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**Flow Structure Associated with Hemodialysis Catheters** JASON FOUST, DONALD ROCKWELL, Lehigh University — Insertion of a hemodialysis catheter into the superior vena cava (SVC) gives rise to complex flow patterns, which arise from the simultaneous injection and extraction of blood through different holes (ports) of the catheter. Techniques of high-image-density particle image velocimetry are employed in a scaled-up water facility. This approach allows characterization of both the instantaneous and time-averaged flow structure due to generic classes of side hole geometries. The trajectory of the injection jet is related to the ratio of the initial jet velocity to the mainstream velocity through the SVC, and to the type of distortion of the jet cross-section. Furthermore, the mean and fluctuating velocity and vorticity fields are determined. Significant turbulent stresses develop rapidly in the injection jet, which can impinge upon the wall of the simulated SVC. Immediately downstream of the injection hole, a recirculation cell of low velocity exists adjacent to the catheter surface. These and other representations of the flow structure are first evaluated for a steady throughflow, then for the case of a pulsatile waveform in the SVC, which matches that of a normal adult.

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