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XXIX IFSO World Congress

1-4 September 2026 | Toronto, Canada

Why you should go all in on robotics

Benjamin Clapp MD FASMBS
El Paso, Texas

TORONTO2026

The Future of Obesity Management:
From Weight Loss to Health Gain

ifso2026.org

Financial Disclosures

- Disclosures:
- Intuitive – travel, consultant, proctoring stipends
  Medtronic – consultant/travel stipends

Private practice for 20 years

14000 laparoscopic cases

Became an employee May 1

Associate clinical professor Texas Tech School of Medicine, El Paso Tx

Train residents from WBAMC

A little about me….

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- 140 publications
- H index - 29
- i10 index -59
- Total citations - 2900
- 220 national and international presentations
- $150,000 in grant money

- BOD of ASMBS
- Co-chair of the American Board of Surgery FPD MBS Committee
- Past Chair of Research
- Past Chair of Numbers Task Force
- Editorial Board of SOARD
- Past President of TABS

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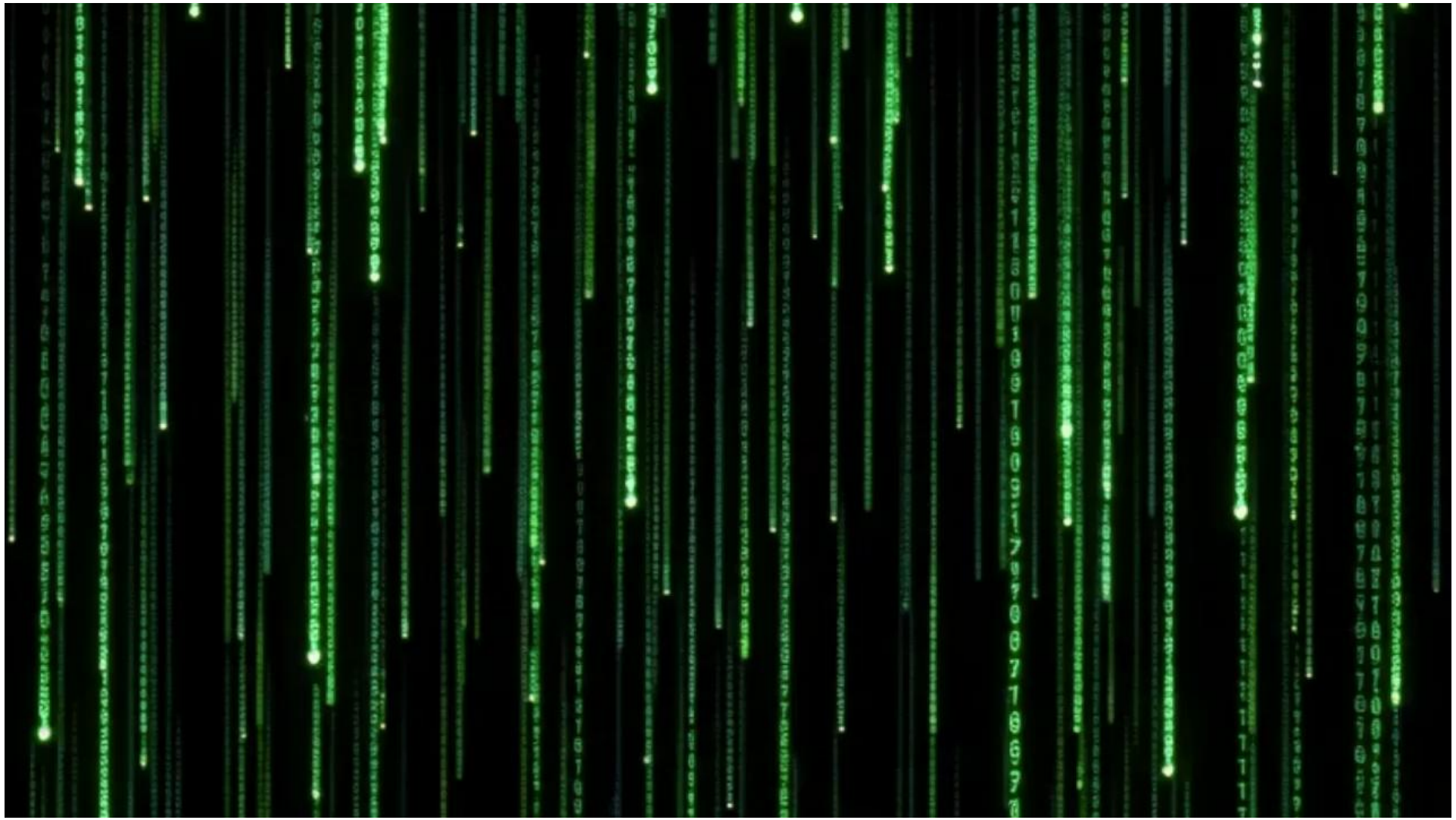
Trained with S in 2005
Retrained in 2016

- Didn’t take
- Proctors didn’t seem experienced
  - Young inexperienced surgeons
- Hard to take advice from them

- Started to watch videos at meetings and on Social Media platforms.
- People I respected started to convert
- Systems became more versatile
- Take back control

Retrained in 2024



Barriers

- EGO
- FEAR
- OTHER

Fear

- What if I wasn't as good?
- What if I hurt someone?
- Can an old dog learn new tricks?
- My sense of self worth was tied up to being a minimally invasive (lap) surgeon

Other things seemed important at the time, but I now realize they were not.

- Cost
- Access
- Overkill
- “Just a fancy suturing device”
- “I can do it just as well lap.”

Other things seemed important at the time, but I now realize they were not.

- Previous attempts:
- Hard sell
- Clubby
- Proctors that I felt did not have my skill set
- The advertisements in my community about how it's better
- The complications I had to take care of

EGO

- Hardest one
- “I may have done 3000 gallbladders and 1500 bypasses, but I hadn’t done 3000 da Vinci cases”
- I challenged myself to become as good on da Vinci as I was lap

If something is hard, you’re doing it wrong

I say this all the time to the residents. But it wasn’t until I was preparing this talk that I realized this applied to me and laparoscopy

Fear

- I trained up
- I was determined to hit the ground running
  - Dry lab 2 hours a week x 8 weeks
  - Case observations in person
  - Tissue models
  - video
- I always had a fallback plan

Site Visits

- See other surgeons in their environment
- We know each other (only good thing from COVID)
- Even as a young surgeon, no one ever told me they didn't have time for me.

Surg Laparosc Endosc Percutan Tech. 2026 Jul 22. doi: 10.1097/SLE.0000000000001492.
Online ahead of print.

Single-surgeon Transition From Laparoscopy to Robotic-assisted Bariatric and General Surgery: Throughput, Operative Times, and Learning-curve Trajectory Across 1664 Consecutive Cases

Benjamin Clapp [1]

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Study design

Single surgeon

Single institution

January 2023 – April 2026

1,664 consecutive operations

- 632 laparoscopic era
- 1,032 robotic era

Multiple procedure types:

- Sleeve gastrectomy (SG)
- Roux-en-Y gastric bypass (RYGB)
- Hernia surgery
- Cholecystectomy
- Foregut surgery
- General surgery

Four independent data sources:

- Surgeon operative log (throughput)
- Hospital EMR timestamps
- MBSAQIP operative times
- Intuitive App

Primary questions

1. Does robotic adoption decrease overall productivity?
2. How much longer are robotic operations?
3. What is the learning curve?
4. How much time is attributable to docking, positioning, and other non-console activities?

Surg Laparosc Endosc Percutan Tech. 2026 Jul 22. doi: 10.1097/SLE.0000000000001492. Online ahead of print.

Major findings

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1. Throughput actually increased

Despite longer robotic operations, weekly cases increased

9.54 → 11.36 cases/week

+19.1%

Robotic surgery took longer

- **Sleeve gastrectomy**
  - EMR data:
  - Lap: 43.4 min
  - Robot: 57.5 min
  - Difference:
  - **+14 minutes**
- **Roux-en-Y gastric bypass**
  - Lap: 73.8 min
  - Robot: 101.4 min
  - Difference:
  - **+27.6 minutes**

› Surg Laparosc Endosc Percutan Tech. 2026 Jul 22. doi: 10.1097/SLE.0000000000001492. Online ahead of print.

Learning curve differed by procedure

Sleeve gastrectomy

- Essentially **no meaningful learning curve**.
- The robotic time penalty remained fairly constant, implying most of the extra time reflects fixed robotic setup rather than surgeon learning.

Roux-en-Y gastric bypass

- Clear learning curve.
- 106 min initially
- 82 min by approximately case 46

Robotic OR overhead averaged about 19 minutes

- Defined robotic overhead as:
- Skin-to-skin time − console time
- This represents:
  - positioning
  - trocar placement
  - docking
  - undocking
  - closure

› Surg Laparosc Endosc Percutan Tech. 2026 Jul 22. doi: 10.1097/SLE.0000000000001492.
Online ahead of print.

Robotic overhead improved substantially over time

One of the novel findings is that robotic overhead is **not fixed**.

Over the study:

- **23.2 min**

  ↓

- **16.3 min**

Approximately **30% reduction**

› Surg Laparosc Endosc Percutan Tech. 2026 Jul 22. doi: 10.1097/SLE.0000000000001492.
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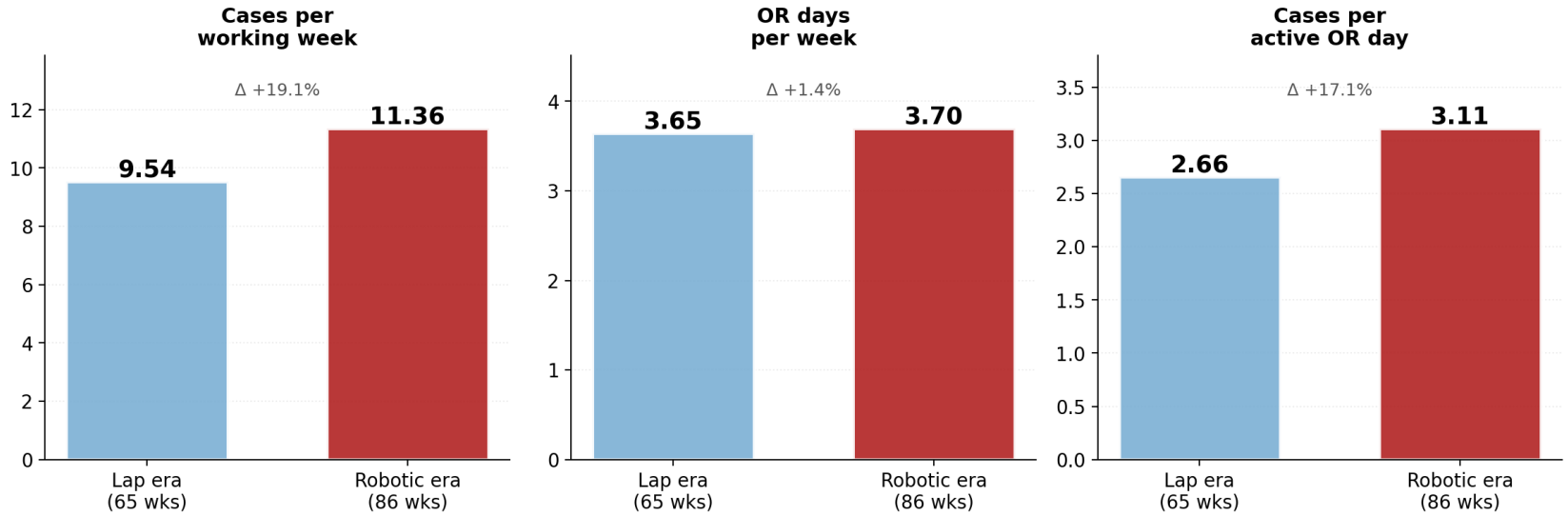
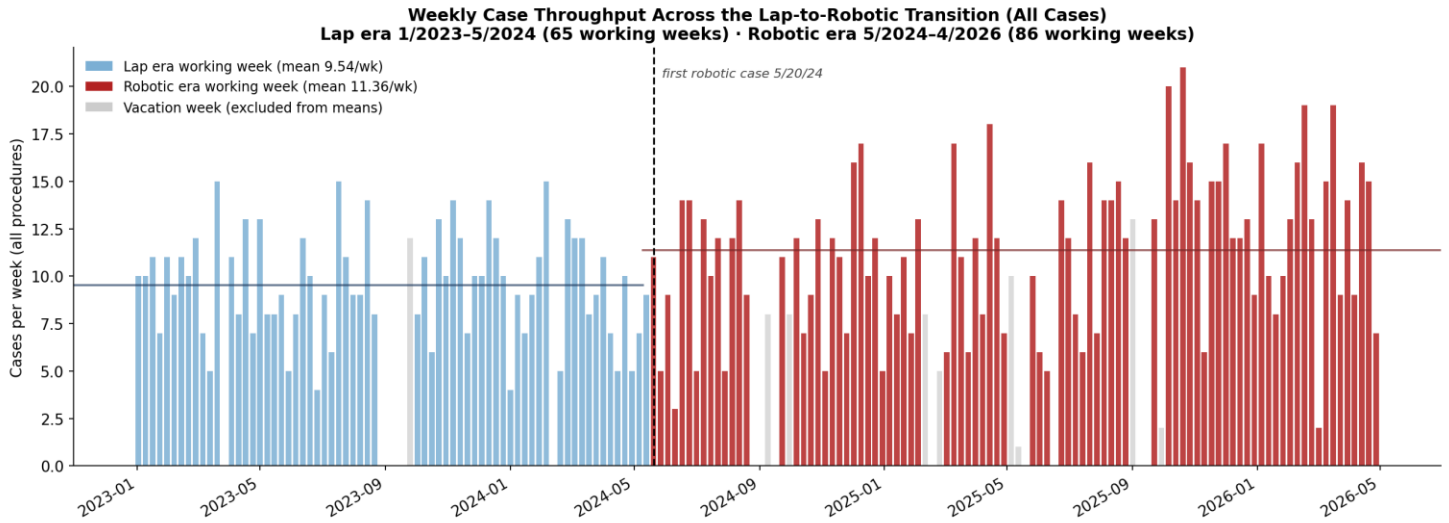
OR Throughput Preserved Across the Lap-to-Robotic Transition (All Cases)



All 1664 cases (Jan 2023 – Apr 2026). Vacation weeks excluded (Sept 2023 full month; 2-wk vacations Sept 2024, Feb/May/Sept 2025).



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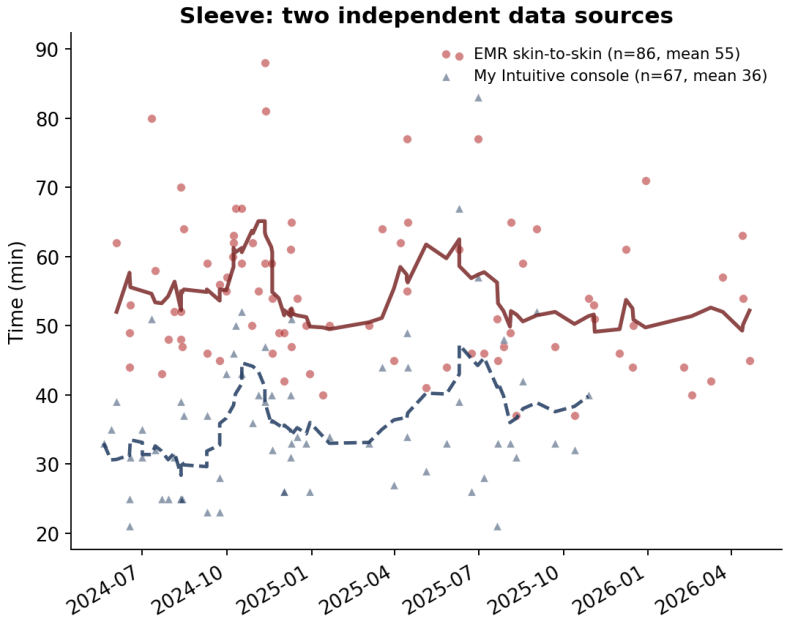
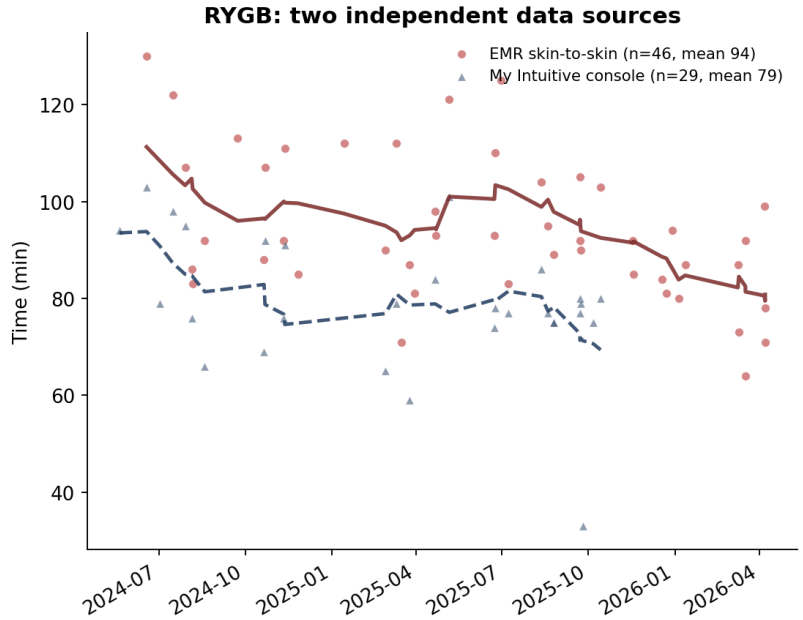
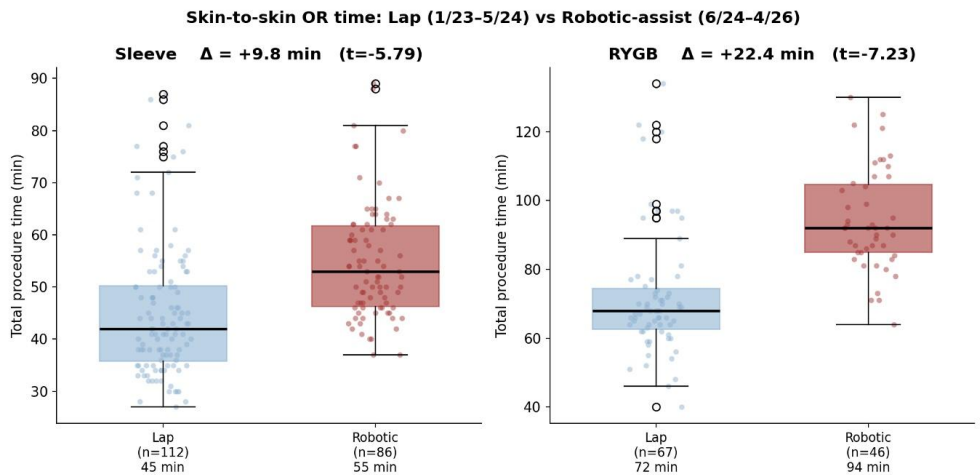
Independent corroboration: EMR skin-to-skin vs Intuitive console time







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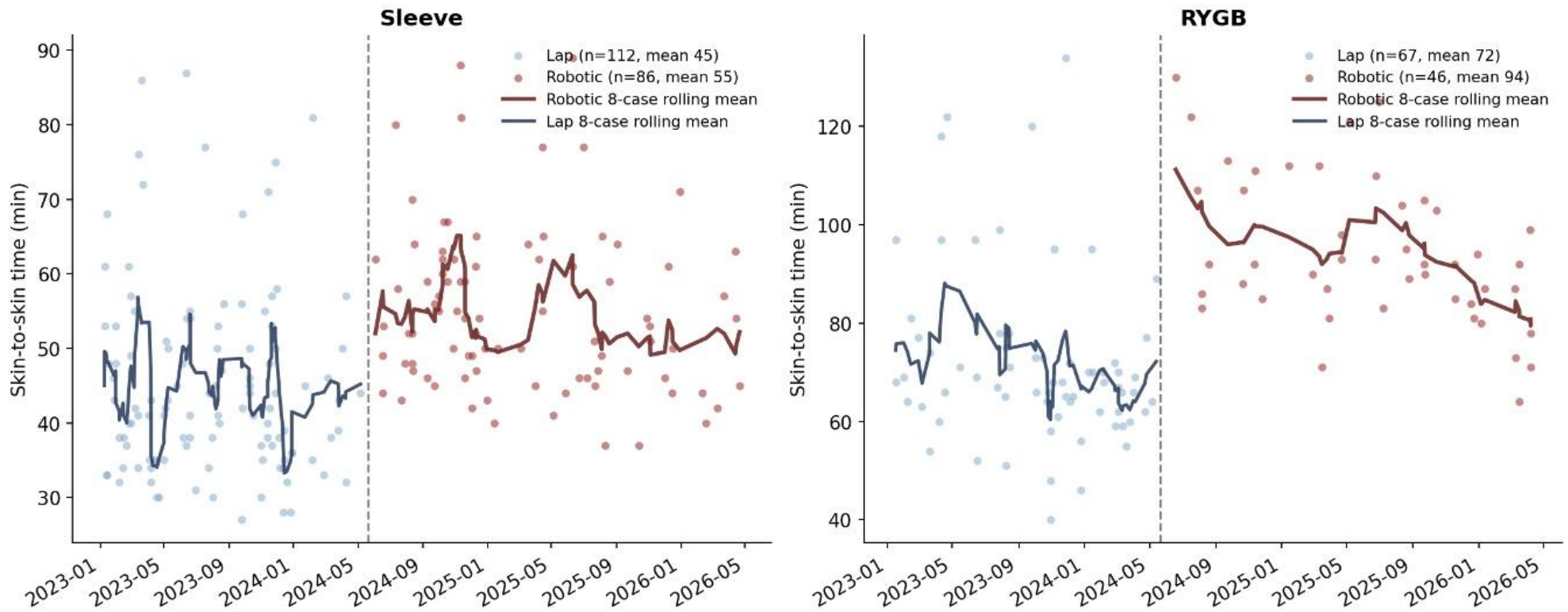
Per-case skin-to-skin OR time across the lap-to-robotic transition



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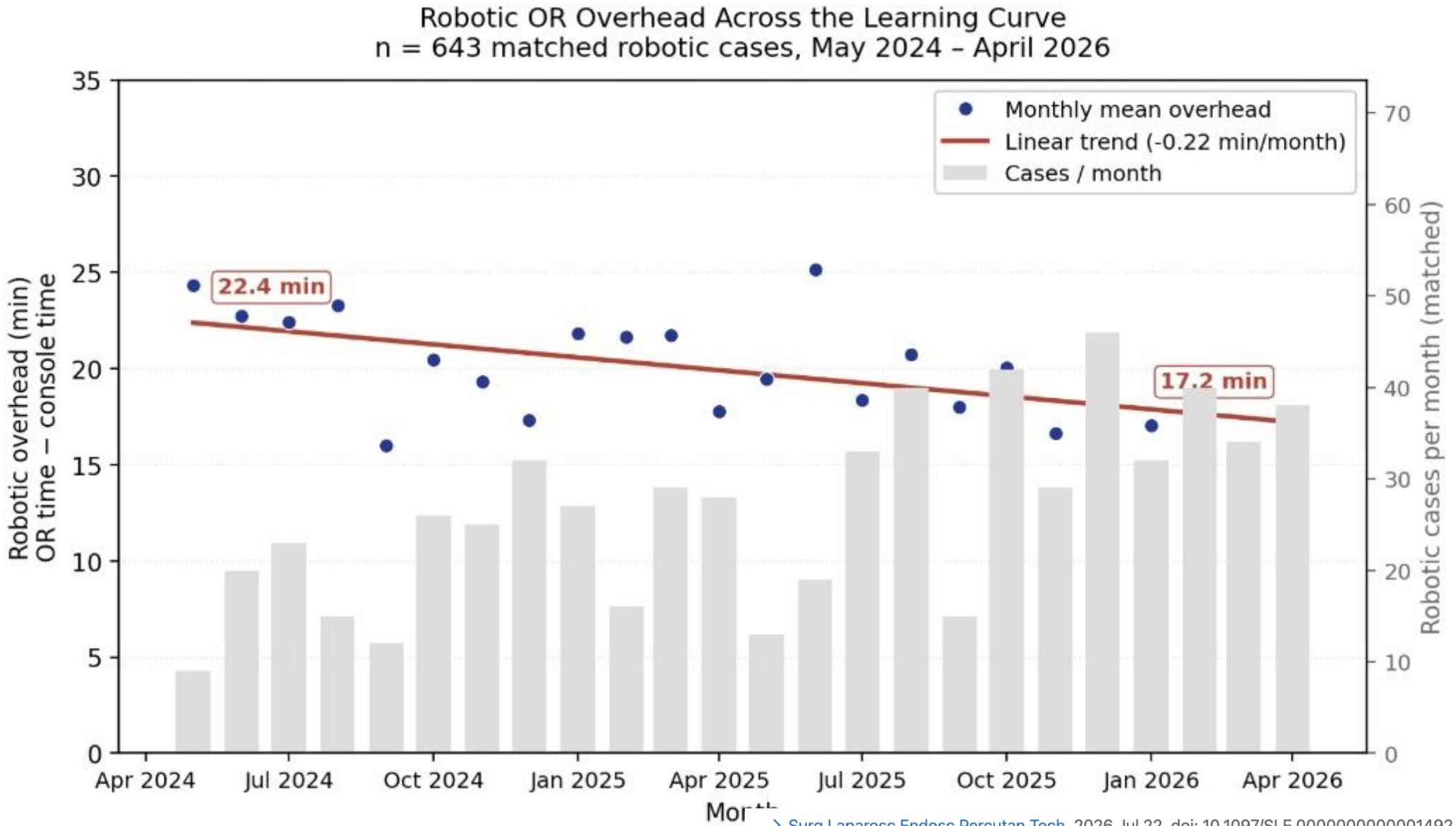

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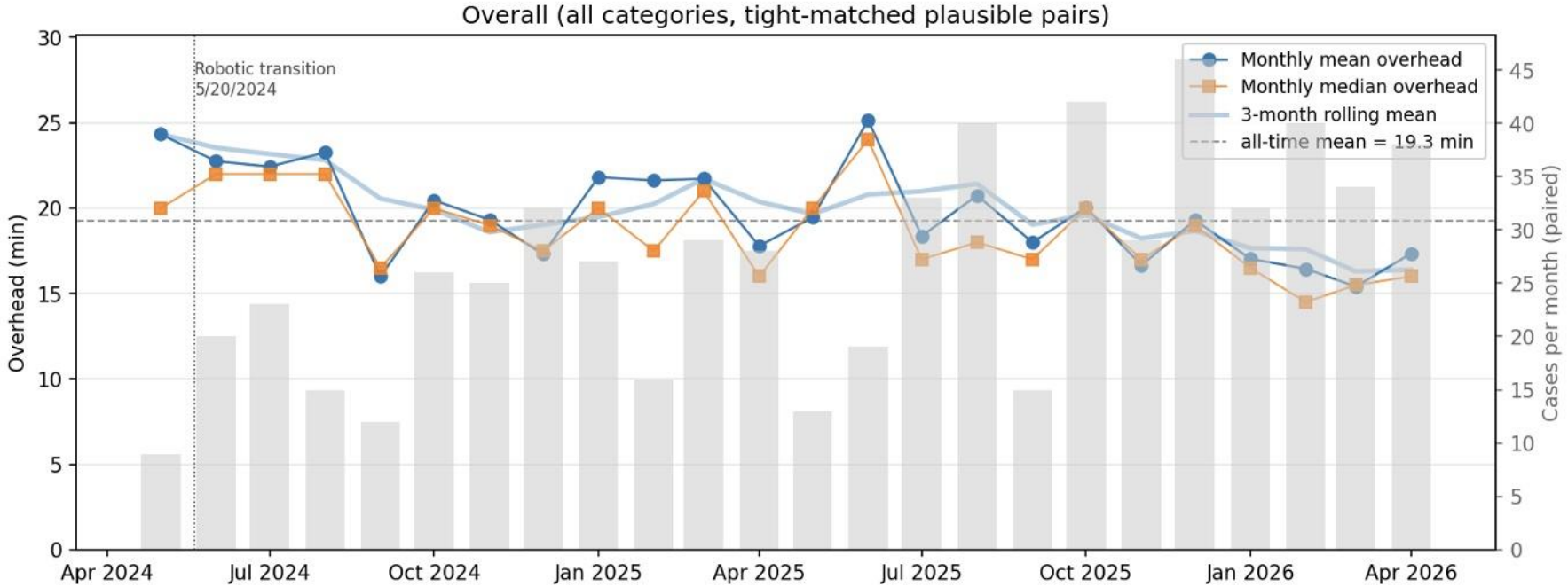

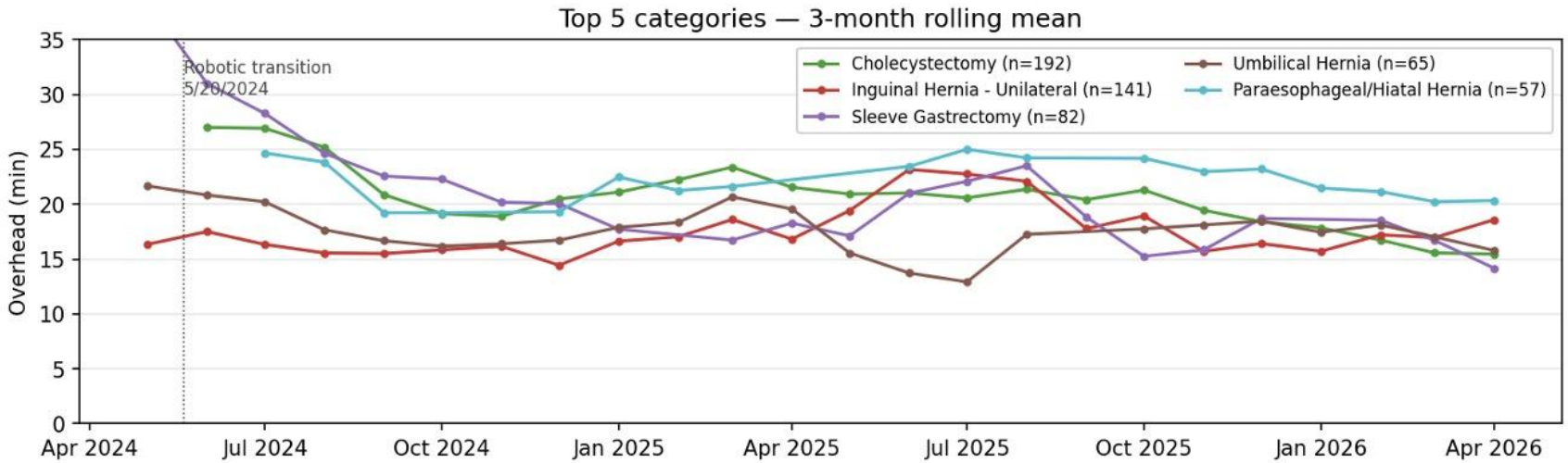

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What about cost?

> Surg Laparosc Endosc Percutan Tech. 2026 Jul 22. doi: 10.1097/SLE.0000000000001492.
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The Most Expensive Part of Robotic Surgery Isn't the Robot—It's the Surgeon

Society invests >$1 million to produce a practicing general surgeon.

→

Training: 4 y college • 4 y medical school • 5 y general surgery residency

→

90% of laparoscopic surgeons report work-related musculoskeletal pain.

↓

20% have considered early retirement because of occupational injury.

→

Robotic surgery generally reduces surgeon fatigue and improves ergonomics.

→

Key Question

If robotic surgery prolongs the career of an experienced surgeon by even a few years, what is that worth?

Economic Perspective: 5-Year Robot Investment vs Early Loss of One Surgeon

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Five-year DV5 investment (base case)

- Acquisition: $2.5M
- Service (Years 2–5): $1.0M
- Total capital + service: ≈ $3.5M

Compared with one surgeon retiring 5 years early

- Hospital revenue at risk: ≈ $13.5M
- Hospital contribution (20%): ≈ $2.7M
- Recruitment/turnover: $0.15–1.2M
- Replacement training: ≈ $0.4–2.6M

Retaining one surgeon for five additional years may preserve value comparable to the 5-year cost of a da Vinci 5.

1 robot ≠ surgeon

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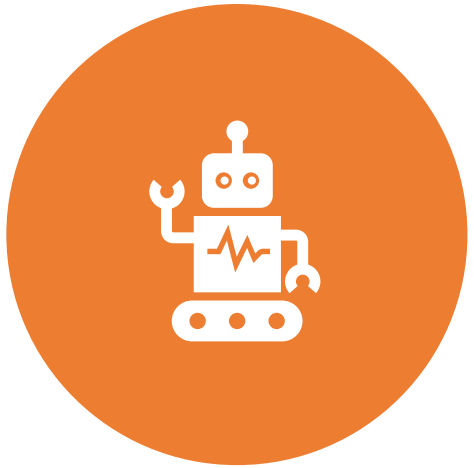

THE ROBOT CAN WORK 24/7

MULTIPLE DISCIPLINES ACROSS ALL SPECIALITIES

One Robot Is a Shared Capital Asset

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Assumptions

5 OR days/week
4 robotic cases/day
20 robotic cases/week
50 working weeks/year

= 1,000 robotic cases/year
= 5,000 cases over 5 years

da Vinci 5

↓

5 Surgeons

↓

~200 robotic cases/surgeon/year

Cost Allocation

5-year robot cost: $3.5M
÷ 5,000 cases
≈ $700 capital/case

≈ $700k/surgeon
over 5 years
≈ $140k/year

A robot is a shared platform—not a cost assigned to one surgeon.

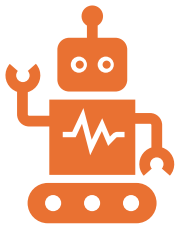
If ONE of 5 surgeons delays retirement by 5 years

Hospital revenue preserved ≈ $13.5M

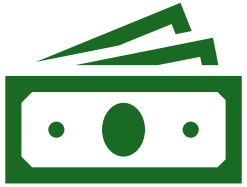
Contribution margin ≈ $2.7M

Avoided turnover: $0.15–1.2M

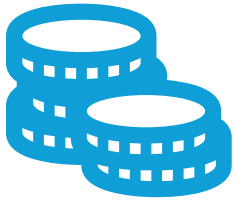
Replacement training: $0.4–2.6M



5-Year Robot Investment



Capital + Service



≈ $3.5 Million

The robot only needs to preserve a fraction of the collective careers of its users to justify its capital cost.

Where the $2.7M Contribution Margin Comes From

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Per-Case Economics

Hospital bills/collects for a robotic bypass: $25,000 (revenue)

Nursing, anesthesia, OR, supplies, overhead: $20,000 (expenses)

Contribution Margin

Revenue – Expenses = $5,000 left over

That's 20% of revenue

This 20% is what funds equipment like the robot

Scaled to One Surgeon

Avg. annual hospital revenue/surgeon: $2.707M

× 20% margin
≈ $541K/year

× 5 years ≈ $2.7M

The $2.7M figure isn't an assumption — it's built directly from the hospital's own margin structure.

Sources: Merritt Hawkins/AMN Healthcare, The Economic Value of Physicians; illustrative per-case revenue/expense figures.

Validating the Model vs. 2026 Market Data

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My Model (Internal)
5 OR days/week
4 robotic cases/day
= 1,000 cases/year

5-yr robot cost: $3.5M
÷ 5,000 cases (5 yrs)
≈ $700/case (capital)
≈ 200 cases/surgeon/yr

5-yr Cost Range
Acquisition:
$1.8M – $2.5M

Service (yrs 2–5):
~10–12%/yr
Total 5-yr cost
(purchase + service):
$3.5M – $3.65M

2026 Published Benchmark
Breakeven volume:
200–250 cases/yr

Post-breakeven margin:
$800–$2,500/case
Same 5-yr cost cited
industry-wide:
$3.5M–$3.65M

The ssumed 1,000 cases/year clears the published breakeven volume 4-5× over.

Sources: ACS Bulletin, Cost of Robotic Surgery Remains a Complex Equation, Feb 2026; industry cost-of-ownership analyses, 2026.

Turnover Cost Sensitivity

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Low Estimate
Recruitment + start-up cost per physician:
≈ $500K

Surgeons to retain to offset $3.5M robot cost:
7 surgeons

Mid Estimate
Recruitment + vacancy cost per physician:
≈ $1.2M

Surgeons to retain to offset $3.5M robot cost:
3 surgeons

High Estimate
Full specialty-adjusted replacement cost:
≈ $2.8M

Surgeons to retain to offset $3.5M robot cost:
1.25 surgeons

The robot is a 5-surgeon platform — retaining even one surgeon can cover most or all of its 5-year cost.

Sources: AMN Healthcare, 2025 Physician Recruiting Report; AMA, Cost of Physician Burnout, 2025; PracticeMatch physician replacement cost data.

Why “One of Five” Is Conservative

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Published Risk
Surgeons who report considering early retirement due to MSK injury from MIS:

≈ 20%
(Capreli et al., 2023)

Applied to Cohort
5 surgeons sharing one da Vinci 5

Expected “at risk” surgeons in group:
5 × 20% = 1

Matches slide model

Expected Value
E[Value] = 5 × 20% × (margin + turnover cost avoided)

Low–high range:
≈ $3.2M – $5.5M
vs. $3.5M robot cost

The expected value of preventing even one injury-driven departure meets or exceeds the robot's 5-year cost.

Sources: Capreli M, et al. Surg Endosc. 2023; ACS Bulletin, Nov/Dec 2025; Medtronic WMSD & Ergonomics Review, 2024.

Conclusions

- **The Future of Bariatric Surgery Is Robotic**
- Robotics has matured from innovation to infrastructure.
  - ✓ Rapid adoption across bariatric surgery and other surgical specialties
  - ✓ Comparable or improved patient outcomes with increasing surgeon experience
  - ✓ Reduced surgeon fatigue and improved ergonomics
  - ✓ Shared capital investment across multiple surgeons and thousands of procedures
  - ✓ Cost per case falls as utilization increases
  - ✓ Investment in robotic surgery is also an investment in surgeon longevity
  - ✓ Cost and longevity models validated against 2026 published market and workforce data

Can we afford not to invest in the technology that will define the next generation of bariatric surgery?

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