Forty-seven of 60 sources said Intuitive Surgical Inc. (ISRG) will continue to post sales and procedure growth as hospitals expand their robotic usage beyond traditional urologic and gynecological procedures and into general surgery. However, 20 of these 47 sources expect the growth rate to be slower than in the past. Eight others predicted flat sales for the company. Use of Intuitive Surgical’s da Vinci in areas of early adoption has been flat or slowing while new applications are being cautiously implemented in order to measure the system’s efficacy and cost against other surgical methods.

Only eight of the 60 sources said their hospitals were considering or in the process of purchasing a da Vinci system.

Da Vinci-assisted procedure counts for 2013 are expected to be higher for 19 sources, flat for seven, and down year to year for one of the 27 gynecological and general surgeons who responded.

Colorectal surgery/LAR and single-site cholecystectomies represent the fastest-growing robotic-assisted procedures in terms of general surgeries. Use of robotics also is becoming more common in cardiothoracic procedures and hernia repair.

Ten general surgeons questioned the efficacy of robotic cholecystectomies when compared with the laparoscopic (lap) procedure, which take 30 to 45 minutes, is easy to perform and is less costly than its robotic counterpart.

1) GYNECOLOGICAL SURGEONS
These 13 sources (including eight sources interviewed at the World Robotic Gynecology Congress in August and three at the Minimally Invasive Surgery Week in September) represent 18 hospitals with da Vinci systems and one without a da Vinci. Five sources expect overall growth for the da Vinci, three expect growth but only within an appropriate patient base, and three predict a short-term plateau and then increased use of the system. Most reported increased robotic use in general surgery driven by single-site procedures. Seven of the 12 sources with access to a da Vinci expect their run rates for 2013 to be higher year to year. Sources averaged 4.3 da Vinci procedures each day. Only two hospitals plan to buy another robot in the near future because of maximized use on their current da Vinci systems. Capacity utilization varied widely by source, ranging from 30% to 100% and averaging 73%.

2) GENERAL SURGEONS
These 23 sources represent 24 hospitals and 58 da Vinci Robots. (We interviewed 19 of them at the Minimally Invasive Surgery Week conference in August.) Twenty-one sources expect use of robotics to grow; nine predict a slower growth rate, and two expect flat robotic procedure counts. Only three sources expect to purchase new da Vinci robots in the near future; most other hospitals are meeting demand with their current systems. Colorectal surgery is the fastest growing general surgery to use robotics. Fourteen sources perform robotic single-site cholecystectomies, but 10 said doing so is not as efficacious as the lap method. Of the 17 sources discussing procedure run rates, 12 expect an increase, four a plateau and one a decline.

3) LAPAROSCOPIC GENERAL SURGEONS
These eight sources have limited interest in the da Vinci robot, citing its prohibitive cost, long and time-consuming learning curve, and a lack of instrumentation for pediatrics. They, however, did acknowledge that robotics is appropriate for some procedures and offers superior visuals. Robotics use will expand as more trained surgeons enter the market and better applications are developed. The five sources working in hospitals without a da Vinci knew of no plans to acquire the system.

4) HOSPITALS USING A DA VINCI SYSTEM
These 11 sources were generally positive about future use of the da Vinci system. However, only three plan to buy another robot in the near future because patient and surgeon demand is being met by current system deployments. One hospital is considering not renewing its da Vinci lease because robotic surgical volumes are down and costs are up. Da Vinci utilization in new procedures is expected, but the procedure growth rate is not expected to be as rapid as in the early areas of adoption.

5) HOSPITALS NOT USING A DA VINCI SYSTEM
These five sources said their hospitals do not plan to purchase a da Vinci system in the next three years, mostly because of a lack of funds, lack of surgeon demand, the long learning curve, and the stiff competition between hospitals with robotics.
**Future Growth for Intuitive Surgical**

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**Background**

Sources for Blueshift Research’s April 24 report on Intuitive Surgical expected sales and procedure growth for the da Vinci robotic surgical system to slow during the remainder of 2013. Da Vinci use was beginning to plateau in early adoption procedures, such as prostatectomies. New applications for robotic surgery were being approached more cautiously until outcome-based care and cost evaluations were available. However, many sources were aware of the negative AAGL study, FDA action and comments made by ACOG President James Breeden, MD; those familiar with these issues expected them to have little or no effect on da Vinci procedure counts. Historically, Intuitive Surgical has beaten its and Wall Street’s quarterly earnings forecasts, usually posting growth in the high teens. In its second-quarter earnings report in July, Intuitive missed expectations and blamed delayed da Vinci robot sales and slower procedure growth.

**CURRENT RESEARCH**

In this next study, Blueshift Research assessed whether Intuitive Surgical could reverse the recent drop in sales and procedure count. We employed our pattern mining approach to establish five independent silos, comprising 60 primary sources and including four repeat sources. Thirty-nine sources were interviewed at medical conferences, and seven admitted to receiving some form of compensation form Intuitive Surgical:

1) Gynecological surgeons (13)
2) General surgeons (23)
3) Laparoscopic general surgeons (8)
4) Hospitals using a da Vinci system (11)
5) Hospitals not using a da Vinci system (5)

**Next Steps**

Blueshift Research will continue to monitor the adoption and growth of the da Vinci system for general surgery procedures and the related effects on Intuitive Surgical’s overall sales and procedure counts. We also will follow medical reports and studies, FDA inquiries and patient lawsuits for their influence on the company’s future. Finally, we will determine how hospital administrators are dealing with the costs of having and using the da Vinci.
1) GYNECOLOGICAL SURGEONS
These 13 sources (including eight sources interviewed at the World Robotic Gynecology Congress in August and three at the Minimally Invasive Surgery Week in September) represent 18 hospitals with da Vinci systems and one without a da Vinci. Five sources expect overall growth for the da Vinci, three expect growth but only within an appropriate patient base, and three predict a short-term plateau and then increased use of the system. Most reported increased robotic use in general surgery driven by single-site procedures. Seven of the 12 sources with access to a da Vinci expect their run rates for 2013 to be higher year to year. Sources averaged 4.3 da Vinci procedures each day. Only two hospitals plan to buy another robot in the near future because of maximized use on their current da Vinci systems. Capacity utilization varied widely by source, ranging from 30% to 100% and averaging 73%.

KEY SILO FINDINGS
1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - These 13 represent 18 hospitals with 30 da Vinci robots and 1 hospital without a da Vinci that performs only laparoscopy (lap) surgeries. 6 use DVs at two hospitals.
   - 2 are considering or are in the process of buying another da Vinci to meet patient demand; 1 said such a purchase is possible. 1 purchased a da Vinci Si for a new center in the spring. 8 are not planning a purchase and 1 did not comment.
2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - Only 5 of the 12 sources could provide their hospitals’ total da Vinci procedures for 2012, ranging from 430 to more than 3,700. Also, only 2 could provide both 2012 and 2013 totals. However, 7 reported a higher run rate in 2013. 4 others did not comment, and one’s da Vinci was new this spring.
   - 10 of the 12 da Vinci users provided personal procedure counts that ranged from 10 to 300, for a total of 1,205 to 1,215 procedures and an average of 121 in 2012.
   - 7 personally are experiencing increasing run rates in 2013, 3 are flat, 2 did not know and 1 did not comment.
3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   - All but 1 of the da Vinci users saw usage outside GYN.
   - Colorectal surgery/LAR (7 sources) and cholecystectomy, or chooley, (6 sources) procedures were growing the most, followed by cardiothoracic (2 sources). 7 sources named other procedures, while 5 said single-site procedures were driving growth.
4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Would you consider using the DV for benign hysterectomies?
   - 7 sources said 85% to 98% of performed hysterectomies were for benign cases.
   - 10 of the 12 sources were performing benign hysterectomies; 1 oncology GYN specialist was not.
5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   - 5 sources said the AAGL study and the negative media coverage had created consternation within their hospital administration.
   - 3 sources said patients were aware of the issues and asking more questions.
6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   - 10 of the 12 reported no difference in reimbursement, 2 did not comment.
   - None expects robotic reimbursement to change in the near future, especially in light of healthcare changes.
7. What is the capacity utilization for your robot/s? What is the max number of procedures per year you think the robot can handle?
   - Capacity utilization (CU) ranged from 30% to 100% and averaged 73%. 2 did not know and 1 did not comment.
   - Only 1 source could provide an average daily run rate (3–6 per day)!.
   - Of 5 sources who provided maximum daily da Vinci procedures, the average for GYN procedures was 4.3 per day.
8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
All 8 who commented said ROI/cost management is an increasing issue.

9. What is your prediction for continued use and expansion of robotic surgery?
- 5 expect continued growth for robotic surgeries because of single-site procedures, 3 expect use to plateau due to slowing demand for the short term and then increase, while 3 said appropriate use/patient selection is important for continued growth; 2 did not comment.
- In addition, 3 said competition will drive costs down and increase usage. 3 sources likened the situation to what occurred with lap surgery 15 to 20 years ago. 2 said healthcare regulation uncertainty was hampering growth.

1. OB/GYN and robotic trainer at a da Vinci epicenter, receives ISRG remuneration for training cases; repeat source
This source does five to seven cases weekly when at the center. She does only benign gynecology and estimates a 5% to 10% increase in her 2013 da Vinci procedures. She predicts increased robotic usage in urology, gallbladder and colon cases. Her hospital is considering a second robot. She strongly believes robotic surgery is here to stay, and reported a high adoption in India, where she trains surgeons.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - "We have one. I think there’s talk about getting one. I am not certain when they will get it, but it seems that it may be early next year. A hospital close to us is getting their first robot."

2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - "I did seven last week. On average I do five to seven, but I’m gone probably 10 weeks doing training or some vacation. I’ll do at least 150 to 160 this year. But I don’t keep track."
   - "I should do 5% to 10% more next year. I’m getting a lot of referrals for complex patients from other doctors. I get a lot of patients with endometriosis, complex and large pathology and pelvic pain.
   - "Gynecology has the most [robotic] use because there’s a lot more patients with complex pathologies."

3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   - "I know cardiothoracic robotic use is increasing [elsewhere], but at our hospital we do gynecology, urology and surgery. In urology they’re doing more and more. And I believe that there are more general surgeons doing cases now, and they are mostly doing gallbladders and colons.”

4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Would you consider using the DV for benign hysterectomies?
   - "We do about 5% to 10% oncological cases. I only do benign. I do benign gynecology [including many robotic cases]."

5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   - “There is definitely skepticism, and the FDA should be skeptical with newer technologies. But there’s been no influence at our hospital—not at all. The feeling about that is there is no doubt robotics is better for preventing open surgery."

There is definitely skepticism, and the FDA should be skeptical with newer technologies. But there’s been no influence at our hospital—not at all. The feeling about that is there is no doubt robotics is better for preventing open surgery.

OB/GYN & Robotic Trainer
Da Vinci Epicenter

6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   - “It’s not a penny higher. People who do open get paid more, but it’s the same for laparoscopic or robotic surgery. There’s skepticism about our [robotic] cost. I don’t get paid any more for my cases. If a surgeon comes in [to our epicenter] and learns from me by observing me, I get reimbursed for my time by da Vinci. But people think we’re getting extra money for doing it robotically. That’s not true. Once you get good at robotics—it takes a lot of skill—it’s a
very good feeling when a patient doesn’t end up with open surgery and being hospitalized for five days with potential for complications. Instead, they don’t have big incisions, and 70% go home within six hours. They can drive in four days.”

7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   - “I don’t know that number for the hospital. I can do four to five a day. That’s the key; it doesn’t take me any longer on the robot. I’ve developed a technique, which is a different way of doing it. But I do faster robotic than lap. Most hysterectomies take 45 minutes to an hour.”

8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   - “I’m sure there is number crunching being done. ... There’s also potential savings on the DRG [diagnosis-related group] if the patient goes home the same day and they don’t have the IV fluid, antibiotics or long-term potential hospitalization. And a hospital like ours has a good name, which brings more patients. If it was losing money, I don’t think they would be looking at getting another.”
   - “I go to India, and they now have nine robots in New Delhi. It’s happening there. These were all lap surgeons and there was some resistance. But I’ve done my fourth trip in the last year and a half. There are so many surgeons sold on robotics globally.”

9. What is your prediction for continued use and expansion of robotic surgery?
   - “When laparoscopic started 25 years ago, there were big naysayers. I think it’s new technology that is absolutely phenomenal. There’s a learning curve, and you have to select the right patients. But the benefits far outweigh the risks.”
   - “With any new technology there’s some resistance, but anyone who gets skilled in robotics has not looked back. Robotics will be the way of life in five years.”
   - “As far as the [FDA investigation] is concerned, the only thing I agree with them is that we should have more stringent criteria for the surgeons to do solo robotic cases.”

2. OB/GYN chair for an East Coast hospital who also practices at another hospital; WRG Congress interview

The negative media coverage has created issues in GYN robotic use, but the technology will be the norm and will receive a boost from competition. The high number of deliveries this source performs limits his robotic surgeries, but he expects to do more procedures in 2013 year to year and the same number in 2014. He was forced to move his surgeries to another hospital with lower robotic volume because his primary hospital took away robotic privileges because of his low numbers. One hospital’s robot is at full capacity, while the other is at 50% to 70% but will increase next year. Intuitive’s Single-Site Instrumentation is driving increases in general surgery.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “Our one hospital has one and has no plans for more. Our second hospital is getting a second one. All hospitals in [our major metro] area have experienced great growth in robot numbers.”

2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “I do not have those numbers for the hospitals.”

3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
“General surgery is increasing a lot with the single port in choleys; there’s a big drive there. [Using robotics in the] chest, anything difficult to open and close, is increasing. There’s more minimally invasive surgery for cardiothoracic and expansion of GYN oncology and GYN. We keep doing more and more; we’re really busy.”

4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you doing benign?
   “I don’t know those numbers. I’ve personally started to do benigns, mainly on obese patients.”

5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   “Yes, but the studies are only affecting benign GYN.”
   “Yes, there are a lot of questions being asked. [Patients being concerned] has started. Everything is changing, and no one knows how everything is going to turn out. Unfortunately, there are complications with anything you do.”

6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   “There’s no difference.”

7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   “[Our one hospital] is working over capacity and cannot increase unless they buy a new robot. At [the other hospital] it seems they are working at 50% to 70% capacity. Next year they will meet capacity due to new docs signing in.”

8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   “Our two hospitals are so different. The CEO only accepts procedures that make money. The woman who runs the other hospital has had robotic surgery herself, and she’s pro-robotic.”
   “Whatever is cheapest is not always better for the patient.”

9. What is your prediction for continued use and expansion of robotic surgery?
   “The future is robotics, not necessarily Intuitive’s robots. I think the Israelis will be coming out with the technology. The robotic future is not as complex as shown with Intuitive.”
   “I still love robotics. Compared to 20 years of laparoscopy, it’s so much better. … The doctor is able to sit down. The exhaustion in surgeries can be great. You’re able to be in street clothes and have water if you need it, take an emergency call.”

3. OB/GYN doing robotic surgeries at two East Coast hospitals; WRG Congress interview

This source expects da Vinci procedures to plateau for a year or so and then increase. His personal da Vinci cases, primarily benign hysterectomies, are increasing, as are GYN and surgery robotic procedures at both hospitals. However, procedure count is reaching maximum. The hospital needs the more advanced da Vinci Si system, which would allow single-site port surgeries. This OB/GYN views the negative media coverage as a temporary issue and likens it to what occurred in laparoscopic surgery’s adoption. He cited the need to convert more abdominal hysterectomies to minimally invasive techniques.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   “In our area, two major hospitals just got new buildings and they’re feeling the cost. Both are having financial difficulties due to the pitfalls in the economy. They have one robot each. We’re road-blocked in that we can’t afford the new version. The S is OK. We’re efficient and the surgeons are so quick; the only issue is the need to upgrade.”

2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   “I started slow in 2008 and have done 200 [da Vinci cases] total now. I did about 75 cases in 2012 and should do 100 cases in 2013 and hope to increase in 2014. My goal is to encourage our area physicians to refer to me. If we don’t, patients end up with abdominal surgery. … In oncology, robotic is a no-brainer. It’s the way to go. I’ll only refer to my oncology cases to a person who does robotic.”
“We’ll go up. A lot of it is getting the area generalists to not refer robotic cases to the nearest major city. If they want minimally invasive, many will send patients to [our nearest major city].”

3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   “Urology has plateaued. Our general surgery has just started, so we’ll have higher choleys, colons and hernias.”

4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you doing benign?
   “A vast majority are benign, maybe 98%.
   “I’m doing the most benign hysterectomies. Probably 70% of my benigns are robotic because I think I’ve been good at convincing referring doctors. We also have a good straight-stick lap surgeon. I put pressure on my colleagues on why we are doing so many abdominal surgeries. Peer pressure does help.”

5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   “They are mainly OK with it. We are more aware of the [negative] press, but the press has been bad on a number of issues so [our administration] is used to it.”

6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   “I don’t really know. I’m sure lap costs are higher. With payer mix there is a financial benefit to do outpatient cases vs. inpatient cases.”

7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   “We’re up to our maximum with urologists, general surgeons using it and thoracic surgeons too. We almost want to overmax our use though [to prove there is a high need].”
   “It depends on efficiency. If I do a six-hour case, you can’t do many in that day. I’ve done three and I can do four to five a day, but you do get tired.”

8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   N/A

9. What is your prediction for continued use and expansion of robotic surgery?
   “I think [the plateau will be] temporary. The same thing happened with laparoscopy. We’re personally growing our numbers. I think this plateau will go on for a year and then go up again.”

4. GYN at two East Coast hospitals; WRG Congress interview

This gynecologist, who has done robotic surgeries at two hospitals, believes Intuitive will continue to do well for several years. Still, she said the AAGL and media reports have increased questions from patients and dampened enthusiasm among hospital administrators. She will be helping one hospital collect data and work toward decreasing robotic procedure time in the OR. She estimates CUs of 60% and 30% for the two robots and projects slow procedure growth in both GYN and general surgery, particularly single-port, among the two general surgeons who have become proctors.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   “We have two hospitals [with one da Vinci each]. Both have the Si. The original hospital got a S five years ago; they got it for cardiothoracic surgery and did less and less. They approached some GYNs in 2010, and I got trained and got all the hysterectomies. They upgraded to a Si a year and a half ago. Another hospital purchased the robot and [recently] had it delivered.”

2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   “I have done over 100 since March 2010. I’m still doing them, but I’ve also decided to open our private practice. In GYN we did 55 in 2012; I should do 75 in 2103 and at least 75 in 2014.
   “I anticipate increases in GYN and significantly more thoracic surgeries, general surgeries.”
3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   ▪ “The single port for choleys and colorectal anterior resection are increasing. ... The two busiest general surgeons were trained and are now proctors. They use it a lot more than GYN.”
   ▪ “The difficulty we’re having is a lot of surgeons are doing LAR but doing them open. They’re doctors who haven’t done lap surgeries. There are lots of general surgeons who don’t even do minimally invasive surgery. I encourage them to allow patients to have minimally invasive.”
   ▪ “I think [the single port] will surpass this negative press. The benefits so outweigh the risks.”

4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you doing benign?
   ▪ “Ninety percent are benign and 10% malignant.”
   ▪ “I do half of the benign robotic procedures. About 75% are done minimally invasive.”

5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   ▪ “In November 2012 one hospital got their Si. In November and December the administration was very excited about the robot. Then in March of this year the ‘fire’ went out. Administration got nervous wondering, ‘Did we do the wrong thing?’ That’s why we’re not getting more physicians using it. They didn’t foresee the cost rising. We’ll be meeting next about collecting data. OR time is a big problem.”
   ▪ “Patients ask questions, and you answer them truthfully. I tell them a lot of these complications are not related to the da Vinci and that risks are implicit to surgery, even without using the robot. Or it’s the level of skill. I’ve only had one patient who preferred to be done open.”

6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   ▪ “There’s no difference.”

7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   ▪ “One hospital is about 60%; the other is 30%, where there are four other GYNs who don’t use the robot.”
   ▪ “It’s going to increase. Even though we are convincing physicians, it’s a work in progress. We’ll convert more of the cases that are being done open or they’ll pass those on to surgeons who do robotic. Everyone will have the defined surgeon who does the bulk of them.”

8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   ▪ “Yes.”

9. What is your prediction for continued use and expansion of robotic surgery?
   ▪ “The only thing that would improve it is if we had other competitors. That would make a huge difference on costs. ... In 10 years we’ll have another competitor and costs will come down a lot. It’s going to come from overseas. Instruments will be better. It will just get better.”
   ▪ “[Intuitive] will continue to do well for the next couple years. There are so many community hospitals that want it.”

5. GYN at a midsized hospital in a rural area of the East Coast; WRG Congress interview

This source thinks any plateau in da Vinci procedures is temporary and that growth will resume. Her da Vinci usage should grow this year and then plateau in 2014. The hospital’s one robot is used in 12 to 15 cases per month but not yet in general surgeries. Training more surgeons is the goal. The negative media is creating more questions among patients, but she said robotic surgery remains popular in her rural area.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   ▪ “We have one robot, and it’s not that busy. They’re trying to train more surgeons.”
2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “I did 10 in 2012, should do 20 to 30 in 2013 and a similar amount in 2014. We now have a GYN oncologist coming from outside.”
   - “I don’t know the total amounts. They use it three to four times a week, so 12 to 15 per month.”
3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   - “There’s no general surgery [robotic use].”
4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you doing benign?
   - No answer, but source does perform benign hysterectomies.
5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   - “The major thing is I’m going to be explaining all the complications to patients. I also did lap so will talk about all that. There’s not a lot of resistance from patients. In the community, the thinking is the robot is a good thing. It’s more in the big cities [where there is patient concern].”
6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   - No answer.
7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   - “I don’t know, but they definitely could do more cases. They’re trying to train more surgeons. But they use the same room for other surgeries when the robot isn’t being used.”
8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   - “Yes, the administration is aware of all that. They’re already monitoring how much time we’re on the console. They’re thinking more about what we need to do.”
9. What is your prediction for continued use and expansion of robotic surgery?
   - “I think it’s great. Once it settles down and the cloud goes away, there’s a lot of promise. The residents getting out are all being trained on it. It’s the old generation that is the problem.”

6. OB/GYN and robotic director for a Midwest community hospital system; WRG Congress interview

This source said the negative news has not slowed her hospital system’s robotic surgeries. She recently was hired as the robotic director to improve efficiency, reduce OR time and increase robotic numbers in two of her system’s hospitals. She expects a 50% increase in procedures in 2013 and more in 2014 year to year, which will be helped by nine surgeons currently receiving da Vinci training. Single-site port procedures are the largest area for growth.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “We have one at one of our hospitals and two at another. No plans for more.”
2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “I’ve done 200 since 2011. 165 in 2012. I hope to increase this year and again next year. I do myomectomies, hysterectomies, prolapse and excision of endometriosis.”
   - “In 2012 we did 280 and 150 [at our two hospitals] so 430 total. Our 2013 growth should be up 50% over 2012. We have more people educated about minimally invasive, and because of the economy people want to get back to work. In GYN, women want to get back to doing their usual activities. 2014 should be another big increase, although I’m not sure what the economy will do with Obamacare and what it will make hospitals do or not do. But there’s a drive to maintain minimally invasive surgery.”
   - “We’re doing GYN, some general surgery, mainly choleys. We need to increase our efficiency; that and our turnover time [in the OR] are our biggest culprits. We’re not putting it out for all the guys to use it.”
3. Do you see regular usage of yourDV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   - "The single-port procedures, such as choleys, are where it’s going to grow. ... There’s a big push for the single port. There’s the vanity of it all. Women especially don’t want incisions all over their bodies."
   - "I see a huge need for the cancer hysterectomies to be done robotically in our hospitals—the improved post-op care and treatment, how they get out so soon with robotics. It’s huge. There are still too many open [surgeries]."

4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you doing benign?
   - "About 10% malignant, 90% benign. I’m doing benigns."

5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   - "I’m spending a lot more time answering questions from patients, but I explain that you need to have it done by someone who uses good technique."

6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   - "No difference."

7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   - "I don’t know; that’s why they hired me." [CU will be increasing.]

8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   - "My goal for the hospital [where I’m robotic director] is to have the rooms fully booked. Right now we have six general surgeons getting trained and three new OB/GYNs. I have six to seven urologists. Everybody gets a half day."

9. What is your prediction for continued use and expansion of robotic surgery?
   - "Robotic surgery has not been harmed at all by the press. I am personally scheduling three to five robots per week. Patients are planning their ‘MIA’ based on schedules with work and life to get back to their normal schedule ASAP."

7. Gynecologist/robotics director at two hospitals; WRG Congress interview

This source uses a da Vinci at one hospital and is the robotic director for a new da Vinci system in another hospital. Capacity utilization is 90% in the hospital that has had the da Vinci for a while and 40% for the new center; procedures, particularly general surgery, are trending up at both centers. He likens the recent negative press to the road bumps experienced in laparoscopy, and believes Intuitive will bounce back as surgeons increase their procedure numbers and equipment continues to improve.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - "Our one hospital is new, since April or May, and we’re ramping up. At [the other hospital] we’ve had one two years now. We’re not planning [a second purchase] there, but we’re closer to getting one."

2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - "At the new one we’re growing rapidly. We’ve done 50 cases since April [when they began], but that’s with few doctors using it. I’m not sure how much we’ll end up with this year, but we’ll be higher in 2014. The other is more mature, and we’re growing in the number of specialties using it."
   - "I’ve been doing it the longest; I’ve done close to 400. I did about 80 in 2012, about 100 in 2013 ... and I expect it to continue to go up similar to that."
   - "Our numbers are increasing in both programs, we’re seeing a higher number of surgeries and specialties using the robot."

3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   - "Probably the most growth is general surgery: gallbladder, Nissen procedure, colon."
4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you performing benign DR?
   - “I would guess 85% benign, 15% malignant. We don’t have a GYN oncologist on staff.”
   - “I refer my oncology hysterectomies to an oncologist doing them robotically.”
   - “Almost all my [benign hysterectomies] are robotic. Of my last 400 [procedures] I opened only five people.”
5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   - “It confuses people. When people started using lap 30 years ago, surgeons considered lap as a gimmick. One [surgeon pioneer] was almost turned down from being able to publish an important paper. It’s very comparable to then. [Robotic surgery has] been rapidly growing, and there will be some bumps.”
   - “The advantage with a new robotic program is we didn’t have to make the mistakes everyone else has. There’s been criticism for over-advertising it, so we’re not doing that. And we’re very careful with credentialing who can use it. The education process is much better and getting more standardized.”
6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   - “There’s no difference.”
7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   - “The CU at our new robot center is about 40%; my older hospital is about 90%. Both are trending up. Three is a realistic number, and I can do four on an unusual day. In general surgery it depends on the difficulty of the cases; it could be three to six a day.”
8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   - “We’re all very aware of the costs. ... I’m the director of robotics, and I know we’ve got to do more cases. I don’t get any pressure from administration, but I feel it personally that I’ve used up a lot of capital that others weren’t able to use. I should use it responsibly, and it must be used efficiently and wisely.”
9. What is your prediction for continued use and expansion of robotic surgery?
   - “The trend downward is people hunkering down because of uncertainty over the future in healthcare. Intuitive’s technology is so good, and their next-generation technology will be better. Yes, they’ll bounce back.”

8. Director of a large da Vinci epicenter and conference speaker, receives ISRG remuneration for training; WRG Congress interview

This source’s hospital has four da Vinci robots for clinical use. GYN cases are steady, while the da Vinci stapler and Single-Site technology is driving colon and colorectal procedures. GYN procedures will gain from da Vinci’s Single-Site Instrumentation in hysterectomies. This source was surprised by the negative media attention and thinks the move for stricter credentialing and privileging standards will improve the situation. He gave a talk at a robotic conference on improving OR efficiency, including reallocating the block time of underperforming surgeons, the importance of transparency in surgeon data measurements, and setting up room standardization.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “We now have four robots with a fifth in the plans.”
   - “There are seven robots among four hospitals in our metropolitan area.”
2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “As of December 2012 we were doing 135 a month. 2013 should increase, but I don’t know. I hope so. 2014, yes, we should grow.”
   - “We have a very active program, and turnover time is the most difficult.”
3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   - “It’s steady for GYN, but it’s increasing for colon and colorectal with the stapler and single-site technology.”

4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you doing benign?
   - “About 85% benign, 15% malignant. And, yes, I do benign [robotic] hysterectomies.”

5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital's DV usage?
   - “It’s a blip in the road. I’m very surprised on how much attention it’s getting paid.”
   - “We hope to nationalize all our credentialing and privileging requirements through the Hospital Corporation of America, a group of 130 hospitals, as early as 2014.”

6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   - No answer.

7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   - No answer.

8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   - [Yes; this source gives talks on this subject].

9. What is your prediction for continued use and expansion of robotic surgery?
   - “I see an uptick in GYN when the single-site technology is adopted for hysterectomy, and I see continued growth in colorectal and colon with the stapler and single-site instrumentation. There’s also [potential with] equipment coming out that should be adopted by the average GYN.”

The source expects his GYN procedures to plateau at his four-robot center, and views the media reports as a significant issue that is being addressed with the development of stricter credentialing and privileging standards as well as the increased use of simulators. Procedures are increasing at high-volume centers as a result. Any competitor will need to have a game-changing technology to challenge well-entrenched Intuitive Surgical.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “We have four clinical robots and six for surgical training.”
   - No answer on plans.

2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - [In 2012 the center performed 3,743 surgeries: GYN with 1,591; urology with 1,224; and general surgery at 553 were the top procedures.]
   - “I’m at a maximum for what I do. I think people are continually moving forward, but plateaus are OK.”

3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   - [Yes. He represents a major training center.]

4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you doing benign?
   - No answer. [Source performs benign hysterectomies.]

5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   - “The position statements and articles and standards are not done well. They don’t reflect what’s really happening. We have people who are specialized, with appropriate patient selection, and so it hasn’t slowed us down. But from a clinical standpoint patients are asking me more and more questions. I’ve seen more and more patients that are..."
identifying surgeons at high-volume centers for complex cases. If anything those centers, the negative news has helped them.”

- “I don’t think it’s just a blip. It’s a serious issue. Depending which way it goes, either we power through it and it settles where it should be, or we may not use it potentially in gynecology.”

6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?

- “We would hope [reimbursement for robotics will increase]. More complex patients should be reimbursed accordingly. But it won’t be any time soon and will be based on data.”

7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?

- No answer.

8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?

- [Yes.]

9. What is your prediction for continued use and expansion of robotic surgery?

- “The problems we’re dealing with are training people, the potential of overselling it and choosing appropriate patients. That’s what we want with selective credentialing and privileging. And we’ll be using much more training simulation.”

10. Miscellaneous

- “Competition honestly won’t occur for three to five years. ... Centers have a lot of infrastructure in place. When you’ve paid $2.4 million, you just don’t flip over to a new technology. That competition has to be a game-changer.”
- “More likely it will be in surgeon-assisted robotic surgeries where Intuitive doesn’t have a presence. There are Mazor [Robotics Ltd.], a device assisting robot just for spinal, and Mako [Surgical Corp.] for knee and hip surgery.”
- “We have more than enough capacity to grow in training. The traditional way was an online class and do a couple surgeries under the hand of a master. We’re trying to change that, and the use of simulators really improves the scores. There are three companies selling simulators. Intuitive markets a simulator for about $600,000 where they use their actual console. Mimic [Technologies Inc.] has a mockup of the hardware and costs only $100,000. A study showed a 3% difference in results before a $600,000 simulator and a $100,000 simulator. Then there’s [Simulated Surgical Systems LLC] ROSS system for about $100,000. Each center has its preference.”

10. Robotic obstetrician and gynecologist at an Eastern health clinic; MIS Week conference interview

This surgeon does approximately 200 robotic GYN surgeries a year. She is doing fewer lap surgeries, although lap is medically and financially beneficial for smaller tubal work. Robotics offers some advantages for the appropriate surgery: increased visualization by a factor of 10; more dexterity for pelvic work; and less bleeding. The two hospitals represented by this source have full robotic schedules.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?

- “I work at one hospital with one robot, a second hospital with two robots. I don’t know of any plans to acquire more.”

2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?

- “I do about 200 robotic cases a year. That is consistent. I used lap surgery more a few years ago than I do now.”
- “I don’t know the hospitals’ case loads.”

3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?

- “I’ve heard of one general surgeon learning to use the robot for hernias, but I’m not sure how that is working out. It would all depend on the skill of the surgeon.”

Robotics serves a very definite place in surgery. It is another tool that we can use, when appropriate. Robotics is good for some moderate GYN surgeries. However, lap works for the small GYN surgeries, like tubes. It is less expensive.

Robotic Obstetrician & Gynecologist
Eastern Health Clinic
4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you doing benign?
   ▪ No answer.

5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   ▪ “I don’t pay attention to this.”

6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   ▪ “The same code is used for both, so they are reimbursed the same.”

7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   ▪ “I don’t do surgeries every day nor even every week. I am able to schedule a robotic time when I need it, but the robots at both hospitals are used consistently.”

8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   ▪ “I can’t address purchase issues, but I can say that the cost is definitely worth it in some surgeries. The 3D camera magnifies by a factor of 10, allowing us to see the anatomy far better than we could before. The robot allows for a lot more dexterity, which is important in pelvic work. And we have 10% less blood loss after robotic surgery than we do during open surgery. You have to look at all of those hidden costs as well when making a cost-management decision.”

9. What is your prediction for continued use and expansion of robotic surgery?
   ▪ “Robotics serves a very definite place in surgery. It is another tool that we can use, when appropriate. Robotics is good for some moderate GYN surgeries. However, lap works for the small GYN surgeries, like tubes. It is less expensive.”

11. Robotic gynecologic oncologist for an Eastern hospital system; MIS Week conference interview

This source performs an average 300 robotic procedures a year, and expects this number to remain stable because of the finite number of women who have uterine cancer. He averages three robotic surgeries a day but could do as many as four to five, depending on the procedure. Older, sicker GYN patients recover more quickly when they have robotic surgery. Robotics will continue to grow in complex cases that benefit from 3D visualization, such as colon resections and spinal fusions; however, robotics is not beneficial for cholecystectomies.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   ▪ “We acquired our first robot in 2007, and now have three. They are in active use, with 40 users. I actually have access to five robots, counting another center.”
   ▪ “I don’t know of any plans to buy another robot.”

2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   ▪ “In 2012, we did 300 GYN, uterine cancer procedures. I average 300 per year, and 2013 will be the same. I imagine 2014 will be steady as well. There is a finite number of people who need this procedure. There are fewer uterine cancer cases than some other types of cancer.”
   ▪ “It’s hard to say overall what the hospital does. Maybe 1,000 cases per year? Our practice does 600 robotic procedures per year, and there are three of us. We are very busy.”

3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   ▪ “Robotics is being used more frequently for colon resections, transaxial thyroids, and anterior fusion of the spine. I see colon resections growing, also bariatric surgery and complex cases that require better visualization.”
   ▪ “Robotics offers zero advantage for cholecystectomies. It is too expensive. The equipment alone costs $2,000 per case, even for single site. And lap single-site choleys are very quick to do.”
   ▪ “I’m not sure how robotics is working for esophageal and heart surgeries.”
4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you doing benign?
   - “We do benign, but I specialize in oncology.”

5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   - “We are not affected by the negative press.”

6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   - “Both [robotic and laparoscopic] procedures are reimbursed the same, so the extra cost of robotic surgery is a big issue.”

7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   - “The machines are in use all the time.”
   - “I average three robotic surgeries per day. Depending on the surgery and difficulty of the procedure, I could do up to four to five in one day. It’s a matter of scheduling.”

8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   - “My patients have significantly [shorter] hospital stays. They are usually just in overnight, then home.”

9. What is your prediction for continued use and expansion of robotic surgery?
   - “Robotics has become a valuable tool. We’ve gone from the cowboy attitude to having everyone being trained.”
   - “Robotics is a game-changer for radical surgery. Sixty percent of my patients never take a pain pill. The robotic torque causes less local tissue damage, less invasion. My older, sicker patients do quite well with robotics.”

10. Miscellaneous
    - “I don’t think Intuitive staplers will be a big deal or grow their business. Staplers are very important, but there are a number of brands out there that work well with the robot.”
    - “We do not use robotics for tubal ligations. That’s a lap surgery.”
    - “Sometimes the arms become misaligned, and the surgeon can lose sight of where he is. Surgeons are assistant-dependent. With the robot, there is no assistant to guide you. When I teach, I train the novice without an assistant.”
    - “The surgeon needs to understand the technology first and become proficient. There is a learning curve, and it is easier for the novice to learn. Unlike the experienced surgeon, the novice surgeon doesn’t have habits to unlearn.”

12. GYN surgeon who does robotic surgery at a private Eastern hospital, receives ISRG remuneration for lectures

This source said he can do about four or five robotic hysterectomies a day for benign cases. The three robots at his hospital are in use about 85% to 90% of the time. Utilization has been increasing every year.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “Three.”
   - “I would imagine at some point they probably will.”

2. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “I don’t know the answer to that.”
   - “I did about 150.”
   - “Definitely higher.” [Do you know how much higher?] “No. This year we had the surgeons who started using it. It just gets used more and more every year. Adoption goes up.”
   - [How many surgeons are using it?] “Probably about 35 at my hospital—urology, GYN and general surgery.”

3. Do you see regular usage of your DV robot outside the gynecological department? If so, which general surgery procedures are gaining the most traction?
   - “Gallbladder and colorectal.”
4. What percentage of hysterectomies performed at your hospital are for benign rather than malignant cases? Are you doing benign?
   - “A lot of the malignant ones go to [another hospital] so I’d probably say 80% or 90% are benign. Those we know upfront are malignant] we send to an oncologist. That’s all I do: hysterectomies and myomectomies.”

5. Does the recent AAGL study and press around robotic efficacy and costs influence your hospital’s DV usage?
   - No answer.

6. How does reimbursement for a DV hysterectomy procedure compare with the laparoscopic procedure? How do you expect this to trend over time?
   - “It’s the same. You get paid the same amount of money no matter how you do it.”
   - “I think more and more people will have robotic surgery over time. I doubt that [payment for it will go up].”

7. What is the capacity utilization of the robot/s at your hospital? What is the max number of procedures per year you think the robot can handle?
   - “Pretty much like 85% or 90%. Ours are pretty busy.”
   - “I can do four to five hysterectomies a day.”

8. Is ROI/cost management becoming a factor in either the use of the robot or the purchase of an additional or first robot?
   - No answer.

9. What is your prediction for continued use and expansion of robotic surgery?
   - “It’s going to go up.” [Do you think it will expand into other areas?] “I don’t know. It can’t be used in all the fields right now the way it is, so maybe not.”

13. Non-da Vinci user, laparoscopic GYN at a rural hospital in the South; MIS Week conference interview

Robotics is so expensive that it is not sustainable, especially in small, rural hospitals. Surgeons are not fully trained in the technology, and the robotic instrument has insulation issues. Conversely, laparoscopic surgery is very efficient and economical.

1. Why do you not use the DV robot? Are you considering getting robotic training? Why/why not?
   - “We work out of a small rural hospital, with no robots. Robotic surgery is done at the larger hospitals.”

2. Does your hospital/surgery center plan on buying a DV robot? If not, why?
   - “This is not something that we could possibly afford.”

3. Do you consider the efficacy of open surgery, lap surgery, and robotic surgery outcomes largely similar, or is one of them better? What about procedure cost and patient care cost? Which method offer an advantage?
   - “Robotic surgery offers good magnification, but in some cases I would say it offers too much magnification.”
   - “Robotic surgery is too expensive. Intuitive’s drapes cost upward of $800. If you use a number of drapes, the surgery cost is that much more expensive. I don’t believe robotics is sustainable.”

4. Do you have patients asking for robotic procedures?
   - “No. We have been doing laparoscopy surgeries very efficiently for a number of years now.”

5. Have you seen a drop-off in patient volume at your hospital/surgery site given that you do not offer the da Vinci?
   - “Our patients have been coming to us for years. They know us, we know them. The robot has not affected what we are doing.”

6. With the recent negative press and studies associated with robotic surgery, have patients or your hospital expressed more interest in open or lap procedures?
   - “We don’t pay too much attention to the press. But if there is any negative press, the [robotic surgeons] are almost screwing themselves.”

7. Miscellaneous
   - “There are two basic problems with robotics, other than expense: 1) Physicians are not trained, and 2) there is a fatal flaw in Intuitive’s insulation, causing problems.”
2) GENERAL SURGEONS
These 23 sources represent 24 hospitals and 58 da Vinci Robots. (We interviewed 19 of them at the Minimally Invasive Surgery Week conference in August.) Twenty-one sources expect use of robotics to grow; nine predict a slower growth rate, and two expect flat robotic procedure counts. Only three sources expect to purchase new da Vinci robots in the near future; most other hospitals are meeting demand with their current systems. Colorectal surgery is the fastest growing general surgery to use robotics. Fourteen sources perform robotic single-site cholecystectomies, but 10 said doing so is not as efficacious as the lap method. Of the 17 sources discussing procedure run rates, 12 expect an increase, four a plateau and one a decline.

KEY SILO FINDINGS
1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - 23 general surgeons representing 58 da Vinci Robots at 24 hospitals were interviewed. Sources ranged from residents and fellows to seasoned experts with extensive robotic experience.
   - 5 hospitals purchased additional robots while 1 acquired its first robot in the last 12 months.
   - 3 are considering or planning the addition of a new da Vinci in the near future.
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - 5 sources provided 2012 da Vinci procedure counts in the 108 to 1,100 range. 2 of 4 others said hundreds of procedures are performed at their hospitals each year, another said robot usage is “smoking,” and another said getting robot time is hard.
   - 1 pediatric general surgeon said the robot assigned to his division was underutilized because of the lack of small instrumentation appropriate for children. He said Intuitive is working on a solution.
   - 14 sources provided annual 2012 personal da Vinci procedure data that ranged from 15 to 450. The total was 2,290 procedures, and the average, 164.
   - 17 da Vinci users commented on future run rates for their hospitals: 12 expect an increase, 4 flat and 1 a decline.
3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   - Key general surgeries performed with the da Vinci include colorectal, hernias, choleys, cardiac, thoracic and ENT.
   - Colorectal is the fastest-growing general surgery to use robotics (10 sources). Cardiothoracic (9 sources), hernia repair (7), and choleys (6 sources) also are turning to robotics, but 10 sources said laparoscopic-performed choleys are as good or better and at a lower cost.
4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - General surgeons had little knowledge of reimbursement rates, but 7 said rates were the same for robotic as for other surgery methods.
5. Do you or are you planning on using Intuitive’s surgical stapler?
   - 1 source is using the stapler, 1 has just purchased it, and another expects delivery next month. It is too soon to tell if it will drive additional use of the da Vinci system.
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   - 14 sources are using the da Vinci for single-site cholecystectomies, 2 are not and 7 did not comment.
   - 10 sources (including 8 who perform robotic single-site choleys) said laparoscopic cholecystectomies are as good or better and less costly.
7. What is your prediction for continued use and expansion of robotic surgery?
   - 1 expect rapid growth for the use of robotics.
   - 11 expect the use of robotics to continue to grow.
   - 9 expect growth but at a slower pace.
   - 2 expect usage to be flat.
8. Miscellaneous
   - 7 sources discussed training. 4 mentioned limited access to training, 2 said new resident population is ahead of the training curve, and 1 source saw no training issues.
   - 3 general surgeons complimented da Vinci’s ergonomics for users.
1. General surgeon who does robotic surgery at an academic medical center

Intuitive Surgical will turn around its problems once it has competition. This source’s hospital, which has two robots, soon will offer single-site robotic choleys. It currently provides robotic GYN, urology as well as other general surgery procedures.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “Two.”
   - “Not for the immediate time being.”
   - “The current complement of robots seems appropriate for the volume we have; in fact, we just got our second one. I think it was about a year ago.”

2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - “In our institution, probably about 1,100.”
   - “In one year in 2012, probably about 120.”
   - “For 2013, we are certainly on the increase because of the additional robot that we got [which has] definitely allowed us to do 30% to 50% more than previous years.”

3. What are key general surgery procedures DV can be and is used for? Which is growing fastest?
   - “Specifically for general surgery, the indications we use it for and have found it most useful for are in the foregut, hiatal hernia repairs, the Heller myotomy as treatment for achalasia. It’s also most useful in the colorectal realm for the lower anterior resections, and for abdominal perineal resections for the treatment of rectal cancer; and then thirdly in the hepatobiliary area for distal pancreatectomies, and the Whipple procedure or pancreatic duodenectomies for treatment of pancreatic cancer.”
   - “Colorectal is probably growing fastest; I’d say that due to the sheer colorectal volume. [Also] in 2012 in the U.S. only, 30% of all colectomies were being done laparoscopically because I think people still find it technically challenging to do colorectal surgery laparoscopically, whereas the robot allows them to do so with greater ease and facility.”

4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - “It is about $1,000 for a single-site cholecystectomy whether it’s being done robotically or not robotically; it’s actually less for multiport.”
   - “I don’t know those numbers [for colorectal/LAR] offhand.”

5. Do you or are you planning on using Intuitive’s surgical stapler? Is the surgical stapler likely to drive more use of DV in general surgery procedures?
   - “We are very excited to use it. ... The stapler really allows you the kind of dexterity and angulation to get in tight corners in both the upper abdomen as well as the pelvis.”
   - “I don’t know that it’s going to be a big driver for that. It will just help facilitate some of the existing things. There might be a marginal increase. I don’t think it’s going to be dramatic.”

6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   - “We are not [doing any robotic surgery] for cholecystectomy.”
   - “We are about to start that program [in about two months].”
   - “I’d say that the usage is driven by patient interest in having single incision surgery at this point.”

7. What is your prediction for continued use and expansion of robotic surgery?
   - “We will likely continue to see the rapid growth that we have seen in recent years, and it will be primarily because of growth in general surgery. I do think though that the current [da Vinci] robotic system is only a kind of introduction to the future of surgical robotics. What I mean by that is that I think the next generation of robotic systems will look and feel very different than the da Vinci system; it will [eliminate] a lot of the current limitations of the da Vinci system, such as its bulk and its inability to do multiquadrant surgery.”

8. With the recent negative press and studies associated with robotic surgery have patients or your hospital expressed more interest in open or laparoscopic procedures?

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General Surgeon
Academic Medical Center

I do think though that the current [da Vinci] robotic system is only a kind of introduction to the future of surgical robotics. What I mean by that is that I think the next generation of robotic systems will look and feel very different than the da Vinci system.
“No, I would not say it has had an effect on the interest or retraction of doing robotics. I’d say the only thing that it has done is perhaps ... made people recognize that just the presence of the robot is not going to make a poor surgeon into a good surgeon; that is, you still have to have every bit of attention to detail [and] carefulness as you would for any other surgical procedure. It’s very easy to cause harm with a scalpel as it is with a surgical robot. And so ... [robotic] surgical cases just like any other must be closely monitored.”

9. **When will Intuitive Surgical reverse the recent trend of declining sales, slowing procedure growth, increased FDA scrutiny and patient lawsuits?**
   - “As a rough guess, I’d say five years. I think they will do it frankly when there is competition.”

10. **Miscellaneous**
    - “There is a growing use for da Vinci in single-site surgery. Right now [in general surgery], it’s limited to treatment of gallbladder disease—that is, single-site cholecystectomy, but there’s interest in expanding it to other conditions.”
    - “[Single-site would] probably ... be very good [for doing a right hemicolectomy]. ... The thing that would be harder is total abdominal colectomy.”

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**2. Robotic general surgeon at an East Coast university medical center; ISRG consultant; MIS Week conference interview**

Although surgeons are limited in the number of surgeries—robotic or lap—they can do in a year, this source expects robotic procedures to continue to grow. He personally averages 450 robotic surgeries a year. Along with this growth will come increasingly relevant commercial products or services. Intuitive’s surgical stapler is just being introduced, and its efficacy still needs to be studied. Intuitive also offers Firefly fluorescence imaging, a near-infrared technology made by Novadaq Technologies Inc. (NVDQ) that allows surgeons to view anastomosis sites and some cancer areas during the surgery. Robotics is growing in colorectal and thoracic surgery. This hospital uses robotics for single-site cholecys.

1. **How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?**
   - “We have four. We just purchased two dual-console robots last year, and we hope to become a national training center.”

2. **How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?**
   - “I perform several hundred each year, upwards of 450. This year will be higher than last year; I’m not sure of the percentage but not much. We only have time for so many surgeries in addition to our other duties.”
   - “Surgeons at our hospital have performed more than 2,000 robotic surgeries collectively. I don’t know how many total robot surgeries they do each year.”

3. **What are key general surgery procedures DV can be and is used for? Which is growing the fastest?**
   - “Robotics is growing in colon and rectal surgery, especially for low anterior resections and perineal resections. Lap surgeries have been unsatisfactory, with high open conversion rates, poor excisions, and increased nerve injury.”
   - “Our hospital performs single-site cholecystectomies, thoracic, GYN and urology. Thoracic surgeries are increasing, and our cardiac patients have fewer problems with atrial fibrillation.”
   - “I perform abdominal surgeries, colorectal, colon cancer, sigmoid colectomies.”

4. **What is the reimbursement rate for cholecystectomies and colorectal/LAR?**
   - “I’m not sure.”

5. **Do you or are you planning on using Intuitive’s surgical stapler?**
   - “We don’t use Intuitive’s surgical stapler. There are not a lot of papers out on the robotic stapler. This still needs to be studied. It is just being introduced, and not a lot of centers have it.”
   - “The [Johnson & Johnson’s/JNJ] Ethicon EndoPath Stapler is used for lap stapling. You can tell the appropriate thickness of the load, and it gives a good staple line.”
   - “The use of Intuitive’s Firefly fluorescence imaging helps surgeons determine if anastomosis sites are secure. Firefly uses near-infrared technology to light up the anatomy. It also allows the surgeon to more easily identify cancerous areas.”

Robotics continues to offer advantages to surgery. It will continue to expand, and with it will grow new technologies.

Robotic General Surgeon & ISRG consultant
East Coast University Medical Center
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   - “We use robotics for single-site choleys. I have done some of these surgeries. The surgery is done via the belly button and leaves almost no scar.”
   - “I don’t know if this use is rising in the hospital; patients may ask for it.”

7. What is your prediction for continued use and expansion of robotic surgery?
   - “Robotics continues to offer advantages to surgery. It will continue to expand, and with it will grow new technologies.”

8. Miscellaneous
   - “One hundred percent of the surgeons have back problems or some type of physical discomfort from doing lap surgery. With robotics, we have less pain at the end of the day. However, there are still problems. With robotics, we have twice the discomfort in our necks but less in our shoulders and back. We still need to work on this.”

3. Robotic general surgeon and chief of general surgery at an East Coast university center; MIS Week conference interview

Robotics has significantly increased since 2007, and will continue to do well for selected surgeries. It will be an extension of lap surgery, not a replacement, and will be useful in cardiac, thoracic, colon, and head and neck cases. This source has noticed quicker recovery in patients who have robotic lung surgery. He averages 300 robotic cases a year, and believes the system becomes cost-effective at 200 cases a year. Most residents are being exposed to robotic surgery, and consistent teaching programs are important.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “We have one old robot and one new.”

2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - “I steadily do 300 cases a year. It is hard to do more than three cases a day.”
   - “If you do 200 cases per year, you get your money’s worth.”

3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   - “Robotics may be a better platform for thoracic surgery. These cases have increased exponentially. It is also growing for cardiac, colon, and head and neck surgery.”
   - “Patients with robotic lung surgery have shorter hospital stays. This has been reduced from nine days to 4.5 days.”
   - “The mitral valve replacement patients aren’t recovering as fast as you would think [with robotic surgery]. I think it has to do with recovering from the bypass pump.”
   - “Good robotic surgeries to practice on include gastric bypass, hernias, pancreatectomies, and colorectal surgeries.”
   - “A lot of pediatric procedures are being done, but the size difference makes peds surgery a bit more complicated.”

4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - “There is no increased reimbursement for robotic surgery for either the surgeon or the hospital.”

5. Do you or are you planning on using Intuitive’s surgical stapler?
   - No answer.

6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   - “We practice with choleys, but they don’t provide experience or value for the residents.”

7. What is your prediction for continued use and expansion of robotic surgery?
   - “Robotics has significantly increased since 2007. It will continue to do well in the future, but for select surgeries. There will always be a need for laparoscopic surgeries. Robotics is not a replacement.”

8. Miscellaneous
   - “I’m not sure robotics has reduced our overall costs. We need to look carefully at all the disciplines.”
"There is a mechanical risk to the robot. It can fail."
"Robotics has penetrated our teaching programs, and residents are ahead in the learning curve. According to studies, 96% of residents have touched a robot, even if it is not required; 63% are involved in cases; 25% have had simulator training."
"We need mandatory hands-on learning and specificity training."
"We also need to train staff and develop teams because robotic surgery requires skilled team work."

4. Robotic general surgeon at a Midwest university medical center; MIS Week conference interview
Robotics is slowing down, but competition and lower prices would broaden the field. Robotic surgery is a lap extension rather than a replacement; it is another tool to use for specific surgeries. The source’s use of robotic choleys has decreased because the technology offers no advantage over the lap method. However, the source cited robotics growth in colorectal, cardiac, and thoracic surgeries.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   "Our hospital has several [three] robots that are all in use. I don’t know if they will buy another. The robots are at 70% to 80% capacity."

2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   "I do a lot of robotic surgeries in a year, an average of two cases a day."

3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   "At our center, colorectal, cardiac, and thoracic robotic surgeries are growing."
   "We use robots for some cholecystectomies and Nissens. But we are finding that the Nissen takes five hours, and the robot doesn’t help us get better placement. We use lap surgery for the Heller myotomy to treat achalasia."

4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   No answer.

5. Do you or are you planning on using Intuitive’s surgical stapler?
   "We just got the stapler, but I haven’t used it yet."

6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   "We are decreasing robotic use for choleys because there is no advantage over lap. We can do choleys faster with lap surgery, but we haven’t gotten the stoplight yet."
   "We don’t do single-site lap or robotic choleys. If you put an 8- to 12-mm camera in a hole plus two or three arms at 8 mm each, then you create a 36-mm hole versus a 27-mm hole for lap surgery. We’ve heard about the problems with hernias too."

7. What is your prediction for continued use and expansion of robotic surgery?
   "They are marketing robotics wrong. It is not a laparoscopy replacement; robotics is just another tool, a laparoscopic extension."

Robotics may not grow as quickly as it did at first. If the price were more reasonable and if there were competition, robotics would be more likely to grow.

Robotic General Surgeon
Midwest University Medical Center

5. Robotic general surgeon for an Eastern private practice; MIS Week conference interview
Intuitive has a firm grip on the U.S. market but, as in Europe, competition is coming. Robotics is really a niche application; a robot is not needed in every operating room. Robotics makes “economic sense” for complex procedures like colorectal surgeries, but it is not as worthwhile in simple surgeries like choleys; insurers should reimburse costs accordingly. The Intuitive stapler will not drive the company’s market.
1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   ▪ “We have two robots, and we are not considering a third. Two is all we need.”
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   ▪ “I do 100 procedures a year, a few a week; I’m not sure what the hospital does.”
   ▪ “The robots are used 100% of the time.”
3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   ▪ “Robotics could be very useful for colorectals.”
   ▪ “Around here, we all do a little of everything. I’ve done some GYN, prostates, even some colorectals.”
4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   ▪ “Insurers should only pay for those robotic surgeries that are necessary and make economic sense. In these cases, they should also be willing to pay the entire robotic cost.”
   ▪ “Cholecystectomies don’t make economic sense; colorectals do.”
5. Do you or are you planning on using Intuitive’s surgical stapler?
   ▪ “Intuitive does not have a universal stapler. Their stapler is an improvement, but it will not drive their market.”
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   ▪ “Intuitive trains people on the robot with cholecystectomies. They do 500,000 choleys per year. They are plugging it. There are a lot of choleys done each year in the United States, and they want to keep using their device for it. They make a boatload of money on choleys, which are better and more cheaply done laparoscopically.”
   ▪ “I try not to do robotic choleys.”
7. What is your prediction for continued use and expansion of robotic surgery?
   ▪ “There is more competition outside the U.S., and Intuitive has a stranglehold here. But clever people are working their way around this.”
   ▪ “It is here to stay in its present embodiment, despite the awful prices and high cost of disposables.”
   ▪ “It is a technical advance, but despite what they tell us, we don’t need a robot in every OR. Robotics will not replace everything. It has true virtue, such as the enhanced visualization system, but it is a niche application.”
8. Miscellaneous
   ▪ “Gaining access to the technology in order to train is limited. The technology is challenging for some, those who are less skilled.”

6. Sharona Ross, robotic general surgeon at Florida Hospital, ISRG consultant; MIS Week conference interview

Dr. Ross cited a need for robotic, laparoscopic as well as single-site surgeries; one procedure type cannot be applied to all cases. After completing a robotic fellowship last year, she has done 45 robotic procedures, most of them complicated cases. Robotics is beneficial for esophageal and colorectal surgery, Whipples, and people with high BMI, but laparoscopic is ideal for simple surgeries such as cholecystectomies. She is working with Intuitive to develop a fellowship program to train new surgeons on specific robotic applications. Other medical centers are specializing in specific complex robotic surgeries. Healthcare reform presents a concern for reimbursements.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   ▪ “We have several robots, and we are now buying a simulator so that we can offer a one-year robotic fellowship.”
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   ▪ “Our practice only started doing robotics seriously in 2012, for about a year now. We tried robotics a few years before that, but it didn’t make sense. I’ve done 45 procedures this past year, and yes, it will be many more next year. Before that, we did procedures in a fellowship.”
   ▪ “The hospital does other robotic procedures. I don’t know how many surgeries they do.”
3. **What are key general surgery procedures DV can be and is used for? Which is growing the fastest?**

   - “Robotics is good for esophagogastrectomies, where you remove part of the lower esophagus and stomach. Robotics allows you to see well. It is all done via the abdomen, so you don’t penetrate the pleural cavity and the patient doesn’t need chest tubes. This is big. It’s a much easier recovery for the patient.”
   - “Robotics is also ideal for colorectal surgeries. You can be more focused.”
   - “We now do our Whipples robotically. The patients do so much better than after an open surgery, and they have less pain. Because of the faster recovery, they can start chemotherapy sooner.”
   - “Patients with a high mass body index, especially those whom you speculate may need open surgery, do better with robotics.”
   - “I do hepatopancreaticobiliary [HPB, liver pancreas, bile ducts, gallbladder] or upper GI surgeries, Whipples for pancreatic cancer, colon resections, and esophagus.”

4. **What is the reimbursement rate for cholecystectomies and colorectal/LAR?**

   - “I don’t know. But with the new healthcare reforms, we will need innovation. This is a major concern.”

5. **Do you or are you planning on using Intuitive’s surgical stapler?**

   - “Intuitive is still developing its stapler. It is only approved for colorectal surgery right now, although they expect approval for other applications soon.”

6. **Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?**

   - “A robotic cholecystectomy doesn’t make sense. This procedure is done quickly and safely using an epidural and a single-site lap procedure through the belly button. We do not use robotics for choleys. We really care to keep the cost down.”
   - “Everyone trains on robotics with choleys. That makes sense because these surgeries are common and easy to do. It is good beginning training, but that doesn’t translate into continuing to do robotics on the gallbladder.”

7. **What is your prediction for continued use and expansion of robotic surgery?**

   - “There will be a role for each type of surgery, robotic, laparoscopic and single-site. You can’t apply one type of surgery to every procedure.”

8. **Miscellaneous**

   - “Robotics came out in 2007, but it didn’t make sense to me until this year. A single-site lap surgery is good in patients with a lower BMI. However, it is less safe in patients with more BMI. Yes, it is harder on the surgeon too. In some larger patients, you have to convert from lap to open, but the robotic allows you to work safely on patients with a high BMI and to view the anatomy in 3D.”
   - “Some of our patients need Whipples for pancreatic cancer. In the past, that surgery was always done as open surgery, and it would take six to seven hours. We’ve heard of a top surgeon at the University of Pittsburgh who did robotic Whipples in much less time. We paid to do a fellowship with him, and then we took his technique and perfected it for our patients.”
   - “Intuitive came to us, and we are now developing a one-year HPB lap and robotic fellowship for Intuitive based on what we’ve learned. Starting next year two fellows will train on a simulator, working from a pig to a cadaver before working on a dual console. They will need to score 90 before moving to the next stage.”
   - “Orlando has a huge robotic colorectal program.”

7. **Robotic general surgeon at a large Midwest medical center, MIS Week conference interview**

   Robotics will not be a standard approach to all surgeries; rather, it will be used for cases that are difficult to see and approach. As a new staff member, this source has done 50 robotic procedures, mostly upper gastrointestinal, liver and pancreas, and he expects this number to grow each year. Robotic use also is increasing for foregut surgeries, including for the stomach and for hernia. Cholecystectomies are easy lap procedures; reported resultant hernias are not caused by the robot. This center soon will be getting the Intuitive stapler.
1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “The clinic has eight robots. Six are in-use and two are used for training. I don’t know if they will acquire another.”
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - “I have just started as a staff member and have done 50 cases total. I did 15 to 20 cases in 2012, and about one a month this year. I expect this number to continue climbing.”
   - “I have no idea how many cases the hospital does.”
3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   - “Robotics will be for selected use rather than for standard procedures.”
   - “I hear rumblings about robotic use in the foregut, stomach, inguinal hernia.”
   - “I do upper GI, pancreas, and liver. The robot helps with visualization for this area.”
4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - “Reimbursements are not different. There is no change for single-port or operative outcome.”
5. Do you or are you planning on using Intuitive’s surgical stapler?
   - “I haven’t used this yet. We are supposed to get the Intuitive stapler next month. I’m not sure what will happen.”
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for cholesys, why not?
   - “For choleys, it is hard to predict how well the robot will do. That’s a lot of instruments in a single-site hole, with such a low margin of improvement in outcomes versus lap surgery. Plus, there’s the added cost. I doubt if the robot will be used frequently for this or could improve on this. Choleys are really a very standard lap surgery.”
   - “Fellows train on robotics by doing cholecystectomies. That’s maybe why there is interest in this surgery. It is really a training procedure, not something that is done on a regular basis.”
   - “Data shows an increased incidence of hernias following single-site cholesys, but I doubt if that is related to the robot.”
7. What is your prediction for continued use and expansion of robotic surgery?
   - “Early-generation robotics will improve. There are definitely applications for robotics in selected patient groups, but it may not be a standard approach to all surgeries.”

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8. Robotic general surgeon at an East Coast surgical center; MIS Week conference interview

Robotics use is stabilizing because the major application areas—urology and GYN—have reached capacity, and other areas are slowly incorporating the technology. The source’s practice averages 200 robotic cases a year. Robotics will not experience growth again until the cost is reduced. Patients no longer ask for robotics, but they are happy with the cosmetic benefit following single-site cholecystectomies. However, the source has not noticed a speedier recovery or less pain following this type of surgery. Resultant problems with hernias following single-site cholesys may be due more to surgery closing by a junior resident and less because of the robot.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “Our practice has one robot, which we have had for four years. We are comfortable with the cases we do and do not anticipate the need for another robot.”
   - “Our local hospital also has one robot. Sometimes we get a call from them about a gap in their [robotic] schedule. They’d like us to fill in and use their robot.”
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - “We do about 200 cases a year. This increased maybe 5% in both 2012 and 2013. The number of cases we do in 2014 will on depend on the instruments available.”
   - “We do roughly 10 cases a week, and this feels about right. We could do up to 500 cases per year instead of 200, but we are at 70% capacity, which is considered full capacity, and we meet our patients’ needs.”
3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
9. Robotic general surgeon at a Midwest community hospital; MIS Week conference interview

This surgeon averages 400 robotic procedures a year. Despite naysayers and concerns about cost, robotic surgery is here to stay. The technology offers better visualization for more difficult surgeries in addition to ergonomic comfort for the surgeon. Robotic general surgery is on the rise for deep pelvic and colorectal procedures. Single-site lap makes more sense than robotics for cholecystectomies.

1. **How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?**
   - “We have one, and we are talking of buying another one.”

2. **How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?**
   - “I do about 10 robotic surgeries a week or 400 last year. The numbers will be up in 2013.”

3. **What are key general surgery procedures DV can be and is used for? Which is growing the fastest?**
   - “The use of robotics for general surgery is on the rise.”
   - “Robotics will excel in some areas such as deep pelvic, colorectal.”

4. **What is the reimbursement rate for cholecystectomies and colorectal/LAR?**
   - “I’m not sure how often the hospital does choleys with their robot.”

5. **Do you or are you planning on using Intuitive’s surgical stapler?**
   - “I have not used this stapler.”

6. **Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?**
   - “We do use the robot for single-site choleys. Patients don’t ask for the robotic. In fact, we haven’t had a patient ask for robotics in the past few years. But the patients are happy about the cosmetics. However, I’m not seeing a difference in their recovery time or pain level.”
   - “Studies have shown resultant hernia problems, but we haven’t seen that with our patients. I think hernias occur when closing is turned over to junior residents.”
   - “I’m not sure how often the hospital does choleys with their robot.”

7. **What is your prediction for continued use and expansion of robotic surgery?**
   - “Robotics is stabilizing. For it to grow more, the price needs to be reduced.”

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**Intuitive Surgical Inc.**

- “We use the robot primarily for anti-reflux surgery, the Nissen, hernia repairs, and gallbladders.”
- “There is some momentum in gallbladder, but we need to get over the curiosity factor.”
- “I don’t see too many other entities using the robotic much. Urology is all set; GYN has gone as far as it can go. There’s not a high volume in colon, although robotics is good for some colon procedures.”

**4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?**
   - “Lap or robotics, all minimally invasive surgeries are one and the same [for reimbursement].”

**5. Do you or are you planning on using Intuitive’s surgical stapler?**
   - “The Intuitive stapler isn’t readily available. We use another brand.”

**6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?**
   - “We have one, and we are talking of buying another one.”

**7. What is your prediction for continued use and expansion of robotic surgery?**
   - “Robotics will stay. The cost is high, and there are a lot of naysayers. However, the optics are good, and this will be an advantage for some procedures.”

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**Robotic General Surgeon**
**East Coast Surgical Center**

“Robotics is stabilizing. For it to grow more, the price needs to be reduced.”

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**Robotic General Surgeon**
**Midwest Community Hospital**

“I’m doing hands-on training now for single-site lap choleys. I’ve done 10 so far. Choleys can be done quickly with lap, and it is less expensive than robotics. We don’t do many robotic choleys.”
10. Robotic thoracic surgeon at a Southwest university medical center, MIS Week conference interview

Robotics is a game-changer, and the technology will continue to improve. It allows surgeons to address “inoperable” patients, who then have a very good recovery. Robotics also allows different specialists to work together and solve medical problems, thereby enabling even more complex cases. This center has performed more than 500 very complex robotic cases. It does not use staplers, instead preferring hand-sewn closings to avoid any leakage.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   ▪ “We have several, and eventually we could use another. We do a lot of robotic surgery.”

2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   ▪ “Our center performs hundreds of robotic procedures each year. We are always expanding. But you must keep in mind that we do very complex procedures, cases that no one else can do, and it is not a matter of increasing the number of cases we do.”

3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   ▪ “Robotics is growing for cardiac and thoracic surgeries. We do both traditional and closed-chest bypass and valve replacements.”
   ▪ “We have better outcomes with lung surgery because we now have better nodal elimination. We can see the nodes affected. There is little guess work. Robotic surgery is more precise. Robotic nodal dissection may change the epidemiology of lung cancer.”
   ▪ “We have been successful with the Ivor-Lewis esophagectomy. It’s an eight- to nine-hour surgery, but the robotics makes the operation doable. It erases the boundaries between the specialties and gives us the power of colleagues; we are of like mind. The patient is no longer on a ventilator, not in intensive care. We now have a 77% survival at three years, thanks to robotics, with zero local recurrence. The mortality rate has decreased to 6%.”
   ▪ “We do other robotic procedures on the esophagus, but I think it is a mixed bag. We still need to work on the technique. Overall, the surgery is safer with robotics because we don’t have to get near the aorta, and we can see the nodes better and remove them all. … We can’t do that with open surgery; you need the magnification. And with robotics, you don’t have too much bleeding.”
   ▪ “Esophageal cancer has increased 600% since 1978, and this may be due in part to antacid medications. So it is important to find better treatments. Robotically, we can do transabdominal or transthoracic approaches, and it appears that the transthoracic approach has a better survival rate.”

4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   ▪ No answer.

5. Do you or are you planning on using Intuitive’s surgical stapler?
   ▪ “We do not use staples at our center. We do hand-sewn anastomoses. I used to use staples for some surgeries, but staple lines at the top of the stomach may have eventual leaks. Hand-sewn is best; you can avoid the gastric leaks.”

6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   ▪ No answer.

7. What is your prediction for continued use and expansion of robotic surgery?
   ▪ “Robotics will only get better. It is like magic. It’s a game-changer. It’s like working with three hands.”

8. Miscellaneous
   ▪ “After surgery, it usually takes the patients awhile to get back to normal. It is totally different for patients after robotic surgery.”
   ▪ “Before, we had criteria that would determine if we could do surgery on a patient. That list is completely thrown out with robotics. Minimally invasive surgery allows us to do surgery on more difficult patients, safely.”
11. Experienced robotic general surgeon in the South

This general surgeon’s hospital acquired a third robot this year and, as he puts it, all three are “smoking.” He uses the robot for only a few procedures, however, including the Heller myotomy and pyloroplasty. The new Intuitive Surgical stapler will significantly increase robotic utilization for colon surgery and for linear gastrectomies in bariatric surgery.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “Three.”
   - “No. We just bought one this year.”

2. How many DV procedures performed in 2012? At your hospital? By you in particular? What is daily run rate in 2013? Higher or lower percentage than 2012? Will your numbers go up in 2013?
   - “I don’t know. But I will tell you that it’s very hard to get robot time. I would probably do more if it were easier to get robot time. It’s freed up a little bit since we got the third robot. They also upgraded [the two] robots that we had.”
   - “I did probably 15 or 16; for me, it’s kind of a niche.”
   - “Higher [overall but] I have no idea what the numbers are. The two robots we had were pretty much maxed out, and now that we have a third, they are all smoking, ... [As for who uses the robot]: urologists and gynecologists. And a couple of general surgeons have started using it in a limited fashion for gallbladders. One of our colorectal surgeons has started [and one or two others are interested]. I’ve been the only general surgeon using it until this year.”
   - “Probably because I’ve started to use the single incision application. ... Actually, I’ve probably done 15 or 16 cases this year, which is more than last year. About seven were single incision gallbladders.”

3. What are key general surgery procedures DV can be and is used for? Which is growing fastest?
   - “Hiatal hernia operation, gastrectomies; it can be used for gallbladder surgery but that’s kind of a learning [one]. [I have] used it for all the procedures that I mentioned in the past. [Also] adrenalectomy and pyloroplasty.”
   - “In the industry now for general surgery, it would be either colon resection or a single incision gallbladder surgery.”

4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - “I don’t know.”

5. Do you or are you planning on using Intuitive’s surgical stapler? Is the surgical stapler likely to drive more use of DV in general surgery procedures?
   - “I probably won’t, but it definitely will be used a lot for colon surgery.”
   - “Yes, because the surgeon [doing robotic surgery] can use it himself or herself [which is a] huge advantage. Otherwise, you rely on a second surgeon or a surgical assistant to apply and fire the stapler. [In addition to colon surgery], I think it’s also going to very much increase [robotic] use for linear gastrectomies for bariatric surgery.”

6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choles, why not?
   - “I am doing that but mainly for getting familiarity with the instrument as I want to start using it for single incision hiatal hernia operations.”
   - “I’m the only one doing it. [For robotic choley that isn’t single site], it was zero last year; it’s increased slightly [this year]. There’ve been a few done—three or four.”
   - “No. I have been doing single-site [cholecystectomies] for a few years now with or without the robot. [It’s my opinion that robotic surgery] is making single site [choley] easier for surgeons who are not already doing it.”

7. What is the maximum utilization of a DV for general surgery procedures?
   - “That’s highly dependent on the team [in terms of] turning the cases around and what the case is. For prostatectomy at my institution, it would be two or maybe three [per day]; for gynecology, it’s two or maybe three. For the specific operation that I use it for, which is very complex [the Heller myotomy], it’s probably two.”

8. What is your prediction for continued use and expansion of robotic surgery?
   - “I think it’s going to continue; it is still expanding rapidly among gynecologists.”
   - “The robot makes any laparoscopic surgeon better. ... [Yet] while the robot may make a 90th percentile laparoscopic surgeon a 91st or 92nd percentile one, that’s not much of an advantage. But if you are a 30th or 40th percentile..."
Intuitive Surgical Inc.

laparoscopic surgeon and it can make you a 70th percentile—that would enable you to do many operations laparoscopically that you would have to do open if the robot was not available. ... This literally enables many urologists and gynecologists to do a lot of laparoscopic surgery that they were not otherwise doing. ... [The learning curve for doing robotic surgery] is dramatically less steep than the learning curve for complex laparoscopy.”

- “The fact that [the robot] has increased the penetration of minimally invasive surgery for hysterectomy is a huge benefit to patients. ... It’s very much like the prostatectomy. Very few urologists could do a radical prostatectomy [laparoscopically] without the robot. It’s probably like 1%.
- “The robot will enable the 40th or 50th percentile general surgeons [to do single-site cholecystectomies] who don’t feel comfortable doing [them] laparoscopically; [that is,] they can’t do it safely or it takes them so long that they financially can’t do it.”

9. When will ISRG reverse the recent trend of declining sales, slowing procedure growth, increased FDA scrutiny and patient lawsuits?
   - “I really don’t really have a feel for that, but I would say that at my institution the demand for and volume of [robotic surgery] is clearly expanding.”

10. Miscellaneous
   - “My own personal experience is that I tried [robotic surgery], I liked it, but I couldn’t justify using it [except for a couple of procedures]. The reason for that is that, quite frankly, I had already been doing advanced laparoscopic surgery for nine years before robotics became FDA-approved, and was very comfortable with traditional laparoscopic techniques.
   - “There are a couple of procedures, such as a Heller myotomy where the precision [of robotic surgery] has been shown actually in studies—in one big study—to have a lower complication rate for perforation, which is the biggest complication for the operation. And that is a precision that is a clear value added for me at [my] level of laparoscopic experience. [That particular surgical procedure] just doesn’t happen to be a high volume operation in the U.S. For pyloroplasty, which I do in probably 5% of my hiatal hernia operations [robotic surgery] is more comfortable [to do than traditional laparoscopy]—it’s an easier thing to do [robotically].”
   - “The people who beginning to use it now for general surgery [at the hospital where I practice] for colon surgery—I predict that those who ... take a long time to do a laparoscopic colon operation will continue to use [robotic surgery] and people who are real slick with laparoscopy colon surgery probably wouldn’t—they might not even [use robotic] to begin with. One likely exception would be mesorectal resections where the robotic resections show a clear advantage.”

12. Robotic general surgeon at an army medical center; MIS Week conference interview

This new surgeon (20 procedures) hopes to develop more robotic skills and has asked for extended simulator training. At the same time, the robotic fad has worn off for some of the older surgeons. Robotics is growing in general surgery, especially in areas that are difficult to view. The rate of robotic choleses is dropping at this center.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “We have one robot, and we just bought a second.”

2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - “I’ve worked with the robot a little and hope to do more, maybe 20 procedures. I’ve applied for more training on the simulator.”
   - “I don’t know the total number of surgeries the robot has been used for, but some surgeons have stopped using it. The fad wore off.”

3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   - “It gives visibility for deep pelvic surgeries. We also use it for upper GI and choleses, plus urology and GYN. General surgery is growing a bit.”

4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - No answer.

5. Do you or are you planning on using Intuitive’s surgical stapler?
   - No answer.
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   ▪ “We did more choleys last year than this year, but I don’t know the numbers.”
7. What is your prediction for continued use and expansion of robotic surgery?
   ▪ “Robotics will be OK.”

13. Resident in general surgery with robotic experience, Midwest medical center; MIS Week conference interview

Robotics is here to stay. This new resident has observed robotic surgery. The center’s robotic training program is thorough, although getting simulator training time can be difficult. The hospital’s one robot typically is used for urology and gynecology; only recently has it been used for general surgery such as hernias. Robotics will be effective on colon resections; lap surgery will be better for cholecystectomies.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   ▪ “We acquired one robot a few years ago. I don’t know what future plans are.”
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   ▪ “I’ve observed a few cases. I’m not sure how many procedures the hospital does each year.”
3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   ▪ “The robot was solely used for urology and gynecology until recently. It is just starting to be used for general surgery, such as hernias, but we haven’t started colons yet. The anterior resections are more popular for colon resections.”
   ▪ “In urology, there are new dyes [fluorescence] that can help the surgeon distinguish nerves from the ureters.”
4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   ▪ “I don’t know.”
5. Do you or are you planning on using Intuitive’s surgical stapler?
   ▪ “We don’t have it.”
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   ▪ “We haven’t done cholecystectomies yet. The lap procedure takes just one-half hour to 45 minutes.”
7. What is your prediction for continued use and expansion of robotic surgery?
   ▪ “Robotics is here to stay unless we have good evidence that it isn’t effective.”
8. Miscellaneous
   ▪ “I’m going through robotic training now, and it seems thorough. I need to reach 90% on the simulator before the attending will let me start, but it is hard to get simulator time. The robot is also a teaching device.”

14. Resident in general surgery with robotic experience, East Coast community hospital; MIS Week conference interview

This source is in the middle of training and believes robotic cholecystectomies are efficacious and will grow. Robotic training takes time and can be difficult to find at centers that have limited number of cases per month.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   ▪ “We have one robot. I don’t know if we will get a second one.”
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   ▪ “We do eight to 10 cases a month. I think this is consistent from last year.”
   ▪ “I’m still in training and getting the hang of things. I’m still in the learning curve of training. It takes time.”
3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   ▪ “We use ours for urology, gynecology, and general surgery—hernias and cholecystectomies. Our general surgeon is just starting to learn robotics; he’s getting fast.”
4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   ▪ No answer.
5. Do you or are you planning on using Intuitive’s surgical stapler?
   - “We haven’t done the staples yet.”
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   - “Robotic choleys will pick up. It seems like the right way to go, the wave of the future. Intuitive does training on cholecystectomies.”
7. What is your prediction for continued use and expansion of robotic surgery?
   - “Overall, I’d put my money in Intuitive. The industry is driven by surgeons, and they are comfortable with robotics. However, at our facility, robotics is not picking up as much as I expected.”
8. Miscellaneous
   - “Robotics seems less stressful on the surgeon’s back.”
   - “There’s a lot more to process with robotic surgery; more communication is involved. With laparoscopy surgery, you have to be more self-reliant.

15. Resident in general surgery with robotic experience, East Coast surgical center; MIS Week conference interview

Robotics is a growing niche market to be used alongside lap and open surgeries. It is user-friendly, but considerable training is required. Robotics works well on involved surgeries such as colorectals, lobectomies, and hepatobiliary; lap surgery is best for cholecystectomies. Single-port surgeries may work for pediatrics. This source has had problems with the EndoPath Stapler and now believes the fewer staples, the better.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “My current hospital does not have a robot, but they are getting one. My previous hospital had one robot.”
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - “I’ve done several dozen robotic surgeries. I don’t know what the hospital did.”
   - “I’m gaining more skill in lap surgery, until the robot comes in. They are a bit behind, but they have trainers lined up. Then there will be a strong push for more training.”
3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   - “I’ve done colorectals and lobectomies, hepatobiliary surgery, and Whipples. They all work on robotics, although in three cases we had to convert to open surgery because the patients had extensive adhesions.”
   - “I’m not sure about hernia development after single-site surgery. You do have a 10-mm hole. Possibly everyone does single-hole just a bit differently.”
4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - No answer.
5. Do you or are you planning on using Intuitive’s surgical stapler?
   - “There is an increasing trend of using staplers for convenience, but I believe the fewer staples, the better.”
   - “I have not used the Intuitive stapler. I believe it is just coming out.”
   - “We use the EndoPath stapler because there is less operating room time and less hospital stay. It is very easy; even an intern could use it. We had problems with the stapler, however, and there are a few isolated reports of problems in the literature. Some of the staples can have unformed edges or be kinked. After surgery, they will catch on the abdominal wall and twist it. The patient continues to be uncomfortable and eventually needs to go back to surgery. We now double-check to ensure that all staples have uniformed edges, and do a one-second pre-soak to look closely at the staples in place.”
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?

Overall, I’d put my money in Intuitive. The industry is driven by surgeons, and they are comfortable with robotics. However, at our facility, robotics is not picking up as much as I expected.

General Surgery Resident
W/ Robotic Experience
East Coast Community Hospital

Robotics will find its niche and do well, but it needs to be used in conjunction with other modalities such as lap and occasionally, when needed, open surgery.

General Surgery Resident
W/ Robotic Experience
East Coast Surgical Center
17. Pediatric general surgeon with robotic experience, East Coast university medical center

Pediatrics is an untapped area for robotics. Although Intuitive is working on smaller instrumentation, the company will not be a pediatric leader. This source does expect growth in this area for as long as 20 years, at which time cheaper competition will be present. Currently, robotics is only performed on older, larger children, mostly for complex procedures. This center has one robot, and it is underutilized; he has performed or assisted in fewer than 20 robotic cases.

8. Miscellaneous
   - “Robotics is easier for the first-time person, who has not done surgery. It is user-friendly.”
   - “Single-port surgeries may be good for pediatrics.”
1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “We have one robot for peds, and it is underutilized at this time. The smaller instrumentation isn’t available yet.”
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - “I have done five to six procedures and assisted in 12. It will increase, but we need to find the right patients, older, bigger children.”
3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   - “Right now we are doing robotics more for complex procedures in older kids, some colorectals.”
4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - “Same code for both.”
5. Do you or are you planning on using Intuitive’s surgical stapler?
   - No answer.
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleysis, why not?
   - No answer.
7. What is your prediction for continued use and expansion of robotic surgery?
   - “I’m not sure what will happen with robotics for adult surgery.”
   - “[In the pediatric arena] I see robotics overall growing up in 10 to 20 years, but it won’t be with Intuitive. Future applications will be better and cheaper in about 15 years.”
8. Miscellaneous
   - “I don’t see training as being a problem.”

18. Robotic cardiac surgeon for a Southwest university medical center

Robotic will climb to a $15 billion market in the next 10 years. Surgeons would like to see competition in the field; they dislike that Intuitive does not overly support the use of the da Vinci in cardiac surgery. The source cited a high failure rate in cardiac robotic surgery. Cardiac robotic training needs to be enhanced; 500 surgeons were trained, but only 20 still are doing the approach. Also, the anesthesiologist cannot observe the heart during a robotic surgery.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “We have two robots in the operating room and one in the lab.”
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - “We do about 800 robotic surgeries a year. I do around 150 to 170. I can do two procedures a day, but it is hard to be efficient with cardiac. There is also a limit to the number of trained cardiac surgeons.”
   - “It is hard to fill our robot 100%; at 70% we have full utilization.”
3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   - “The failure rate in cardiac is very high. It is a different type of surgery. But I think there is real possibility for minimally invasive mitral valve replacement and cardiac bypass.”
4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - No answer.
5. Do you or are you planning on using Intuitive’s surgical stapler?
   - No answer.
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleysis, why not?
   - No answer.
7. **What is your prediction for continued use and expansion of robotic surgery?**
   - “People are down on Intuitive. They are the only ones on the market, and we’d all like to see some competition. Intuitive does not support cardiac.”
   - “Robotics is a $1 billion market now, and in the next 10 years it is supposed to climb to $15 billion.”

8. **Miscellaneous**
   - “Surgeons get woefully inadequate robotic training. You need more than a short mentor relationship and a two-day course.”
   - “Five hundred cardiac surgeons have been trained on robotics, but only 20 are still using it.”
   - “Minimally invasive heart surgery is hard on the anesthesiologist because he can’t see the heart.”

19. **Robotic pediatric cardiac surgeon at a Southwest university medical center; MIS Week conference interview**

Growth in pediatric robotics, especially cardiac surgery, is limited to the current larger instrument and cannula sizes. Intuitive Surgical is developing smaller tools for pediatric surgery, and the field may grow in the future. Patient recovery from even robotic cardiac surgery is hindered by use of the bypass machine; determining the cost-effectiveness of robotics in pediatric cardiology will take time.

1. **How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?**
   - “We have two or three robots used for surgery and study.”

2. **How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?**
   - “This is a limited field, and robotics is relatively new to pediatrics. Right now the number of robotic procedures are limited, but they will be growing.”

3. **What are key general surgery procedures DV can be and is used for? Which is growing the fastest?**
   - “I use robotics for epicardial or bypass grafting, left ventricular assist devices, and intracardiac valve repairs.”

4. **What is the reimbursement rate for cholecystectomies and colorectal/LAR?**
   - No answer.

5. **Do you or are you planning on using Intuitive’s surgical stapler?**
   - No answer.

6. **Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choles, why not?**
   - No answer.

7. **What is your prediction for continued use and expansion of robotic surgery?**
   - “Robotics is growing very slowly in pediatrics, especially cardiology. With children, we need smaller instruments and cannulas, and they haven’t been developed yet. We are limited by size, but they are becoming smaller. It is on the horizon; Intuitive is working on this.”
   - “It is hard to tell at this point if robotics will be cost-effective for pediatric cardiology. However, robotic general surgery for pediatrics has positive benefits. We hear that patients recover faster. And parents can go back to work more quickly, so that is a hidden cost benefit.”

8. **Miscellaneous**
   - “Any cardiac surgery (except vascular ring and patent ductus arteriosus) requires the use of the bypass machine. This slows down recovery of even minimally invasive surgery.”

20. **Bakır Altai, robotic cardiovascular surgeon for an East Coast private practice; MIS Week conference interview**

Robotic surgery will continue to grow, but Intuitive’s equipment is so expensive that many smaller centers cannot afford to adopt the technology. Robotics offers the precision that cardiac surgery requires; it also is beneficial for thoracic
surgery. This experienced surgeon continues to work on his skills. His medical center overall consistently performs 20 to 30 robotic procedures a month.

1. **How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?**
   - “The smaller hospital I am at doesn’t have a da Vinci. The medical center has one.”

2. **How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?**
   - “The medical center does 20 to 30 robotic procedures a month. Pretty steady. They have four to five surgeons trained, and I continue to work on my skills.”

3. **What are key general surgery procedures DV can be and is used for? Which is growing the fastest?**
   - “Robotics is best for cardiac because it gives you better precision. It is also good for thoracic surgeries like lobectomies.”

4. **What is the reimbursement rate for cholecystectomies and colorectal/LAR?**
   - No answer.

5. **Do you or are you planning on using Intuitive’s surgical stapler?**
   - “We don’t have this stapler.”

6. **Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for cholesys, why not?**
   - No answer.

7. **What is your prediction for continued use and expansion of robotic surgery?**
   - “Robotics has a future in surgery. This is just the beginning, and it is always slower in the beginning.”
   - “Intuitive is too expensive. They lose some patients because centers cannot afford the device. It’s a financial issue.”
   - “I would like to see robotics keep growing, and I would like to have them expand to the Middle East. I would like to help the medical situation in the Middle East.”

8. **Miscellaneous**
   - “I used one of the first surgical robots 15 years ago. The AESOP Robotic System, the first-generation surgical robot, was developed by NASA. It is a voice-activated system used during laparoscopic surgery.”

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**21. Robotic ENT surgeon for an East Coast university medical center; MIS Week conference interview**

Intuitive Surgical will continue to successfully push robotics for a few years, until competition enters the field. Robotics is very expensive and should be restricted to very complex cases or difficult-to-access cases, such as in the deep pelvis. It is hard to justify paying for cosmetic procedures with public money. However, robotics is beneficial when working with obese patients. This source does an average 200 cases a year, and said robotics is growing in otolaryngology.

1. **How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?**
   - “We have three robots; two new robots are dual-console for teaching.”

2. **How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?**
   - “I do up to 200 robotics a year. With the new robots, I might increase this a bit by next year.”

3. **What are key general surgery procedures DV can be and is used for? Which is growing the fastest?**
   - “Robotics is growing in otolaryngology. The transaxial approach is being used more. The surgery was first performed in Korea, and the recovery time is good.”

4. **What is the reimbursement rate for cholecystectomies and colorectal/LAR?**
   - “Same for robots and lap.”

5. **Do you or are you planning on using Intuitive’s surgical stapler?**
   - No answer.

6. **Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by...**

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*Intuitive Surgical Inc.*

1 Ferry Building, Suite 255, San Francisco, CA 94111 | www.blueshiftideas.com
22. Robotic general surgeon for an East Coast surgical center; MIS Week conference interview

Robotics usage will continue to grow in appropriate surgeries. It is the easiest method to use on obese patients. This source has completed only a handful of robotic surgeries compared with 100 lap procedures; he said his bariatric patients are more comfortable post-lap surgery. His center’s robots he are mainly used for urology and gynecology although general surgery use, especially colorectal, is slowly growing. His center only does a few robotic single-site choleys. He stressed the importance of remembering robotic surgery’s hidden costs of strains and injuries in physicians.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - "The hospital acquired one robot in 2012. We are still learning. Another hospital I work at has two or three robots, and one is new and upgraded."

2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - "I could do two bariatric robotic surgeries a day, but the number of patients who seek this surgery is limited. Last year I was still learning, and I did two robotic bariatric surgeries. This year I am doing a few more. I’ve done more than 100 lap bariatric surgeries."
   - "I do not know what the hospitals do. However, our partners do colorectal robotic surgery, and they do 40 to 50 per year."

3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   - "We use robotics for bariatrics because it is easier to use robotics on people who are obese. However, robotic surgery takes slightly longer, and I think the patients are more comfortable after they have lap surgery."
   - "One hospital mostly uses its robot for gynecology and urology and now some bariatrics. The other hospital uses their robots for a variety of surgeries, and general surgeries are growing some."

4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - "The reimbursement is the same for both lap and robotic surgery."
   - "It’s a matter of cost of the surgery versus the cost of the surgeon’s injured back and shoulders. It is very difficult to work on obese patients."

5. Do you or are you planning on using Intuitive’s surgical stapler?
   - "For some bariatrics, we do anastomosis of the gastric and jejunum, and it may be possible to use their surgical stapler for this procedure. We don’t use it, however."

6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   - "One hospital uses the robot for single-site choleys, but they only do a few. I don’t think it is really a better procedure than lap surgery. I hear that 10% of the patients get hernias."
7. What is your prediction for continued use and expansion of robotic surgery?
   - “It will keep growing for the right surgeries.”
8. Miscellaneous
   - “There is less robotic training for bariatric surgery because it is not as complicated as the other surgeries. We train on a module and a robot. We observe three cases and are proctored. You have to answer online questions.”
   - “Someone from Europe presented a new bariatric procedure. It is not approved in the United States. A type of net is introduced with an endoscope and placed at the top of the stomach, where it expands. It takes 10 minutes and doesn’t require anesthesia. The patient feels full and eats less. Some patients have lost 40% of their body weight. Removal of the net is a very quick reversal. How durable is the net? How long does it stay in place? We have to look at all these questions. But we might find that this has a place for some patients and may replace either lap or robotic bariatric surgery.”

23. Robotic urology surgeon for a Southern university medical center; MIS Week conference interview

Robotcs will continue to grow although Intuitive is just one part of it. This source has performed 30 urology robotic procedures this year; the robot proved to be very useful and has resulted in shorter hospital stays for patients. Single-site surgeries, used solely for cosmetics, are expensive. Robotics should be used conservatively because it is so expensive, and care should be taken when addressing patient requests.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “We have three robots: one at one center, two at the other. One is dual-console, for teaching.”
2. How many DV procedures did you and your hospital perform in 2012? What is the daily run rate in 2013? How much higher or lower is the percentage than in 2012?
   - “I finished my fellowship one year ago. I’ve done 30 robotic procedures this year, and it will increase next year.”
   - “I don’t know how many the hospital does, but they do a lot at both centers. My fellowship center also did a lot of robotic urology procedures.”
   - “If I planned well, I could do two to three procedures in a day.”
3. What are key general surgery procedures DV can be and is used for? Which is growing the fastest?
   - “I use it for stones, also prostates, nephrectomies, urethra implants. It is very helpful for urology.”
   - “I really don’t know if the robot is widening beyond urology, but I think they use it all over the place.”
4. What is the reimbursement rate for cholecystectomies and colorectal/LAR?
   - “Choleys are common, but I don’t know the reimbursement rates for either.”
5. Do you or are you planning on using Intuitive’s surgical stapler?
   - “We have not used their stapler.”
6. Are you using the DV for single-site cholecystectomies? Is robotic usage rising or falling for this procedure at your hospital? Is your usage driven by better efficacy? If you are not using the DV for choleys, why not?
   - “Single-site surgery for laparoscopic is used for cosmetics only. It is helpful to have, but you can’t use it on obese patients. Intuitive developed the VeSPA instruments for robotic laparoscopic single-site surgery [R-LESS].”
7. What is your prediction for continued use and expansion of robotic surgery?
   - “Robotics is here to stay, but Intuitive is just the first step. There will be different systems in the future.”
8. Miscellaneous
   - “Robotics should be used wisely. It is expensive, and you need to be careful with the instruments. There is a limit to the ability of the robot itself, although people are applying pressure to use it.”
   - “At my fellowship clinic, we limited the amount of instruments you could use.”
   - “Hospital stays are much less with robotic surgery compared to open.”

Robotic Urology Surgeon
Southern University Medical Center
3) LAPAROSCOPIC GENERAL SURGEONS
These eight sources have limited interest in the da Vinci robot, citing its prohibitive cost, long and time-consuming learning curve, and a lack of instrumentation for pediatrics. They, however, did acknowledge that robotics is appropriate for some procedures and offers superior visuals. Robotics use will expand as more trained surgeons enter the market and better applications are developed. The five sources working in hospitals without a da Vinci knew of no plans to acquire the system. Only two sources have had patients inquire about robotic procedures. Meanwhile, patients and some physicians generally are unaware of the recent negative press, studies and lawsuits facing Intuitive Surgical.

KEY SILO FINDINGS
1. Why do you not use the DV robot? Are you considering getting robotic training? Why/why not?
   - 5 of 8 are not using robotics because they have no or limited access to a da Vinci robot.
   - 1 is involved in other projects and does not have time.
   - 1 said training is too costly and time-consuming.
   - 1 said ISRG does not have instrumentation for pediatrics.
   - 1 is just starting training, and 1 is interested in getting training.
2. Does your hospital/surgery center plan on buying a DV robot? If not, why?
   - 3 sources’ hospitals have at least 1 da Vinci.
   - 4 sources said their institutions do not have a da Vinci and have no plans to acquire one because of cost.
   - 1 source said his hospital has looked into renting one temporarily for specific cases.
3. Do you consider the efficacy of open surgery, lap surgery, and robotic surgery outcomes to be largely similar, or is one better? Does one method offer an advantage in procedure and patient care cost?
   - 7 sources were diplomatic in their response, stating that different procedures require different devices.
   - 1 said the da Vinci was a waste of time, but then acknowledged that it might be beneficial for prostate procedures.
4. Do you have patients asking for robotic procedures?
   - 6 have not had patients ask for robotic procedures, while 2 said patients have asked.
   - 1 source said ISRG is promoting directly to patients.
5. Have you seen a drop-off in patient volume at your hospital/surgery site given that you do not offer the da Vinci?
   - 3 without a da Vinci said no to a patient drop-off.
   - 1 source reported experiencing a loss of patients. 4 did not answer.
6. With the recent negative press and studies associated with robotic surgery, have patients or your hospital expressed more interest in open or lap procedures?
   - There is a lack of awareness of the negative press and lawsuits surrounding the da Vinci.
   - 1 source said the press situation was a blip on the radar.
7. Miscellaneous
   - Robotics is expected to grow as more doctors receive training and as new applications are developed.

1. Laparoscopic general surgeon at a Midwest academic teaching hospital; MIS Week conference interview
This source is interested in the treatment possibilities of robotics; however, Intuitive is more interested in selling machines than in developing complementary treatment modalities. Robotic surgery is an extension of laparoscopy surgery, and has generated patient interest. Teaching methods for surgeons are evolving, with a whole new generation of residents trained on robotics entering the workforce. While robotic surgery is not meant for every procedure, single-site robotic cholecystectomies will continue to grow.

1. Why do you not use the DV robot? Are you considering getting robotic training? Why/why not?
   ▪ “General surgeons do not have the time it takes to relearn a new technique, and it is expensive. That’s why you don’t see too many general surgeons here using the robot. Robotics is a specialty field now.”
   ▪ “There will be a groundswell of robotics coming up, with the new residents who are learning robotics. They will all be trained and will bring that training with them where ever they go.”
“I’m very interested in the robot but more in the possibilities it offers. Since 2002, I’ve been working with Xoft [Inc.], which has developed an intraoperative radiation therapy (IORT). The device is inserted during surgery, and a full-radiation treatment can be given in less than 10 minutes. It is an incredible breakthrough in radiation therapy. This would be perfect during robotic surgery of the breast because it fits in the sleeve of the robot. But Intuitive wasn’t interested. They were more interested in selling their own machines than in being part of an innovative therapy.”

2. Does your hospital/surgery center plan on buying a DV robot? If not, why?
   - “The medical center and the local hospital each have a robot. By watching the device, we were able to determine that IORT would just be an extension of robotic surgery.”

3. Do you consider the efficacy of open surgery, lap surgery, and robotic surgery outcomes to be largely similar, or is one better? Does one method offer an advantage in procedure and patient care cost?
   - “Robotic surgery is just an extension of lap surgery. It’s another advancement.”
   - “The robotic surgery approach will not fit all surgeries. It will be better for some surgeries than others.”
   - “Single-port surgery may be a good possibility with robotics. Robotic cholecystectomies will be the way to go. Everyone talks about money, money, money, but in the end, what’s best for the patient that counts.”
   - “General surgeons will need to enhance their skills to meet modern therapy. Surgeon training is picking up. It is evolving, like everything else.”

4. Do you have patients asking for robotic procedures?
   - “Patients are interested in the hospitals’ robots.”

5. Have you seen a drop-off in patient volume at your hospital/surgery site given that you do not offer the da Vinci?
   - No answer.

6. With the recent negative press and studies associated with robotic surgery, have patients or your hospital expressed more interest in open or lap procedures?
   - “This [negative press] is just a blip on the radar.”

7. Miscellaneous
   - “Robots is here to stay. They will continue to become more a part of our surgical repertoire. They can be used for more than surgery, such as inserting the IORT radiation therapy device. The robot can give radiation oncologists another tool.”

2. Laparoscopic general surgeon at a rural hospital in the South; MIS Week conference interview

Robotics may be the wave of the future, but rural areas have limited financial resources and few trained surgeons to ensure robotic growth. In 30 years, this source envisions long-distance robotic surgeries. Robotics will have to evolve this way to ensure that all patients are treated.

1. Why do you not use the DV robot? Are you considering getting robotic training? Why/why not?
   - “I’m a surgeon in a small rural area. We can’t afford a robot. And at my age, I would not consider learning the technique.”

2. Does your hospital/surgery center plan on buying a DV robot? If not, why?
   - See previous comment.

3. Do you consider the efficacy of open surgery, lap surgery, and robotic surgery outcomes to be largely similar, or is one better? Does one method offer an advantage in procedure and patient care cost?
   - “Robotic surgery is probably the wave of the future. They give the surgeon more visual; now they can view up to 3D.”

4. Do you have patients asking for robotic procedures?
   - “Not around here.”

5. Have you seen a drop-off in patient volume at your hospital/surgery site given that you do not offer the da Vinci?
   - “No change.”
6. With the recent negative press and studies associated with robotic surgery, have patients or your hospital expressed more interest in open or lap procedures?
   - “I don’t think anyone is aware of the negative press.”
7. Miscellaneous
   - “We barely get paid for lap choleys, and they are trying to cut more reimbursements.”
   - “The biggest hole I make when doing a single-site choley is 4 mm. I haven’t had any problems with hernias.”
   - “There are fewer and fewer young surgeons who are willing to work in rural areas. ... With fewer rural surgeons, there will come a time when we need to do more telemetry medicine. In 30 years, I can picture robotic surgery being performed by a surgeon 60 miles away from the patient. It will have to go that way if patients want to be treated.”

3. Laparoscopic general surgeon at a rural hospital in the Northeast; MIS Week conference interview
   This source would like to learn robotics, but training and the robot are not available in his area. Determining which type of surgery is best and more cost-effective for certain types of procedures takes time; eventually robotics may become more economical. Single-site procedures create a larger hole to accommodate all the instruments; they are more painful for the patient, and abdominal incisions may result in hernias. Residents now are being trained in robotics.
   1. Why do you not use the DV robot? Are you considering getting robotic training? Why/why not?
      - “The hospital in our area does not have a robot. I would have no way to be trained, no place to practice the robot.”
      - “I think it would be a blast to learn and use the da Vinci.”
   2. Does your hospital/surgery center plan on buying a DV robot? If not, why?
      - “No. We are a very small hospital. The robot is very expensive, a big overhead for a hospital our size.”
   3. Do you consider the efficacy of open surgery, lap surgery, and robotic surgery outcomes to be largely similar, or is one better? Does one method offer an advantage in procedure and patient care cost?
      - “I can see the advantage of certain robotic procedures, for heart and prostate.”
      - “I was involved in the early lap surgeries. In 1989, lap surgery was applying economic pressures, just like robotics is doing now. It will take a while to see how patient outcomes are, what surgery is best for what procedure, what the costs are.”
      - “It is important that we learn from each other and pick up ideas.”
      - “I do quick lap cholecystectomies, single-site, using reusable materials. They take 45 to 60 minutes. I also do lap single-site colon resections. They are both cost-effective.”
      - “There are pros and cons to single-site surgeries. You have more instruments in a single hole, so the hole is bigger, maybe 10 mm. The bigger incision is more painful and may cause hernias. It is hard to hide a single port.”
   4. Do you have patients asking for robotic procedures?
      - “Not yet.”
   5. Have you seen a drop-off in patient volume at your hospital/surgery site given that you do not offer the da Vinci?
      - “No. We are a 25-bed critical-access hospital.”
   6. With the recent negative press and studies associated with robotic surgery, have patients or your hospital expressed more interest in open or lap procedures?
      - “We have not been affected by this.”
7. Miscellaneous
   - “Forty percent to 50% of my lap surgeries are endoscopic. I do a lot of hiatal hernias.”
   - “Residents are learning robotics now. First they learn the 2D field to identify depth; then they advance to 3D.”
   - “It’s true that the young surgeons do not want to live in rural areas, and this may create a problem in the future. Distance robotic surgery may have to evolve.”
4. Laparoscopic general surgeon at a rural hospital in the South; MIS Week conference interview

Rural hospitals cannot afford the expensive cost of a robot; they barely get reimbursed for laparoscopic procedures. Most procedures can be done less expensively using lap surgery, although robotics might be beneficial for prostatectomies. This source has done 1,500 cholecystectomies in the past 12 years. A three-port choley takes him 20 to 30 minutes, and the patient goes home that same day; the surgery is over before the robot can even be set up.

1. Why do you not use the DV robot? Are you considering getting robotic training? Why/why not?
   - “I work in a small community hospital; we don’t have a robot. I trained in a larger hospital that had one, but I hear that it is for sale now. They just didn’t use it. I didn’t use it when I was at the med center.”

2. Does your hospital/surgery center plan on buying a DV robot? If not, why?
   - “No. It is too expensive. Think about it from an economic standpoint. We barely get reimbursed for lap procedures. And the rate of robotic mishaps, problems is much higher.”

3. Do you consider the efficacy of open surgery, lap surgery, and robotic surgery outcomes to be largely similar, or is one better? Does one method offer an advantage in procedure and patient care cost?
   - “Robotics is a waste of time. Surgeons are never really trained on it. I haven’t seen too many things that you can’t do with lap, but you can do with a robot. Sometimes it is more harmful than good.”
   - “I suppose it is beneficial for some procedures, urology, the prostate.”

4. Do you have patients asking for robotic procedures?
   - “No.”

5. Have you seen a drop-off in patient volume at your hospital/surgery site given that you do not offer the da Vinci?
   - “No. We are their closest hospital.”

6. With the recent negative press and studies associated with robotic surgery, have patients or your hospital expressed more interest in open or lap procedures?
   - “Everyone knows about the mistakes that happen in the rural areas. I can’t make a mistake without everyone knowing. You have to be on your toes if you want to survive.”

7. Miscellaneous
   - “In the past 12 years, I’ve done 1,500 cholecystectomies. I use three ports, and it takes me 20 to 30 minutes max. It is a day surgery; they go home that day. How can a robot improve this? You can’t even set up a robot in that time.”

5. Laparoscopic general surgeon at a Midwest university hospital; MIS Week conference interview

The current robotics configuration will need to change before the field can grow further, but the future looks promising. The console will have to be more ergonomically sound for the surgeon. Surgeries that will benefit from robotics still are being identified, but two promising areas are closed-chest thoracic surgery and esophagus surgery. Single-site cholecystectomies are creating a hernia problem, and surgeons may need to rethink using robotics for this procedure. The source is working on a software app to reduce communication errors in the operating room.

1. Why do you not use the DV robot? Are you considering getting robotic training? Why/why not?
   - “We have two robots; they are used mostly for gyn and urology. I’m wrapped up in some other projects and don’t expect to learn it.”

2. Does your hospital/surgery center plan on buying a DV robot? If not, why?
   - “I don’t know what their plans are.”

3. Do you consider the efficacy of open surgery, lap surgery, and robotic surgery outcomes to be largely similar, or is one better? Does one method offer an advantage in procedure and patient care cost?
   - “Robotics in the current configuration won’t be extended, but it will be great in the future. First we need the proper tools and better ergonomics for the surgeon. There are people studying this.”
“Robotics is good for only a few surgeries. Esophagectomies work best, when you have to go through the mediastinum.”

“At our site, robotics is growing in thoracics, and I’ve heard that people are pleased with how it is going.”

“You can’t do everything as single-site incisions. It is easy to create other injuries. Besides, the 4-mm scars don’t show; they are very hard to see.”

“Regarding choleys: Anytime you penetrate the midline of the fascia, you create an avenue for hernias, especially in the obese.”

“Now we have a new business, repairing hernias following abdominal surgery.”

4. Do you have patients asking for robotic procedures?
   - “Not my patients.”

5. Have you seen a drop-off in patient volume at your hospital/surgery site given that you do not offer the da Vinci?
   - No answer.

6. With the recent negative press and studies associated with robotic surgery, have patients or your hospital expressed more interest in open or lap procedures?
   - “Negative press, really?”

7. Miscellaneous
   - “There are many problems in OR communications and documentation. I’ve developed iOS solution software for the tablet, to be readily used in the OR.”

6. Laparoscopic general surgeon at an East Coast community hospital; MIS Week conference interview

The main hospital’s da Vinci has not been used by general surgeons, who appear to have little interest in the system. The source has heard positive things about robotic use in cardiac, difficult cancer cases, and the elderly, but he views the technology as an expensive gimmick. Intuitive Surgical has run a strong advertising campaign aimed directly at patients.

1. Why do you not use the DV robot? Are you considering getting robotic training? Why/why not?
   - “I mostly work at the hospital site that doesn’t have a robot.”
   - “The robot at our main hospital is mostly used for GYN and urology. We really haven’t started using it for general surgery. I’m not sure the interest is there.”

2. Does your hospital/surgery center plan on buying a DV robot? If not, why?
   - “No. I think one robot is working out for their needs.”

3. Do you consider the efficacy of open surgery, lap surgery, and robotic surgery outcomes to be largely similar, or is one better? Does one method offer an advantage in procedure and patient care cost?
   - “Robotics seems like a fun gimmick.”
   - “Robotics may be a good way to go for cardiac. And it is useful for difficult cancer cases. I have also heard that some very elderly patients do well following robotics.”
   - “I’m happy with how my patients do on lap surgery. I’ve done up to 2,000 lap procedures, and the patients do well.”
   - “Lap surgery is so much less expensive than the equivalent robotic surgery.”

4. Do you have patients asking for robotic procedures?
   - “I haven’t run into that, although I know that Intuitive has a good marketing campaign aimed at patients.”

5. Have you seen a drop-off in patient volume at your hospital/surgery site given that you do not offer the da Vinci?
   - No answer.

6. With the recent negative press and studies associated with robotic surgery, have patients or your hospital expressed more interest in open or lap procedures?
   - “I don’t think the patients are aware of any negative press. It hasn’t come up.”
7. Laparoscopic general surgeon at a Midwest community hospital; MIS Week conference interview

Robotics has created exciting changes to surgery in the past decade, but adoption in general surgery is slow. This is due to advancements being made within lap surgeries and the fact that some general procedures, such as cholecystectomies, are quick and same-day. Small, rural hospitals cannot support the robotic cost, but this hospital has discussed renting a robot for specific cases. Robotics will continue to grow as newly trained residents encourage hospitals to acquire and use the systems.

1. Why do you not use the DV robot? Are you considering getting robotic training? Why/why not?
   - “I work at a small community, rural hospital. Robotics is not in our budget. But robotics is exciting, and I’m impressed with the changes that have been made in the last five to 10 years.”

2. Does your hospital/surgery center plan on buying a DV robot? If not, why?
   - “We’ve talked about renting one for individual cases, maybe bring in mobile robotic truck. I’m not sure if they could do this or not.”

3. Do you consider the efficacy of open surgery, lap surgery, and robotic surgery outcomes to be largely similar, or is one better? Does one method offer an advantage in procedure and patient care cost?
   - “The robotic slope is very slow for general surgery. I’m not sure if robotics is more beneficial for cholecystectomies. They are quirky surgeries that take just 15 to 20 minutes. All patients go home the same day. How could you improve on that?”
   - “The LESS [laparo-endoscopic single-site surgery] approach is better for single-port surgeries. It’s another advancement of lap surgery, which is much less expensive than robotics.”
   - “They have neat, new closures now to counter hernias following abdominal surgery.”

4. Do you have patients asking for robotic procedures?
   - “I don’t think so.”

5. Have you seen a drop-off in patient volume at your hospital/surgery site given that you do not offer the da Vinci?
   - No answer.

6. With the recent negative press and studies associated with robotic surgery, have patients or your hospital expressed more interest in open or lap procedures?
   - “We are moving toward more lap procedures as a matter of course.”

7. Miscellaneous
   - “Robotics will grow more quickly as the new residents come in with the robotic skills that they’ve learned. It will be a wave coming up. They will encourage hospitals to acquire a robot and other surgeons to learn the technique. Hospitals will need to have higher margins, however.”
   - “I do hernias, Nissens, some colon resections, gallbladders.”

8. Laparoscopic pediatric general surgeon at an East Coast medical center; MIS Week conference interview

Robotics is limited for pediatrics because instrumentation for this patient base has not yet been developed. Because minimally invasive surgery is so important in pediatrics, this will be an area of growth for the technology. Intuitive Surgical is working on smaller instrumentation.

1. Why do you not use the DV robot? Are you considering getting robotic training? Why/why not?
   - “Robotic instrumentation is currently limited for pediatrics. Intuitive is developing smaller instruments.”

2. Does your hospital/surgery center plan on buying a DV robot? If not, why?
   - “We have one robot. I don’t think we’ll get a second one until robotics is established for pediatrics.”

3. Do you consider the efficacy of open surgery, lap surgery, and robotic surgery outcomes to be largely similar, or is one better? Does one method offer an advantage in procedure and patient care cost?
   - “Robotics is here to stay if the media keeps pushing patients. Then physicians are forced to offer it.”
“Minimally invasive surgery is better for pediatrics. The high-definition cameras help us see better. The patients have less pain, less scarring both inside and out, and a shorter recovery time.”

“It is hard to evaluate what surgeries would be better for robotics. We have no analysis.”

“Surgical coding is a mess. It is not relevant for either lap or robotics. But cost data is irrelevant.”

4. Do you have patients asking for robotic procedures?
   • “The media keeps forcing robotics. That is what patients see.”

5. Have you seen a drop-off in patient volume at your hospital/surgery site given that you do not offer the da Vinci?
   • “We push the envelope of minimally invasive surgery. And we do have a robot.”

6. With the recent negative press and studies associated with robotic surgery, have patients or your hospital expressed more interest in open or lap procedures?
   • “There is always interest in minimally invasive surgery for pediatrics.”

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**4) HOSPITALS USING A DA VINCI SYSTEM**

These 11 sources were generally positive about future use of the da Vinci system. However, only three plan to buy another robot in the near future because patient and surgeon demand is being met by current system deployments. One hospital is considering not renewing its da Vinci lease because robotic surgical volumes are down and costs are up. Da Vinci utilization in new procedures is expected, but the procedure growth rate is not expected to be as rapid as in the early areas of adoption.

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**KEY SILO FINDINGS**

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - 11 hospital professionals representing 20 da Vinci robots were interviewed.
   - 3 are considering or are in the process buying another da Vinci to meet patient demand. 1 recently added the single-port platform and 1 upgraded to an Si.
   - 1 source is considering not renewing the da Vinci rental because of cost.

2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   - 8 sources consider efficacy, cost and ROI, 1 does not consider these factors, and 2 have evaluated their programs and looked at patient advantages.

3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers?
   Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   - 5 said their purchase was driven by patient and/or surgeon demand, and 5 experienced increased patient traffic following the da Vinci addition. 6 sources did not comment on purchase drivers. 3 did not experience any patient increase. 1 said ISRG is trying to help increase da Vinci usage. 2 did not comment.

4. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - Sources reported performing a range of da Vinci procedures of 80 to more than 1,000 per year, with the average of 480. 7 are experiencing a higher run rate this year, 3 are flat and 1 is down because of the relocation of a trained surgeon. 5 expect 2014 to provide higher run rates, 3 expect a plateau, 1 expects a 5% decline because of the surgeon loss, and 2 did not comment.

5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or falling?
   - 2.8 da Vinci procedures are the average daily run rate for a skilled surgeon.
   - 5 sources are maxed out, 5 are utilizing their da Vincis in the 40% to 70% range, and 1 did not comment.
   - 2014 utilization outlook is up for 2, flat for 7, down for 1; 1 did not comment.

6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   - 4 consider capital costs, 4 do not, 3 did not know or did not respond.
7. How do costs of robotic procedures compare with those for lap procedures, such as hysterectomies, choleys and colorectal/LAR?
   - 4 reported da Vinci hysterectomies as higher-priced than a lap procedure, 1 said costs were the same, 4 did know and 2 did not comment.
   - 3 said da Vinci choleys are higher-priced than lap, 1 less and 7 did not know.
   - 3 said da Vinci colorectal/LAR are higher-priced than lap and 8 did not know.
8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   - Sources were not knowledgeable regarding reimbursement rates. 1 said the same codes are used, and 1 said da Vinci hysterectomies have a higher reimbursement rate.
9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures' losses made when the robot is used? Or does the hospital not think about costs per procedure?
   - 5 did not know or did not respond. 1 said they were not losing money, 1 is considering not renewing the rental contract for the da Vinci. Other comments included the da Vinci being better for the patients and offering a shorter hospital stay.
10. How do you think about the cost benefit of having a DV robot in-house?
    - 2 see no cost benefit, 1 commented on the marketing advantage, on claims to be making money, and 8 did not know or did not comment.
11. Are you seeing your DV usage widen beyond OB/GYN, urology and choley?
    - 8 are experiencing expanded use of their da Vinci. General surgery, single-site procedures, cardiac and GYN procedures were cited as growth areas.
12. What is your prediction for continued use and expansion of robotic surgery?
    - 8 expect growth for robotic surgeries, 2 expect use to be flat, 1 did not comment.

1. Surgical director at a midsized regional hospital; repeat source

This repeat source continues to project flat procedural volume in 2013 and 2014 year to year for the hospital's one da Vinci S robot. The hospital sees four to six robotic cases each month. Robotic supplies add approximately $1,500 more per hysterectomy, cholecystectomy and colectomy case. Media attention has created concern for hospital administration, but the source was not aware of any patient reaction to the negative press.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “Not enough volume for the one we already own.
2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   - “We considered [cost and ROI] a lot. We thought we would have more cases than we do now.”
   - “We knew the cost would not lead to increase in reimbursement; we just wanted the competing factor and the surgeon satisfaction.”
3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   - “No, we have not seen additional procedures. We started off doing bariatrics, GYN, urology. We stopped doing GYN [because one GYN left and another decided robotics was not that beneficial].”
4. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “We only do four to six cases a month now. That is consistent with 2012. I do not expect growth for 2014.”
5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or failing?
   - “We’re running at 40% capacity.”
   - [CU is flat.]
6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   ▪ “No.”
7. How do costs of robotic procedures compare with those for lap procedures, such as hysterectomies, choleys and colorectal/LAR?
   ▪ “Lap hysterectomies are the same cost as lap choleys—$1,100 for a straight lap choley and colectomy, and an additional $1,500 to $2,600 for robotic [which does not include setup time].”
   ▪ “We’re not doing [colorectal/LAR].”
8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   ▪ “I don’t know.”
9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ losses made when the robot is used? Or does the hospital not think about costs per procedure?
   ▪ No answer.
10. How do you think about the cost benefit of having a DV robot in-house?
    ▪ “There really is not a cost benefit if you’re comparing to laparoscopic procedures.”
11. Are you seeing your DV usage widen beyond OB/GYN, urology and choley?
    ▪ No.
12. What is your prediction for continued use and expansion of robotic surgery?
    ▪ “I see us just keep doing what we’re doing. No new procedures, no new surgeons to use it. The media has only made hospital administration afraid of it. I have not heard anything about how patients have reacted to it.”

2. Surgery manager of a Midwest hospital; repeat source

The negative media has not dampened this hospital’s enthusiasm for robotics, but the source thinks Intuitive Surgical is experiencing a slower growth rate in new procedures and in surgeon training. Although this two-robot hospital recently traded in its S for an Si, growth will be flat this year and not the 10% the source predicted in April. This primarily is due to declining urology procedures that are being made up by more single-site lap-cholecystectomies and hysterectomies. This hospital is gathering robotic cost data, but the administration is more focused on the expected increase in patients seeking single-site hysterectomies in particular.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   ▪ “We still have the two robots, but what we did was we had an S system and an Si. Now we have traded the S for another Si. I know our administration was good in the negotiations.”
2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   ▪ “They looked at those things, but one of the main reasons was patient safety. The S system’s pedals are different from the Si, and surgeons were concerned with the patient safety potential. Plus, every new procedure Intuitive is coming out with uses the Single-Site, such as the TransOral Robotic Surgery [TORS] oral surgery. … Patient safety and continuity for our physicians were the reasons.”
3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   ▪ “Yes, we have a competitor that’s affiliated with a major medical center that is just five miles away. They are slowly getting into robotics, but we’re far and away exceeding what they’re doing. We have had extra patients as a result.”
4. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower?
   ▪ “In 2012 we did 347 cases. Year-to-date through early August we’ve done 157. Surgeons had scheduled around not having the second Si system, but I think we’ve plateaued here for a while—in 2013 and possibly 2014.”
   ▪ “We may pick up in gynecology. We do have a few surgeons who are supposed to get training this fall and are looking to start a cardiac program, but I’m not sure when they actually will go—certainly [by] 2014.”
5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is OU rising or falling?
“It depends on the cases, but if we run both we can do three or four cases in a day. We’ve done that. Right now we’re fine with the ebb and flow, and there’s no push from administration to do more. We’ve scheduled cases out to the end of the year.”

[CU is flat.]

6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   ▪ “No.”

7. How do costs of robotic procedures compare with those for lap procedures, such as hysterectomies, choleys and colorectal/LAR?
   ▪ “I don’t think we have that though we are looking at this, especially the costs of the robotic procedures.”
   ▪ “We’re looking at numbers. A multi-port cholecystectomy has different pricing than a [single-site] choley. We’re looking at that fiscally to see what we should charge for. The instruments for the single are [more expensive]; though they are reusable, they have less lives. It’s … only stretched out for five patients.”
   ▪ “It’s our intention to do [colorectal/LAR] on the robot, but we aren’t yet.”

8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   ▪ “I don’t have that.”

9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ losses made when the robot is used? Or does the hospital not think about costs per procedure?
   ▪ “I don’t think they’re considering all that. I think with the marketing of the two Si systems and the Single-Site hysterectomy that it will drive some more patients who would go somewhere else.”

10. How do you think about the cost benefit of having a DV robot in-house?
    ▪ No answer.

11. Are you seeing your DV usage widen beyond OB/GYN, urology and choley?
    ▪ “Urology has dropped off because of the press, and they’re not screening PSAs [Prostate-specific antigen] as closely. They used to take them in right away for surgery; now there’s more watchful waiting.”
    ▪ “Single-Site [da Vinci] hysterectomies have taken off. We have two gynecologists that just got back from training, and we have cases booked. We also have the TORS procedures that are increasing and some general surgeries with the Si. We plan to do colorectals.”

12. What is your prediction for continued use and expansion of robotic surgery?
    ▪ “They’re at a plateau because of the negative press, and the [new] procedures … aren’t taking off as fast as they hoped. They are looking at cardiovascular applications, especially with the fluorescence imaging.”
    ▪ “Intuitive is also almost tapping out with new surgeons, although we’ve had some older surgeons that have taken to it very well.”

13. Miscellaneous
    ▪ “[The negative media is] not affecting us yet. We have been hearing about it, but the thing is, nothing is without risks. That’s what we’re thinking here. Doctors are talking about it, but I haven’t heard if patients are.”

**3. OR nurse manager for a Southeast hospital**

The hospital’s da Vinci Si use has been stable at 35 to 40 cases monthly, although it will decrease next year when several surgeons move to a sister hospital that does not have a robot. GYN remains the primary use although gastric bypass procedures likely will increase because one surgeon has received training. GYN procedures also will increase when the Single-Site platform becomes available.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   ▪ “We have the Si. No other plans. Right now we’re fairly stable, and we’ve only had our system for not quite three years. We grew from two to three surgeons using it to 16 now.”
2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   - “I don’t know. We haven’t measured [ROI].”

3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   - “We have two hospitals in our system. Our sister hospital had a robot three to four years when some surgeons requested one at our center to have the ability to get on the robot to do more cases. Since we got it, many other doctors have gone for training.”
   - “No [the source did not see increased patients or procedures post-acquisition].”

4. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “We do an average of 35 to 40 cases per month. Some months we’ve done more than 40. We built up fairly quickly. We’ve done 1,000 cases now as of early September.”
   - “We should do a similar number this year. I don’t think there will be any more growth in 2014. Unfortunately, we’re opening a new, smaller sister hospital, and several of our surgeons who do a number of [da Vinci] cases will be going there where they don’t have a robot. They’ll still do some at our facility, but it will go down—not more than 5%.”

5. What is the maximum procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or falling?
   - “We have done four in a day. Three to four would be our maximum based on staffing and depending on what surgery it was.”

6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   - “There has been some research done on that topic. But we do not include capital equipment costs.”

7. How do costs of robotic procedures compare with those for lap procedures, such as hysterectomies, choleys and colorectal/LAR?
   - “There is certainly added cost to the da Vinci, so we are focusing on reducing the number of instruments.”
   - “We have two surgeons trained [in robotic choleys], but we do not have cost information for those procedures.”
   - “We had one surgeon who was on the fence about doing [colorectal/LAR]. He’s done some but none in the last six months. We don’t have any data on those.”

8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   - “I don’t know.”
   - “I have been told that we are getting higher reimbursement for the da Vinci hysterectomies.”

9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ losses made when the robot is used? Or does the hospital not think about costs per procedure?
   - “[Da Vinci use is] something the surgeons and patients are driving, and we’re dealing with that.”
   - “We had a consultant firm last year who looked at the lap vs. robot costs, and financially we were told we’re OK doing the da Vinci. We’re recognizing that some patients are more educated than in the past and there’s more emphasis on customer satisfaction.”

10. How do you think about the cost benefit of having a DV robot in-house?
    - “I haven’t heard anything about that. [As for length of stay] most surgeries, such as our robot prostatectomies, stay one night and go home. Most hysterectomies are 24-hour observation though one to two docs keep them overnight. ... But lap is going that way too.”

11. Are you seeing your DV usage widen beyond OB/GYN, urology and choley?
    - “One surgeon who was doing many prostatectomies has left so that has gone down. Our GYN volume has stayed stable, and I expect it to stay. GYN is the majority of what we’re doing. ... We’re doing benign hysterectomies.”
    - “General surgery use has been increasing a little bit. We’ve had two surgeons trained in the last six months for choleys, but we’re unsure if that will grow. And one was trained for gastric bypass, and I expect that to increase.”

12. What is your prediction for continued use and expansion of robotic surgery?

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General surgery use has been increasing a little bit. We’ve had two surgeons trained in the last six months for choleys, but we’re unsure if that will grow. And one was trained for gastric bypass, and I expect that to increase.

OR Nurse Manager
Southeast Hospital
“I don’t see the surgeons changing their current practice, except for the legitimate reason of several having to go to the other hospital that doesn’t have a robot. I think right now things are pretty steady, but I do expect that when the [single-site] platform is available in GYN we’ll see more use there.”

4. Robotics manager for a Texas hospital

This three-robot hospital just created a committee to track da Vinci use and growth, and expects higher general surgery procedure growth in 2013 and 2014 related to its recent single-site instrument acquisition. One of the three robots is used only five times per month because of a lack of trained physicians.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot?
   - “We just recently got the single-site system. We have three da Vincis now.”
   - [No plans for more as one robot is not used much.]

2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   - “We just started something where we will meet once a month and look at how we’re growing and these types of things.”

3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   - “Our da Vinci rep is busy with building demand; he’s very cool with that. We’re also getting new physicians who are interested in trying it.”

4. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “We don’t track those. I don’t know who would. I suppose scheduling might be able to pull that. … We’ll be up this year and next. I don’t know by how much.”
   - “We’re growing with the single-site. We just picked up another urologist, and we have surgeons who are doing more.”

5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or falling?
   - “We have one [robot] that just sits there; we use it four to five times a month. We don’t have enough physicians to use them [all to capacity].”
   - “The first part of the week we can do as many as 10 [robotic procedures], Thursday and Friday is less, about two to three.”

6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   - No answer.

7. How do costs of robotic procedures compare with those for lap procedures, such as hysterectomies, choleys and colorectal/LAR?
   - “We just started a committee that will look at these kinds of things.”

8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   - No answer.

9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ losses made when the robot is used? Or does the hospital not think about costs per procedure?
   - [The committee will be looking into these aspects.]

10. How do you think about the cost benefit of having a DV robot in-house?
    - No answer. [However, the da Vinci has attracted new physicians.]

11. Are you seeing your DV usage widen beyond OB/GYN, urology and choley?
    - “Yes, general surgery. [The single-site] is a cool tool. They’re doing more lap choleys, and they’ll do a Nissen or hernia repair.”

12. What is your prediction for continued use and expansion of robotic surgery?
    - No answer.
5. CFO for an Eastern community hospital; repeat source

This 135-bed hospital currently rents one robot for $20,000 per month, and considered renting a second device in June. However, surgical volumes are down and costs are up despite a 5% to 10% increase in robotic surgeries in 2013. Therefore, the hospital now may not even renew its Intuitive Surgical contract in two years.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot? If not, why?
   - “We currently rent one robot from Intuitive. We have a two- to three-year deal at $20,000 per month. Our service agreement is $1.3 million per year. We were considering renting a second robot in 2014, but it is not living up to expectations. The monthly price we are paying makes it very difficult for us to consider a second robot at this time.”
   - “We would have to be extremely creative to consider a second robot. Our volumes and expenses just do not support a second robot, and we are considering dropping our contract in two years.”

2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   - “We are not affected by negative press. We are internally hooked by our own performance.”
   - “The cost is onerous; it is very expensive. We are not getting reimbursed for the extra expenses. Lap surgery and robotic surgery are reimbursed the same, although robotic surgery is more expensive. As a result, our margins are starting to decrease.”

3. What is the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   - “More competitive dynamics, although our surgeons were interested.”
   - “We started off with GYN. We thought we could draw patients from the other hospitals, but it is not growing our business. The volumes just aren’t there.”
   - “Patients are simply not asking for the robotic procedure. They want less-intrusive surgery than traditional open surgery, and lap covers that.”

4. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “We did 280 procedures in 2012, and we hope to do 5% to 10% more in 2013.”
   - “GYN is our big one. We do a few thoracics, some urology. We do single-site lap for cholecystectomies, but not robotics. Lap is successful and less expensive for choleys.”

5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or falling?
   - “Using the robotic is very strenuous for our surgeons. It is hard to do two robotic surgeries per day. However, there are times when some surgeons do three. It is hard to say how many they do a year because the numbers vary on a weekly basis.”
   - “Our robot may be used 60% of the time, maybe 70%, which is considered capacity.”

6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   - “We rent our robot, so we don’t consider depreciation costs. However, we do look carefully at instrument replacement costs, drapes, etc. This is a major expense.”

7. How do costs of robotic procedures compare with those for lap procedures, such as hysterectomies, choleys and colorectal/LAR?
   - “I can’t comment on specific operation costs. Robotics costs at least $400 to $500, plus up to a $1,000 more per surgery depending on the surgery. It is significant.”
   - “We get more reimbursement for a single-port GYN surgery.”
   - “We do single-site lap choleys, which are more cost-efficient than the robotic equivalent.”
   - “We do not do colorectal surgeries with the robot.”

8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?

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We started off with GYN. We thought we could draw patients from the other hospitals, but it is not growing our business. The volumes just aren’t there.

... We are losing money on this procedure, which is why we are reconsidering not acquiring a second robot. I doubt if we’ll do another contract.

CFO, Eastern Community Hospital
“All similar surgeries, whether lap or robotics, are reimbursed the same. We use the same codes for both types of surgery, and I don’t think that will change.”

9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ losses made when the robot is used? Or does the hospital not think about costs per procedure?
   - “We are losing money on this procedure, which is why we are reconsidering not acquiring a second robot. I doubt if we’ll do another contract.”

10. How do you think about the cost benefit of having a DV robot in-house?
   - See earlier comments.

11. Are you seeing your DV usage widen beyond OB/GYN, urology and choley?
   - “No. We are sticking to GYN, urology, some thoracic. With one robot, it is hard to do more.”

12. What is your prediction for continued use and expansion of robotic surgery?
   - “Intuitive has got to make the cost more affordable for hospitals. Until that happens, there won’t be a big growth.”
   - “Intuitive needs to help the hospitals market this procedure—not just talk back but actually help. Right now they are only interested in selling machines to the hospitals, not in helping the hospitals grow their patient numbers.”

6. Robotic nurse manager at a large Southern hospital

This 498-bed hospital has two robots, which are used for approximately 50 cases a month. Cleaning the robots takes three hours each day, which cuts down on the time they can be used for surgery. The source expects to add a third robot in a few years, following a hospital addition. General surgery just started using the da Vinci systems last fall; the hospital may add another general surgeon by 2014, which also will increase the robotic load. Recovery from single-site choleys has been mixed, but the source still believes robotics will continue to grow.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot? If not, why?
   - “We currently have two Si systems. We purchased our first system in 2006. Then we had a proctor come in, and the number of our procedures grew.”
   - “We are building a new tower in 2017 and will have need for a third robot then.”

2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   - “We are not affected by negative press. We go by our own records.”
   - “Robotics is expensive, but our robotic program has been successful.”

3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   - “Robotics is the next wave of surgery. It is important to keep ahead.”

4. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “We are doing more cases in 2013 than in 2012. In 2012 the urologists only did two to three a month; now they are doing three to seven cases a month. The general surgeons just started in October 2013, and now they do about 10 to 15 cases per month, including single-site choleys and Nissens. We will be bringing in another general surgeon in 2014, so numbers will be up next year as well.”
   - “The majority of our cases are GYN, hysterectomies, cystectomies. The GYN doctors do about 35 cases per month. With the rest, this adds up to somewhere in the neighborhood of 50 cases a month, more or less.”

5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or falling?
   - “A surgeon could maybe do two surgeries a day, possibly three depending on the surgery.”
6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   - “All costs are considered: robot, instruments, drapes, cleaning.”

7. How do costs of robotic procedures compare with those for lap procedures, such as hysterectomies, choleys and colorectal/LAR?
   - “I couldn’t really comment on the costs of the surgeries.”
   - “For single-site choleys, we use a stapler that fits down the Intuitive cannula, so we don’t have to stop use of the robot to sew up.”
   - “I haven’t heard about hernias following single-site choleys. But two staff members had single-site choleys, and their recovery took longer and was quite painful.”

8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   - “As I understand it, reimbursement is the same for a lap or robotic surgery.”

9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ losses made when the robot is used? Or does the hospital not think about costs per procedure?
   - “I’m not sure of the finance part of it. We cannot charge for each individual item we use, so we have just one fee. The instruments have 10 lives, so that cost is distributed for a few surgeries. Some surgeries use two instead of three drapes, which also reduces cost.”

10. How do you think about the cost benefit of having a DV robot in-house?
    - No answer.

11. Are you seeing your DV usage widen beyond OB/GYN, urology and choley?
    - “At one time we attempted cardiac, but we needed an in-state proctor to continue. Then one cardiac doctor was leaving. I know one patient who loved the robot for his cardiac procedure because he recovered more quickly.”
    - “Our gynecology, especially GYN oncology, is increasing.”

12. What is your prediction for continued use and expansion of robotic surgery?
    - “Intuitive and robotics are going to continue to grow. I’m sorry I didn’t buy stock back in 2007.”

7. Executive director of perioperative services for a large West Coast hospital

This 498-bed hospital has four robots, which meets growing demand for GYN surgeries as well as colorectal, pelvic floor, and cardiac robotic surgeries. The hospital has a pilot program for single-site cholecystectomies, which is driven by patient selection and demand and not by efficiency. The four robots are often used for 10 to 15 surgeries a day. The source expects Intuitive Surgical to face competition in the future.

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot? If not, why?
   - “We have four robots. [We are not planning on buying another one] at this time because our demand is pretty well being met.”

2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   - “We have a pilot program for single-site choleys. The usage is driven by patient selection and demand.”

3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   - No answer.

4. How many DV procedures were performed at your hospital in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “We are on track to hit the 960 to 1,060 mark this year, perhaps slightly exceeding last year.”

5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or falling?
   - “[Our surgeons can perform] 10 to 15 robotic surgeries in a day, depending on the type of case and surgeon proficiency.”
6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   ▪ No answer.
7. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   ▪ “I do not have data on hand and prefer not to state.”
8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   ▪ See number seven.
9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ losses made when the robot is used? Or does the hospital not think about costs per procedure?
   ▪ No answer.
10. How do you think about the cost benefit of having a DV robot in-house?
    ▪ No answer.
11. Are you seeing your DV usage widen beyond OB/GYN, urology and choley?
    ▪ “Our biggest growth is in GYN. [We have] a small growth in colorectal, pelvic floor and cardiac [surgeries].”
12. What is your prediction for continued use and expansion of robotic surgery?
    ▪ “The recent setbacks will impede growth, and Intuitive will not continue to be the sole source of this technology.”
    ▪ “[The Intuitive surgical staple] is being asked for, but we are not using it yet.”

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8. Nurse coordinator at a teaching hospital

The hospital, which has one robot, does gynecological (both benign and oncology), urological, and ENT robotic surgeries, and may add cardiovascular procedures. Robotic surgery has increased by 30% this year because the hospital now has a room for robotic-only cases. (The source reports that she receives no payment from Intuitive Surgical.)

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot? If not, why?
   ▪ “In my system, I don’t know. [We have] one [in this hospital].”
   ▪ “I would love to. The [hospital] will eventually [acquire another robot].”
2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   ▪ “Yes.”
3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   ▪ “I don’t know.”
   ▪ “I would say yes [to an increase of patients] probably because we have some doctors who are really focused on the robot so they would bring those patients here.”
4. How many DV procedures performed in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   ▪ “I don’t know.”
   ▪ “I know it’s 30% higher [run rate], … I know because we have a dedicated robot room. Before, I had to share the robot room with other cases, and since I have the new dedicated room, I am able to put more [cases].”
   ▪ “I am always hoping it will be higher.”
5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or falling?
   ▪ “In a day, I think my most active [GYN] surgeon has done three hysterectomies with staging. We do oncological and benign [procedures].”
   ▪ “I have no idea [robot capacity] but not nearly enough.”
   ▪ “[CU is] rising [because of the dedicated robot room].”
6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   ▪ “I don’t know.”
7. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   - “I don’t know.”
8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   - “I don’t know.”
9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ financial losses when the robot is used? Or does the hospital not think about costs per procedure?
   - “I don’t know.”
10. How do you think about the cost benefit of having a DV robot in-house?
    - “It’s definitely better for the patient. I also think it’s more innovative, and I think it’s better for a hospital. Would you want to be the hospital known for big open-belly cases, or would you want to be a hospital known for [doing surgeries that allow you to] go back to work in a couple of days?”
11. Are you seeing your DV usage widen beyond OB/GYN, urology and chokey?
    - “Yes. We do ENT also. ... We are hopefully going to start doing cardiovascular but that remains to be seen. We’ll see.”
12. What is your prediction for continued use and expansion of robotic surgery?
    - “I know there are some issues with it legally, and there are some problems with the techniques. But I think that’s more of a surgeon-by-surgeon [technique] rather than the robot itself.”

9. Director of surgery for a community hospital in the South

The hospital has one robot and does not plan to get another one because of its limited OR space. The hospital’s plans for a new, large OR is on hold because of uncertainty surrounding Affordable Care Act. Robotic patients have had “excellent” clinical outcomes. (The source says she doesn’t receive remuneration from Intuitive Surgical.)

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot? If not, why?
   - “One.”
   - “Not at this time.”
   - “For the surgeons [GYN and urology] who use it, we can schedule them accordingly, and one is enough for us at this point.”
2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   - “Yes, absolutely.”
3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   - “I would say both. ... I think it was emerging information that these procedures done with the robot were less traumatic, the patients were able to be up and about and discharged quicker, and [had] shortened length of stays. Even though the procedure is longer and more tedious, there were less patient complaints and less patient time in the hospital.”
   - “I don’t know that [increased patient traffic is] the case, but we did have patients who have come because we have [the robot]. They specifically asked for the robotic procedure because of the shortened length of stay and the shortened period of time that they would have to be off work.”
4. How many DV procedures performed in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “This would be a guess on my part. I would think it was somewhere in the neighborhood of 80 to 100.”
   - “[The 2013 run rate] is actually lower because one of the physicians who used the robot has relocated to a different town. We have [recruited a new OB/GYN surgeon]. She is on board, but she hasn’t been trained on use of the da Vinci yet. I don’t know if [getting her trained] is in the works, but I heard that was a possibility.”
   - “I think that we will be doing more procedures [in 2014]. I don’t know that we will be doing enough to warrant a second robot. As long as we can utilize the one we have effectively, we will probably stick with one until we get more of a demand.”
5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or falling?
   - “I have no idea. A lot of it would basically be dependent on the area that [the surgeon] works in and the clientele. ... One of our physicians who does the hysterectomies could probably do two or three a day if the clientele demand was there. [But] we are not in a huge city. We have three OB/GYNs, and one of those is retiring.”
   - “Depending on the procedure, there could be four hysterectomies a day, or there could be one sacrocolpopexy a day [which] takes longer. They are four- to five-hour procedures, so we probably wouldn’t put but one of those on a day. ... The OB/GYNs could do quite a bit more because basically their procedures are quicker.”
   - “I think we are able to manage anybody who comes in and who is an adequate candidate and wants [to have surgery] done with a robot. We are able to do that at this point, and we still have time available to do more.
   - “Our limiting factor is our room space; this is an older facility and we only have three large rooms. Most everybody’s cases require more and more equipment, including the robot.”
   - “We are working on [expanding]. I think after the implementation of the Affordable Care Act, they are going to see how the financial aspect is reflected. And we actually have plans to construct another big OR to help us out with that.”

6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   - “I don’t know. ... Knowing the people who do the accounting in this facility, I’m sure that they keep that in mind. I don’t know that that’s one of their major areas of focus at least as far as the robot goes, but I’m sure they know down to the penny how much it costs per procedure for us to do them.”

7. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   - “[The robotic hysterectomy] is probably a little more, but I don’t know that it would be significantly more. I don’t do the accounting on it so I couldn’t tell you for sure. A lot of the things on the robotics cases are reusable, whereas the things on the laparoscopy cases are all single-use only and disposable.”
   - “We don’t do [robotic choleys or colorectal/LAR] at this point.”

8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   - “I don’t know. I’ve been in it long enough to know that it just depends on what insurance the patient has; some of them will pay well and some of them don’t. We don’t use that as a determining factor on who gets it and who doesn’t though.”

9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ losses made when the robot is used? Or does the hospital not think about costs per procedure?
   - “I have no idea, [but] I am betting not because they wouldn’t be encouraging us to use it as much as they do. If we were losing money on it, they’d be trying to find somewhere to unload this thing.”
   - “For the retropubic prostatectomy that was done in the past, [patients] may have stayed five to seven days, had blood transfusions. Now [with the robotic] radical prostatectomy, we have had at least one [patient who has gone home] the next day, and most of them are gone by the second day. ... [With the robotic hysterectomies] we have had several [patients] who have gone home the next day.”

10. How do you think about the cost benefit of having a DV robot in-house?
    - “I really don’t have a judgment call on that.”

11. Are you seeing your DV usage widen beyond OB/GYN, urology and choley?
    - “I have not at this point. There have [been discussions about widening it]. The general surgeons have been talking, especially one of our newer ones. But he is extremely adept at doing single-incision laparoscopic procedures, so I don’t know that he would want to change his process.”

12. What is your prediction for continued use and expansion of robotic surgery?
    - “It should expand just by virtue of the positives and the patient satisfaction with it.”

13. When will ISRG reverse the recent trend of declining sales, slowing procedure growth, increased FDA scrutiny and patient lawsuits?
    - “That I do not know. In this society where everything is a lawsuit, there’s no way of telling, but we seem to have had good results. I like to think it’s because we have such exceptional surgeons but we have had excellent results with [robotic surgery]. If there has been any problems [with it], I haven’t known it—and I’ve been here ever since we got it [in 2011].”
10. Robotic nurse coordinator at a large hospital in the South

In assessing whether to move forward with a third robot, the hospital is identifying whether its robotic surgeons are operating as skillfully and efficiently as they should be. The hospital’s robotic surgery program, which the source said appears to be in the black, runs the gamut from gynecology and urology, to colorectal, transplantation, thoracic and bariatric procedures. (The source reports that he receives no payment from Intuitive Surgical.)

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot? If not, why?
   - “Currently we have two.”
   - “We are considering installing a third system.”

2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   - “First and foremost before we install the third system, we need to justify the third one being installed, and we are working on that right now [by looking at data].”
   - “So far the data has shown that we are making money out of it. We are just trying to make sure we get the right people who have been trained and make sure they are utilizing the proper instrumentation and proper supplies without wasting additional supplies to deal with their procedure.”

3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   - “I have an idea, but I don’t really know.”
   - “[The program started] with maybe seven or eight doctors, and now we have about 30 doctors trained to do robotic surgery.”

4. How many DV procedures performed in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   - “I would say more than a thousand cases.”
   - “I would say it would be higher. I don’t have that data right now … but we are expecting to surpass what we had in 2012.”
   - “It’s not going to change much … unless [we] install the third [robot] system.”

5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or falling?
   - “With shorter procedures, you can do more. If you have a good doctor who can do it fast enough, [we] can accommodate more cases. Instead of doing two complicated cases in one day, we can do maybe six or eight shorter cases [on] one system.”
   - “Basically in a day, one doctor will do four cases and another one can do three, [and] we still [have a lot of doctors] waiting for a slot [to use the robot].”
   - “We have the volume … to need another system to be installed, but again … those individuals who are not performing well with their skills or taking more time to do a surgical procedure need to be looked at.”

6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   - “Yes.”

7. How do costs of robotic procedures compare with those for lap procedures, such as hysterectomies, cholesys and colorectal/LAR?
   - “Some doctors prefer robotic because they are not that confident doing [a hysterectomy] laparoscopically or vice versa. Basically if you are comparing both with the efficient doctor laparoscopically and the efficient doctor robotically, I’d say the robotics will cost a little bit more.”
   - “[Choleys are] the same way.”
   - “When we do robotic [colorectal/LAR], there is a slight increase in expenditures.”

8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, cholesys and colorectal/LAR?
   - “I don’t have access to that.”
9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ losses made when the robot is used? Or does the hospital not think about costs per procedure?
   • “The hospital does think about the costs per procedure.”
10. How do you think about the cost benefit of having a DV robot in-house?
   • N/A
11. Are you seeing your DV usage widen beyond OB/GYN, urology and choley?
   • “We do different specialty procedures: urology, GYN, colorectal, transplant, thoracic and bariatric.”
12. What is your prediction for continued use and expansion of robotic surgery?
   • “Some hospitals have some issues with regards to getting the right people in the right place. I think that is very important because you want somebody who is well-trained, skillful and knowledgeable operating these machines. At the same time, you should have the staff to support that. That way, you will achieve a better outcome. Without those components, your [robotic surgery] program isn’t going to succeed.”

11. OR nurse for a Southwestern hospital

Robotic surgery will become commonplace in the future. The hospital has two robots, which currently is sufficient, and provides robotic GYN and urology procedures, as well as distal pancreatectomies and splenectomies. The hospital likely will do slightly more robotic procedures this year. (The source says he does not receive payment from Intuitive Surgical.)

1. How many da Vinci robots currently are in your hospital system? Are you planning on buying another robot? If not, why?
   • “Two.”
   • “No, two is enough for now.”
2. As you consider buying additional robots or your first robot, do the following factors come into play: medical efficacy, cost and ROI?
   • “Of course, that’s always a consideration.”
3. Was the purchasing decision driven by surgeon demand or competitive dynamics with other hospitals/surgical centers? Did you see increased patient inflow and procedure execution following the acquisition of your DV?
   • “Both.”
   • “[The patient increase is] not substantial. We have only a certain number of surgeons who come to us, especially in terms of GYN and urology surgeons. … [And] all the hospitals that are around me have the same robot.”
4. How many DV procedures performed in 2012? What is the 2013 run rate: higher or lower? What is the outlook for 2014?
   • “I think we will do just a little more this year.”
   • “I expect more if we can convince the general surgeons to get on board, especially with the single-site [cholecystectomy].”
5. What is the max procedures you think a robot can do in the hands of a skilled surgeon per year? Measured against this number, what is current capacity utilization for your robots? Is CU rising or falling?
   • “Two per day back to back in one room. Maybe three for a little procedure.”
   • “I’m working at 50% to 75% capacity in any given day.”
   • “[The CU is] the same basically.”
6. When thinking about the cost of a robotic procedure, do you include the robot’s capital costs?
   • “Yes, I think so.”
7. How do costs of robotic procedures compare with those for lap procedures, such as hysterectomies, choleys and colorectal/LAR?
   • “[The cost of a robotic hysterectomy] should be higher with setup time, disposables, and the nature of the semidisposable instruments.”
   • “We haven’t done [a robotic choley or colorectal/LAR] yet, so I can’t comment on that. I’m sure it’s going to be more.”
8. What is the standard reimbursement that hospitals get per procedure for lap hysterectomies, choleys and colorectal/LAR?
   • “I don’t know.”
9. Given DRG codes/reimbursement payments, how does a hospital handle the higher costs of robotic procedures? Are most procedures’ losses made when the robot is used? Or does the hospital not think about costs per procedure?
5) HOSPITALS NOT USING A DA VINCI SYSTEM
These five hospitals said their hospitals do not plan to purchase a da Vinci system in the next three years, mostly because of a lack of funds, lack of surgeon demand, the long learning curve, and the stiff competition between hospitals with robotics. Only one source reported losing patients as a result of not offering robotics, while two were not sure. The use of robotics will expand but slowly because of the lack of cost effectiveness, reimbursement issues and limited efficacy advantages, and will be restricted to teaching and larger hospitals.

KEY SILO FINDINGS
1. Do you plan to acquire a DV robot in the next one to three years?
   - None of the 5 hospitals plans to purchase a da Vinci system in the next 1 to 3 years.
2. What drove the decision to not acquire/purchase a DV system?
   - 4 have not purchased a da Vinci for economic reasons, the technology’s lack of cost effectiveness, and too much competition from neighboring hospitals.
   - 1 source reported little no interest from the hospital’s surgeons.
   - 1 commented on the long learning curve for surgeons to become proficient in using the da Vinci.
3. Have you lost patient traffic to a competitor in the district/neighborhood who does have a DV?
   - 2 claim they have not lost patients.
   - 2 are not sure.
   - 1 reported losing patients.
4. Did worries about likely reimbursement policy and regulation play a role in your decision?
   - 3 said reimbursement concerns were part of their decision not to buy a da Vinci.
   - 2 said reimbursement did not affect their decision but still matters.
5. Do you consider laparoscopic surgery within urology/gynecological and general surgery fields to be as efficacious, more efficacious or less efficacious?
   - Efficacy depends on the procedure and the surgeon performing it.
   - 1 source said data indicated the da Vinci is not more efficacious than other methods in prostatectomies.
   - The same source said data indicated the da Vinci may be more efficacious in gynecological oncology procedures.
6. How does a robotic general surgery procedure such as a choley make money or show a positive ROI for a hospital?
   - 2 sources do not think robotic general surgery can generate a positive ROI; others did not know.
7. What is your prediction for the continued use and expansion of robotic surgery?
   - 3 think the use of robotics will expand but at larger hospitals and possibly not at the past rate.
   - 1 thinks economics will determine the future of robotics, especially in light of Obamacare.
   - 1 thinks expansion is five years out because demand has slowed and will only be boosted by new, younger surgeons.
1. Surgical services director in Texas

This 300-plus bed hospital, which is part of a large hospital system, has no plans to purchase the da Vinci because its surgeons are not interested. Also, designating a room to robotic procedures would be a strain on performing other surgeries. The director said the hospital has not lost patients or physicians to hospitals with a da Vinci. He does not expect his hospital to change its decision in light of Obamacare and the cost of the da Vinci system.

1. Do you plan to acquire a DV robot in the next one to three years?
   ▪ “No. As the years go by, our COO and our CFO talk to us about the capital budget to see if there’s a buzz or any interest in the da Vinci. It never comes up on the radar. No one has ever said, ‘We have to have one.’”

2. What drove the decision to not acquire/purchase a DV system?
   ▪ “The da Vinci was developed for laparoscopy and for urology as the primary area. Our urologist thinks it’s a waste of time, and our general surgeons agreed. ... None of our surgeons are robotic-friendly. And we’re not a teaching hospital.”
   ▪ “The other main factor is you have to have a designated room. We do 1,200 to 1,500 surgeries each month in seven rooms; to designate one of those rooms would take away from the others.”
   ▪ “We’re a [corporate] facility, so [the parent company] would be involved in the decision.”

3. Have you lost patient traffic to a competitor in the district/neighborhood who does have a DV?
   ▪ “No. Our urologist has so much business here and we’ve never had a GYN go elsewhere to do a da Vinci procedure.”

4. Did worries about likely reimbursement policy and regulation play a role in your decision?
   ▪ “I haven’t heard that directly, but the economics are important.”

5. Do you consider laparoscopic surgery within urology/gynecological and general surgery fields to be as efficacious, more efficacious or less efficacious?
   ▪ “We do a lot of laparoscopic procedures in GYN and other areas. None of our surgeons has ever said, ‘We need the da Vinci because [it’s more efficacious].’”

6. How does a robotic general surgery procedure such as a choley make money or show a positive ROI for a hospital?
   ▪ “I’m not hearing anything on that. ... I don’t believe there is extra reimbursement for the robot.”

7. What is your prediction for the continued use and expansion of robotic surgery?
   ▪ “I’m probably not a good person to ask since in my 33 years I’ve never been around the robot or around a group of people who are marketing it.”
   ▪ “Who knows? [Our parent company] could say one year, ‘We want all our facilities to have it,’ but a lot of it is economical. With the tight margins for reimbursement and now with Obamacare setting in, I don’t see that happening soon.”

2. Acting director of surgery for a regional hospital with 235 beds

This source reported no plans to purchase a da Vinci, saying three to five daily da Vinci surgeries are necessary for the system to be cost-effective. Only certain robotic procedures, such as prostatectomies, are efficacious. Robotic use could become the norm as younger surgeons join the workforce.

1. Do you plan to acquire a DV robot in the next one to three years?
   ▪ “I haven’t heard anything. I hope not.”

2. What drove the decision to not acquire/purchase a DV system?
   ▪ “I’ve worked at a number of hospitals with da Vincis. Unless you’re a big university or big medical center that uses it every day for three to five cases, it’s not cost-effective.”
   ▪ “We have too many resources elsewhere. We have all these big hospital and university institutions around us. If we have a patient who needs the da Vinci, that’s where I would send them.”
   ▪ “The learning curve is too high. There can be too many complications.”
3. Have you lost patient traffic to a competitor in the district/neighborhood who does have a DV?
   - “Frankly, I don’t know if in this community people have enough education to know much about it. It’s not the kind of surgery we do here; 80% of our patients are government or unreimbursed surgeries.”
   - “Patients shouldn’t look for a place like ours [for robotic surgeries]. They’re looking for 500-, 700- or 900-bed institutions that use them all the time. They want to look for a big institution. The learning curve is so steep.”
4. Did worries about likely reimbursement policy and regulation play a role in your decision?
   - “Yes.”
5. Do you consider laparoscopic surgery within urology/gynecological and general surgery fields to be as efficacious, more efficacious or less efficacious?
   - “Prostatectomy is what [the robot] was designed for. It’s reasonable in prostatectomy. It’s great for those, and the pain makes a difference in post-op and recovery. In heart, it can be good too.”
   - “But to use the robot for what we call ‘bread and butter’ operations, no. There are some cases, such as vaginal hysterectomies, that can be done in 20 minutes, but to do them on the da Vinci, which can take three hours? The learning curve is so steep. It needs to be used in the right cases.”
6. How does a robotic general surgery procedure such as a chokey make money or show a positive ROI for a hospital?
   - “Unless you have a very young surgeon who grew up on video games, it’s unlikely.”
   - “Intuitive is making tons of money, and [hospitals are] losing it. For the ordinary hospital, it’s not cost-effective.”
7. What is your prediction for the continued use and expansion of robotic surgery?
   - “It’s useful for the right thing but ... it’s not a machine for every surgeon, such as for hysterectomies. For the younger surgeon, it’s great.”
   - “At this point it’s not there. I think it will be as more surgeons become accustomed to it, as the younger surgeons mature—but not for five or more years.”

3. Nurse executive at a Southeastern hospital

This hospital has no plans to purchase a da Vinci for the next one to three years. According to the hospital’s own analysis, the robot would only be more efficacious than traditional laparoscopy for GyN oncology surgeries, which the hospital does not perform.

1. Do you have a DV robot? Why not?
   - “No.”
   - “Primarily economics—the initial investment as well as the ongoing expense. We do not feel there is enough supporting data to justify the costs of purchase or continued operation.”
2. Do you plan to acquire a DV robot in the next one to three years?
   - “No.”
3. Have you lost patient traffic to a competitor in the district/neighborhood who does have a DV?
   - “It’s debatable. Some say yes—the urologists.”
4. Did worries about likely reimbursement policy and regulation play a role in your decision?
   - “Certainly. I researched it myself [and found out that] there’s no additional reimbursement opportunities for a robotic surgery.”
5. Do you consider laparoscopic surgery within urology/gynecological and general surgery fields to be as efficacious, more efficacious or less efficacious than robotic?
   - “It depends on the specific type of surgery. For the surgery that we do, it is equal to [robotic surgery]. ... Based on our analysis, the robotic surgery would offer additional efficacy [in] gynecological oncology. ... From a urology standpoint, for prostatectomies, there has been ample data out in recent times that support that the outcomes are no better than an open or a laparoscopic [procedure].”
6. How does a robotic general surgery procedure such as a choley make money or show a positive ROI for a hospital? Do you feel like a robotic choley can make money or show a positive ROI on investment?

- “No way.”

7. What is your prediction for the continued use and expansion of robotic surgery?

- “Based on my understanding, [robotic surgery] was initially invented to assist cardiac surgeons. There wasn’t a whole lot of business there, so they went to urology for prostatectomy. That was huge because that is a predominantly open procedure; you have to open up. This offered minimally invasive surgery for a very specific surgical group. I personally feel that the addition of GYN surgery and general surgery was nothing more than marketing to help justify the purchase of a robot. ... Unless you are a very large academic facility that gets lots of referrals, [having a robot] is hard to justify for many facilities based on prostatectomies alone.”
- “[I don’t know that [da Vinci sales] will ever recover to the point they were in the beginning, based on the data coming out now to show that it isn’t as advantageous as they wanted the public perception to be. Therefore, unless they find another niche market for it ... I don’t think that their continued sales will remain at the same scale that it was before. I’m not saying the robot is going away.”

4. Nurse manager at a small Southern hospital

The source was not aware of any plans for the hospital to acquire a da Vinci, because it lacks the resources and is next to institutions that already provide robotic surgery. The source was certain the hospital has lost patients as a result.

1. Do you plan to acquire a DV robot in the next one to three years?

- “Not that I know of.”

2. What drove the decision to not acquire/purchase a DV system?

- “We are just a small hospital, and I don’t think we have the funds to do the da Vinci. And we are not that far [from other hospitals that have the robot].”

3. Have you lost patient traffic to a competitor in the district/neighborhood who does have a DV?

- “Yes, I am sure we have. ... I don’t know what the percentage would be, but I know we have lost some.”

4. Did worries about likely reimbursement policy and regulation play a role in your decision?

- “No.”

5. Do you consider laparoscopic surgery within urology/gynecological and general surgery fields to be as efficacious, more efficacious or less efficacious?

- “I don’t know the difference because I haven’t researched it or been involved much in robotics.”

6. How does a robotic general surgery procedure such as a choley make money or show a positive ROI for a hospital?

- “I don’t know.”

7. What is your prediction for the continued use and expansion of robotic surgery?

- “I am sure it will expand. How far and how it will go, I don’t know, but I am looking forward to it expanding into other fields.”

5. Nurse manager at a community hospital

This community hospital was poised to buy a robot two years ago but decided against it after reviewing reimbursement rates. One of the hospital’s surgeons does robotic surgery at a nearby hospital.

1. Do you plan to acquire a DV robot in the next one to three years?

- “No.”

2. What drove the decision to not acquire/purchase a DV system?

- “Expense. We don’t have the volume to support it. We have a couple of other community hospitals in our area that have it.”

Unless they find another niche market for it ... I don’t think that their continued sales will remain at the same scale that it was before. I’m not saying the robot is going away.

Nurse Executive, Southeastern Hospital
“We had money two years ago for [purchasing] it. [We decided not to purchase it, however, because of] reimbursement. It just came back from finance that we would do nothing but lose money.”

3. Have you lost patient traffic to a competitor in the district/neighborhood who does have a DV?
   • “No. We have one physician who uses it; he just goes to another hospital. ... We know exactly what patient population is going. We just choose not to spend the money on the few patients that he does [robotic surgery on].”

4. Did worries about likely reimbursement policy and regulation play a role in your decision?
   • “Yes, it did.”

5. Do you consider laparoscopic surgery within urology/gynecological and general surgery fields to be as efficacious, more efficacious or less efficacious?
   • “That is definitely practitioner-dependent, so I can’t give one statement. I think it’s probably the same.”

6. How does a robotic general surgery procedure such as a choley make money or show a positive ROI for a hospital?
   • “I would have no opinion on that.”

7. What is your prediction for the continued use and expansion of robotic surgery?
   • “It will grow in the teaching hospitals, the big hospitals, but small community hospitals like ours can’t afford it.”

Additional research by Karen Lusky, Renee Euchner and Linda Richards

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