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Pulsatile flow through idealized trabeculae NICHOLAS BATTISTA, LAURA MILLER, University of North Carolina at Chapel Hill — Trabeculae begin to form in the human developing heart for Reynolds numbers on the order of 10. Other hearts, such as the squid heart, have trabeculae for Re on the order of 10 and larger. The effect of trabeculae on the flow in this range of Re is not well understood. In this study, computational fluid dynamics is used to quantify the effects of Reynolds number and idealized trabeculae height on the resulting flows. An adaptive and parallelized version of the immersed boundary method (IBAMR) is used to solve the fluid-structure interaction problem. We see the formation of vortices depends upon Re and trabeculae height. We then explore how the periodicity of the flow effects vortex formation and shear patterns. This is important because it is thought that these dynamic processes are important to the generation of shear at the endothelial surface layer and strains at the epithelial layer, which will aid in proper development and functionality.

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