

CLINICAL VALUE OF *DA VINCI*® SURGERY

and Impact on Total Cost of Care for Lobectomy

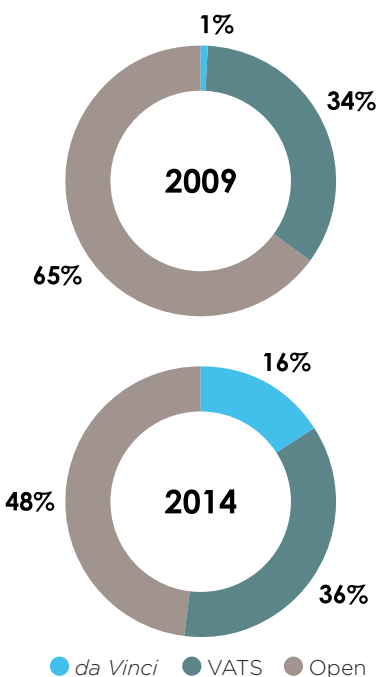
Cost estimates seen here have been independently generated by Intuitive Surgical, Inc. using cost modeling methodology based on national averages and have not been published or peer-reviewed. Cost calculations include intraoperative instrument and accessory costs. Costs related to *da Vinci*® System acquisition, yearly service costs and other intraoperative and post-operative hospital costs are not included/considered.

SUMMARY

Historically, the benefits of minimally invasive surgery (MIS) have not been extended to the majority of patients. However, the introduction of *da Vinci* Surgery addressed some limitations, such as technical demand of the procedure or visualization challenges, and has allowed surgeons to offer patients another MIS approach.

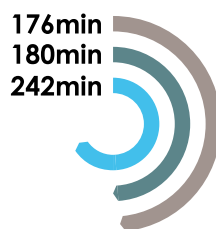
MARKET SHARE¹

da Vinci Surgery is Enabling MIS



OUTCOMES^{2*} AND POTENTIAL COST OFFSETS

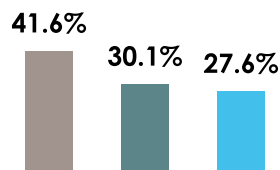
● *da Vinci* ● VATS ● Open



Operative Time⁺
Cost per Minute: \$11^a

Estimated Savings vs Open **vs VATS**

-\$726 -\$682



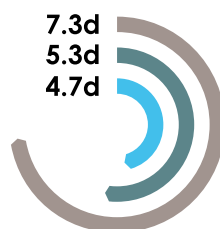
Major Complication Rate[^]
Cost: \$38,283^a

\$6,003 \$1,072



Transfusions[^]
Cost: \$1,142^c

\$79 \$33



Length of Stay
Cost per Day: \$1,553^d

\$4,038 \$932

Estimated Instrument and Accessories Cost Differential[§]

-\$862 -\$862
to to
-\$670 -\$670

Estimated Potential Cost Savings per Case

\$8,532 **\$493**
to to
\$8,724 **\$685**
vs Open vs VATS

*Data for conversion to open surgery for video-assisted thoracic surgery (VATS) not reported. Readmissions are not shown separately since readmission surrogates (i.e., unexpected return to OR and unexpected return to ICU) per STS are shown as parts of major complications.

⁺Operative time reflects surgeon experience during initial learning curve.

[^]Not statistically significant

References

1. ISI internal estimates based on 2014 national Premier database. Analysis and data, including ICD-9 codes, are on file at Intuitive Surgical.
2. Adams RD, Bolton WD, Stephenson JE, Henry G, Robbins ET, Sommers E. Initial multicenter community robotic lobectomy experience: comparisons to a national database. *Ann Thorac Surg.* 2014 Jun;97(6):1893-8. NOTE: Robotic data is surgeon collected and compared to VATS and Open data from STS. STS does not report standalone readmission data; it instead uses return to OR and return to ICU as a proxy for readmission. Data listed reflects for return to OR.
3. Instrument and accessories data provided by Kimble Jett, MD, Doug Adams, MD, Jeffrey Hagen, MD. Instrument and accessories cost estimates based on internal ISI data.

Cost Modeling Methodology

Reference	Clinical Metric	Resources	Calculation Method	Published Value	Value Adjustment
a	Operative Time	Chatterjee A, Payette MJ, Demas CP, et al. Opportunity cost: a systematic application to surgery. <i>Surgery</i> 2009;146:18-22.	Opportunity Cost	\$9/min	2009-2014 Medical Services Consumer Price Index

NOTE: Published value is based on laparoscopic ventral hernia repair.

b	Major Complications				
	DRG multiplier	Vonlanthen R, Slankamenac K, Breitenstein S, et al. The impact of complications on costs of major surgical procedures: a cost analysis of 1200 patients. <i>Ann Surg.</i> 2011;254(6):907-913.	$\frac{\text{Cost of complication} - \text{Cost of surgery w/o complications}}{\text{Cost of surgery w/o complications}}$	n/a	n/a
	DRG value	FY 2016 Final Rule Tables. Centers for Medicare and Medicaid Services.	n/a	\$15,313	n/a

NOTE: Surgical complications classified as Clavien-Dindo Grade IIIb, IVa and IVb constitute "Major Complications" for the purposes of this analysis. The DRG multiplier featured (2.8) is an average of the calculated values from column 4 for each of these classifications.

c	Transfusions	Shander A, Hofmann A, Ozawa S, et al. Activity-based costs of blood transfusions in surgical patients at four hospitals. <i>Transfusion</i> 2010;50(4):753-765.	Activity-based Costing	n/a	2010-2014 Medical Services Consumer Price Index
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NOTE: Analysis and data, including ICD-9 codes, are on file at Intuitive Surgical.

d	Length of Stay	Halpern NA, Pastores SM. Critical care medicine in the United States 2000-2005: an analysis of bed numbers, occupancy rates, payer mix, and costs. <i>Crit Care Med</i> 2010;38(1):65-71.		\$1,153/day (general ward) \$3,518/day (intensive care)	2005-2014 Medical Services Consumer Price Index
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Important Safety Information

Surgical risks of benign hysterectomy (benign) include urinary tract injury, vaginal cuff problem (separation, adhesions, granulation tissue, infection, cellulitis, hematoma), bladder injury, bowel injury, vaginal tear or laceration, vaginal shortening, voiding dysfunction, fistula formation: vesicovaginal, rectovaginal. Uterine tissue may contain unsuspected cancer. The cutting or morcellation of uterine tissue during surgery may spread cancer, and decrease the long-term survival of patients.

Serious complications may occur in any surgery, including da Vinci® Surgery, up to and including death. Examples of serious or life-threatening complications, which may require prolonged and/or unexpected hospitalization and/or reoperation, include but are not limited to, one or more of the following: injury to tissues/organs, bleeding, infection and internal scarring that can cause long-lasting dysfunction/pain. Individual surgical results may vary. For Important Safety Information, indications for use, risks, full cautions and warnings, please also refer to www.davincisurgery.com/safety and www.intuitivesurgical.com/safety.