

Abstract Submitted  
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**Non-Invasive Measurement of Viscosity in Pulsatile Flow in Elastic Vessels** G.J. BRERETON, M.M. KOCHESFAHANI, V. DURGESH, Michigan State University — When laminar pulsatile flows in elastic-walled vessels are fully developed, theoretical solutions can be found relating any two flow variables at a given axial location. When the flow variables are both velocities, such as the time-dependent centerline and area-averaged velocities, their interdependence on the wave speed of pulse propagation cancels. When the wave-speed Reynolds number exceeds 1,000, effects of the vessel wall's compliance on the solution become negligible, leaving the vessel radius and the Newtonian viscosity as the only *parameters* in the time-dependent problem. A non-invasive method for determining the fluid viscosity based on such solutions is demonstrated in arbitrarily unsteady flow, that is relevant to the critical problem of accurate *in vivo* measurement of the local viscosity of blood in patients.

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