fluid, e.g., saline, may be selected to be less viscous than blood so that delivery of the aspiration fluid into the vasculature of the patient via outer catheter 12 may help create turbulence in the inner lumen of inner catheter 14 as the aspiration fluid is aspirated through the inner lumen of the inner catheter.

[0051] Aspiration catheter system 10 may be configured to be advanced through vasculature of a patient via a pushing force applied to a proximal portion of aspiration catheter system 10 with minimal or no buckling, kinking, or otherwise undesirably deforming (e.g., ovalization). Aspiration catheter system 10 may be used to remove a thrombus, such as a clot or other material such as plaques or foreign bodies, from vasculature of a patient. In such examples, a positive pressure may be applied, such as by aspiration pump 6, to the proximal end of outer catheter 12 to deliver aspiration fluid to the site of the thrombus and a negative pressure may be applied, such as by aspiration pump 6, to the proximal end of inner catheter 14 to draw a thrombus into the inner lumen of inner catheter 14 through one or more distal openings. Aspiration catheter system 10 may be used in various medical procedures, such as a medical procedure to treat an ischemic insult, which may occur due to occlusion of a blood vessel (arterial or venous) that deprives brain tissue, heart tissue or other tissues of oxygen-carrying blood.

[0052] In some examples, aspiration catheter system 10 is configured to access relatively distal locations in a patient including, for example, the middle cerebral artery (MCA), internal carotid artery (ICA), the Circle of Willis, and tissue sites more distal than the MCA, ICA, and the Circle of Willis. The MCA, as well as other vasculature in the brain or other relatively distal tissue sites (e.g., relative to the vascular access point), may be relatively difficult to reach with a catheter, due at least in part to the tortuous pathway (e.g., comprising relatively sharp twists or turns) through the vasculature to reach these tissue sites. Each of outer catheter 12 and inner catheter 14 may be structurally configured to be relatively flexible, pushable, and relatively kink- and buckle-resistant, so that it may resist buckling when a pushing force is applied to a relatively proximal section of a respective outer catheter 12 and inner catheter 14 to advance aspiration catheter system 10 distally through vasculature, and so that it may resist kinking when traversing around a tight turn in the vasculature. In some examples, outer catheter 12 may be a guide catheter that is introduced into the vasculature before inner catheter 14, and may define a pathway through which inner catheter 14 may be navigated to a target treatment site.