

Fluid Management System for Hemofiltration (#4209)

A management system for continuous renal fluid management in extracorporeal membrane oxygenation.

Inventors at Georgia Tech have developed a patented fluid management system for ECMO utilizing a multiple pump-based mechanism to achieve a perfect fluid balance. One pump works to create ultra-filtrate (essentially urine) from the blood, while another pumping system delivers replacement fluid to the filtered blood creating perfect fluid balance. A third pumping system allows the creation of positive or negative fluid balance to allow treatment for the patient with existing fluid overload or deficit. The movement of fluids is synchronously controlled by pinch valves, and the blood path remains isolated, making this a completely sterile process.

Benefits/Advantages

- **Compact**- size addresses concern of restricted bed-side space
- **Age-friendly**- potential use in any age group, from newborns to adults

Potential Commercial Applications

Medical applications for treatment of chronic disease/conditions

- Lung Failure
- Heart Failure
- Severe Infections

Background/Context for This Invention

Conventional treatments and management methods for cardiac and respiratory failure often fail to keep the organs functioning properly on extracorporeal life support. In these cases, solutions such as extracorporeal membrane oxygenation (ECMO), are used to support the failing organs. Patients in need of ECMO are at a higher risk of kidney injury and fluid overload in the body. ECMO can be combined with continuous veno-venous hemofiltration (CVVH), a renal replacement therapy that works to improve fluid balance, restore normal electrolytes, and dispel toxins from the blood. Current combination mechanisms do not work well, delivering inaccurate amounts of replacement fluids leading to excessive fluid removal and higher risk of dehydration. Thus, a combination method that reliably provides CVVH during ECMO is needed.

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More Information

U.S. Patent Issued - [8206594](#)

Publications

For more information about this technology, please visit:

<https://licensing.research.gatech.edu/technology/fluid-management-system-hemofiltration>

Images: