

Novel peritoneal dialysis catheter design

Infant-specific PD catheter with helical, multi-port design reducing occlusion and complications in low-resource settings.

Researchers at Purdue University have developed a technology via a novel PD catheter specifically designed for neonates, featuring a unique multi-diameter side port configuration and helical geometry. These design innovations aim to reduce common complications associated with current off-label solutions, improving the safety and efficacy of neonatal peritoneal dialysis.

Currently, the lack of peritoneal dialysis (PD) catheters specifically designed for neonates poses a significant challenge in delivering effective neonatal dialysis. In high-resource settings, this limitation is often addressed through alternative extracorporeal dialysis methods. However, in low-resource settings (LRS), where PD remains the preferred and often only viable option, the use of off-label catheters can lead to serious complications such as omental wrapping and catheter occlusion. These serious complications are addressed by this technology.

Technology Validation:

The results of the numerical analysis performed on the control pigtail catheter with 5 equal-diameter side ports demonstrate increased velocity at the 2 most proximal side ports while the remaining 3 side ports had a velocity close to 0 m/s. The results shown in the insert of Figure 2a shows that over 70% of fluid will drain through the two most proximal side ports, creating a high-pressure region adjacent to these side ports.

Advantages:

- Neonate-Specific Design
- Reduced Complications
- Improved Flow Dynamics

Applications:

Technology ID

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Category

Digital Health &
Medtech/Implantable Medical
Devices

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- Neonatal Peritoneal Dialysis
- Low-Resource Settings (LRS)
- Emergency or Temporary Dialysis

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