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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

Proceeding	91175319
Party	Plaintiff Intuitive Surgical, Inc.
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

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INTUITIVE SURGICAL, INC.,	)	
	)	
Opposer,	)	
	)	
vs.	)	Opposition No. 91175319
	)	Serial No. 78/728,786
DAVINCI RADIOLOGY	)	Published: 12-19-06
ASSOCIATES, P.L.,	)	
	)	
Applicant.	)	
	)	

CERTIFIED COPY

TESTIMONY DEPOSITION OF

DAVID SCOTT

Tuesday, January 27, 2009

REPORTED BY: DEBRA ALLUSTIARTI CSR 10929 JOB 416321

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Surgical web site, "Products"

13 section

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Deposition of DAVID SCOTT, taken by the Opposer, at Four Embarcadero Center, 17th Floor, San Francisco, California, commencing at 2:08 p.m., on Tuesday, January 27, 2009, before DEBRA ALLUSTIARTI, CSR, pursuant to subpoena.

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A P P E A R A N C E S

FOR THE OPPOSER:

SHEPPARD MULLIN RICHTER & HAMPTON LLP
Four Embarcadero Center, 17th Floor
San Francisco, CA 94111-4106
415.434.9100
By: MICHELLE J. HIRTH, Attorney at Law

FOR THE APPLICANT TELEPHONICALLY:

LAW OFFICE OF MATTHEW T. VANDEN BOSCH
301 Clematis Avenue, Suite 3000
West Palm Beach, FL 33401
561.736.4696
By: MATTHEW T. VANDEN BOSCH, Attorney at Law

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1 SAN FRANCISCO, CALIFORNIA; Tuesday, January 27, 2009
2 2:08 p.m.
3 --o0o--
4 DAVID SCOTT
5 ---
6 called as a witness by the Opposer, who, having been
7 first duly sworn, was examined and testified as follows:
8 EXAMINATION BY MS. HIRTH
9 MS. HIRTH: Q. Please state your name.
10 A. David Scott.
11 Q. And who is your current employer?
12 A. Intuitive Surgical.
13 Q. Please state your current business address.
14 A. 1266 Kifer Road, Sunnyvale, California.
15 Q. Have you ever had your deposition taken
16 before?
17 A. No, I have not.
18 Q. Have you ever given testimony at trial
19 before?
20 A. No, I have not.
21 Q. Because this is a little different from both
22 of those -- we're giving testimony at a deposition
23 setting -- I'm going to go through some general ground
24 rules.
25 You've taken an oath, so we want your best

1 testimony, your best memory.
2 I'm going to try to not speak over you, and
3 if you can try not to speak over me, that will help the
4 court reporter and everybody else who's listening;
5 meaning, Mr. Vanden Bosch on the phone.
6 Also, if you can answer questions audibly --
7 obviously, the court reporter needs to hear it.
8 Mr. Vanden Bosch needs to be able to hear it -- so
9 nodding or shaking your head we'd rather avoid.
10 I'm not -- I'm going to ask you to give us
11 your best testimony. I don't want you to guess. But
12 you can estimate, as long as you tell us you're
13 estimating.
14 And I think those are all the things I
15 wanted to ask you about. The only other important thing
16 is, if you need a break, let us know. We don't want you
17 to have to suffer through, and that goes for the court
18 reporter as well.
19 All of that is clear?
20 A. Yes, it is.
21 Q. Okay. Have you taken any medication during
22 the past 24 hours?
23 A. I have not.
24 Q. Is there anything else that you're aware of
25 that could affect your memory and your ability to

1 testify today?
2 A. No.
3 Q. Could you describe for us your educational
4 background?
5 A. I have a master's degree in aerospace
6 engineering with an emphasis in medical imaging
7 technologies.
8 Q. Can you tell me when you received that
9 master's degree?
10 A. It was 19 -- fall -- or let's see -- the
11 spring of 1995.
12 Q. From where did you obtain that master's?
13 A. University of Colorado in Boulder.
14 Q. Prior to the master's degree, did you have
15 any other higher education beyond high school?
16 A. My bachelor's degree is in aerospace
17 engineering from the University of Kansas in Lawrence,
18 Kansas.
19 Q. Can you briefly describe your work history
20 for us?
21 A. I worked for Lawrence Livermore Lab, in the
22 medical technology program there, doing medical device
23 development with a focus on medical imaging technology
24 like X-ray, CT, ultrasound and white-light imaging.
25 After Livermore, I worked for a small company developing

1 a 3-D tomography system, X-ray tomography system. After
2 that, I started my own company with a colleague, and we
3 developed a laser scanning microscope system primarily
4 for the semiconductor industry. After that, I left
5 there and joined Intuitive Surgical in June of 2007.
6 Q. When you joined Intuitive Surgical, what was
7 your job title?
8 A. It's senior product management for vision
9 systems.
10 Q. Do you still hold that position?
11 A. I do.
12 Q. What are your job duties in that position?
13 A. I am -- primarily, I'm responsible for the
14 medical imaging aspects of the da Vinci platform and all
15 of our products that have any relationship to medical
16 imaging. So that's -- that covers everything from
17 interfacing with the surgeons and the hospitals on
18 existing products -- addressing problems or issues they
19 might be having or helping them answer questions -- to
20 driving the strategic direction of the product line as
21 it relates to medical imaging; so defining requirements
22 for next-generation medical imaging technologies that we
23 plan to integrate into the da Vinci product line and
24 platforms.
25 Q. In that role, are you familiar with the

1 da Vinci surgical system?
2 A. I am.
3 Q. Is there a manner in which you generally
4 refer to those systems?
5 A. We have two platforms in the field. We have
6 the da Vinci -- the first da Vinci system, which we
7 refer to as the "da Vinci standard" or "da Vinci
8 classic," and then the next-generation platform is the
9 da Vinci S. Together we refer to them as the "da Vinci
10 platform" or the "da Vinci systems."
11 Q. Are both of those systems still in use
12 today?
13 A. Yes, they both are.
14 Q. Okay. Can you generally describe the
15 da Vinci classic system?
16 A. It's comprised of three components. There's
17 what people would commonly refer to as the "robot
18 component," which is the patient-side cart, and that's
19 the component that actually has the interface to the
20 patient. There is the surgeon console, and that's often
21 several meters away from the patient cart -- maybe in
22 the corner of the OR room -- and that's where the
23 surgeon sits and controls the patient cart. And then
24 there is the vision tower or vision system, and that is
25 a wheeled cart that houses all the camera equipment and

1 lighting equipment that's used for the imaging side of
2 the system.
3 Q. How -- well, let me back up.
4 Is the da Vinci S similar to the da Vinci
5 standard classic system?
6 A. It's very similar. So the -- between the
7 da Vinci standard and the da Vinci S, the patient-side
8 cart was upgraded. So the arms on the patient-side cart
9 were changed to be more user friendly, larger range of
10 motion, more ergonomic and a nicer industrial interface;
11 you know, the cables are hidden, and it's not so rough
12 looking. The da Vinci classics are the very first
13 systems, so it was -- had a lot of the cables hanging
14 off and things like that. That's the primary difference
15 between the systems.
16 In the da Vinci classic, at that time we
17 didn't have -- HD technology wasn't mature, so the
18 da Vinci classic does not have HD imaging capability.
19 The da Vinci S, we then added HD imaging capability to
20 the vision cart. So you can get it either in standard
21 definition or with HD definition video.
22 Those are the primary two differences
23 between the platforms; is the patient-side cart was
24 updated and we added HD capability.
25 Q. Can you describe for me -- let me back up.

1 You said you commonly refer to both systems
2 as "da Vinci," and I'm going to go ahead and do that for
3 the remainder of this deposition. If for some reason
4 there's a reason to distinguish them in your answer,
5 please let us know that and do that.
6 Can you briefly describe how the da Vinci
7 system works?
8 A. So it's a -- calling it a robot probably is
9 somewhat of a misnomer. In a lot of people's minds,
10 they think of an autonomous robot, and it creates a
11 scary picture in their mind. It's a master-slave robot
12 in that the patient-side cart cannot perform any motions
13 or move at all unless the motion is initiated at the
14 surgeon console. So the surgeon console is the master;
15 the patient-side cart is the slave.
16 In essence, the way it works is, the surgeon
17 sits at the surgeon console and looks into the displays,
18 which create 3-D stereo vision, and he grabs
19 manipulators that allow -- as he moves the manipulators
20 or the masters, that allows him to control and
21 manipulate the arms at the patient-side cart which, in
22 turn, control instruments inside the patient's body, and
23 that's how he's able to perform surgeries.
24 Q. Is there a computer component to the
25 da Vinci surgical system?

1 A. There's many levels of computer processors
2 in the system, both in the patient cart and in the
3 surgeon console and in the vision cart. Each different
4 processor is handling different aspects. There's
5 processors handling the motion -- the master-slave
6 motion control. There's processors that are handling
7 the video processing; doing the real-time streaming of
8 the video and filtering the imaging and cleaning it up
9 and adding overlays and other additional information to
10 the video image. There are processors that are
11 monitoring errors and fault checking and redundancy and
12 so on and so forth. So there's an extensive amount of
13 various levels of processing happening in the system.
14 Q. Now, you mentioned -- I think you said -- a
15 video-imaging component. Can you -- well, let me just
16 back up.
17 In your current job, are you -- is that
18 something with which you have any sort of
19 responsibility?
20 A. So that's -- yeah. So the video-imaging
21 component is the piece of the system that I am the
22 manager for, so I manage that. Any aspect to the
23 medical imaging and video-imaging component, as I said,
24 I manage it; everywhere from the very downstream side --
25 which is customer-facing, you know, surgeon-facing

1 issues -- all the way to the very upstream, where it's
2 interfacing with the engineering team, developing new
3 concepts for medical imaging and trying to bring those
4 concepts to market.
5 So as a product manager, I have my hands in
6 all of these pots, and I coordinate the various groups
7 of the organization to, you know, either address service
8 issues or to develop new technologies. In a sense, I'm
9 kind of a focal point for the medical-imaging side of
10 the technology.
11 Q. Can you describe for us the medical-imaging
12 side of the technology?
13 A. So the da Vinci is unique in that it
14 provides 3-D imaging capability compared to standard
15 laparoscopic surgery which is only 2-D imaging on a flat
16 standard 2-D monitor. We've built into the system the
17 ability to see and perceive everything in 3-D -- in
18 three dimensions -- just as you would normally.
19 So that's achieved through a special design
20 of the endoscope which utilizes actually two eyes -- two
21 optical trains -- so we carry two optical trains all the
22 way through the entire system. From the tip of the
23 endoscope, there's two sets of optics. There are two
24 separate camera video heads at the back of the endoscope
25 that capture the video; left-eye and right-eye video.

1 Those two channels of left- and right-eye
2 video are then carried through the video processing
3 system and over to the surgeon console. At the surgeon
4 console, there are two separate physical displays -- CRT
5 displays -- in both systems, and the left eye is
6 displayed in the left display, and the right-eye video
7 image is displayed in the right display. And,
8 therefore, when you look at that with your left and
9 right eye, your mind creates the three dimensional
10 scene, and you see everything in 3-D.
11 Q. Can you explain -- well, let me ask you
12 this: When the surgeon uses the da Vinci system, does
13 the surgeon see the surgical field? When I say that, I
14 mean the operating field on the patient.
15 MR. VANDEN BOSCH: Objection, leading.
16 MS. HIRTH: Q. You can -- well, let me ask
17 you a little differently.
18 What does the surgeon see when they're
19 sitting at the surgeon console?
20 A. So they see anything that the endoscope is
21 pointing at. So when the endoscope is inside the body,
22 they are seeing a 3-D view of the anatomy inside the
23 body, as well as we -- the system has the capability to
24 bring in other imaging modalities, such as ultrasound
25 image or a CT data set or a vital-signs monitor. So we

1 call it -- we have a trade name for it -- we call it
2 TilePro, but it's essentially like Picture in Picture on
3 your television set.
4 You can feed up to two different displays of
5 video, and then that is overlaid into the -- like
6 Picture in Picture -- overlaid into the surgical view
7 allowing the surgeon -- for example, ultrasound is often
8 used for partial nephrectomies, which is the removal of
9 part of your kidney for kidney tumors. So they will use
10 ultrasound to scan the kidney to look for the tumor
11 site.
12 Well, the way they do this is, they look --
13 the surgeon has their head inside the surgeon console,
14 and they're manipulating an ultrasound probe and
15 scanning the kidney. And then the ultrasound video
16 image is piped into the surgeon console into TilePro --
17 or Picture in Picture -- and they're able to
18 simultaneously see the video and the anatomy from the
19 video, and then in a Picture in Picture, see the
20 ultrasound image and identify where the tumor is in
21 relation to the anatomy. And then they can use that
22 information to decide how to cut out the tumor and
23 remove the tumor.
24 Q. You mentioned some of the data set that can
25 be piped in are vital-signs monitor, CT data set and

1 ultrasound. Is there anything else that can get piped
2 in there?
3 A. Really, any type of video -- or still
4 images, for that matter -- that the surgeon wants to put
5 into it. So a surgeon could take his or her laptop and
6 have prerecorded scenes of surgical video that -- maybe
7 they've -- maybe they're teaching a student, and they
8 have some prerecorded scenes of a critical part of the
9 procedure that they want to be able to show the student
10 at the right time during his or her case. They can take
11 their laptop, play this video and -- through, say, an
12 S-Video connector or other type of standard video
13 connector plug into our system -- and pipe that video
14 into our TilePro -- or Picture-in-Picture view -- so the
15 person at the surgeon console can see that.
16 So, really, any kind of video can be
17 displayed. Any kind of medically relevant video can be
18 incorporated.
19 Q. Are there -- in terms of what can be played
20 or piped in, are there other types of medical imaging
21 that can be piped in, other than ultrasound and CT that
22 you already mentioned?
23 MR. VANDEN BOSCH: Objection, asked and
24 answered.
25 MS. HIRTH: Q. You can answer.

1 MR. VANDEN BOSCH: Also, leading.
2 THE WITNESS: So if -- I can think of --
3 let's see -- there's ultrasound, CT, MRI, PACS
4 workstation. I've seen people incorporate -- for
5 cardiac procedures, they incorporate vital-signs monitor
6 and ultrasound. For general surgery procedures, they're
7 using MRI and CT. So those are the ones that normally
8 I'm used to seeing.
9 MS. HIRTH: Q. You mentioned, when you
10 talked about TilePro, that -- I think you used the
11 words: It creates an interface that the surgeon can see
12 and look at.
13 Can you describe what that looks like to the
14 surgeon when they're looking in the console?
15 A. So the upper part of the screen is -- the
16 larger, say, two-thirds of the screen is -- remains the
17 normal surgical -- live surgical view -- video view, and
18 then the, say, bottom third -- and this is adjustable in
19 the system. You can shrink it, or you can make it
20 larger as you want -- but the bottom portion of the
21 screen has two small windows that display the video from
22 any outside source that you want to show.
23 Q. And when you say "outside source," from
24 where do these videos or data sets, as you referred to
25 them, come from?

1 A. They can come from lots of sources. They
2 could come from the surgeon's laptop. They could come
3 from an ultrasound machine that's in the room at the
4 time. They could come from a vital-signs monitor that
5 is in the room at the time. So those would be all, kind
6 of, live situations.
7 They could also come from prerecorded or
8 preoperative data that was collected anytime prior to
9 the surgery; say, a CT data set that was collected in
10 the hospital or by some outside service, or an MRI data
11 set that was collected prior to the procedure and stored
12 on a disk -- say, a DVD or a CD -- and then played back.
13 So really those -- those video sources can
14 come from anywhere.
15 Q. And just to clarify, does Intuitive Surgical
16 provide any of those sources?
17 A. We do not provide any outside imaging
18 capabilities at this time. We just -- you know, we just
19 have -- we just really focus on our core technology of
20 surgical -- da Vinci surgery and da Vinci surgical
21 imaging.
22 Q. In your work at Intuitive, have you had
23 occasion to see an outside source of video or data set
24 piped in through the system as you've told us about?
25 A. I have. I've seen folks that have taken a

1 CT data set that was recorded at an outside imaging
2 services provider, and they played it back using the
3 their laptop -- through an S-Video connection on the
4 back of their laptop and connected that video into the
5 system -- so they could, in real time, review the
6 preoperative CT data while they were performing the
7 surgery.
8 This is in contrast to having printed pieces
9 of paper or maybe radiographic slides that they would
10 have to get out of the console, go over and review
11 somewhere else. They can stay -- they don't have to
12 remove themselves from the surgical experience. They
13 can keep their head in the surgeon console and review
14 the preoperative data -- MRI or CT data -- real time
15 during the procedure.
16 Q. In your experience, having seen these
17 images, are there any markings on the images that are
18 piped in, as you've described?
19 MR. VANDEN BOSCH: Objection to the form of
20 the question, seeing these data images. I believe he
21 just testified to just seeing CT data.
22 MS. HIRTH: I'll rephrase that.
23 Q. Have you had more than one occasion to see
24 imaging data piped into the system?
25 A. So on a number of occasions, I've been in

1 live procedures with surgeons, and I've seen -- I've
2 seen them utilize this feature of the system to be able
3 to bring in these data sets, whether it's -- from these
4 different imaging modalities.
5 Q. Which different imaging modalities are you
6 referring to that you've seen?
7 A. I've seen CT, ultrasound, prerecorded
8 surgical video, MRI and vital-signs monitors; like EKG
9 and pulse oximeter and things like that.
10 Q. On the occasions where you've seen MRI
11 images piped into the system during its use, have you
12 seen any markings on those MRI images?
13 A. Often --
14 MR. VANDEN BOSCH: Objection, leading.
15 MS. HIRTH: Q. You can answer.
16 THE WITNESS: Often, when the -- when the --
17 when outside imaging groups -- or whoever's performing
18 the imaging -- often the source of that data is
19 digitally encoded, either in the file or in the actual
20 images themselves, so that the surgeon knows where they
21 came from; or there's information there as to, you know,
22 where they come from. So there's maybe a logo and the
23 name of the imaging service; whether it's a hospital or
24 an outside agency.
25 MS. HIRTH: Q. And I asked you that

1 question with regard to MRI images. Can you answer that
2 question as to CT images that you've seen?
3 A. Yeah, CT and MRI, they kind of fall into the
4 same category. These can be done by outside imaging --
5 either inside or outside the hospital, and they're not
6 at the point of care -- they're not at the time of the
7 surgery, so they're done preoperatively. And so they
8 mark these images with all the patient -- they embed
9 into the images all the patient data information, as
10 well as information about where the data was collected
11 and often the radiologist that might have been involved
12 in reading the data.
13 You don't see this in, say, like the
14 ultrasound machines because the ultrasound is real
15 time -- live in the OR -- and so it will have all the
16 patient data embedded, but, obviously, there's no -- it
17 might have the name of the machine on it -- like Aloka
18 or Siemens or GE; something like that -- and model
19 number of the machine, but that would be it.
20 Q. Now, you mentioned earlier on in this
21 deposition that you're involved in, I think you said,
22 new technologies for use in the system.
23 So are you familiar with any potential
24 future changes or modifications to the technology in the
25 da Vinci system?

1 A. Mm-hmm, absolutely. I'm probably
2 responsible for -- for driving a lot of those new
3 technologies into the system. So we view -- we view the
4 da Vinci platform as a unique platform in surgery, in
5 that the surgeon is working at the surgeon console,
6 which is a unique situation. He's never -- never have
7 we had the surgeon's attention in the way that we do
8 today with the surgeon console.
9 Because of the design of the surgeon
10 console, it's a very immersive experience. So we have
11 the opportunity to feed him lots of information that
12 normally would be distracting in a normal OR room
13 environment, where he's standing patient side, and he
14 wouldn't necessarily be able to digest the information.
15 In this scenario, we can incorporate lots of additional
16 types of medical imaging as well as other information --
17 my interest is in medical imaging -- but medical imaging
18 information to enhance his ability to make surgical
19 decisions real time.
20 And so we're looking at -- for example,
21 we're looking at building our own ultrasound instrument.
22 We have a project where we're building our own
23 ultrasound instrument, and that ultrasound data
24 information would be fed into the surgeon console. And
25 he'd be able to not only see the video -- see the live

1 ultrasound image, but also manipulate the ultrasound
2 probe himself.
3 We're looking at incorporating fluorescence
4 imaging capability -- similar to, like, angiography --
5 but this would be real-time angiography -- real-time
6 intraoperative angiography, which would allow the
7 surgeon to view -- through our camera head and through
8 our video system and displayed in the surgeon console --
9 fluorescence imaging of tissue structures that are
10 targeted for the fluorescence; whether it's cancer or
11 nerve tissue or, say, healthy prostate tissue versus
12 cancerous prostate tissue; or cardiac procedures, say,
13 for heart surgery, like an angiography type of scenario.
14 Also, similar with CT data, we have a
15 project going where we can take preoperative CT data and
16 manipulate that three-dimensional data set using the
17 surgeon console. Using the masters in the surgeon
18 console, he or she can manipulate the CT data set real
19 time, and that's the first phase. The second phase is
20 to be able to blend that three-dimensional CT data into
21 the live video image.
22 Another project that we're working on is
23 microscopy, so it's in vivo histology which means
24 doing -- normally, a biopsy might be taken prior to a
25 surgery, and the lab would do a pathology report and be

1 able to determine whether that tissue is cancerous or
2 not. We're working with a company to incorporate a
3 high-resolution microscope into the system that would
4 allow the surgeon to view high-resolution microscopic
5 images real time, and rather than having to take
6 biopsies and send samples back to the lab, he or she
7 could make surgical decisions about the pathology of the
8 tissue as they are performing the surgical procedure.
9 So they can basically -- the use for this
10 would be to determine tumor margins or boundaries.
11 Where are the boundaries of the tumor? How much tissue
12 do I need to take versus what tissue can I leave behind?
13 Q. You mentioned that you were working on
14 blending CT data into live video imaging -- or images,
15 excuse me.
16 Can you describe what that would be --
17 excuse me -- could you describe what the surgeon would
18 see if that is blended in the way you've discussed?
19 MR. VANDEN BOSCH: Objection, calls for
20 speculation.
21 MS. HIRTH: Q. Let me ask you a
22 foundational question: Are you yourself working on this
23 particular modification?
24 A. It's a research project, yes.
25 Q. And are you familiar with the intended

1 result of that research?
2 A. I am.
3 Q. Okay. So can you explain what it's intended
4 that the surgeon would see if this -- when this blending
5 that you described occurs?
6 A. So the -- currently, when a surgeon utilizes
7 preoperative imaging data -- whether it's CT or MRI data
8 or ultrasound -- they have to make a mental
9 transformation between the images that they saw
10 preoperatively and what they're looking at real time
11 during the procedure. And there's two transformations
12 that are going on. One is a spatial transformation; the
13 orientation of the CT data they're looking at may not be
14 the same orientation as the anatomy that they're looking
15 at during the procedure. The other transformation is
16 they have to make a transformation between the modality
17 of CT, X-ray imaging and what those images look like
18 compared to a visible, like, video image.
19 So there's a lot of mental Olympics that
20 they have to perform to really utilize the preoperative
21 CT data during the real-time surgery. And they're, of
22 course, very good at this, and years of training and
23 they get it; or some of them get it better than others.
24 But that's -- in general, that's what they're doing.
25 So our goal, in this research project, is to

1 be able to take this preoperative data and be able to
2 blend it into the CT data set and be able to allow the
3 surgeon either -- we're looking at two solutions now --
4 either the surgeon can rotate the data set themselves to
5 get the spatial orientation to match up to what they're
6 seeing in the visible light video image, or we're
7 working on algorithms that can do that registration --
8 what's called image registration -- to do that
9 registration automatically; where it would automatically
10 recognize the video image -- you know, where the camera
11 is looking at the anatomy, and what the orientation of
12 the anatomy is -- and then automatically register the CT
13 data to that, spinning the CT data -- it's a
14 three-dimensional data set -- so spinning it so that
15 they're looking at the CT data from the same perspective
16 that they're looking at the video image.
17 Then, the blending aspect comes in through
18 being able to treat the video image like a
19 three-dimensional data set, and slice and cut into the
20 video image like you could -- or would be able to with
21 the CT data. As you know, you can slice and cut into
22 the 3-D data set of CT or MRI to display different
23 layers or different depths in the image. So these
24 projects are all oriented toward making the surgeon's
25 job easier by providing the information in a way that's

1 more intuitive.
2 Q. Okay. As -- in your role at Intuitive, are
3 you generally familiar with Intuitive Surgical's web
4 site?
5 A. Yes, I am.
6 Q. And have you had occasion to view the
7 www.intuitivesurgical.com web site?
8 A. I have.
9 Q. I want to ask you just a little bit about
10 that, and I'm going to hand you some documents.
11 Perhaps, we can off the record for a moment.
12 (Discussion held off the record.)
13 (Whereupon, Deposition Exhibit 26 was marked
14 for identification.)
15 MS. HIRTH: Back on the record.
16 Q. Mr. Scott, I've handed you a set of
17 documents. I see you're taking a look. Can you tell me
18 what that is that you're looking at?
19 A. This page?
20 Q. The entire set of documents, if you can
21 tell.
22 A. This looks like the product section of our
23 web site which gives an over -- as distinct from, say,
24 the company section or the other resources section,
25 which are hospital and physician and patient -- this is

1 the product section which gives an overview of the
2 da Vinci robot as a product; you know, the hardware. It
3 looks like it covers all three components: the patient
4 side, the vision system and the surgeon console.
5 Q. Are you familiar with these web pages that
6 you have in front of you?
7 A. I am.
8 Q. How is it that you're familiar with them?
9 A. Being part of the marketing team, it's also
10 my role to help define the content that is put into --
11 for the product section, and most -- I contribute to all
12 aspects, but most specifically I contribute to the
13 imaging aspects; what is referred to in here as the
14 vision system, or this section called "Superior
15 Visualization." I help provide the content for that and
16 make sure that what the people that are putting up on
17 the site -- make sure what they put up there is correct.
18 Q. Now, I'm going to ask you to look at each
19 one of the pages you have, and while you're looking at
20 them, my question is: Are these, to your knowledge,
21 true and correct copies of the product web pages from
22 the Intuitive Surgical web site?
23 A. It does look accurate, yes.
24 Q. To your knowledge, due to your involvement
25 in the content portion of those pages, is the

1 information displayed on each of those pages true and
2 correct?
3 MR. VANDEN BOSCH: Objection, calls for
4 hearsay.
5 MS. HIRTH: Q. You can answer.
6 A. Can you repeat the question?
7 Q. To your knowledge, is the information that
8 appears on the web pages that you have in your hand true
9 and correct?
10 A. Yes. Again, I mean, I've had to review this
11 content at some time in the past in order for it to go
12 up here.
13 Q. I believe that there is a picture in here
14 somewhere -- if you turn to the page -- it's the third
15 page that's labeled www.intuitivesurgical.com, slash,
16 products, slash, da Vinci, underscore, surgical system,
17 slash, index -- I believe there is a picture displayed
18 on that page.
19 Can you tell me what that is a picture of?
20 A. So that's the picture of a da Vinci S --
21 MS. HIRTH: Matt, are you still there?
22 MR. VANDEN BOSCH: Hold on one moment.
23 MS. HIRTH: We'll go off the record.
24 (Discussion held off the record.)
25 THE WITNESS: So this is a picture of the

1 da Vinci S system. I can tell that because -- for two
2 reasons. One, the patient-side cart, where the woman is
3 standing, I can tell that that has the new arms on it,
4 so that's the da Vinci S. Also, the surgeon console has
5 the da Vinci S logo on it. I can also tell from the
6 vision system, which is the cart there to the right of
7 the woman standing there in the picture, that it's an HD
8 vision system, which is the newer vision system.
9 So these are the three components I was
10 referring to earlier: The surgeon console -- from left
11 to right -- the surgeon console; in the middle, the
12 patient cart; and on the right, the vision tower.
13 MS. HIRTH: Q. And I may have asked you
14 this -- I apologize if I did -- is this an accurate
15 depiction of a da Vinci surgical system?
16 A. Yes, it is.
17 MS. HIRTH: Okay. We may or may not have
18 marked this, but I would like to mark this as the next
19 exhibit in order, which I think is 26.
20 And I believe those are all the questions
21 that I have for you.
22 So we can go off the record, and then we can
23 put it up to Mr. Vanden Bosch.
24 (Discussion held off the record.)
25 MS. HIRTH: Back on the record, except you

1 should know Mr. Scott is just taking a bite of
2 something, so it might take him a minute.
3 EXAMINATION BY MR. VANDEN BOSCH
4 MR. VANDEN BOSCH: Very good.
5 Q. Mr. Scott, there isn't an actual MRI machine
6 hooked up to the -- let me get the wording right -- the
7 surgeon console, then; is that right?
8 A. No, there is not; currently, there's not.
9 Q. And there's not a CAT scan that's hooked up
10 to the surgeon console; is that right?
11 A. No, there's not.
12 Q. And the bottom third of the interface of
13 TilePro where you could view a data set, that data set
14 could come from a CD-ROM?
15 A. As long as you have something to play it --
16 a video player to play it, yes.
17 Q. Does the surgeon console have a CD-ROM?
18 A. No, it does not.
19 Q. Does it have a DVD player?
20 A. No, it does not.
21 Q. Does the surgeon console have an HDMI port
22 in which to insert a media device to display the data
23 set?
24 A. So -- no, it doesn't have HDMI. It has an
25 S-Video port, and it has a DVI port, not HDMI; although

1 what we tell people, if they have HDMI, you can convert
2 HDMI over to DVI.
3 Q. So there is a DVI port on the surgeon
4 console, true?
5 A. There's actually two, so --
6 Q. Can you answer that question? Does it have
7 a DVI port?
8 A. Yes, that's correct.
9 Q. And it has an S-Video port?
10 A. Yes.
11 Q. Those are two input ports to the surgeon
12 console?
13 A. That's correct.
14 Q. And you were discussing projects that you're
15 working on. How far -- do you have an estimate of how
16 far away you are -- well, let me ask you: Do any of
17 these projects require FDA approval before you use them?
18 A. Yes, they do.
19 Q. Okay. Do you have an estimate of how far
20 away you are before you'd be able to use your microscopy
21 project; this in vivo project you discussed?
22 A. That particular project is -- we're actually
23 partnering with an outside company, and we have --
24 there's a couple of locations right now that are -- so
25 they have FDA approval on their product, and because

1 we're not changing their device, we're able to take
2 their video output and put it into our TilePro display,
3 so we are actually in some human-use trials for that.
4 They're not FDA trials. They're just to determine the
5 clinical benefit of that particular application.
6 Q. Do you have an estimate, again, of when this
7 would have FDA approval, or no?
8 A. So, no, I don't -- it's not even clear,
9 actually, if that product would need FDA approval
10 because, again, we're partnering with an outside company
11 for that, and so their product has FDA approval already.
12 So we can already go into humans with -- it's like using
13 an ultrasound machine. We don't need FDA approval for a
14 surgeon to use an ultrasound machine in conjunction with
15 our system. It's a separate stand-alone system, and we
16 feed that video into the surgeon console, which is
17 already -- we have FDA approval for the TilePro use, so
18 that particular application you mentioned, we, I don't
19 believe, are going to need FDA approval.
20 Q. Do you have any idea of the likelihood of
21 success of this project at this point?
22 MS. HIRTH: I'm just going to interject and
23 object for relevance, but you can answer.
24 THE WITNESS: So I'm probably the wrong
25 person to answer that. That's why we have it -- so as I

1 mentioned, we have a couple of trials going on right now
2 with some surgeons who -- that's what we're looking to
3 them for. We're asking them: What are the clinical
4 applications that you see of this technology and its
5 relevance to utilizing it during da Vinci surgery?
6 And so there -- we've done some clinical
7 labs in house with animals, where we've tested this to
8 try to understand the potential clinical applications,
9 and we can speculate as to what they are, but this is
10 really a unique -- it's a unique field that we're
11 getting into. No one's ever really done this. It's
12 being done in GI tract procedures, but it hasn't been
13 done intraoperatively in the abdomen. So I would be
14 completely speculating to say that it was going to have
15 a big market or not at this point.
16 MR. VANDEN BOSCH: Q. And you would be
17 speculating also whether or not it would ever come to
18 market; is that true?
19 A. Well, I guess come to market -- their
20 product -- they already sell and market their product
21 for other uses, so whether or not --
22 Q. Intuitive Surgical -- would you be
23 speculating whether Intuitive Surgical would be likely
24 to bring this project to market?
25 MS. HIRTH: Counsel, I would just ask that

1 you let the witness finish his answer before you ask
2 another question.
3 But you can answer.
4 THE WITNESS: So, yes, I'd be speculating at
5 this point to know whether or not we would co-market a
6 product with this company because at this point, it's
7 unclear, you know, what the potential clinical
8 applications are.
9 MR. VANDEN BOSCH: Q. The ultrasound
10 machine project that you discussed, is there -- from --
11 are there any differences between your projected
12 ultrasound and ultrasounds that are already on the
13 market?
14 MS. HIRTH: I would just object to
15 relevance.
16 You can answer.
17 THE WITNESS: So the primary difference is
18 that we are enabling the surgeon to control the
19 ultrasound probe itself through the surgeon console, so
20 that he or she doesn't have to get up from the surgeon
21 console or go somewhere else. What we've done is taken
22 an ultrasound probe and mounted it to a da Vinci
23 instrument to allow the surgeon to control the
24 ultrasound probe through the use of his da Vinci master
25 controllers.

1 MR. VANDEN BOSCH: Q. So the probe would be
2 on an EndoWrist that's located at the patient station --
3 A. Exactly.
4 Q. -- patient cart?
5 A. That's right.
6 Q. Does this require FDA approval?
7 A. It would require FDA approval, yes.
8 Q. Would you be speculating in determining how
9 long it would take to get FDA approval for this device?
10 MS. HIRTH: I'm just going to object to
11 relevance again.
12 THE WITNESS: A project like that I would
13 say -- you know, our -- I would say is about a
14 12-month -- the whole project is about an 18-month lead
15 time, and the FDA approval process is about six months
16 of that, so there's a year of development with six
17 months to obtain FDA approval. We're right now into
18 about the first six months of the development effort on
19 that.
20 MR. VANDEN BOSCH: Q. And would you be
21 speculating, or is there a likelihood of success for
22 this ultrasound machine?
23 MS. HIRTH: Objection. Compound, relevance.
24 Go ahead.
25 THE WITNESS: I think it's -- this one I

1 feel much more confident about. Because ultrasound is
2 already an FDA-approved technology -- we aren't
3 fundamentally changing that -- so it would be a 510(k)
4 application process, which means we're submitting based
5 on the precedent of an existing preapproved safe
6 device -- ultrasound -- and we're basically marrying two
7 FDA technologies; our EndoWrist technology with
8 ultrasound. So it's a fairly low-risk FDA approval
9 process. Still we like to budget into our schedule, for
10 these kinds of things, six months.
11 MR. VANDEN BOSCH: Q. With respect to the
12 fluorescence imaging of tissue structures -- that
13 project -- would you be speculating on how long --
14 first, let me ask: Would that project require FDA
15 approval?
16 MS. HIRTH: Objection, irrelevant.
17 THE WITNESS: Yes, that will require FDA
18 approval.
19 MR. VANDEN BOSCH: Q. Is it -- in your
20 opinion, is it likely to get FDA approval?
21 MS. HIRTH: Objection, irrelevant.
22 THE WITNESS: Yes, it's likely. We are --
23 we just announced -- this is public announcement -- we
24 just announced a partnership agreement with a Canadian
25 company called Novadaq, and they have brought to market

1 a fluorescence imaging capability. We are taking their
2 technology and integrating it into the da Vinci
3 platform. Again, it's a scenario where they have paved
4 the path with the FDA for us, and we are taking that
5 existing technology and incorporating it into the
6 da Vinci platform to basically bring real-time
7 angiography to the surgeon console and to the surgeon.
8 MR. VANDEN BOSCH: Q. Would it also be
9 attached to -- be part of the patient cart and, perhaps,
10 an EndoWrist or one of the robotic arms?
11 MS. HIRTH: Objection, relevance.
12 THE WITNESS: So in this project, the
13 strategy is to incorporate the technology into the --
14 shall I say, as a core technology into the system, so we
15 would -- we are in a development project right now.
16 All of this is confidential, by the way.
17 MS. HIRTH: I'm going to stop you for a
18 moment. If this is confidential, then I'm going to
19 instruct you not to answer.
20 THE WITNESS: Okay.
21 MS. HIRTH: That will be with regard to
22 anything that's confidential.
23 THE WITNESS: I can talk about the
24 nonconfidential aspects?
25 MS. HIRTH: Yes. Let's go off the record

1 for just a moment.
2 (Discussion held off the record.)
3 MS. HIRTH: Back on the record.
4 THE WITNESS: So this fluorescence project,
5 as I said, is a publicly announced contract with this
6 outside company -- Novadaq in Canada -- and the concept
7 is to take their core technology and integrate it into
8 our camera and vision system. So we are -- I think, to
9 answer your question, it's going to be an integral part
10 of the system; as opposed to, say, an ultrasound
11 machine, which is a separate box that's provided by
12 another company.
13 In this program, we're going to actually
14 sell and provide the fluorescence imaging capability,
15 and it's going to be integrated into the platform.
16 MR. VANDEN BOSCH: Q. You don't know with
17 certainty whether it will receive FDA approval, though;
18 do you?
19 MS. HIRTH: Objection. Relevance, calls for
20 speculation.
21 THE WITNESS: Well, certainty -- I can't say
22 what the FDA is going to do in the future, but given --
23 I mean, this is what we do for a living, being a
24 surgical company, so every time we introduce a new
25 instrument we have to get FDA approval. We have a

1 hundred-some-odd instruments. Every new capability we
2 introduce, depending on its impact, we have to achieve
3 FDA approval.
4 So we have a team at the FDA who's dedicated
5 to working on the da Vinci platform, and so we try to
6 work very closely with them. As we develop new
7 products, we work closely with them to let them know
8 about the technology that's coming. So I can say with
9 high certainty, high probability, that because -- I
10 would say that if the technology didn't already have FDA
11 approval, I'd say there's a much bigger hurdle to cross
12 with the FDA. But because the technology already has
13 FDA approval through the work Novadaq has done with
14 their system, they've established the predicate device
15 standard for us. So because that predicate standard
16 exists, we can file a 510(k) based on that predicate
17 device, and that makes the approval process -- although
18 very paper and labor intensive -- very good chance of
19 happening successfully.
20 Did I answer your question?
21 MR. VANDEN BOSCH: I think so.
22 Q. The FDA approval process is underway for the
23 integration of the ultrasound machine; was that your
24 testimony?
25 MS. HIRTH: Objection, relevance.

1 THE WITNESS: No, that has not started yet.
2 We're in the development phase of that. So in the
3 product development process, you first have to develop
4 the hardware, and then there's a -- it's called a design
5 control process with the FDA. So you have to design the
6 product, build a proto -- build prototypes and, of
7 course, document that extensively; and then you have to
8 perform a battery of tests on the device to show its
9 safety and efficacy; and then that pile of paperwork
10 that you generate, that's what you submit.
11 So right now, in that process, we're still
12 in the product development. We're in the part of
13 integrating the ultrasound probe into the -- into the
14 EndoWrist instrument technology and haven't yet started
15 the submission to the FDA yet.
16 MR. VANDEN BOSCH: Q. Have you started the
17 FDA submission approval process with the fluorescence
18 imaging?
19 MS. HIRTH: Objection, relevance.
20 THE WITNESS: No, we have not. Again, we've
21 just signed the contract as of, I think, two weeks ago,
22 and so we're at the very beginning of that product
23 development process, and so no. We plan to submit to
24 the FDA latter half -- latter -- probably in the fall of
25 this year.

1 MR. VANDEN BOSCH: Q. With respect to the
2 preoperative CD data that would mirror the visual -- 3-D
3 visual images, has that -- have you begun the FDA
4 approval process for that?
5 MS. HIRTH: Objection, mischaracterization
6 of the witness's prior testimony.
7 But you can answer, if you understand the
8 question.
9 THE WITNESS: So I think you're referring to
10 the --
11 MR. VANDEN BOSCH: Let me rephrase it.
12 Q. The preoperative CD data, your project is to
13 superimpose CT images on the patient's live visual
14 anatomy; is that right?
15 A. That's right.
16 Q. Has that project -- has FDA approval process
17 begun for that project?
18 A. No, it has not.
19 Q. With the microscopy project with the
20 high-resolution magnifying camera, is that -- did I
21 identify that properly?
22 A. I understand what you mean.
23 Q. Okay. Has that project -- has the FDA
24 approval process begun for that?
25 MS. HIRTH: Objection, relevance.

1 THE WITNESS: No, it has not, and, again,
2 it's not -- we may not need FDA approval on that
3 product.
4 MR. VANDEN BOSCH: Q. Okay. On the top
5 two-thirds of the screen in the TilePro interface of the
6 surgeon console, it's -- what you see is as if you have
7 your own eyes within the surgery itself; is that right?
8 A. That's right. I'll call it the normal or
9 the standard video image. That -- the best way to
10 imagine that is, it's as if you had your eyes inside the
11 patient's body -- because the image is coming from the
12 tip of the endoscope -- so it's almost as if your eyes
13 were coincident with the tip of the endoscope. And so
14 you're seeing what the tip of the endoscope is seeing,
15 and you're seeing it in 3-D.
16 And because the surgeon has his head in this
17 console, all the rest of the outside world is blocked
18 out, and so it's a very immersive experience. It feels
19 like you have your head right there looking at the
20 anatomy.
21 MR. VANDEN BOSCH: I don't have any further
22 questions. Thank you.
23 FURTHER EXAMINATION BY MS. HIRTH
24 MS. HIRTH: Mr. Scott, I just have a couple
25 questions on redirect.

1 Q. Mr. Vanden Bosch asked you whether there
2 was, I think, a DVD port to the da Vinci surgical
3 system. And should Intuitive wish to do so, could a DVD
4 port be added to the system in the future?
5 A. Yes; I mean, it's technically feasible.
6 Q. Could a CD-ROM port be added to the system
7 should Intuitive Surgical wish to do so?
8 A. Yes, it's technically possible.
9 Q. Could an HDMI port be added to the da Vinci
10 surgical system should Intuitive wish to do so in the
11 future?
12 A. Yes.
13 MS. HIRTH: Those are all the questions I
14 have.
15 FURTHER EXAMINATION BY MR. VANDEN BOSCH
16 MR. VANDEN BOSCH: I have one question.
17 Q. Using that type of configuration, you could
18 watch anything you wanted on that CD-ROM; isn't that
19 true?
20 MS. HIRTH: Objection, vague and ambiguous
21 as to "that type of configuration." Could you be more
22 specific?
23 MR. VANDEN BOSCH: Q. If you hooked up a
24 CD-ROM to the surgeon's console, you could watch "Good
25 Fellas," couldn't you, in the lower third of the

TilePro, and do your surgery?

A. That's right. You could watch any type of video that you want to play over -- over the connection. You could pipe in -- it's like Picture in Picture on your television. You could be watching the football game on one channel, and the Home Shopping Network on the other channel.

MR. VANDEN BOSCH: Very good. Thank you.

MS. HIRTH: Thank you. I think we are done.

--o0o--

(Whereupon, the deposition was adjourned at 3:10 p.m.)

--o0o--

I declare under penalty of perjury that the foregoing is true and correct. Subscribed at _____, California, this ____ day of _____, 2009.

_____

Signature of Witness

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2 I, DEBRA ALLUSTIARTI, a Certified Shorthand
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On MARCH 17, 2009 (Date) before me, RAE A. COVINGTON, NOTARY PUBLIC (Here Insert Name and Title of the Officer),

personally appeared DAVID SCOTT (Name(s) of Signer(s))

who proved to me on the basis of satisfactory evidence to be the person~~(s)~~ whose name~~(s)~~ is~~/are~~ subscribed to the within instrument and acknowledged to me that he~~/she/they~~ executed the same in his~~/her/their~~ authorized capacity~~(ies)~~, and that by his~~/her/their~~ signature~~(s)~~ on the instrument the person~~(s)~~, or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

RAE A. COVINGTON
COMM. #1674278
Notary Public-California
SANTA CLARA COUNTY
My Comm. Exp. June 11, 2010

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

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TilePro, and do your surgery?

A. That's right. You could watch any type of video that you want to play over -- over the connection. You could pipe in -- it's like Picture in Picture on your television. You could be watching the football game on one channel, and the Home Shopping Network on the other channel.

MR. VANDEN BOSCH: Very good. Thank you.

MS. HIRTH: Thank you. I think we are done.

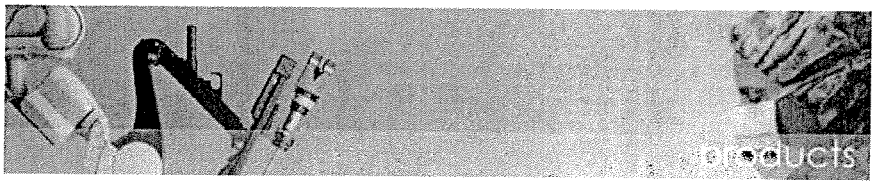
--o0o--

(Whereupon, the deposition was adjourned at 3:10 p.m.)

--o0o--

I declare under penalty of perjury that the foregoing is true and correct. Subscribed at SUNNYVALE, California, this 17 day of MARCH, 2009.

Signature of Witness



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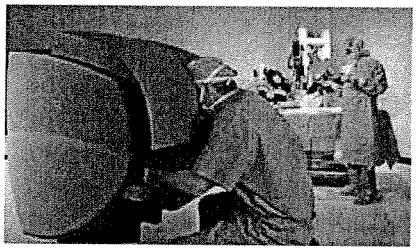

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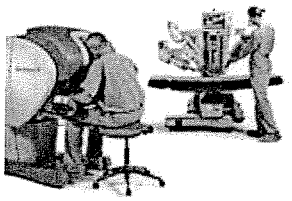
A number of procedures that could not be performed using traditional MIS technologies can now be performed using the *da Vinci* Surgical System. The advanced feature set and extensive *EndoWrist*® instrumentation of the *da Vinci* System enable surgeons to perform more procedures through 1-2 cm incisions.

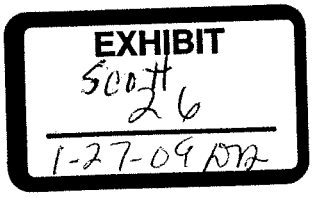
Improved Patient Outcomes

By enhancing surgical capabilities, Intuitive's products are helping to improve clinical outcomes and redefine standards of care. Patients may experience the following benefits:

Video Overview



da Vinci S HD Video Overview



Opposition No. 91175319
Intuitive Surgical, Inc.

- Reduced trauma to the body
- Reduced blood loss and need for transfusions
- Less post-operative pain and discomfort
- Less risk of infection
- Shorter hospital stay
- Faster recovery and return to normal daily activities
- Less scarring and improved cosmesis

Due to the patient- and procedure-specific nature of surgery, these benefits cannot be guaranteed.

For more information about Intuitive Surgical products, please contact your local representative.

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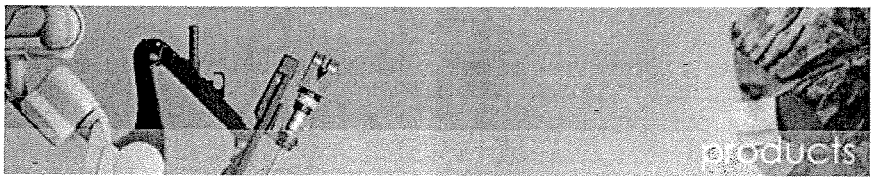
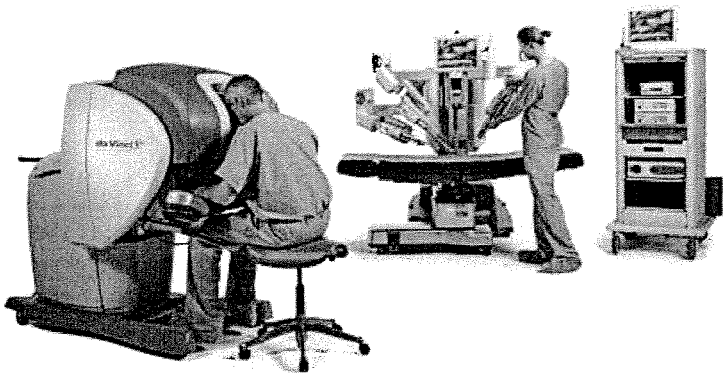


The *da Vinci*® Surgical System

The *da Vinci* Surgical System consists of an ergonomically designed surgeon's console, a patient-side cart with four interactive robotic arms, the high-performance *InSite*® Vision System and proprietary *EndoWrist*® Instruments. Powered by state-of-the-art robotic technology, the surgeon's hand movements are scaled, filtered and seamlessly translated into precise movements of the *EndoWrist* Instruments. The net result: an intuitive interface with breakthrough surgical capabilities.



Components of the *da Vinci* Surgical System

Surgeon Console

Using the *da Vinci* Surgical System, the surgeon operates while seated comfortably at a console viewing a 3-D image of the surgical field.

The surgeon's fingers grasp the master controls below the display, with hands and wrists naturally positioned relative to his or her eyes.

The system seamlessly translates the surgeon's hand, wrist and finger movements into precise, real-time movements of surgical instruments inside the patient.

Patient-side Cart

Provides either three or four robotic arms—two or three instrument arms and one endoscope arm—that execute the surgeon's commands.

The laparoscopic arms pivot at the 1-2 cm operating ports, eliminating the use of the patient's body wall for leverage and minimizing tissue damage.

Supporting surgical team members assist in installing the proper instruments, prepare the 1-2 cm port in the patient and supervise the laparoscopic arms and tools being utilized.

Clinical Validation

Cardiac
"The *da Vinci* System makes it possible to offer a wider range of patients a minimally invasive open-heart procedure to repair the mitral valve. This will allow more patients to benefit from both shorter hospital stays and reduced recovery times."

W. Randolph Chitwood, Jr. M.D.
Professor and Chairman Department of Surgery
Chief of Cardiothoracic Surgery
East Carolina University School of Medicine

Urology
"As a trained surgical oncologist, *da Vinci* has allowed me to offer my patients a better cancer operation with improved clinical outcomes."

Thomas E. Ahlering, M.D.
Associate Professor of Urology
Director, Urological Oncology
University of California Irvine Medical Center

General Surgery
"I can achieve superb clinical results in technically demanding operations such as Heller myotomy and Esophagectomy with fewer complications."

Santiago Horgan, M.D.
Director of Minimally Invasive Surgery
University of California, San Diego

EndoWrist Instruments

A full range of proprietary EndoWrist instruments is available to support the surgeon while operating.

The instruments are designed with seven degrees of motion that mimic the dexterity of the human hand and wrist.

Each instrument has a specific surgical mission such as clamping, suturing and tissue manipulation.

Quick-release levers speed instrument changes during surgical procedures.

Vision System

The Vision System, with high-resolution 3-D endoscope and image processing equipment, provides the true-to-life 3-D images of the operative field.

Operating images are enhanced, refined and optimized using image synchronizers, high-intensity illuminators and camera control units.

The *da Vinci* Surgical System is the only commercially available technology that can provide the surgeon with the intuitive control, range of motion, fine tissue manipulation capability and 3-D visualization characteristic of open surgery, while simultaneously allowing the surgeon to work through tiny incisions typical of minimally invasive surgery.

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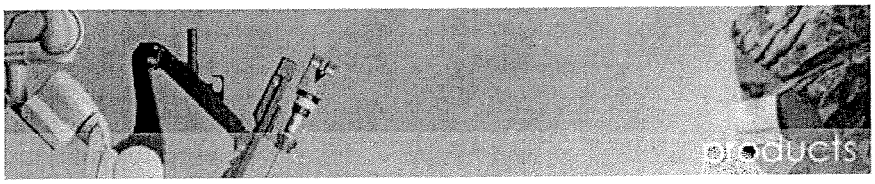

Features and Benefits of the *da Vinci*® Surgical System

The *da Vinci* Surgical System enables physicians to perform surgery in a manner never before experienced.

The *da Vinci* System seamlessly translates the surgeon's hand movements at the console instrument controls into corresponding micro-movements of instruments positioned inside the patient.

Overall, the *da Vinci* System can provide the surgeon with better visualization, dexterity, precision and control than with open surgery, while enabling operation through 1-2 cm incisions.

Superior Visualization

- Revolutionary true-to-life 3-D vision
- Bright, crisp, high-resolution image
- Immersive view of the surgical field

The *da Vinci* System provides visualization of the target anatomy unlike that ever experienced, with natural depth-of-field, enhanced contrast and magnification for more accurate tissue identification and tissue layer differentiation.

Improved visualization also enables surgeons to perform delicate tissue handling and dissection with added precision – even in confined spaces. This precision allows the surgeon to avoid trauma to surrounding structures and tissues such as the neurovascular bundle located near the prostate.

Enhanced Dexterity, Precision and Control

- Fingertip control of *EndoWrist*® Instruments
- 4 robotic arms enable Solo Surgery™
- 7 degrees of freedom – 90 degrees of articulation
- Motion scaling and tremor reduction

The *da Vinci* System's tremor reduction, motion control and proprietary EndoWrist instrumentation enhance ambidexterity for precision and control beyond the capabilities of the human hand. The surgeon can now move instruments with such accuracy that the current definition of surgical precision is exceeded.

Enhanced control and intuitive motion enables more widespread use of advanced technique, as well as a reduced learning curve because now complex MIS procedures feel more like open surgery. For example, two-handed intracorporeal suturing can become standard practice, as well as Solo Surgery™ during selected procedures with the addition of a fourth arm.

Added instrument range-of-motion enhances access and safety while operating in

Clinical Validation

Watch Video

"The System in my view really is a step towards the future. I think that surgery as a specialty has been behind other industries – the space industry, the automobile industry – in taking advantage of computer-assisted procedures and taking advantage of robotic types of technology. So in my view this system is the first clear, solid step forward in that direction."

Mark Talamini, M.D., F.A.C.S.
Professor of Surgery
Chairman, Department of Surgery
University of California, San Diego

the confined space of the closed chest, abdomen or pelvis. This enables surgeons to more accurately and easily perform complex surgical maneuvers through small "ports," eliminating the need for large, traumatic incisions.

Superior Ergonomics

- Optimal alignment of visual and motor axes
- Comfortable seated posture

The *da Vinci* System is the only surgical system designed to allow surgeons to operate while seated, which is not only more comfortable, but also may be clinically advantageous due to reduced surgeon fatigue.

The *da Vinci* System's design allows natural hand-eye alignment at the surgeon's console, which provides better ergonomics than traditional laparoscopic technology.

Since the *da Vinci* System's robotic arms hold the camera and instruments steady, there is also potentially reduced abdominal wall torque, less patient trauma; less surgeon assistance required and reduced surgeon fatigue.

Finally, with the robotic arms providing added mechanical strength, physicians can now offer a minimally invasive approach to higher-BMI patients.

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INTUITIVE SURGICAL®

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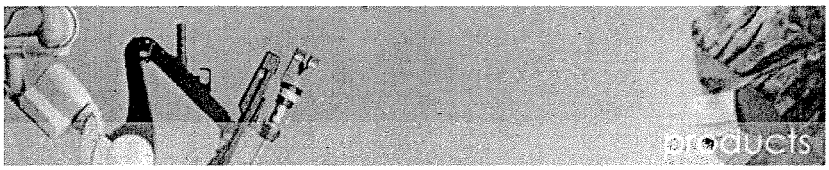
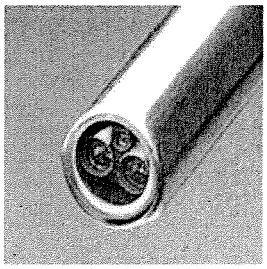


3D Vision System

The remarkable visualization provided by the *da Vinci*® Surgical System immerses the surgeon in an enhanced 3-D view of the operative field, providing direct eye-hand-instrument alignment and natural depth perception necessary for precise manipulation of delicate tissue layers. A custom dual lens endoscope coupled with two 3-chip cameras take the surgeon "inside" the patient.

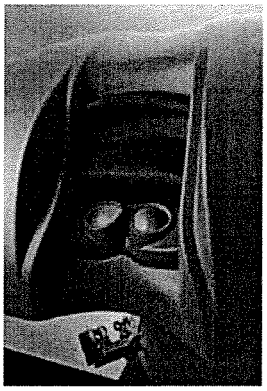
High-Resolution Image Processing



Intuitive Surgical's vision system includes a high-resolution 3-D endoscope with two independent vision channels linked to two high-resolution, progressive scan color monitors. The system also incorporates image processing equipment comprised of high-performance video cameras, specialized edge enhancement and noise reduction equipment.

The resulting high-resolution 3-D image is bright, crisp and clear, with no fatigue-inducing flicker or cross-fading as with single monitor systems.

Visual Continuity



Camera control, provided through the hand controls and foot pedals, provides near-seamless transition between views. Reposition the surgical camera in an instant with foot controls or zoom in, out, up, down, left and right by moving your hands in the desired direction. Repositioning your head at the console does not affect image quality as with other 3D display systems.

Further Information

Video - See how it works

Clinical Validation

Watch Video

"The System in my view really is a step towards the future. I think that surgery as a specialty has been behind other industries - the space industry, the automobile industry - in taking advantage of computer-assisted procedures and taking advantage of robotic types of technology. So in my view this system is the first clear, solid step forward in that direction."

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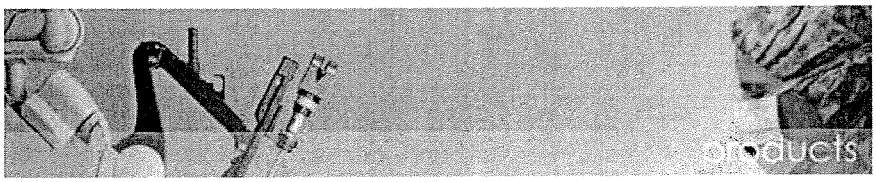
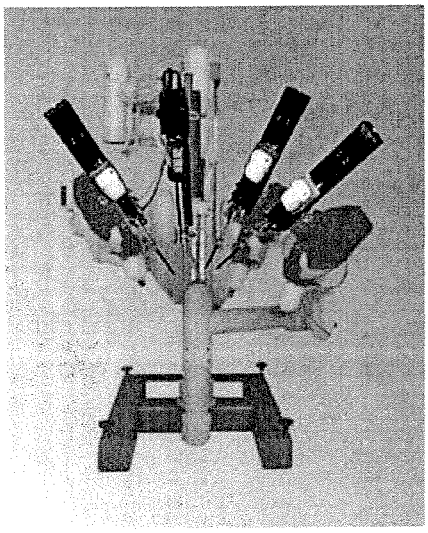


4th Arm

The *da Vinci*® Surgical System's patient-side cart holds up to four electromechanical arms that manipulate the instruments inside the patient. The instruments and camera attach easily to the arms, and are easily repositioned by either the console or patient-side surgeon. The addition of a 4th Arm allows *Solo Surgery*™, a breakthrough in robotic-assisted MIS.



The first two arms, representing the surgeon's left and right hands, hold the *EndoWrist*® instruments. A third arm positions the endoscope, allowing the surgeon to easily change, move, zoom and rotate his or her field of vision from the console. This mobility eliminates the need for an assistant to hold the camera steady.

The optional 4th Arm extends surgical capabilities by enabling the surgeon to add a third *EndoWrist* instrument and perform additional tasks like applying countertraction and following running sutures. This optional feature potentially eliminates the need for a patient-side surgeon.

The surgeon can simultaneously control any two of the operating arms by tapping a foot pedal underneath the surgeon's console. The 4th Arm is available as an option on new da Vinci Surgical Systems and can be added as an upgrade to existing *da Vinci* Systems.

Further Information

Video - See how it works

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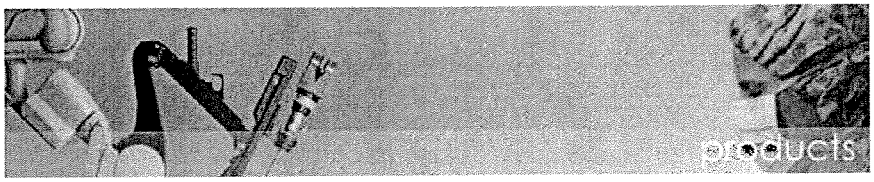
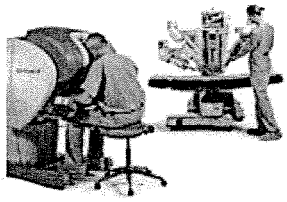


da Vinci S HD SURGICAL SYSTEM

The *da Vinci S HD* Surgical System integrates 3D HD endoscopy and state-of-the-art robotic technology to virtually extend the surgeon's eyes and hands into the surgical field. Only the da Vinci System enables new, minimally invasive options for complex surgical procedures.

- Fast foolproof setup
- Rapid instrument exchange
- Multi-quadrant access
- Interactive video displays

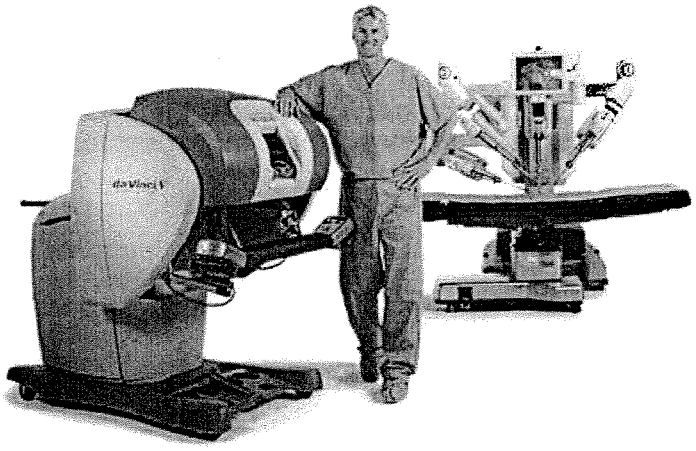
Video Overview



da Vinci S HD Video Overview

***da Vinci S HD* Data Sheet**

da Vinci® S HD™ Data Sheet



Unparalleled 3D HD Visualization

- World's first robotic surgical system with 3D HD vision
- Twice the effective viewing resolution provides improved clarity and detail of tissue planes and critical anatomy
- Panoramic 16:9 aspect ratio is 30% wider, providing 20% more viewing area
- Digital zoom reduces interference between endoscope and instruments
- 0° and 30° stereo endoscopes

Enhanced Dexterity, Precision & Control

- Precise fingertip control of fully articulating EndoWrist® Instruments
- Motion scaling & tremor reduction
- Patented Intuitive® Movement

Large range of motion robotic arms and extended length instruments enable multi-quadrant access

Slim, telescoping instrument arms provide better patient access and optimal port placement

Broad selection of 8mm and 5mm EndoWrist instruments

Superior Ergonomics

Optimal hand-eye alignment

Immersive stereo viewer

Comfortable seated posture

Fast, Foolproof Setup

Motorized Patient Cart

Quick-click cannula mounts for simplified patient docking

Integrated 4th arm for rapid deployment

Touchscreen scope configuration

Single high-speed fiber-optic connection

Single-use sterile adaptors with integrated drapes

Streamlined Interface

Integrated touchscreen monitor

Telestration for improved proctoring and team communication

TilePro multi-input display allows an integrated view of patient critical information

Intuitive status LEDs & icons

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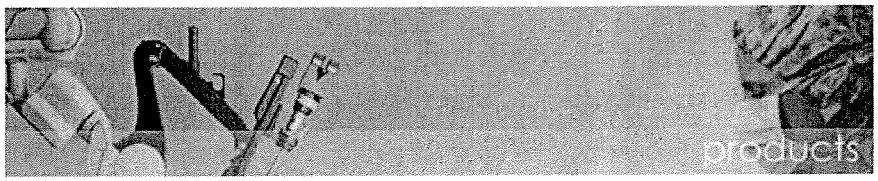


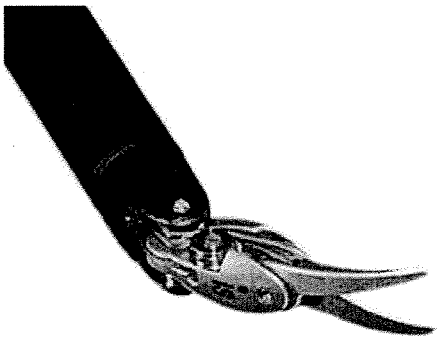
EndoWrist® Instruments

Instruments & Accessories Catalog

Intuitive Surgical's exclusive *EndoWrist* Instruments are designed to provide surgeons with natural dexterity and full range of motion for precise operation through tiny incisions. Modeled after the human wrist, *EndoWrist* Instruments can offer an even greater range of motion than the human hand. They truly allow the *da Vinci*® System to take surgical precision and technique beyond the limits of the human hand. Similar to human tendons, an *EndoWrist* Instrument's internal cables provide maximum responsiveness, allowing rapid and precise suturing, dissection and tissue manipulation.

Recently Launched Instruments

EndoWrist SutureCut Needle Driver
EndoWrist Tapered Mega Needle Driver
EndoWrist 5mm Instruments
EndoWrist Atrial Retractor
EndoWrist PK™ Dissecting Forceps
Based on Gyrus ACMI PK™ Technology



EndoWrist Instruments
provide enhanced dexterity, precision and control
› 7 degrees of freedom
› 90 degrees of articulation
› Intuitive motion and finger tip control
› Motion scaling and tremor reduction

Further Information

The proprietary design of *EndoWrist* instruments allows simple instrument exchange during procedures. Over 40 different tip styles are available in both 5mm and 8mm shaft diameters.

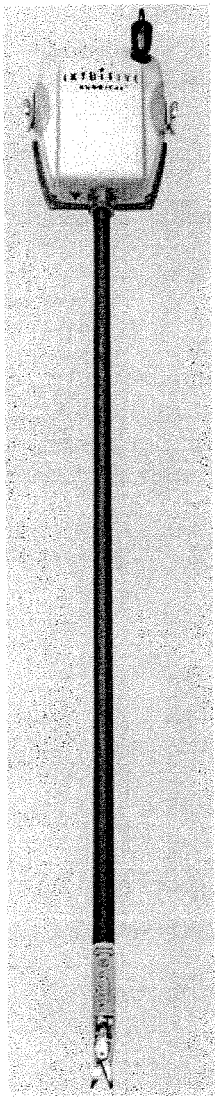
The wrist-like movement, responsiveness and robotic control afforded by the *da Vinci* System and its exclusive *EndoWrist* Instruments provide surgeons fluid ambidexterity and unparalleled precision. These advantages enable better outcomes when operating in confined environments experienced during minimally invasive surgery.

Wide Selection

The *EndoWrist* Instruments are available in a wide selection of specialized tip designs to enable a broad range of procedures using the *da Vinci* Surgical System. The *EndoWrist* product line includes a variety of forceps, needle drivers, scissors; monopolar and bipolar electrocautery instruments; scalpels and other specialized instruments. Moreover, *EndoWrist* Instruments are available in 5 mm and 8 mm diameters to meet surgeons' requirements.

Ease of Use

The EndoWrist Instruments are designed to be user-friendly in all aspects of the surgery. After an instrument is mounted to the *da Vinci* System, the interface is designed not only to recognize the type and function of the instrument, but to also display the number of uses. With this unique interface, the *da Vinci* System can



easily detect when an instrument needs replacement.

The *EndoWrist* Instruments, designed exclusively for the *da Vinci* System, are available directly from Intuitive Surgical and its authorized distributors worldwide. For additional information contact Intuitive Surgical Customer Service.

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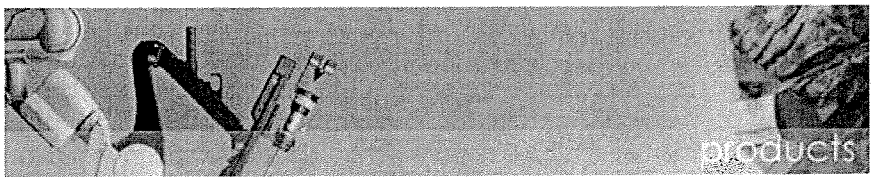
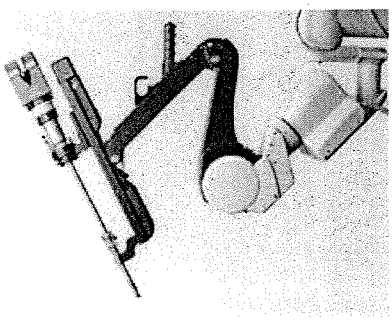


The Development of Robotic-Assisted Surgery

The past two decades have witnessed a revolutionary transition in surgical technique and technology. Traditionally, surgeries had been performed in the open manner, in which large incisions were required for the surgeon to plainly observe and manipulate the surgical field. These incisions inevitably created significant patient trauma—substantial pain and suffering, extended recovery time, prolonged pain management and elevated costs.

Minimally Invasive Surgery



Approximately 20 years ago, surgeons began practicing a new approach to performing surgery, an approach that came to be known as minimally invasive surgery, or MIS. During this era, tiny cameras in instruments called endoscopes or laparoscopes were introduced. These visual and surgical aids could be inserted in the patient's body through small ports.

Although revolutionary in its positive effect on patient trauma and recovery times, MIS encountered significant technical drawbacks. The surgeon operated using a standard 2D monitor instead of looking at his or her hands. The resulting image flattened the natural depth of field, and the fixed-wrist instruments limited his/her dexterity. The lack of 3D visualization of the operative field, the poor ergonomic design and reduced control were major roadblocks to further progress. As a result, this type of MIS turned out to be suitable for a narrow range of surgical procedures.

Robotic-Assisted MIS

In the late 1990s, another evolutionary stage in the development of surgical technique was achieved with the application of robotics to surgical technology. At the forefront of this new era, Intuitive Surgical introduced the *da Vinci*® Surgical System. The *da Vinci* System features wristed instruments with seven degrees of freedom, three-dimensional, intuitive visualization and ergonomic comfort. These innovations created the preconditions for minimally invasive solutions to complex procedures in a wide range of surgical specialties. Today, Intuitive Surgical's products continue to enable a new generation of surgical advancements, providing benefits to surgeons, hospitals and patients.

Further Information

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Clinical Validation

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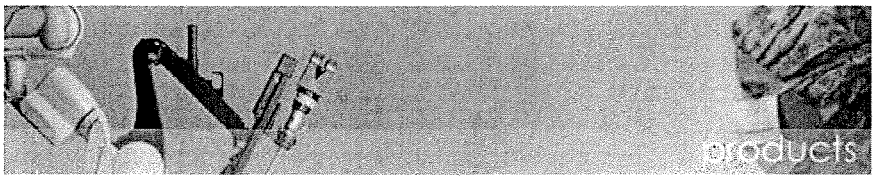

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Frequently Asked Questions

Why is the company called Intuitive Surgical®?
Why is the product called the *da Vinci*® Surgical System?
Is a surgeon using the da Vinci Surgical System operating in "virtual reality"?
Is this telesurgery? Can you operate over long distances?
Is Intuitive Surgical developing the *da Vinci* System for telesurgical applications?
Where is the *da Vinci* Surgical System being used now?
Is Intuitive's technology patented?
Has the da Vinci Surgical System been cleared by the FDA?
What is Minimally Invasive Surgery (MIS)?
Will the *da Vinci* Surgical System make the surgeon unnecessary?
What are the benefits of using the *da Vinci* Surgical System over more traditional methods of surgery?
Is this "robotic surgery?"
Why can't surgeons perform complex procedures such as cardiac surgery through 1-2 cm ports today?
Why isn't Intuitive Surgical getting involved in the Defense Advanced Research Projects Agency (DARPA) Defense Sciences project to develop robotic technology for use on the battlefield?
While using the da Vinci Surgical System, can the surgeon feel anything inside the patient's chest or abdomen?
What procedures have been performed using the da Vinci Surgical System? What additional procedures are possible?
Where is Intuitive headquartered?
How are Intuitive's products sold?
How many *da Vinci* Systems have been sold?
How many employees does Intuitive have?

Q. Why Is the company called Intuitive Surgical?

A. The Company is called "Intuitive" Surgical because its technologies are designed to allow surgeons to operate with the same skills learned in open surgery, yet with increased precision. The technology maintains a corresponding eye-hand-instrument alignment and intuitive instrument control: As the surgeon twists the controls clockwise, the patient-side cart instruments twist clockwise as well. This "intuitive motion" is the antithesis of laparoscopic surgery, where the surgeon moves the instrument handles in the opposite direction as the instrument tips.

Q. Why is the product called the *da Vinci*® Surgical System?

A. The product is called "da Vinci" in part because Leonardo da Vinci invented the

Clinical Validation

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first robot. He also used unparalleled anatomical accuracy and three-dimensional details to bring his masterpieces to life. The *da Vinci* Surgical System similarly provides physicians with such enhanced detail and precision that the System can simulate an open surgical environment while allowing operation through tiny incisions.

Q. Is a surgeon using the *da Vinci* Surgical System operating in "virtual reality"?

A. Although seated at a console a few feet away from the patient, the surgeon views an actual image of the surgical field while operating in real-time, through tiny incisions, using electromechanically enhanced instruments. At no time does the surgeon see a virtual image or program/command the system to perform any maneuver on its own/outside of the surgeon's direct, real-time control.

Q. Is this telesurgery? Can you operate over long distances?

A. The *da Vinci* Surgical System can theoretically be used to operate over long distances. This capability, however, is not the primary focus of the company and thus is not available with the current *da Vinci* Surgical System.

Q. Is Intuitive Surgical developing the da Vinci System for telesurgical applications?

Intuitive Surgical's goal is to extend the benefits of minimally invasive surgery to the broadest possible base of patients. Our strategy to achieve this includes the development of products that allow any physician today to rapidly expand his/her surgical technique and capabilities. Our robotic surgical platforms currently enable surgeons to perform complex procedures using a minimally invasive approach.

In the interest of expediting surgeon training and expanding training programs, we are exploring telesurgery as a way to facilitate surgeon-to-surgeon proctoring and coaching. We see telesurgery as a means to allow surgeons to get up to speed in robotic-assisted surgery under the guidance of leading specialists – with less disruption to their clinical schedules and less impact on their patients.

Q: Where is the *da Vinci* Surgical System being used now?

A: Currently, The *da Vinci* Surgical System is currently being used worldwide, in major centers in the United States, Austria, Belgium, Canada, Denmark, France, Germany, Italy, India, Japan, the Netherlands, Romania, Saudi Arabia, Singapore, Sweden, Switzerland, United Kingdom, Australia and Turkey.

Q. Is Intuitive's technology patented?

A. Intuitive has an extensive patent portfolio of internally developed technology, as well as a variety of patents acquired or exclusively licensed from leaders in computer-enhanced robotics.

Q. Has the *da Vinci* Surgical System been cleared by the FDA?

A. The U.S. Food and Drug Administration (FDA) has cleared the *da Vinci* Surgical System for a wide range of procedures. Please see the FDA Clearance page for specific clearances and representative uses.

Q. What is Minimally Invasive Surgery (MIS)?

A. MIS is surgery typically performed through small incisions, or operating ports, rather than large incisions, resulting in shorter recovery times, fewer complications, reduced hospitalization costs and reduced trauma to the patient. MIS has become standard-of-care for particular surgical procedures, it has not been widely adopted for more complex or delicate procedures – for example, prostatectomy and mitral valve repair.

Intuitive Surgical believes that surgeons have been slow to adopt MIS for complex procedures because they generally find that fine-tissue manipulation – such as

dissecting and suturing – is more difficult and are less precise than in open surgery. Intuitive Surgical's technology, however, enables the use of MIS technique for complex procedures.

Q. Will the *da Vinci* Surgical System make the surgeon unnecessary?

A. On the contrary, the *da Vinci* System enables surgeons to be more precise, advancing their technique and enhancing their capability in performing complex minimally invasive surgery. The System replicates the surgeon's movements in real time. It cannot be programmed, nor can it make decisions on its own to move in any way or perform any type of surgical maneuver without the surgeon's input.

Q. What are the benefits of using the *da Vinci* Surgical System over more traditional methods of surgery?

A. Some of the major benefits experienced by surgeons using the *da Vinci* Surgical System over traditional approaches have been greater surgical precision, increased range of motion, improved dexterity, enhanced visualization and improved access. Benefits experienced by patients may include a shorter hospital stay, less pain, less risk of infection, less blood loss, fewer transfusions, less scarring, faster recovery and a quicker return to normal daily activities. None of these benefits can be guaranteed, as surgery can be both patient- and procedure-specific.

Q. Is this "robotic surgery?"

A. Devices for "robotic surgery" are designed to perform entirely autonomous movements after being programmed by a surgeon. The *da Vinci* Surgical System is a computer-enhanced system that interposes a computer between the surgeon's hands and the tips of micro-instruments. The system replicates the surgeon's movements in real time. It cannot be programmed, nor can it make decisions on its own to move in any way or perform any type of surgical maneuver. Sometimes, however, the general term "robotic surgery" is used to refer to our technology.

Q. Why can't surgeons perform complex procedures such as cardiac surgery through 1-2 cm ports today?

A. Cardiac surgery requires an excellent view of the operative field and the ability to maneuver instruments within the chest cavity with precision and control. Surgeons historically have used the "open sternotomy" approach to heart surgery, which means splitting the breastbone, pulling back the ribs and typically results in a foot-long incision. This provides visibility and allows room for the surgeon to get his hands and instruments very close to the operative site. More recently, smaller incisions have been used to perform a variety of cardiac procedures. However, many cardiac surgeons feel the reduced access may limit visualization and may impede access to the operative field.

Q: Why isn't Intuitive Surgical getting involved in the Defense Advanced Research Projects Agency (DARPA) Defense Sciences project to develop robotic technology for use on the battlefield?

A: Intuitive Surgical's *da Vinci* Surgical System could theoretically be used to operate over long distances. However, optimizing the *da Vinci* System for remote or telesurgery applications is not the primary focus of the company's product design and development efforts, and this capability is not available with the current *da Vinci* Surgical System.

While the company is supportive of the forward-looking research that SRI is engaged in, Intuitive Surgical is optimizing its products for applications in minimally invasive surgery today. We are committed to the development of products that can extend the benefits of minimally invasive surgery to the broadest possible range of patients.

Q. While using the *da Vinci* Surgical System, can the surgeon feel anything inside the patient's chest or abdomen?

A. The system relays some force feedback sensations from the operative field back to the surgeon throughout the procedure. This force feedback provides a substitute for tactile sensation and is augmented by the enhanced vision provided by the high-resolution 3D view.

Q: What procedures have been performed using the da Vinci Surgical System? What additional procedures are possible?

A: The da Vinci System is a robotic surgical platform designed to enable complex procedures of all types to be performed through 1-2 cm incisions or operating "ports." To date, tens of thousands of procedures including general, urologic, gynecologic, thoracoscopic, and thoracoscopically-assisted cardiotomy procedures have been performed using the da Vinci Surgical System.

Q: Where is Intuitive headquartered?

A: Intuitive's principal corporate offices are located at:

1266 Kifer Road Sunnyvale, CA 94086

Q: How are Intuitive's products sold?

A: We currently market our system in the United States through a direct sales organization to Hospitals. We have European operations headquartered in Aubonne, Switzerland. We sell directly in some European countries and use distributors and agents in the rest of the world.

Q: How many da Vinci Systems have been sold?

A: As of March 31, 2008, there have been 867 unit shipments worldwide - 647 in the United States, 148 in Europe and 72 in the rest of the world.

Q: How many employees does Intuitive have?

A: As of March 31, 2008 we had total of 859 employees.

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