

Robotic Surgery and Endoscopic Platforms Are Here to Stay

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Whether the robot performs better is no longer the question

01

Adoption cannot be undone

Roughly a third of primary bariatric procedures are now robotic, as are a third of revisional bypasses. Endoscopic sleeve gastropasty carries an FDA de novo authorization, a society endorsement, and a Category I CPT code.

02

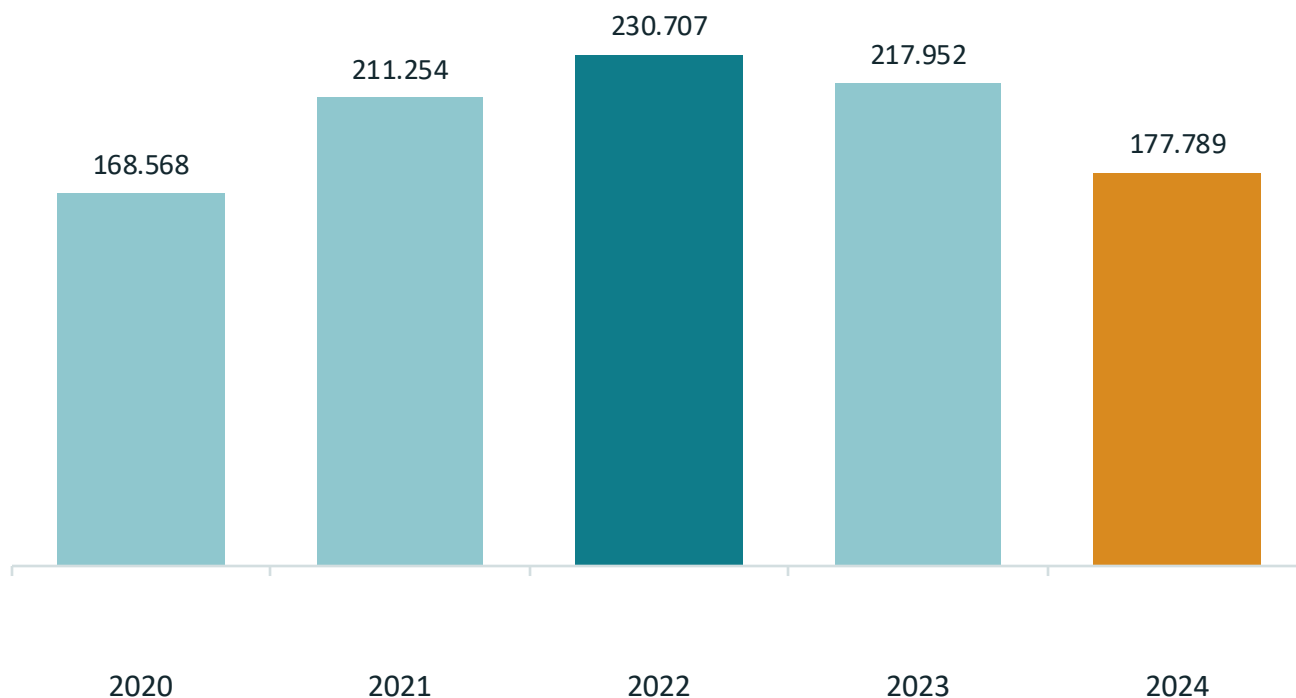
Surgeons Capture the Value

03

The case mix is shifting in their favor

Volumes have fallen 23% from their peak while conversions climb, primary BMI declines and revisional BMI rises. What remains on the schedule is precisely the work these platforms were designed to handle.

Metabolic & bariatric procedures, MBSAQIP-accredited centers



-23%

Decline in MBSAQIP volume from the 2022 peak through 2024 — the first time below 200,000 since 2020

- Conversions rose from 8.9% to 11.0% of all cases
- Sleeve fell 73.4% → 70.6% of primary cases; bypass rose 26.6% → 29.4%
- ASA class ≥III rose 79.8% → 82.5%
- Serious complications fell 3.39% → 3.10%; mortality 0.08% → 0.06%

94.7%

of a 16.8M-patient claims cohort received neither a GLP-1 receptor agonist nor metabolic surgery

<6%

of eligible patients receive either surgical or medical intervention for obesity

0.6%

of patients who stop a GLP-1 receive metabolic surgery in the year that follows

Meanwhile, the drugs are leakier than the trials suggest:

64.8% discontinue within one year (patients without type 2 diabetes)

47.6% of those who stop cite cost or insurance — not side effects, not efficacy

8.7% mean real-world one-year weight loss, versus 14.9% in STEP-1

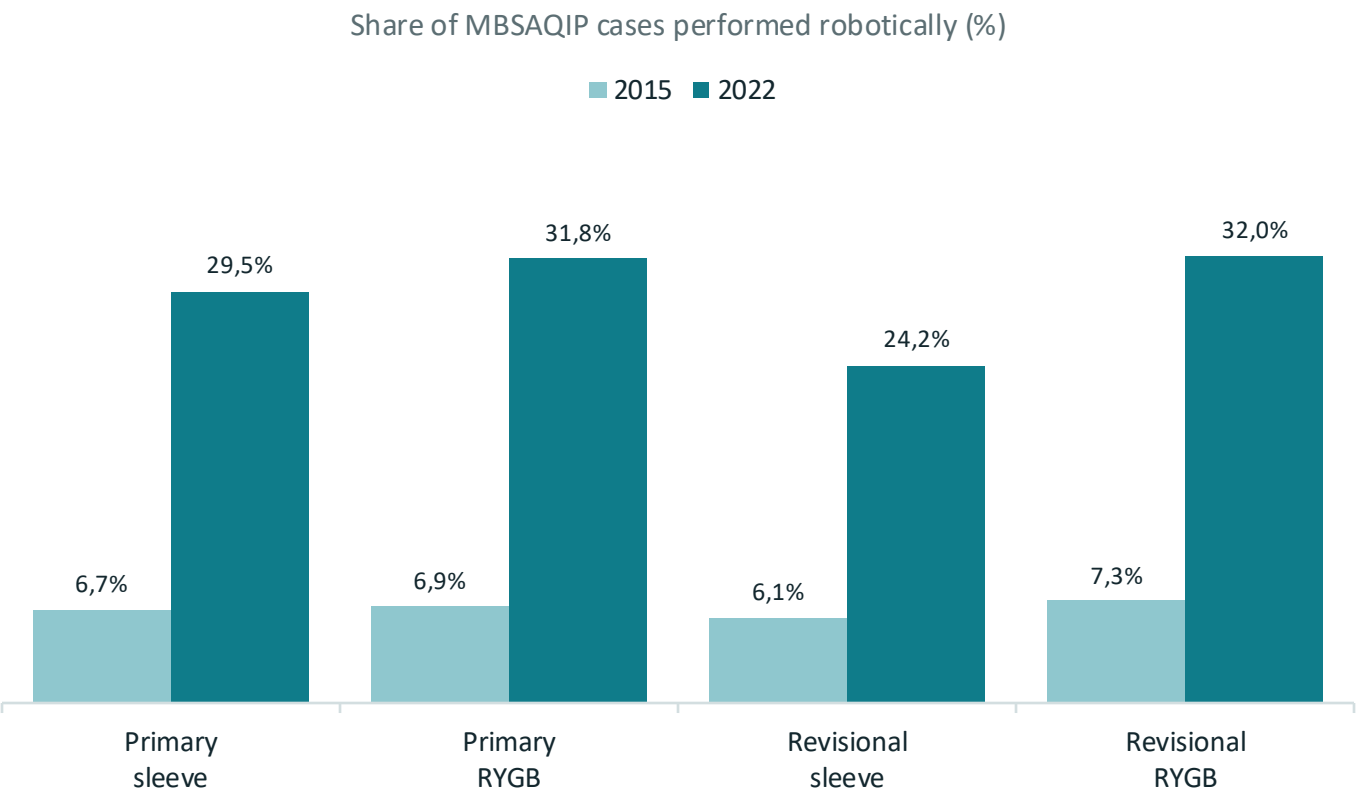
~67% of lost weight regained within a year of stopping

PART ONE

The Robotic Platform

An adoption curve that no registry finding has slowed

Adoption did not wait for the evidence to settle



3×

Growth in robotic bariatric surgery among Medicare beneficiaries, 2012–2020

28.4%

Robotic share of BPD-DS — the most robotically penetrated bariatric operation

66.2%

Robotic share at a 13-centre health system by 2024, from 5.6% in 2011

Spurzem GJ et al. Surg Obes Relat Dis 2025;21:372 (PMID 39732583) and Surg Endosc 2024;38:6294 (PMID 39179689). Howard R et al. Ann Surg 2025 (PMID 41199628). Bauerle WB, El Chaar M. Obes Surg 2023;33:482. Bonte A, Juo YY. Obes Surg 2026;36:3511.

Case mix is migrating toward the robot's strengths

What the remaining volume looks like

8.9% → 11.0% Conversions as a share of all MBSAQIP cases, 2020–2024

7.3% → 32.0% Robotic share of revisional gastric bypass, 2015–2022

73.7% Of revisional operations that are conversions; sleeve is the most converted index operation

39.4 → 41.1 Mean BMI of revisional patients, while primary BMI fell (46.6 → 45.9 for RYGB)

What that means at the console

- Reoperative fields, adhesiolysis, and hand-sewn anastomoses — the exact tasks where wristed instruments and a stable camera are worth the docking time
- Sleeve-to-bypass for reflux, now the single commonest conversion, with GERD the leading indication (54.2%)
- SADI-S and duodenal switch, the most robotically penetrated operations in the field, with a robotic learning curve of 58 cases by textbook outcome
- Concurrent hiatal hernia repair, where the only demonstrated robotic leak benefit lives

Cost is falling; ergonomics survives every critique

COST

\$3,819

Pooled total-hospital-cost difference favouring laparoscopy across 1,414,357 patients — evidence quality rated low.

€113

Median material-cost difference per case in a lean three-arm, three-port robotic bypass programme — a 6% premium, at the price of 32 additional minutes. Cost is a technique and volume variable, not a fixed property of the platform.

SURGEON ERGONOMICS

12%

Of surgeons with a work-related musculoskeletal disorder required a leave of absence, practice restriction, or early retirement. Career prevalence: rotator cuff 18%, lumbar degeneration 19%, cervical degeneration 17%.

The monopoly is ending, which resolves the cost debate

20

multi-visceral robotic platforms at or near FDA approval — ten North American, ten European and Asian. SAGES: “Increased competition has the potential to bring value to surgical patients by stimulating innovation and driving down cost.”

da Vinci 5

Cleared 14 Mar 2024

Force feedback instrumentation and >10,000× the compute of Xi. 870 systems placed in 2025 versus 362 in 2024; ~3.15M procedures globally, up 18%.

The 43% force-reduction figure is preclinical and not bariatric.

Hugo RAS

Cleared 3 Dec 2025 — urology only

In 45:45 propensity-matched robotic bypasses, no difference from da Vinci in complications, docking, console or total operative time. Commercial experience in more than 35 countries outside the US.

No US bariatric indication; general-surgery 510(k) filed.

Ottava

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The deskilling argument deserves a serious answer

The argument: robotic surgery has rapidly become the default platform in US surgical training, and widespread adoption may erode the core laparoscopic skills essential for safe, adaptable care.

As summarized by the journal. Pazzaglia E, Violante T, Rottoli M, Raimondo D. “Laparoscopic Deskilling — The Hidden Risk of Robotic Dominance.” JAMA Surg, 29 July 2026.

The premise is not wrong. The inference is.

1

The trend is real

Fellowship Council logs, 2010–2021: robotic cases rose 2.0% → 23.2% of fellow volume while laparoscopic fell 80.2% → 65.3%. Median robotic cases per MIS fellow went from 0 to 72.5.

2

But skill transfers — in both directions

Meta-analysis of 30 studies: laparoscopy → robotics composite SMD 0.40 (0.19–0.62), and robotics → laparoscopy SMD 0.66 (0.33–0.99). “Should not be regarded separately.”

3

And the fix is curricular

Structured robotic curricula raised trainee active-console time (PGY5 38% → 57%) without collapsing laparoscopic volume — over 80% of graduates still logged ≥20 laparoscopic cases.

PART TWO

Endoscopic Platforms

From fringe therapy to a CPT code in eight years

ESG has what most surgical innovations never get

MERIT · 9 US centres · 209 patients · class 1–2 obesity · ESG + lifestyle vs lifestyle alone · Lancet 2022

13.6%

Total body weight loss at 52 weeks, versus 0.8% with lifestyle alone (49.2% vs 3.2% EWL)

77%

Reached $\geq 25\%$ excess weight loss at 52 weeks, versus 12% of controls

68%

Still maintained $\geq 25\%$ EWL at 104 weeks — durability without a maintenance drug

2%

ESG-related serious adverse events (3 of 131). No deaths, no ICU admission, no surgery

And the metabolic effect is not incidental:

80%

of ESG patients improved at least one metabolic comorbidity at 52 weeks (vs 45% of controls, of whom 50% worsened)

1.25%

pooled serious adverse event rate across 15,714 patients in the IFSO Bariatric Endoscopy Committee review

Durable enough to matter — not a sleeve substitute

WHAT HOLDS UP

21.2% → 14.4% %TWL at 1 and 6 years in 1,377 patients — the longest published series. Revision in 5.7%, no mortality.

15.9% %TWL at 5 years (n=216); 90% and 61% maintained ≥5% and ≥10% TWL respectively.

51–90% Six-year resolution or improvement: diabetes 51.2%, hypertension 65.8%, dyslipidaemia 73.6%, OSA 89.9%.

\$23,432 Cost per QALY versus lifestyle alone in a MERIT-based Markov model — dominant over longer horizons.

WHAT DOES NOT

−9.63 Fewer percentage points of total weight loss than laparoscopic sleeve (95% CI −11.21 to −8.05) across 1.14 million patients.

RR 1.44 Higher readmission after ESG than after sleeve gastrectomy (95% CI 1.29–1.59).

RR 0.79 Diabetes remission favours sleeve gastrectomy (95% CI 0.68–0.91); hypertension improvement is equivalent.

No consensus IFSO's 2024 Delphi reached consensus on ESG alongside RYGB and sleeve — but none on intragastric balloons.

ESG is not competing with your sleeve — it is competing with nothing.

Most of us already depend on the endoscope

Weight regain after bypass

Transoral outlet reduction in 331 patients: gastrojejunal anastomosis narrowed 23.4 → 8.4 mm, with 8.5%, 6.9% and 8.8% TWL at 1, 3 and 5 years. No severe adverse events. Now an FDA-cleared indication, not off-label use.

Jirapinyo P, Thompson CC. Gastrointest Endosc 2020

Weight regain after sleeve

Revisional ESG in 82 patients across nine centres: 15.7% TWL at 12 months, with 81% achieving ≥10% TWL. One moderate adverse event.

Maselli DB, Alqahtani AR, Abu Dayyeh BK. Gastrointest Endosc 2021

Sleeve stenosis

Occurs in 1–4% of sleeves. Endoscopic management succeeds in 69%; hydrostatic dilation first for safety, pneumatic dilation for higher single-session success (62.2% vs 36.4%).

D'Alessandro A, Donatelli G. SOARD 2023 · Jaruvongvanich V. SOARD 2020

Staple-line leak and chronic fistula

Leaks complicate 1–6% of sleeves; roughly 70% resolve with endoscopic management and adequate drainage. Even chronic gastro-bronchial and gastro-colic fistulas closed in 47.5% without an operation.

Chung Y et al. Clin Endosc 2021 · D'Alessandro A, Donatelli G. Obes Surg 2022

A bariatric programme without endoscopic capability is a programme that reoperates on problems its neighbours dilate, suture, or drain.

Four institutions have already moved

2022

FDA

De novo authorization (DEN210045) for endoscopic sleeve gastropasty and transoral outlet reduction in adults with BMI 30–50.

2024

ASGE / ESGE

Joint GRADE guideline suggests endoscopic bariatric therapies for BMI ≥ 30 , or 27.0–29.9 with at least one obesity-related comorbidity.

2024

IFSO

Bariatric Endoscopy Committee formally endorses ESG; the international Delphi places it alongside RYGB and sleeve gastrectomy.

2026

AMA / CPT

ESG receives Category I CPT code 43889 effective 1 January 2026 — the reimbursement system conceding permanence.

And the volume is no longer trivial.

In the 2023 ASMBS estimate, 4,587 endoscopic sleeve gastropasties were performed in the United States — more than intragastric balloons, gastric bands and one-anastomosis gastric bypasses combined, and nearly twice the number of SADI procedures.

The future is sequencing, not substitution

1

Drugs before the platform

In patients with BMI ≥ 49.5 , preoperative GLP-1 or GLP-1/GIP therapy produced 10.3 kg of weight loss versus 3.1 kg with lifestyle alone — a genuine bridge into a safer operation.

Obermark AD et al. Surg Endosc 2025

2

Drugs after the platform — timed

In 1,506 ESG patients, adding pharmacotherapy at the 12-month plateau produced significantly greater weight loss than starting it at the time of the procedure. After suboptimal surgical response, liraglutide added 8.0 percentage points over placebo.

Obes Pillars 2024 · BARI-OPTIMISE, JAMA Surg 2023

3

The platforms are converging

Flexible robotics has entered US trials: EndoQuest's endoluminal system received an FDA IDE in December 2024, with the PARADIGM trial running at five US centres. The console and the endoscope are becoming the same instrument.

EndoQuest Robotics, FDA IDE, Dec 2024

We are not being displaced. We are setting the rules.

The 2024 multisociety guidance that reversed the blanket preoperative GLP-1 hold — reserving a 24-hour clear liquid diet for patients at elevated risk of delayed gastric emptying — was co-authored by ASMBS leadership alongside ASA, AGA, ISPCOP and SAGES.



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Endoquest Robotics

- Transanal and Transoral access
- Not FDA approved
- ESD, ESG primary procedures
- Triangulation, 60 cm access



What I want you to take back

1

Robotic Surgery is here to stay.

2

The Robotic platform is getting better and with more players in the market price will come down.

3

Build endoscopic capability into the programme, not beside it. Stenosis, leak, fistula, and weight regain are endoscopic problems first and surgical problems second.

4

Stop arguing about which modality wins. Ninety-five percent of eligible patients receive neither a drug nor an operation, and only 0.6% of those who stop a GLP-1 reach a surgeon within the year. That is the number that should keep us up at night.