes that additional data will help medical responses to AAA endoleaks based on the knowledge of other related conditions.

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