

Abstract Submitted  
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**Flow diversion and coil embolization may perform best in conjunction for treatment of intracranial aneurysms: a hemodynamic investigation**<sup>1</sup> ROBERT DAMIANO, DING MA, ADNAN SIDDIQUI , HUI MENG, University at Buffalo, State University of New York — Coiling and flow diversion is the current standard for treatment of intracranial aneurysms (IAs). Coils deployed into the IA sac trigger its thrombotic occlusion, while flow diverters (FDs) deployed across the IA ostium redirect blood flow and reconstruct the parent vessel. Despite the wide adoption of these interventions, poor treatment outcomes have been reported. Recent clinical reports indicate that IA patients treated with both coils and FDs had better outcomes, compared to individual strategies alone. To better understand the hemodynamic mechanisms underlying coiling and flow diversion, we applied our advanced FEM-based device modeling toolset in conjunction with CFD to investigate 3 clinical strategies: coiling, FD, and FD with adjunctive coiling. Using 3 patient-specific IAs as test beds, we assessed the hemodynamic modifications induced by each strategy. Hemodynamic modifications in inflow rate, velocity, and wall shear stress revealed that coils were most effective at reducing intra-aneurysmal flow, while FD worked best at reducing flow into the IA sac. When coils were combined with FD, these effects appeared to be synergistically enhanced. Our modeling results support clinical observations that flow diversion and coiling may work best in conjunction for treating IAs.

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