CathNova Business Model

Degree programme: BSc in Industrial Engineering and Management Science
Specialisation: Business Engineering
Thesis advisor: Prof. Dr. Bastian Widenmayer
Expert: Prof. Dr. Cédric Bessire
Industrial partner: CathNova, Biel

CathNova aims to enter the European hospital market with a smart catheter system that prevents reflux by stimulating the lower esophageal sphincter. This thesis develops a commercialization strategy focused on high-risk ICU use cases. Value-based pricing fits well by offsetting high opportunity costs. Direct sales allow per-patient billing and support a razor-and-blade model that enables recurring revenue and efficiency.

State of the Art

Smart catheters combining sensing and stimulation provide clear advantages in high-risk clinical environments such as intensive care, anesthesia, and postoperative care. CathNova's system detects gastroesophageal reflux in real time and delivers targeted stimulation of the lower esophageal sphincter to prevent aspiration. Figure 1 shows the catheter for this function, while Figure 2 illustrates the flex-printed electronics platform enabling miniaturized signal processing on the catheter surface. Despite strong technical maturity and usability in short-term applications, adoption is hampered by procurement routines, reimbursement uncertainty, and lack of integration with hospital IT systems.

Methods

To address these adoption barriers, the thesis combined qualitative interviews with clinical users, procurement officers, and regulatory stakeholders, alongside targeted literature research. Interviews were thematically coded and compared across stakeholder groups to identify converging patterns. The European hospital landscape was analyzed in detail, with focus on procurement triggers, cost allocation models, reimbursement mechanisms, and hospital governance. The analysis also examined structural contrasts between decentralized institutions and integrated hospital networks.

Results

The resulting model builds on value-based pricing, linking the catheter's preventive effect to avoided downstream costs—especially in ICU cases where complications like aspiration pneumonia or intubation are both life-threatening and cost-intensive. Hospitals function as primary customers, and direct sales enable simple cost assignment per patient episode. This aligns with hospital billing logic and DRG systems. The model also proposes a razor-and-blade setup: single-use catheters generate recurring revenue, while a reusable controller supports operational efficiency. High-potential clinical use cases include patients with functional ileus and gastric retention, neurologically impaired or geriatric patients with silent reflux, and non-intubated patients on non-invasive ventilation. The business model emphasizes early onboarding and clinician engagement as key access drivers.

Future Research

Future work should prioritize clinical validation studies in large hospitals, ideally supported by outcome data and cost-effectiveness analysis. Engaging clinical staff through pilot phases and workshops will build trust in the technology. The diffusion strategy should rely on peer advocacy, measurable benefits, and cross-functional champions. Further research could explore integration with digital monitoring.

Dominic Flury

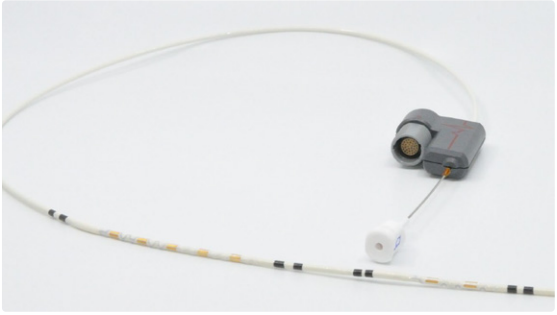

Figure 1: CathNova Smart Catheter

Figure 2: Electrode Segment