

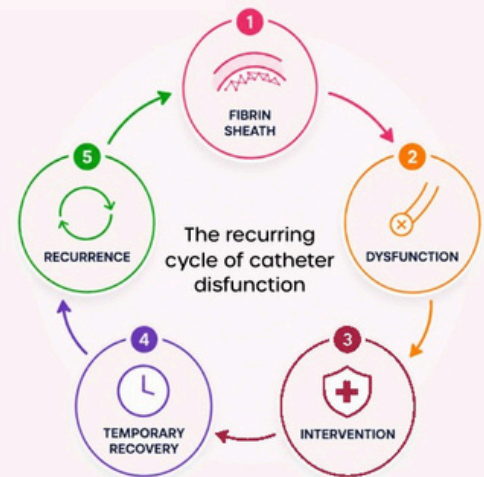
FIBRIN SHEATH: IS THERE A SIMPLE SOLUTION TO IMPROVE CATHETERS?

The Problem - The Hidden Driver of Catheter Dysfunction

Forming rapidly on Catheter surfaces, fibrin sheath can:

- Compromise blood flow
- Increase Thrombosis risk
- Contribute to recurrent dysfunction
- Increase intervention frequency

For many patients, this becomes a cycle



Differences Between Fibrin Sheath and Thrombosis

Feature	Fibrin Sheath	Thrombus
Composition	A membranous structure composed of endothelial cells, smooth muscle cells, collagen and fibrous connective tissue.	A blood clot comprising of platelets, fibrin, and red blood cells.
Structure and effect	This thin sleeve-like structure encases the CVC, leading to malfunction or infection.	A larger rounder, non-compressible mass that blocks the vein.
Development time	Shorter development time: within 24 hours to 72 hours	Takes longer to develop; approximately 6 days.
Management	Requires mechanical disruption.	Can be treated with thrombolytics without physical disruption.

Fibrin sheath statistics

- Approximately 80% of HD patients start on a catheter
- The proportion of patients who dialyse long-term on a catheter is around 25%
- Even in those with a fistula or graft, around 15–20% will need a CVC within the first year of starting dialysis
- The economic burden of Fibrin Sheaths is a \$billions* annual cost

*Cost ranges derived from CMS reimbursement data, published vascular access studies, and infection cost analyses (CDC, peer-reviewed literature). Detailed references available on request.

Pharmaceuticals do not work on preventing Fibrin Sheaths. Therefore, we need alternative technologies to prevent this clinical issue. If catheter failure begins at the surface, prevention strategies may need to begin there to.

The Evidence

Clinicians recognise the problem - but solutions remain limited

A recent international survey of 111 vascular access clinicians across 37 countries highlights a clear gap: low confidence in current catheter technologies and a lack of meaningful progress in addressing Fibrin Sheath.

Despite the range of devices available, catheter selection continues to be driven by:

- Availability
- Ease of insertion
- Practical performance considerations
- Not by the ability to prevent the complications that ultimately limit catheter lifespan.

Survey results - decision making

Which factors most influence your choice of catheter?



Crucially, over half of clinicians surveyed identified Fibrin Sheath and thrombosis as the key reasons catheters fail prematurely - reinforcing that dysfunction is not a secondary issue, but a major unresolved driver of catheter performance.

Survey results - choice in dialysis catheters

In your experience which complication most often limits catheter lifespan?



A surface-led approach to prevention

Could the answer begin at the catheter surface?

If dysfunction begins through biological events occurring at the blood-material interface, then modifying that interface may represent an important opportunity.

Emerging surface technologies are exploring whether it is possible to influence:

- Protein deposition
- Platelet activation
- Thrombotic adhesion
- Fibrin accumulation before dysfunction becomes established.



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FIBRIN SHEATH**

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