

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

The role of intraluminal thrombus on oxygen transport in abdominal aortic aneurysms SUDHARSAN MADHAVAN, ERICA CHERRY KEMMERLING, Tufts University — Abdominal aortic aneurysm is ranked as the 13th leading cause of death in the United States. The presence of intraluminal thrombus is thought to cause hypoxia in the vessel wall eventually aggravating the condition. Our work investigates oxygen transport and consumption in a patient-specific model of an abdominal aortic aneurysm. The model includes intraluminal thrombus and consists of the abdominal aorta, renal arteries, and iliac arteries. Oxygen transport to and within the aortic wall layer was modeled, accounting for oxygen consumption and diffusion. Flow and transport in the lumen layer were modeled using coupled Navier-Stokes and scalar transport equations. The thrombus layer was assumed to be biomechanically inactive but permeable to oxygen transport in accordance with previously-measured diffusion coefficients. Plots of oxygen concentration through the layers illustrating reduced oxygen supply to the vessel walls in parts of the model that include thrombus will be presented.

Sudharsan Madhavan
Tufts University

Date submitted: 01 Aug 2017

Electronic form version 1.4