Pulsatile Flow Assisted Dialysis Machine with Enhanced Membrane Transport

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Technology description

Technology Summary

Dr. Albert Ratner and Dr. Jay Bhama have developed a new method of optimizing flow rates through a hemodialysis machine that would optimize the flow rate, which substantially decreases the time for each procedure. They discovered the flux through the tube increased when using pulsatile flow instead of a steady state flow to and from the hemodialysis machine. This method allows for faster procedure times since the energy loss is minimized and therefore fluid can be accelerated through the tubing. This could lead to smaller and more efficient dialysis machines.

Background Information

The global market for hemodialysis and peritoneal dialysis is expected to reach $83.9 billion by 2021, due to increasing numbers of renal disease, diabetic, and hypertension patients. Hemodialysis treatments function as substitute kidneys for patients who are unable to filter blood to produce urine. This leads to toxin build up in the body along with excess fluid. Flow through the machine is currently limited by the properties of the tubing materials, and the rate is therefore lower than ideal.

Advantages

Shorter dialysis time
Reduced dialysis machine size

Institution

University of Iowa

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