

Improved Fluid Management System for Continuous Hemofiltration

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Technology description

Market Summary

The dialysis device field consists of dialysis accessories, hemodialysis machines, and continuous renal replacement therapy. When continuous veno-venous hemofiltration (CVVH), a renal replacement therapy, is necessary, it is often implemented with either addition of a dialysis machine or by insertion of additional fluid pumps into the extracorporeal membrane oxygenation (ECMO) life support system. Although the addition of fluid pumps during ECMO to create a combined system decreases cost, complexity, and the need for diuretics and other medications as compared to the addition of a dialysis machine, the combination system is more likely to deliver replacement fluids at inaccurately measured rates, to cause a need for excessive fluid removal, and to increase the likelihood of undesired dehydration and ultimately shock. Currently marketed renal replacement devices do not have the optimum sensitivity or accuracy required to most effectively adjust fluid volumes in pediatric patients. As there are no CVVH devices available that are approved for pediatric use, there is a need for a device that has the capability to be used on children while having the versatility to also be used on adults.

Technical Summary

This technology describes a safer and more accurate CVVH fluid management device that can be integrated with an ECMO circuit. Its specially designed fluid pumping and control mechanism provides the volume control needed to safely treat pediatric patients. It is also fully adjustable for use on adult patients as well. The device can produce either a zero or negative fluid balance between the hemofilter and the replacement fluid delivered to the filtered blood which can occur simultaneously, and it has been designed to replace fluid at a flow rate as high as 8 liters per hour. With these improvements, the device is still compact enough to fit near the patient's bed, can be sterilized, and is easily operated via a simple user interface.

Application area

Device that provides continuous veno-venous hemofiltration for adults and children with kidney failure.

Advantages

Used in combination with extracorporeal membrane oxygenation machines.

Improves the accuracy and safety of fluid delivery and extraction compared to existing technology, thereby improving outcomes of critically ill patients.

Can be used in children - currently no similar device is approved for pediatric use.

Institution

[Emory University](#)

联系我们



叶先生

电话 : 021-65679356

手机 : 13414935137

邮箱 : yeyingsheng@zf-ym.com