

ROBOTIC ENDOLUMINAL & FLEXIBLE ENDOSCOPY PLATFORMS

A comprehensive overview of the 2026 landscape based on the IDEAL-D framework.

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Medtronic

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Boston Scientific

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GI Windows

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Advantage Bariatrics

Consultant

INTITUIVE

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The 2026 Landscape at a Glance

17

DISTINCT SYSTEMS

16

COMPANIES

Inc. 2 Monarch applications

9

APPROVALS

In assessed countries

2

STAGE 3 SYSTEMS

Ion & Monarch (branch)

Important Scope Note

The 17-system review is broader than GI therapeutic flexible endoscopy. It also includes robotic bronchoscopy, urology, and gynecologic natural-orifice systems.

The following platform slides preserve the full landscape while clearly labeling the clinical focus of each distinct system.

Device	Intuitive Endoluminal Gastrointestinal System (IG1000)
Applicant	Intuitive Surgical, Inc.
Submission	Traditional 510(k), K253702
Received	24 November 2025
Decision	Substantially Equivalent (SESE)
Decision date	7 August 2026
Primary code	FDS - gastroscope and accessories, flexible/rigid
Secondary code	FET - endoscopic video imaging system/component

Monarch™ — Bronchoscopy 02 / 17

Company Auris Health / Johnson & Johnson (USA)

Application Robotic bronchoscopy

Architecture Flexible telescoping scope-in-scope

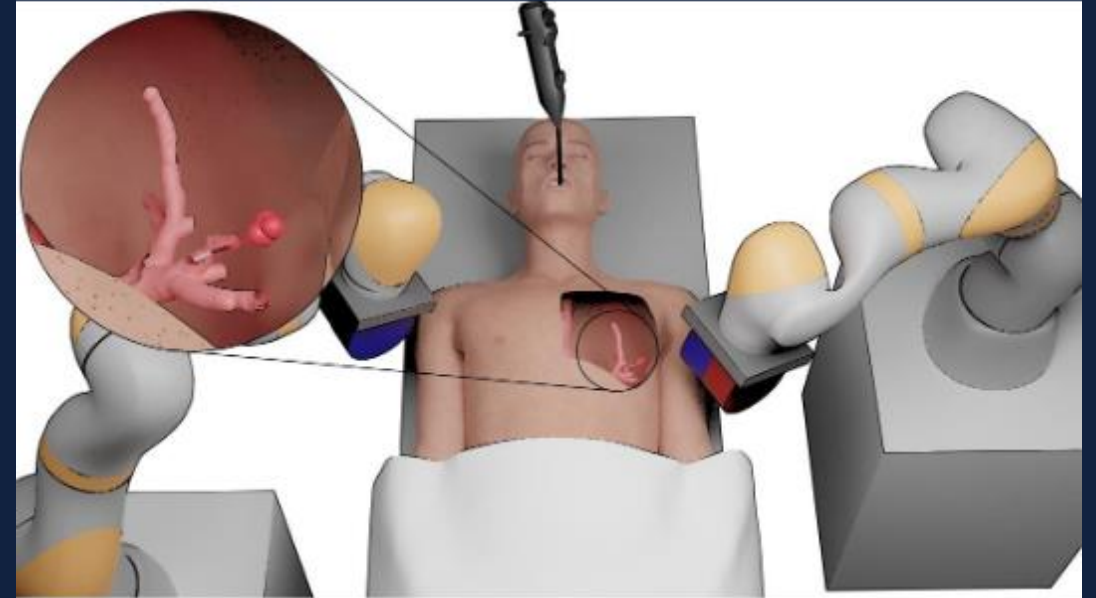
Maturity FDA cleared; IDEAL Stage 3 (2025)

Key Point: *Designed for peripheral lung navigation and biopsy; uses electromagnetic navigation.*



Clinical Evidence: Agrawal A et al. (2020): Review includes ACCESS trial data showing stable peripheral reach.

Low SW (2026): Achieved 72% diagnostic yield, highly comparable to shape-sensing alternatives.



Monarch™ — Urology 03 / 17

Company Auris Health / Johnson & Johnson (USA)

Application Robotic urology / endoluminal access

Architecture Flexible robotic endoluminal platform

Maturity Regulatory-cleared platform family

Key Point: *Included as a distinct application and system profile in the 2025 endoluminal scoping review.*



Ion™ Endoluminal System 01 / 17

Company Intuitive Surgical (USA)

Application Robotic bronchoscopy / navigation

Architecture Flexible shape-sensing catheter; nav + biopsy

Maturity FDA cleared; IDEAL Stage 3 (2025)

Key Point: *3.5 mm catheter; 180° articulation in all directions; 2.0 mm working channel.*



Clinical Evidence: Reisenauer J et al. (2022): Multicenter trial (241 pts, 270 nodules) highlighted high safety profile.

Low SW (2026): Comparative study showed 75% diagnostic yield, equivalent safety to Monarch.



Anovo™ Surgical System 04 / 17

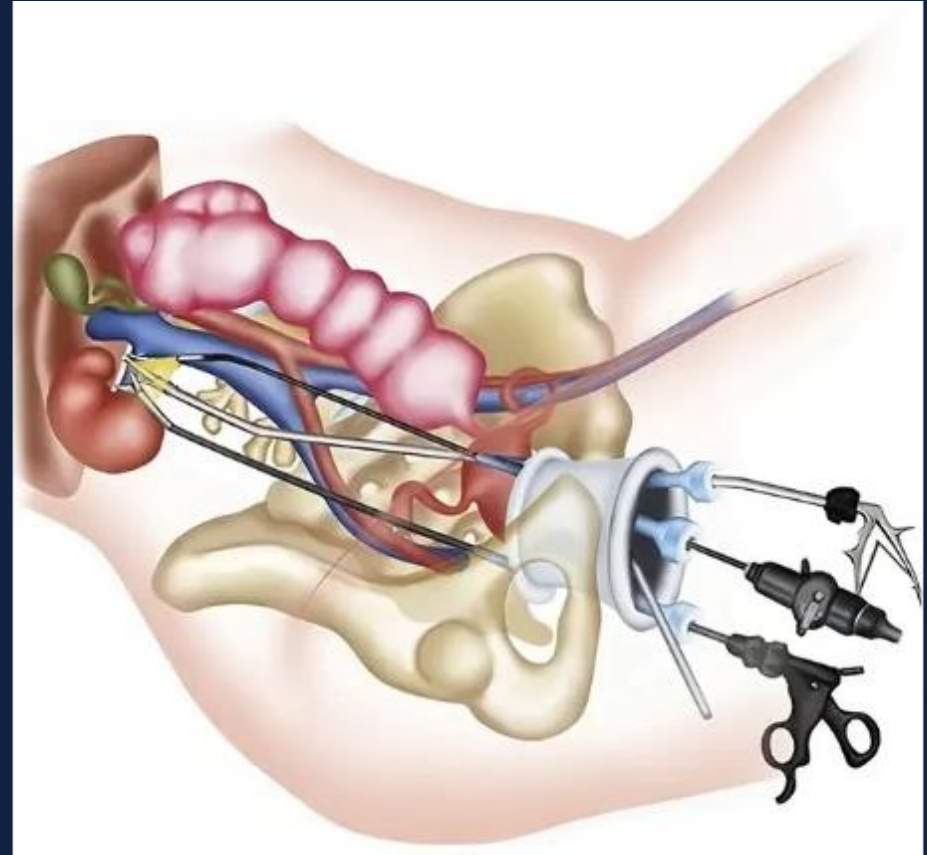
Company Momentis Surgical (Israel / USA)

Application Natural-orifice / transvaginal surgery

Architecture Two miniaturized humanoid arms + console

Maturity FDA authorized; commercial clinical platform

Key Point: *FDA-authorized for benign transvaginal procedures; a 2025 clearance further expanded platform capabilities.*



EndoMaster EASE 05 / 17

Company EndoMaster Pte Ltd (Singapore)

Application GI ESD / EFTR / NOTES

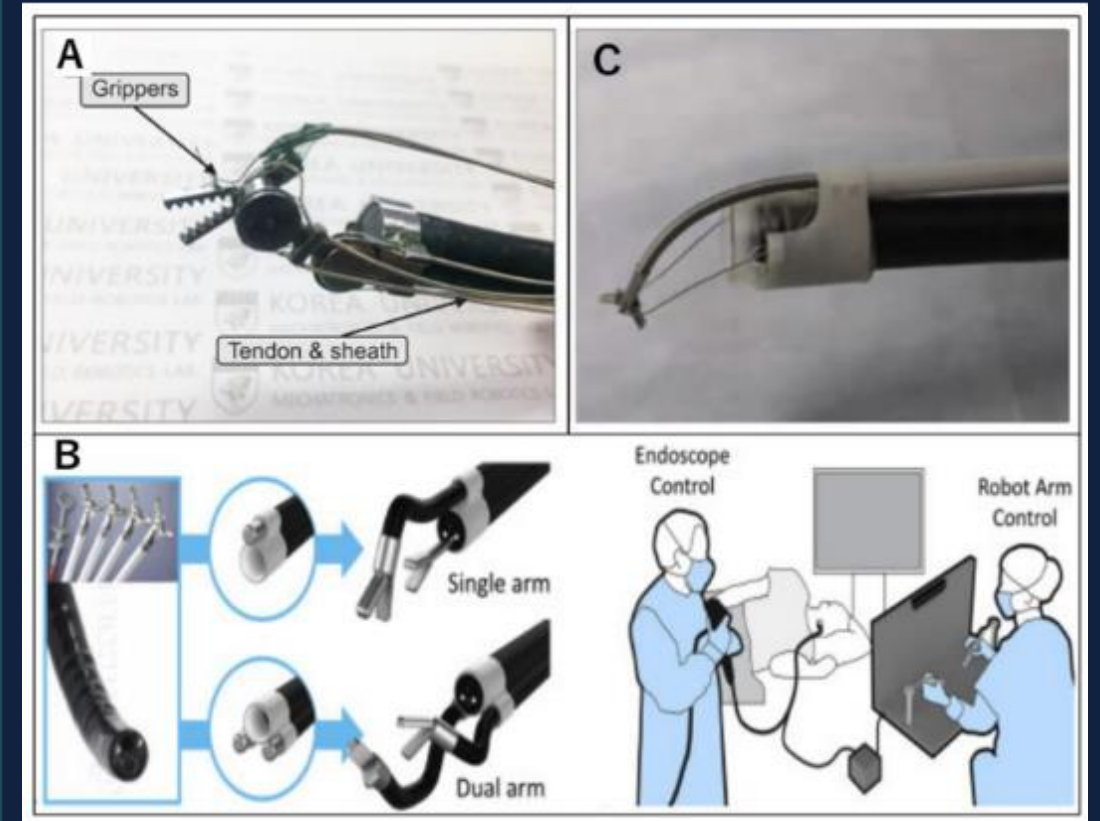
Architecture Flexible endoscope with two instrument arms

Maturity Clinical evaluation

Key Point: *Specialized dual-arm system explicitly designed for triangulation, retraction, and dissection.*

 **Clinical Evidence: Prospective Trial:** Safe and feasible for colonic ESD (43 patients), achieving an 83.8% complete resection rate.

Chiu PWY et al. (2021): Preclinical data confirmed advanced capabilities for tissue retraction in colon models.



FASTER / EndoFaster 06 / 17

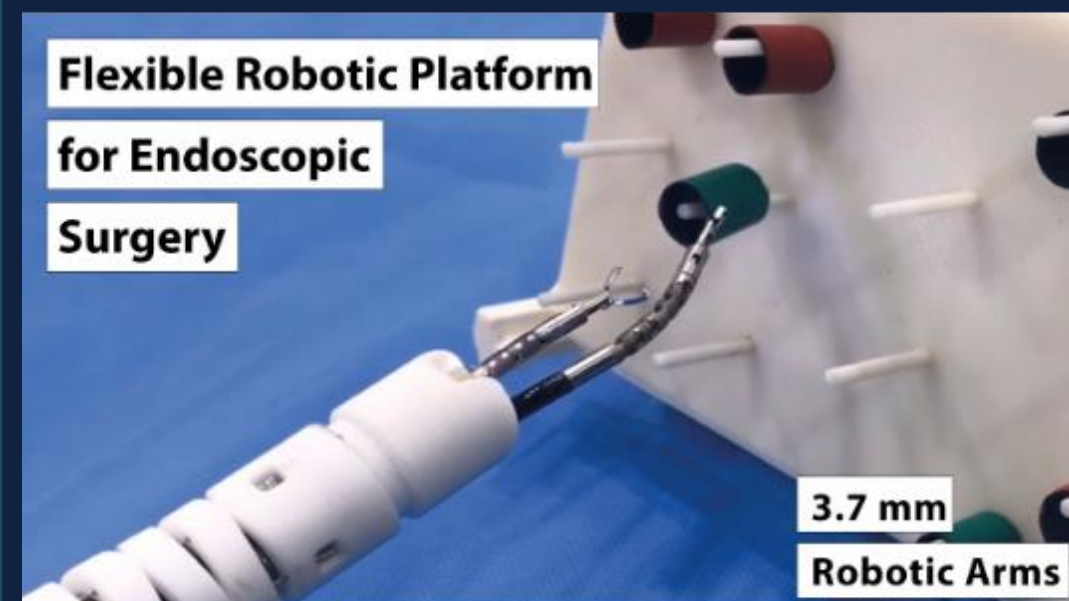
Company Robo Medical Robotics Institute (China)

Application GI therapeutic endoscopy / ESD

Architecture Flexible robotic endoscopic platform

Maturity Clinical evaluation (Status varies by version)

Key Point: *The 2025 IDEAL-D review highlights FASTER as a prominent distinct system in GI therapeutics.*



EndoQuest ELS 07 / 17

Company EndoQuest Robotics (USA)

Application GI / colorectal endoluminal surgery

Architecture Flexible overtube + two channels + HD vision

Maturity FDA IDE pathway / clinical development

Key Point: *Designed specifically for Endoscopic Submucosal Dissection (ESD) and future full-thickness / NOTES procedures.*

 **Clinical Evidence: SAGES Review (Sarin A et al., 2024):** Identified as a highly promising upcoming multi-visceral robotic system, paving the way for advanced, scarless endoluminal interventions.



Invendoscope 08 / 17

Company Invendo Medical (Germany)

Application Robotic / motorized colonoscopy

Architecture Self-propelled, disposable flexible colonoscope

Maturity Regulatory-cleared in multiple markets

Key Point: *Emphasizes deeply controlled navigation and significantly reduced insertion forces during colonoscopy.*



Flex® Robotic System 09 / 17

Company Medrobotics (USA)

Application Natural-orifice access (ENT, colorectal)

Architecture Flexible, steerable scope with instrument control

Maturity FDA / CE history; clinical use

Key Point: *Historically one of the most clinically mature flexible natural-orifice robotic platforms in the market.*



Clinical Evidence: SAGES Review (Sarin A et al., 2024): Recognized as a foundational multi-visceral robotic system with established clinical maturity in natural-orifice surgical access.



ZAMINEX™ R 10 / 17

CompanyRoen Surgical (South Korea)

ApplicationRobotic urology / retrograde intrarenal

ArchitectureMaster–slave robotic flexible endoscopic system

MaturityClinical development in Korea; emerging

Key Point: *Explicitly identified in the 2025 Shah et al. review as a rapidly emerging distinct endoluminal system.*



Virtuoso Surgical System 11 / 17

Company Virtuoso Surgical (USA)

Application Gynecologic endoluminal applications

Architecture Robotic instrument system for endoscopic access

Maturity Preclinical / early development

Key Point: *Has demonstrated advanced endoscopic hysteroscopy applications in published preclinical work.*



Endotics 12 / 17

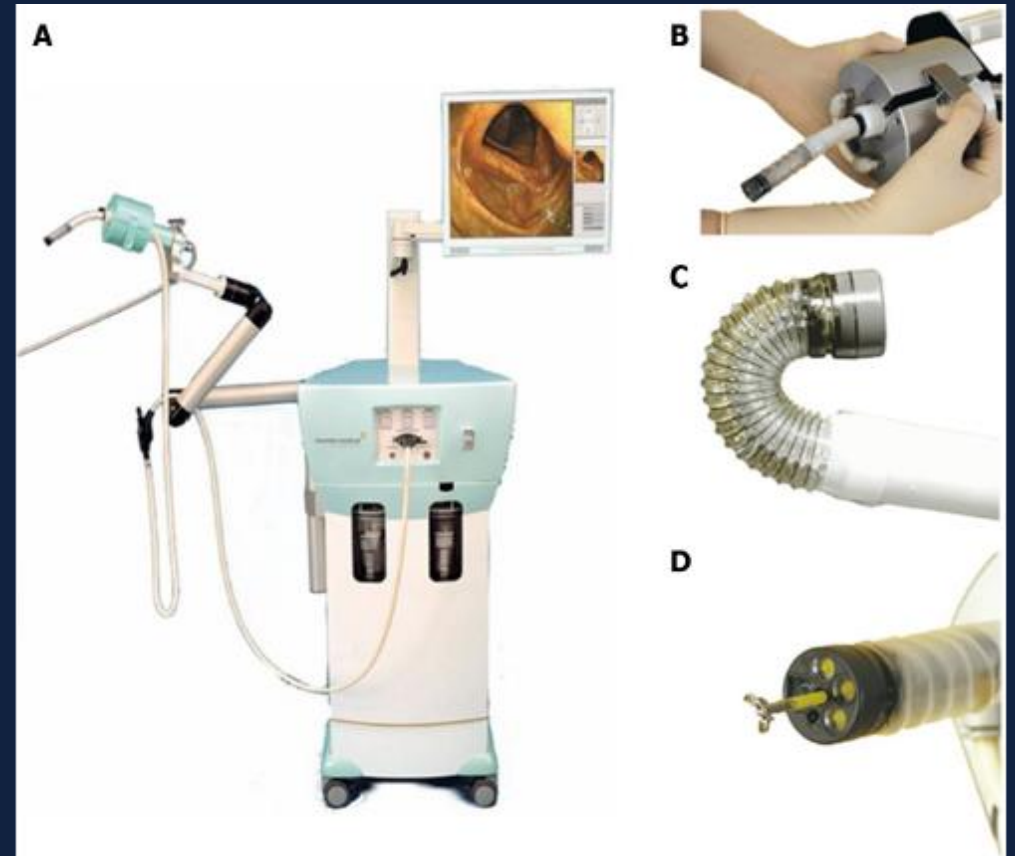
Company ERA Endoscopy (Italy)

Application Robotic colonoscopy / navigation

Architecture Self-propelled worm-like disposable colonoscope

Maturity Clinical platform; regulatory history in Europe

Key Point: *Uses unique anchoring and elongation biomechanics to advance through the colon with remarkably low push force.*



NISImagine 13 / 17

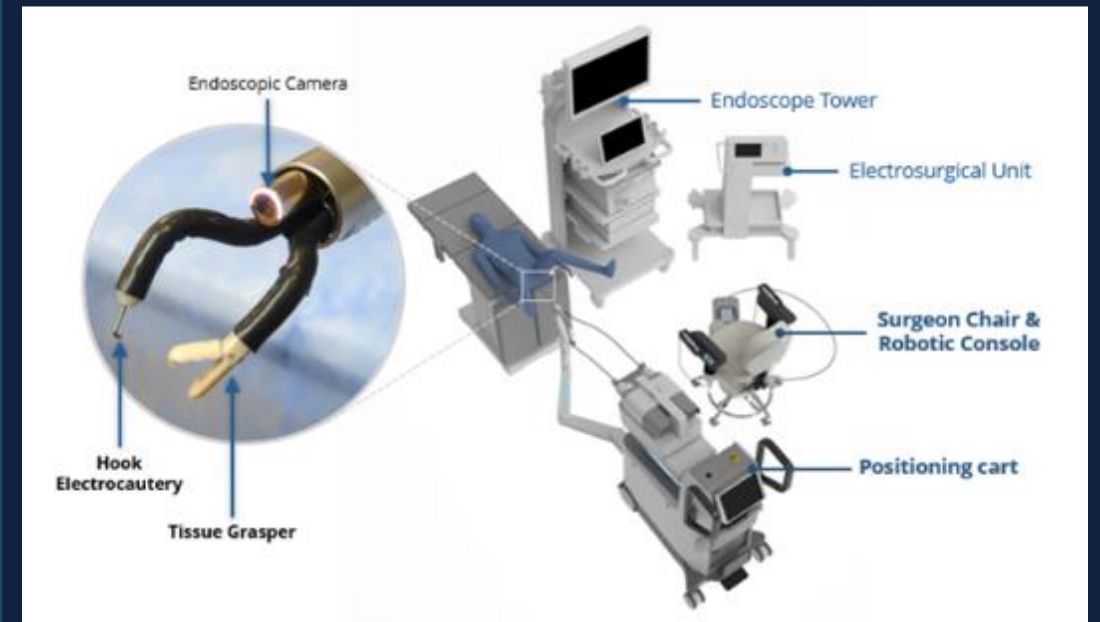
Company NISI Limited (Hong Kong / China)

Application Natural-orifice gynecologic surgery

Architecture Robotic natural-orifice surgical platform

Maturity Preclinical / early development

Key Point: *Proof-of-concept porcine hysterectomy and salpingo-oophorectomy studies have been reported in the literature.*



i² Snake 14 / 17

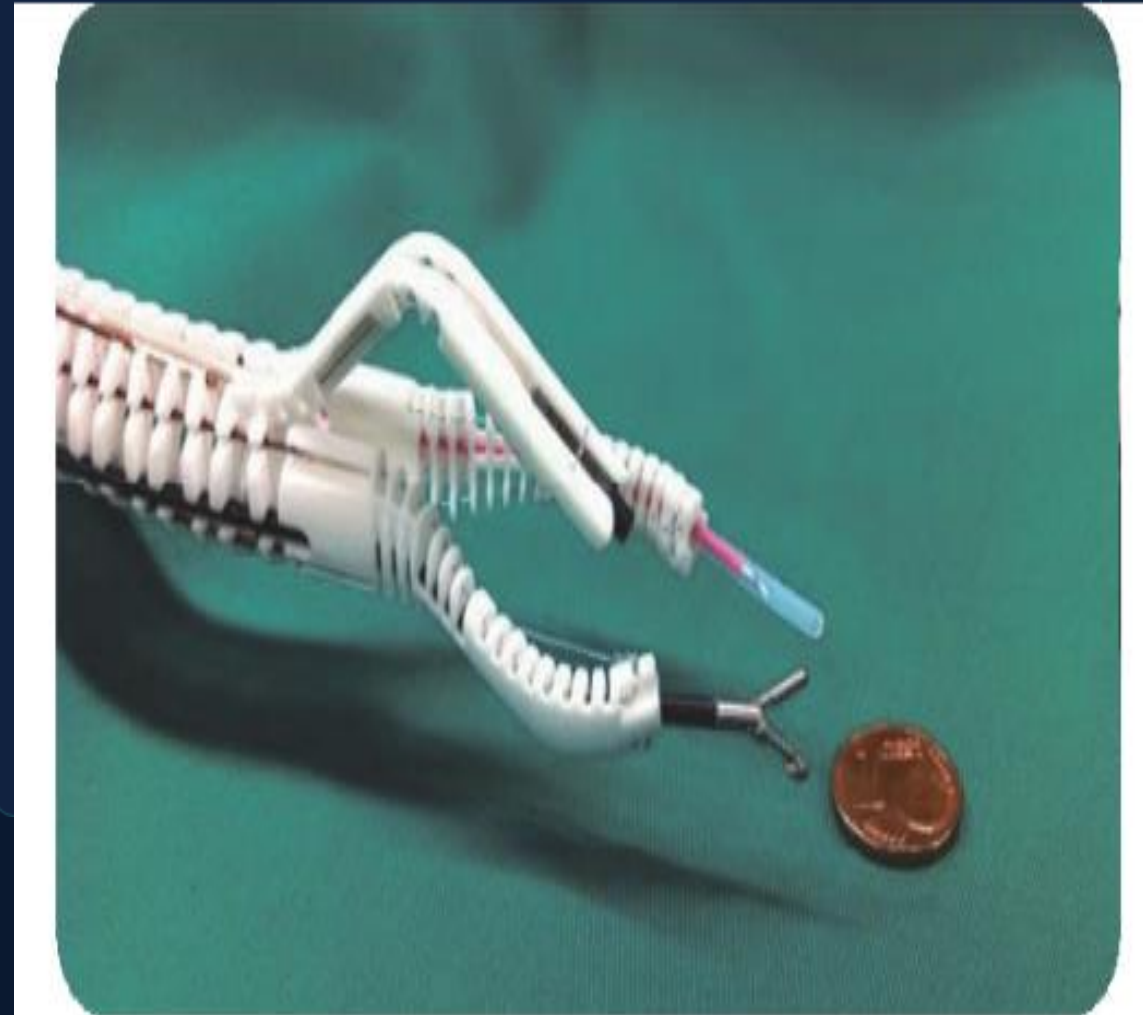
Company Imperial College London (UK)

Application Flexible robotic endoscopic surgery

Architecture Snake-like endoscope + arm + articulated tools

Maturity Research / preclinical

Key Point: *Advanced seven-DOF robotic platform uniquely designed for complex flexible endoscopic instrumentation.*



EndoSAMURAI™ 15 / 17

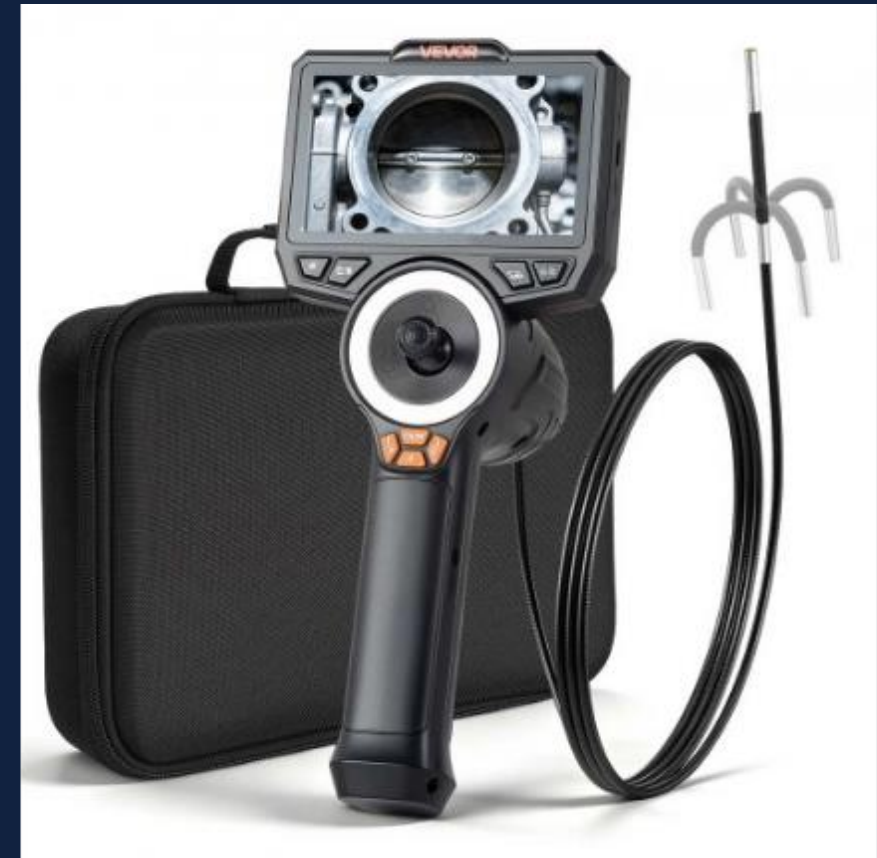
Company Olympus Medical Systems (Japan)

Application NOTES / therapeutic endoscopy research

Architectur e Flexible endoscope with articulated arms

Maturity Research / preclinical

Key Point: *An early, highly influential dual-arm research platform aimed specifically at triangulation and tissue manipulation.*



K-FLEX 16 / 17

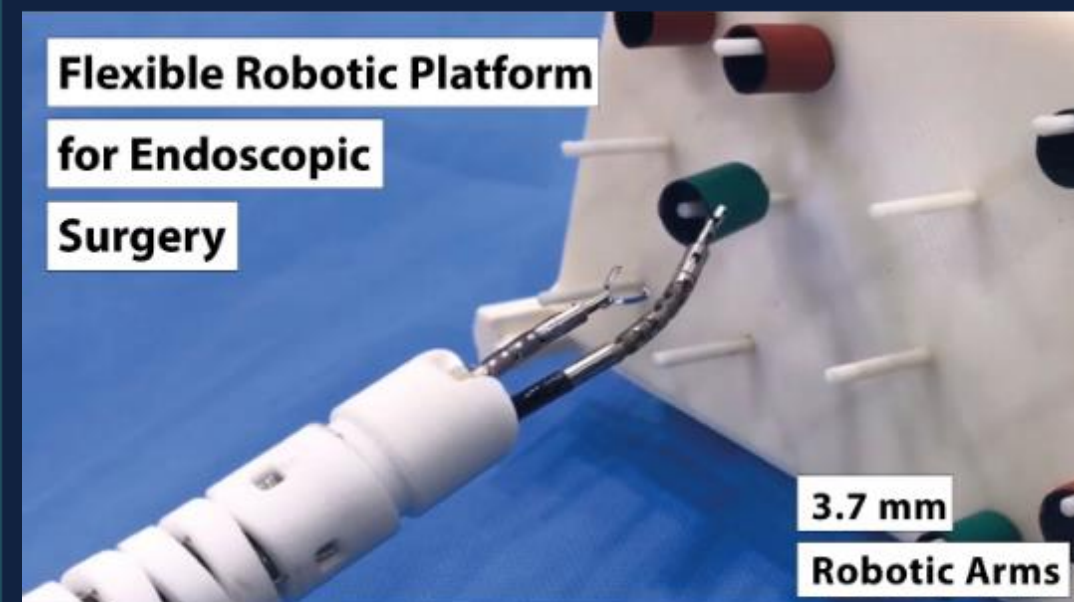
Company KAIST Future Medical Robotics (South Korea)

Application GI ESD / scar-free endoscopic surgery

Architecture Flexible platform with articulated instruments

Maturity Preclinical / development

Key Point: *Highly dextrous system with reported 14 degrees of freedom, highlighted in 2024–2025 literature reviews.*



W Endoluminal Robotics 17 / 17

Company W Endoluminal Robotics (Israel)

Application Robotic endoluminal nav / bronchoscopy

Architecture Compact flexible robotic endoluminal system

Maturity Early development; limited published data

Key Point: *Emphasizes an ultra-low OR footprint and advanced real-time endoluminal imaging integration.*



Take-Home Map: How the Platforms Cluster

Therapeutic GI

Systems focused on complex dissections and resections in the gastrointestinal tract.

- ▶ EndoMaster EASE
- ▶ FASTER / EndoFaster
- ▶ EndoQuest ELS
- ▶ K-FLEX
- ▶ EndoSAMURAI



Robotic Navigation

Systems prioritizing precise anatomical access and diagnostic biopsy.

- ▶ Ion (Bronchoscopy)
- ▶ Monarch (Bronchoscopy)
- ▶ Invendoscope
- ▶ Endotics
- ▶ W Endoluminal



Natural-Orifice / Other

Systems targeting urology, gynecology, and highly specialized access.

- ▶ Flex Robotic System
- ▶ Anovo
- ▶ NISImagine & Virtuoso
- ▶ ZAMINEX R & Monarch Uro
- ▶ i² Snake

The Strategic Opportunity: Supported by emerging clinical trials, the field is decisively moving from pure *robotic navigation* toward true evidence-based bimanual endoluminal surgery.

THE FUTURE OF ENDOSCOPIC ROBOTIC PLATFORMS

From Robotic Assistance → Intelligent, Flexible & Adaptive Endoscopy

1 MINIATURIZATION

- Smaller, flexible and multi-articulated platforms
- Designed for natural-orifice access
- Greater reach into difficult anatomical spaces

2 ADVANCED DEXTERITY

- Multi-arm systems with independent articulation
- 3D articulation and triangulation
- Precise dissection, suturing and tissue manipulation

3 NEXT-GENERATION VISUALIZATION

- High-definition 3D imaging
- Fluorescence & multispectral imaging
- Real-time anatomical mapping

4 AI-ENABLED ROBOTICS

- AI-assisted navigation
- Automatic recognition of anatomy and pathology
- Decision support and procedural guidance

5 HAPTICS & FORCE SENSING

- Real-time tissue-instrument interaction
- Tissue characterization through force sensing
- Improved safety around critical structures
- Restoration of "touch" in flexible endoscopy

6 TOWARD SEMI-AUTONOMOUS ENDOSCOPY

- Automated navigation
- Robotic stabilization
- AI-guided targeting and repetitive procedural tasks

The surgeon remains in control

INTELLIGENT
FLEXIBLE
ROBOTIC
ENDOSCOPY