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THE EFFECT OF HEAT TRANSFER ON TWO-LAYERED BLOOD FLOW THROUGH A COMPOSITE STENOSIS IN THE PRESENCE OF A MAGNETIC FIELD

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ABSTRACT

A two layered model consisting of a peripheral cell-free layer and a core particle-fluid suspension was used to describe blood flow through a composite stenosis in the presence of both an external magnetic field and convective heat transfer. The effect of varying the strength of the magnetic field and the pressure gradient on the fluid's velocity was examined. Temperature profiles were generated and used to examine the effect of varying the magnetic field strength and hematocrit level on blood temperature. The effect of varying the magnetic field strength, hematocrit and stenosis height on the friction-factor Reynold's number and Nusselt number was examined in the presence of the composite stenosis. This knowledge can aid in the improvement of existing diagnostic tools used for cardiovascular diseases and in the understanding of the effect that a magnetic field and convective heat will have on cardiovascular patients.

KEYWORDS: Blood Flow, Heat Transfer, Hematocrit, Magnetic Field, Stenosis