Inspired by *Magnetic Origami Reprogramming and Folding System* (MORF)

STENTIX

A Noninvasively Reconfigurable Biliary Stent

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Biliary Stenting

Why **Malignant Patients?**

- **Severe complications**: highest risk
- Tumor growth → **Frequent interventions**
- **Maximizing QoL:** reducing repeat procedures = critical

Benign Biliary Conditions

Malignant Biliary Obstruction

Plastic Stents

Plastic:

Uncovered:

Fully covered:

SEMS: Self-Expandable Metal Stents

✓ Lower risk of recurrent biliary obstruction

✓ More cost-effective and durable

Fully Covered Metal Stents

✓ Reduces chances of occlusion

✓ Higher stent patency

✓ Smoother Surface

✗ **Higher risk of migration**

Uncovered Metal Stents

✗ More prone to occlusion

✗ Lower stent patency

✗ Harsher surface

✓ **Lower risk of migration**

Stentix's Value Add:

- **Noninvasive adjustability** post-deployment with **magnetic technology**
- Maintains optimal positioning
- Enhanced stent patency

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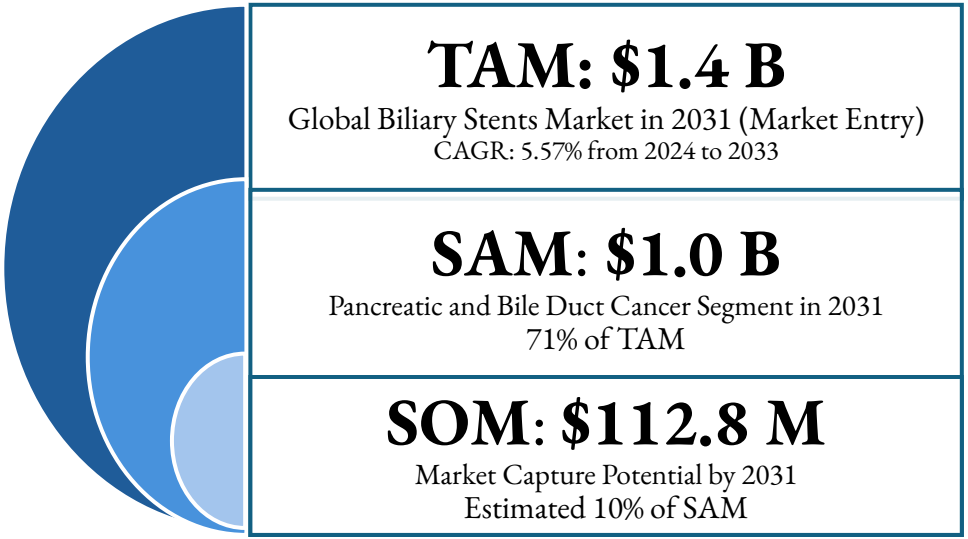
Market Opportunity



TAM: $1.4 B

Global Biliary Stents Market in 2031 (Market Entry)
CAGR: 5.57% from 2024 to 2033

SAM: $1.0 B

Pancreatic and Bile Duct Cancer Segment in 2031
71% of TAM

SOM: $112.8 M

Market Capture Potential by 2031
Estimated 10% of SAM

1. Precedence Research, Biliary Stents Market Size, Share, and Trends 2024 to 2033
2. Journal of Visceral Surgery, Acute cholangitis: Clinical manifestations, diagnosis, and management
3. Estimate based on current landscape

Demand Drivers:

- Increasing adoption of minimally invasive procedures (**~700,000 annual ERCPs** in US)
- Expansion of endoscopic luminal stenting for malignant obstructions

Critical for malignant obstructions:

- Serves **~56,000 pancreatic & bile duct cancer** cases annually in US

Cost Savings Potential:

- **>$2,450** per patient by reducing repeat procedures & migration-related interventions

20 - 40%
of Fully Covered Self-Expandable Stents Migrate

>$700M
Estimated Economic Burden in 2024 Malignant Patient Stent Migration

$15,000-20,000+
Cost of Surgical Revision of Stent Migration

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Technology Overview

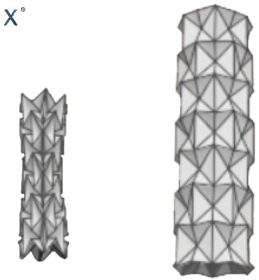
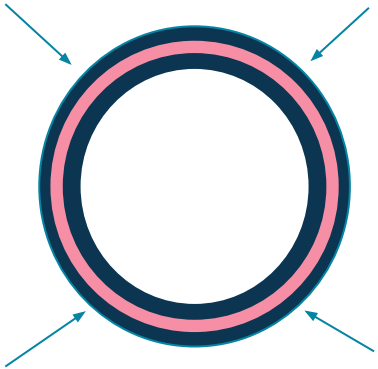


Fig 1: State 1 and State 2 of waterbomb folded stent.



Applied heat and magnetic field for adjustment capabilities

1 Waterbomb Fold

6 crease fold pattern and negative Poisson's ratio allowing for adjustable diameter (Fig 1)

2 Magnetic Outer Layer

NdFeB magnets with a Fluorinated Ethylene Propylene coating to allow for magnetic manipulation and biocompatibility

3 Thermoplastic Inner Layer

PPC inner layer allows for flexible manipulation when heated, and structural stability when at resting body temperature in the bile duct

4 Non-Invasive Adjustability

1. Dynamic Diameter Adjustment

Through **modulating the strength** of an alternating NSNS magnetic field, the stent **diameter can be readjusted** to adapt to tissue swelling, inflammation, or tumor growth over time, etc

2. Remote Stent Repositioning

Through disrupting the NSNS pattern, a **magnetic moment** is created. A **rotating, moving, magnetic field** can be used to manipulate the torque on this magnetic moment, providing control over the stent's internal placement