



Fluid Structure Interaction in Human Blood Vessels

Objective

- To understand and numerically model the fluid structure interaction behaviour of flow in blood vessels

Methodology

- The onset of a pressure pulse was simulated at the entrance of a three dimensional straight segment of the artery and the resulting dynamic response in the form of a propagating pulse wave through the blood vessel wall was analyzed.
- Two types of fluid structure interaction methods were used, Merge node method & Penalty method
- The Arbitrary Lagrangian Eulerian (ALE) formulation was used to overcome the disadvantages of the two more commonly utilised finite element procedures, Lagrangian and Eulerian modelling, while at the same time, utilising the advantages of both simulation techniques.

Outcome

- The ALE is an appropriate numerical modelling technique to simulate the fluid structure interaction in blood vessels. A good agreement is found between the numerical and theoretical results.

