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Computational Analysis of Human Blood Flow YOGENDRA PANTA, HAZEL MARIE, MARK HARVEY, Youngstown State University — Fluid flow modeling with commercially available computational fluid dynamics (CFD) software is widely used to visualize and predict physical phenomena related to various biological systems. In this presentation, a typical human aorta model was analyzed assuming the blood flow as laminar with complaint cardiac muscle wall boundaries. FLUENT, a commercially available finite volume software, coupled with Solidworks, a modeling software, was employed for the preprocessing, simulation and postprocessing of all the models.The analysis mainly consists of a fluid-dynamics analysis including a calculation of the velocity field and pressure distribution in the blood and a mechanical analysis of the deformation of the tissue and artery in terms of wall shear stress. A number of other models e.g. T branches, angle shaped were previously analyzed and compared their results for consistency for similar boundary conditions. The velocities, pressures and wall shear stress distributions achieved in all models were as expected given the similar boundary conditions. The three dimensional time dependent analysis of blood flow accounting the effect of body forces with a complaint boundary was also performed.

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