

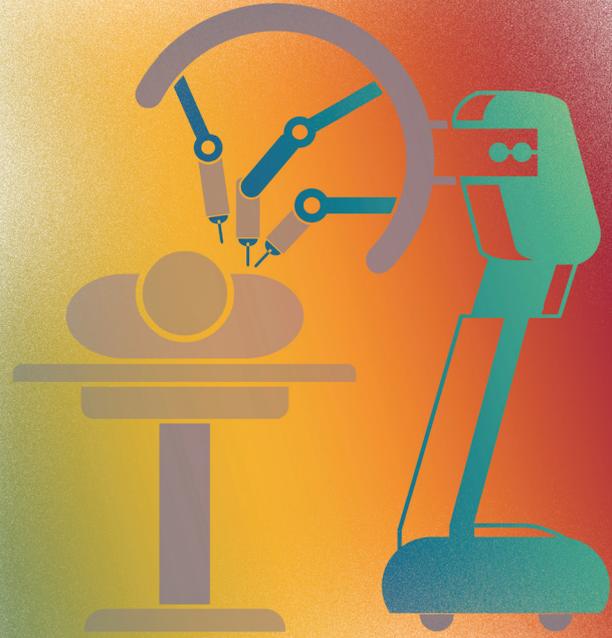
Robotic Surgery

Arm yourself with the latest information on pricing, performance, clinical efficacy, and safety

Surgical robots are proliferating and there are more than a dozen systems on the market. Intuitive Surgical still has a monopoly on robotic laparoscopic surgery—but for how long? Is the da Vinci Xi a revolution or an evolution?

In the age of healthcare reform, creating value is essential and the C-suite is more involved than ever in purchasing decisions. The value proposition for robotic surgery is controversial because of:

- ▶ high capital, service, and recurring costs
- ▶ lack of additional reimbursement from insurers
- ▶ serious, high-profile patient injuries
- ▶ wide-ranging clinical outcomes



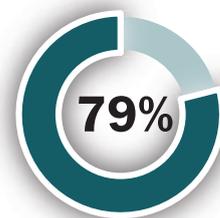
What is the current state of laparoscopic robotic surgery?



1 in 4 US hospitals has at least 1 da Vinci robot



67% of all da Vinci robots (n=3,317) in the world are installed in the US



79% of all da Vinci robotic procedures in the world are performed in the US

Incremental cost per da Vinci procedure = **\$3,000 to \$6,000**

570,000 worldwide da Vinci robotic procedures in 2014: **↑ 178%** compared to 2009

What does the future hold?

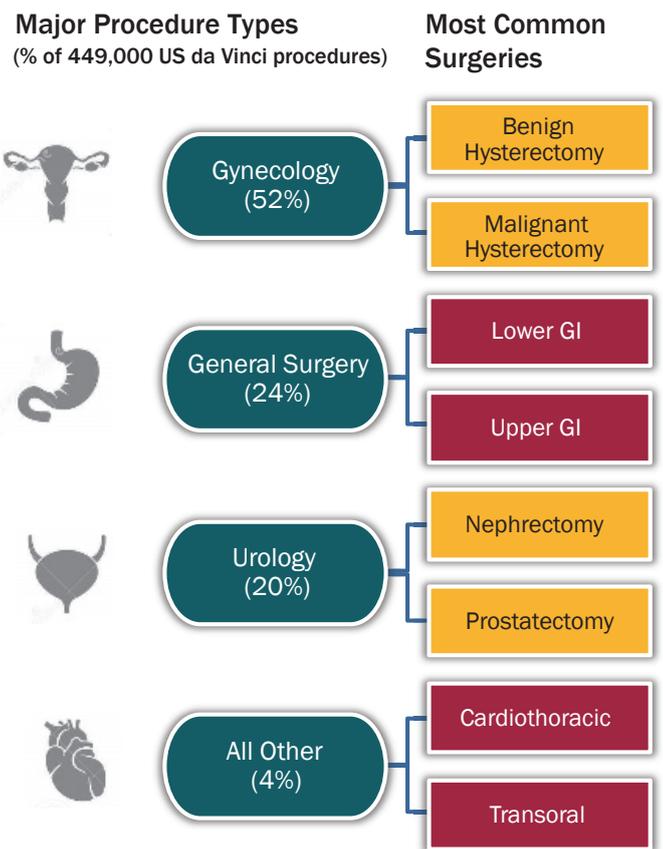
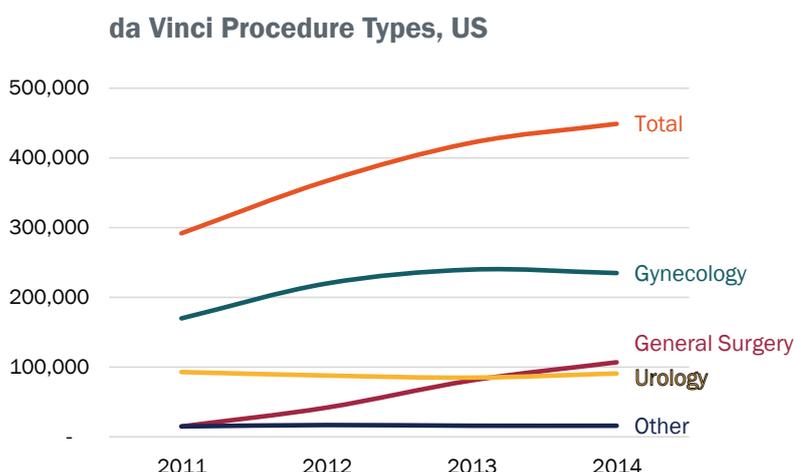
Manufacturer	Model	Key Features	Regulatory Status
Medrobotics	Flex	Single-port, snake-like, cleared only for transoral surgery	FDA 510(k) cleared July, 2015 CE marked March, 2014
SOFAR	Telelap ALF-X	Multiple port, 3 or 4 arms, haptic feedback, reusable instruments	CE marked December, 2011
Titan Medical	SPORT	Single-port, snake-like, designed for small to medium surgical field	None (Projected 2017)
TransEnterix	SurgiBot	Single-port, hybrid of robotics and traditional laparoscopy	FDA 510(k) submitted June, 2015

What procedures can be performed?

The clinical evidence is low to moderate in terms of quality and quantity for all of the most common robotic surgeries.

In the US, da Vinci-assisted gynecologic and urologic procedure volumes have plateaued.

General surgeries such as laparoscopic cholecystectomy, hernia, and colorectal resection have increased dramatically in the past three years.



Clinical Evidence High Moderate Low

How does the Xi differ from the other da Vinci models?

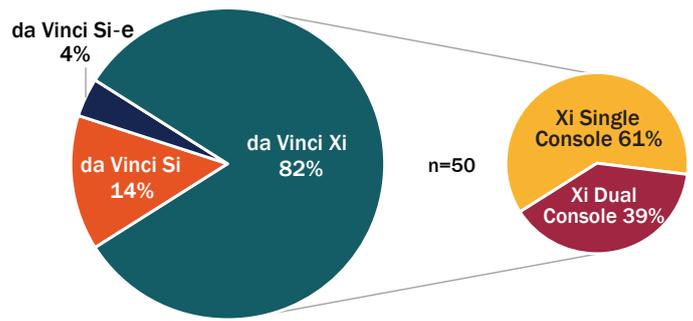
Introduced in April 2014, the da Vinci Xi is the latest iteration of Intuitive Surgical's surgical robot. Compared to the da Vinci Si and Si-e, the Xi is better suited for multi-quadrant surgery because all 4 arms are mounted on an overhead boom, enabling repositioning without the need to undock the system. Also, the Xi arms are longer and slimmer than previous versions which may improve anatomical access.



Key Features	Xi	Si	Si-e
Number of robotic arms	4	4	3
Single-site surgery	*	✓	✓
Overhead boom	✓		
Laser targeting guidance	✓		
Compatible instruments		✓	✓
Large surgical field procedures	✓	✓	
Fluorescence imaging	Std	Opt	Opt

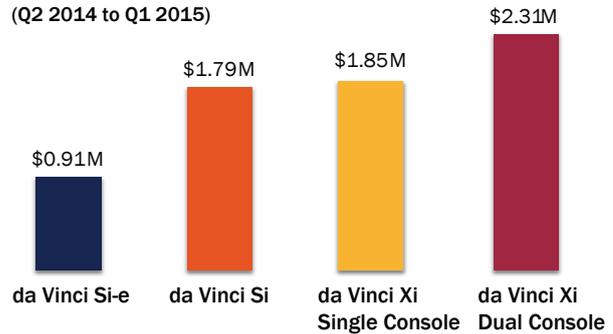
*Awaiting FDA Approval

ECRI Institute Member Interest: da Vinci Robot Models (Q2 2014 to Q1 2015)



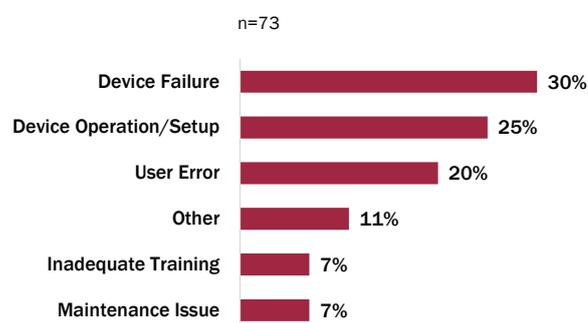
During the first year it was launched, the da Vinci Xi accounted for more than 80% of all ECRI member interest in da Vinci robots.

Average Quoted Prices: da Vinci Robot Models (Q2 2014 to Q1 2015)



Is safety an issue?

Major Contributing Factors to Adverse Events



Source: ECRI Institute User Experience Survey, 2015

What is the State of Your Robotic Safety Program?



Source: ECRI Institute Webinar Survey, 2013

How do you keep it safe?

Deaths related to surgical robots = **144**

Safety Committee

Multi-disciplinary committee that will consist of robotic surgeons, OR managers, anesthesiology, risk management, quality, and technical personnel

- ▶ Enforce credentialing
- ▶ Amend privileging/training pathways
- ▶ Approve da Vinci-assisted procedures
- ▶ Address safety concerns

Surgeon Training

- Vendor general training
- Observe procedure-specific cases
- Serve as bedside assistant
- Perform surgical team simulation and cadaver training
- Proctored sessions

\$ 3,000 per physician per training or proctoring session

Annual Privileging

- ☑ Perform at least 20 procedure-specific robotic surgeries
- ☑ Review clinical outcomes during monthly inter-departmental meeting and annual privileging process
- ☑ Require simulation and cadaver exercises if outcomes are inadequate or procedure volume is insufficient
- ☑ Score ≥90% on simulation training modules

Medical Device Alerts

Track ECRI Institute safety hazards associated with the robot as well as its instruments and accessories

6 ALERTS

In the past year, there were 6 alerts for the da Vinci Xi including 3 high priority problems that may lead to patient injury.

How ECRI Institute's Applied Solutions Group can help you establish and maintain an effective robotic surgery program:

- Evaluate your case mix and procedural volumes to assess the need to purchase or add another surgical robot.
- Consider current procedures and projected growth opportunities to determine which da Vinci model is the best option.
- Provide decision makers with evidence-based guidance for proposed new robotic surgical procedures that may warrant additional costs.
- Ensure that you have all of the key components of a robust robotic safety program.
- Assess your operational efficiencies to maximize throughput by minimizing operating time and optimizing turnover.

Take the next step.

For expert, independent advice on your robotic surgery program, call (610) 825-6000, ext. 5655, e-mail consultants@ecri.org, or visit www.ecri.org/roboticsurgery.