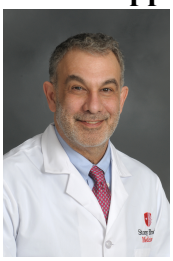
Biomedical Informatics Grand Rounds

Wednesday, Feb 17, 2021 3 pm - 4 pm

Clinical applications of artificial intelligence to improve diagnosis and risk stratification for patients with aortic aneurysms



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SUNY Distinguished Professor
Cherith Professor and Founding Chair
Department of Biomedical Informatics
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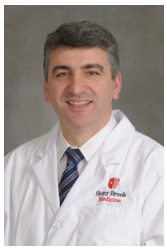
Apostolos K. Tassiopoulos, MD, FACS
Professor of surgery and vice chair for quality and outcomes
Chief of the Division of Vascular and Endovascular Surgery
Director of the Stony Brook Vascular Center
Stony Brook Medicine



Remote Access

Join Zoom Meeting https://stonybrook.zoom.us/j/95617197636?pwd=KytzZ2pVRG9SZGpKZUtpNXJISjNjZz09
Meeting ID: 956 1719 7636 Passcode: 924293

Bio of Apostolos K. Tassiopoulos, MD, FACS: Apostolos K. Tassiopoulos, MD, FACS, professor of surgery and vice chair for quality and outcomes, is chief of the Division of Vascular and Endovascular Surgery at Stony Brook Medicine. In addition, he serves as director of the Stony Brook Vascular Center, co-director of the Aortic Center, and director of the Surgical Skills Center. Dr. Tassiopoulos joined the faculty of Stony Brook's Department of Surgery in 2006, rising quickly to leadership positions. He received his MD from Aristotle University Medical School in Thessaloniki, Greece, in 1989, and subsequently served for two years as a general medical officer in the Hellenic Air Force of Greece. In 1992, he moved to Houston, TX, to pursue a one-year postdoctoral fellowship in cardiovascular surgery at Baylor College of Medicine. He then completed his residency training in general surgery at SUNY Upstate Medical University in 1999 and went on to complete his training in vascular surgery at Loyola University. An active scholar as well as a dedicated clinician, Dr. Tassiopoulos is the author of more than 80 peer-reviewed articles and book chapters. At Stony Brook, he continues to advance his clinical research in the field of venous disease.

Bio of Joel H. Saltz, MD, PhD: Joel Saltz is a Digital Pathology pioneer having worked for the past twenty years in the development of digital Pathology whole slide image software, methods, tools and algorithms. He is a boarded Clinical Pathologist, holds an MD-PhD in Computer Science from Duke, completed a Clinical Pathology residency from Hopkins and has founded Biomedical Informatics departments at Stony Brook, Emory and Ohio State. Dr. Saltz is Cherith endowed Chair of Biomedical Informatics Department at SUNY Stony Brook, Distinguished Professor at Stony Brook University, and the Associate Director for Informatics at Stony Brook Cancer Center.

Joel Saltz received his Bachelors and Masters of Science degrees in Mathematics at the University of Michigan and then entered the MD/PhD program at Duke University, with his PhD studies performed in the Department of Computer Sciences. He completed his residency in Clinical Pathology at Johns Hopkins School of Medicine. Dr. Saltz is a fellow of the American College of Medical Informatics.

Abstract: Aortic aneurysms (AAs) are a pathologic dilatation of the aorta beyond 1.5 times its normal diameter. Most abdominal aortic aneurysms (AAAs) are completely asymptomatic and diagnosed incidentally, but if left untreated, progressive growth can lead to rupture, a catastrophic complication with mortality of up to 80%. Despite the high mortality associated with a AAA at risk of rupture, current screening guidelines and surveillance recommendations are rudimentary, based solely on patient gender, age and smoking history. The protocol for follow-up surveillance studies is determined only by aneurysm size, a strategy that can put a number of patients with accelerated growth at rupture risk. For men with an aneurysm measuring >5.5 cm and women >5.0 cm, surgical intervention is advised. Elective repair carries a very small perioperative risk making timely diagnosis, assessment of individual rupture risk and well-designed follow up protocol's key components of successful patient outcomes without prohibitive cost.

Without the discovery of new risk factors or imaging biomarkers, vascular surgeons have found it difficult to improve on current preventative strategies for patients with aneurysmal disease. This is particularly true for patients with smaller aneurysms that do not require elective repair. For some of them, interval imaging can be as long as 3 years. Shifting current preventative strategies towards a more personalized approach based on unique patient risk profiles has proven to be elusive due to the difficulties inherent in longitudinally capturing, monitoring and properly analyzing all variables that may contribute to the progression of AA disease.

We describe a collaborative project between the Department of Vascular Surgery and Department of Biomedical Informatics aiming to improve the identification and care of asymptomatic AA patients through the application of validated machine learning algorithms to EMR-captured data and relevant imaging studies. The implementation of these machine learning modalities will allow us to develop a self-sustaining comprehensive database for AA patients – one which allows for optimal monitoring, individual risk stratification, and personalized approach to AA disease management.

Educational Objects: Upon completion, participants should be able to:

- Describe current screening and care challenges for patients with aortic aneurysms
- Discuss novel artificial intelligence methodologies for the extraction, longitudinal collection, and analysis of clinical data pertinent to aortic aneurysm disease
- Describe the role of artificial intelligence algorithms in establishing a refined individual risk profile for patients with aortic aneurysms

Disclosure Statement: In compliance with the ACCME Standards for Commercial Support, everyone who is in a position to control the content of an educational activity provided by the School of Medicine is expected to disclose to the audience any relevant financial relationships with any commercial interest that relates to the content of his/her presentation.

The faculty: *Apostolos K. Tassiopoulos*, *Joel H. Saltz*, the planners; and the CME provider have no relevant financial relationship with a commercial interest (defined as any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients), that relates to the content that will be discussed in the educational activity.

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