URN etd-0407109-183722-1787
Author Vu Ha Hai
Author's Email Address No Public.
Statistics This thesis had been viewed 58 times. Download 15 times.
Department
Year 2006
Semester 2
Degree Master
Type of Document Master's Thesis
Language English
Title Fluid Analysis inside Left Ventricular Assist
Devices with Non-Newtonian Theory
Fluid Analysis inside Left Ventricular Assist Devices with Non-Newtonian theory
Date of Defense 0000-00-00
Page Count 100
Keyword
LVADs
Non-Newtonian
shear stress

Abstract
Left Ventricular Assistant Devices (LVADs) have been researching since 1986 based on many various theories about blood. Most of studies recognized that blood belongs to type of Newtonian fluid with constant viscosity. With this principle, scientists carried out many experiments, analysis and succeeded in manufacturing several kinds of LVADs. However, because of complex phenomenon of blood, duration of these devices after implanting into living organism is still big problem with researchers. In our research, blood was modeled as Non-Newtonian fluid whose viscosity is not constant, but be a function of deformation. Fluent software with finite element methods is utilized to simulate the hemodynamic characteristics of blood flow and analyze the flow. We focus on how different between Newtonian fluid and Non-Newtonian one The study found that Non-Newton fluid gave more precise results and was successful in increasing head pressure of device to larger than 120 mmHg (arterial blood pressure). These analysis results will provide better parameters to optimize the shape of casing, impeller as well as other parts of LVADs and therefore increasing the durability of devices.

Keywords：LVADs, Non-Newtonian, shear stress
Advisory Committee Lin, Cheung-Hsian Hsu, Cheung-Hwa - advisor

Files etd-0407109-183722-1787-001.pdf

indicate access worldwide
Date of Submission 2007-07-17