WHAT’S NEW ON THE MEDICAL DEVICE HORIZON?

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Healthcare Challenges

- Aging population
  - Longer exposure to diseases and surgery
  - Need for longer product life
- Total cost of care
  - Hospital stays, complications, readmissions, reoperations, recovery, etc.
- Matter of life or quality of life
Can Surgery Be Better?
Other choices?
Can MIS Be Better?
(Minimally Invasive Surgery)

- Counter-intuitive control
- Long learning curve
- Ergonomic challenge
- Unstable vision
- Injury to surgeons
Toward Better Surgery

• Innovate to improve outcomes and shorten recovery time to enable minimally invasive surgery (MIS) as the standard of care in complex procedures

• Innovate in access, precise tissue interaction, and imaging to improve upon conventional MIS procedures

• Reduce the total treatment cost for surgery by reducing complications, readmissions, and recovery time
An Example of Innovations in MIS
Only Surgeon Benefit?
Surgeon Benefit = Patient Benefit

da Vinci
Prostatectomy starts safer and gets better for the average surgeon and patient

Population-based study using the Premier Perspective Database: 71,312 prostatectomies performed between 2004 and 2010 at more than 300 hospitals - 27,348 Robotic Prostatectomies, 43,964 Open Prostatectomies. The authors examined perioperative outcomes stratified by surgeon experience with robotics. Intuitive Surgical paid for access to the Premiere database and Axistat consulting services. Lead author Dr. Davis was reimbursed for travel expenses related to this study. Author Jessica Gabbert is employed by InClin (formerly Axistat). Author Usha Kreaden, Principal Biostatistician, is employed by Intuitive Surgical.
Is it only cosmetic?
U.S. PROSTATECTOMY MARKET BY MODALITY
Estimated Adoption of Minimally Invasive Surgery (MIS)

Percentage of all procedures

100
96
87
4
3
1
13

1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010

OPEN & LAPAROSCOPIC

FDA clearance of da Vinci Surgery Prostatectomy, 2001

Rapid decline
Rapid increase

DA VINCI

IMPACT OF ROBOTIC SURGERY
Since 2010 over 85% of men in the United States who undergo a prostatectomy benefit from a minimally invasive approach to the procedure. In 2004, prior to the widespread adoption of robotic surgery, less than 5% of men in the United States undergoing a prostatectomy received a minimally invasive approach via traditional laparoscopy.

A number of complexities can limit the patients who may benefit from minimally invasive procedures including:
- Prior abdominal surgery
- High Body Mass Index
- Enlarged prostate gland
- Advanced stage of disease

The enhanced visualization, precision, and control allowed robotics to overcome these limitations and enabled this shift in the market.

1. Prostatectomy prevalence data: Nationwide Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality.
2. MIP percentage prior to introduction of robotic prostatectomy: Premiere Prospective Database 2004-2010 as cited by Davis et. Al. BJUI 2013 (accepted for publication)
3. da Vinci® Prostatectomy data: ISI Internal Estimates
Prostatectomy
Robotic vs Open

Complications: - 57%
Readmissions: - 67%
Mortality: - 83%

U.S. MALIGNANT HISTERECTOMY MARKET BY MODALITY

Estimated Adoption of Minimally Invasive Surgery (MIS)

Percentage of all procedures

IMPACT OF ROBOTIC-ASSISTED SURGERY:
Since 2012, more than 70% of U.S. gynecologic cancer patients now receive a minimally invasive procedure.

Prior to robotic-assisted surgery, less than 15% of these patients received a minimally invasive surgical option.

A number of complexities can prevent patients from receiving a traditional MIS approach.

Surgical complexities include:
- Stage of disease
- High patient BMI
- Size of uterus

The enhanced visualization, precision, and control of the da Vinci Surgical System helps experienced surgeons overcome these complexities and has enabled this shift in the market.

1. Inpatient data: Nationwide Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality
2. Outpatient data: Solucient® Database - Truven Health Analytics (Formerly Thomson-Reuters)
3. da Vinci data: ISI Internal Estimates
Hysterectomy
Robotic vs Open

Complications: - 72%

Readmissions: - 86%
Complications: - 54%
Readmissions: - 18%
Mortality: - 80%

Colon Resection
Robotic vs Open

Worldwide Robotic Procedures

Company estimate
Making Surgery Better

Access

Multi-Port  *Single-Port, NOTES*

Visualization

HD, Flexibility, Fluorescence & Augmentation

Instrumentation

Simulation Training

* Some images from Google.com
* NOTES: Natural Orifice Transluminal Endoscopic Surgery
THANK YOU