

Takizawa, Kenji; Schjodt, Kathleen; Puntel, Anthony; Kostov, Nikolay; Tezduyar, Tayfun E. Patient-specific computer modeling of blood flow in cerebral arteries with aneurysm and stent. (English) [Zbl 1311.76157](#)
Comput. Mech. 50, No. 6, 675–686 (2012).

Summary: We present the special arterial fluid mechanics techniques we have developed for patient-specific computer modeling of blood flow in cerebral arteries with aneurysm and stent. These techniques are used in conjunction with the core computational technique, which is the space-time version of the variational multiscale (VMS) method and is called “DST/SST-VMST.” The special techniques include using NURBS for the spatial representation of the surface over which the stent mesh is built, mesh generation techniques for both the finite- and zero-thickness representations of the stent, techniques for generating refined layers of mesh near the arterial and stent surfaces, and models for representing double stent. We compute the unsteady flow patterns in the aneurysm and investigate how those patterns are influenced by the presence of single and double stents. We also compare the flow patterns obtained with the finite- and zero-thickness representations of the stent.

MSC:

[76Z05](#) Physiological flows

[92C35](#) Physiological flow

[74F10](#) Fluid-solid interactions (including aero- and hydro-elasticity, porosity, etc.)

Cited in **55** Documents

Keywords:

[cardiovascular fluid mechanics](#); [patient-specific modeling](#); [cerebral aneurysms](#); [stent](#); [mesh generation](#)

Full Text: [DOI](#)

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