Abstract Submitted
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Hemodynamic simulations in coronary aneurysms of children with Kawasaki disease[1] DIBYENDU SENGUPTA, Mechanical and Aerospace Engineering Dept, UCSD, JANE BURNS, Pediatrics Dept, UCSD, ALISON MARSDEN, Mechanical and Aerospace Engineering Dept, UCSD — Kawasaki disease (KD) is a serious pediatric illness affecting the cardiovascular system. One of the most serious complications of KD, occurring in about 25% of untreated cases, is the formation of large aneurysms in the coronary arteries, which put patients at risk for myocardial infarction. In this project we performed patient specific computational simulations of blood flow in aneurysmal left and right coronary arteries of a KD patient to gain an understanding about their hemodynamics. Models were constructed from CT data using custom software. Typical pulsatile flow waveforms were applied at the model inlets, while resistance and RCR lumped models were applied and compared at the outlets. Simulated pressure waveforms compared well with typical physiologic data. High wall shear stress values are found in the narrow region at the base of the aneurysm and low shear values occur in regions of recirculation. A Lagrangian approach has been adopted to perform particle tracking and compute particle residence time in the recirculation. Our long-term goal will be to develop links between hemodynamics and the risk for thrombus formation in order to assist in clinical decision-making.

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