

Next-Generation Mini-ECMO

Intravascular Dual-Lumen Cannula for assistive oxygenation

Overview

Patients with severe respiratory failure or low oxygen saturation are currently supported by ECMO, but conventional systems are bulky, highly invasive, and require specialized expertise.

This system integrates a miniature axial-flow blood pump and a hollow-fiber oxygenation unit within a dual-lumen cannula, allowing blood pumping, oxygenation, and CO₂ removal in a single device.

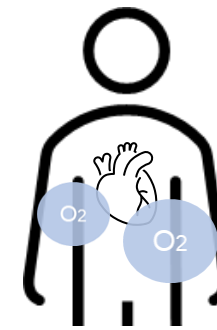
- Integrated pump and oxygenator: No additional artificial lung needed
- Single-port percutaneous insertion: Femoral or jugular access reaching the right atrium
- Recirculation control: Flow rate and oxygenation optimized via pump speed
- Low-flow gas exchange proven: Effective oxygenation and CO₂ removal demonstrated at 0.2 mL/min

Applications

- Simplified V-V ECMO System (Bridge Device Before Full ECMO)
- Long-Term Gas Exchange Support for Chronic Respiratory Failure Patients

IP Data

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Compact

Simple

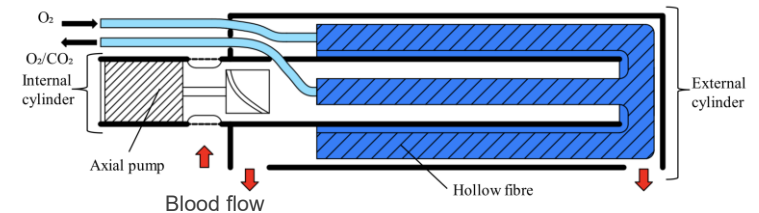


Fig.1 Schematic illustration of an oxygenation cannula with a double luminal axial blood pump

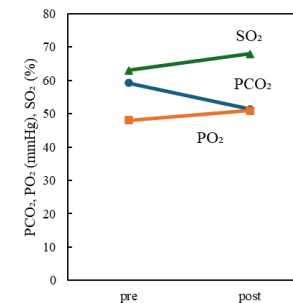


Fig.2 A periluminal oxygenation test was carried out in the test circuit. The acute changes in PCO₂, PO₂, and SO₂ showed the gas exchange under the slow flow in the test loop.

Related Works

ICBHI 2024. IFMBE Proceedings, vol 118. Springer, Cham.
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