Surgical Robotics:
The Third Great Wave in the Operating Room

For centuries there was only "open" surgery, with its long incisions, trauma to the body, and relative lack of precision. Then, in the late 1980s, came minimally invasive surgery (MIS), made possible by the surgical scope, a flexible tube that reaches into the body through a cut no bigger than a keyhole. The scope is a conduit for a tiny camera and chopstick-like instruments manipulated by the surgeon from outside the patient's body.

Scopes have certainly transformed the operating room, but every surgeon knows their limitations. Because the only way to see inside the body is by watching a TV screen, the surgeon must work with a mirror image, moving hands to the right to make the scalpel move left. Moreover, the instruments have a limited range of motion. The process is hard to master and suitable only for about 20 percent of all operations. Until now, the complex procedures that are the leading edge in modern surgery have remained beyond the reach of MIS.

Now, as the new century begins, computer-assisted surgical robots are making history, not *replacing* human surgeons but rather expanding what they can accomplish even with traditional open surgery, while reducing trauma and, most importantly, improving outcomes.

Alta Bates Summit Medical Center Foundation invites you to join us in bringing this extraordinary new equipment to our patients. Far more than just a new machine, surgical robotics represents the next great wave in the evolution of health care. Finally, we will begin to witness the full potential of minimally invasive surgery.

The medical center's plan is to purchase the da Vinci ™ Surgical System from Intuitive Surgical, Inc. This is the first robotics to earn federal approval for actual surgery. Your support for this historic investment will help remove the major shortcomings of MIS, transforming surgery at Alta Bates Summit forever.

Although the surgeon uses small "keyhole" incisions just like those in traditional MIS, here the similarity ends. With robotics, the surgeon sits relaxed at a console instead of standing for hours. A headrest and armrests further reduce fatigue. A small microphone facilitates communication with nurses and anesthesiologists stationed near the patient.

© 2006 Gail Terry Grimes for Alta Bates Summit Medical Center Foundation

Rather than watching a flat TV screen, the surgeon looks into a magnifying eyepiece that provides an exact, three-dimensional view of what is really there, not backwards as before, and without goggles to distort the view. The image can zoom in, out, and all around, at ten to fifteen times normal size, with greater clarity than the human eye could possibly register on its own.

A few feet away from the surgeon, the patient rests on a standard operating table, attended by one or two nurses. There, a robotic arm unit holds one scope for the system's camera and two others for the tiny interchangeable surgical instruments that do the actual work. The surgeon controls all this from the console, holding the instrument handles with a natural, relaxed grip.

Inside the patient's body, the instruments reproduce the exact movements of the human hands, wrists, and fingers, but with greater dexterity and, most remarkably of all, without the slightest tremor. The surgeon can grasp, cut, cauterize, stitch and otherwise manipulate tissue, tools and materials just as with open surgery, but with greater accuracy, and confidence, than ever before. Because the movements are so familiar, sewing up an artery feels almost exactly the way it does in traditional open surgery.

No wonder many surgeons are saying robotics will one day make traditional open surgery completely obsolete. Already it is approved for use in nearly a dozen specialties, with new procedures entering trials all the time. There has never been a serious complication related to this equipment.

Robotics may seem like the stuff of science fiction, but real people will thank you for helping bring it to Alta Bates Summit. For a man with a history of stroke that might otherwise make surgery too risky, your gift could mean the difference between life and death if he should ever need an operation. The same holds true for patients with diabetes, lung problems, and kidney disease. A young husband with prostate cancer will have life-saving surgery and still retain both his continence and his ability to have children. A working mother will receive a new heart valve and go home in less than three days. Surgeons foresee bypass surgery without opening the chest or stopping the heart. Even organ transplantation via robotics is not out of the question.

All this starts here, with your gift today. Please help us make Alta Bates a leader in bringing robotic surgery to the Bay Area.

Fund Raising Goal: $1,000,000

Robots For Real People

How Your Gift Will Make A Difference

Life-saving procedures never before possible. Today, even the best surgeon may not want to risk operating on a fetus with a birth defect or a patient with a tumor in the ear, brain, or spine. The surgical robot will give new meaning to the phrase "delicate operation" as it reaches into tight spaces, differentiates between two precise points inside the body, and holds steady when the smallest movement could cause paralysis or death.

Difficult procedures made routine. Procedures now deemed do-able but high risk–the purview of only a few highly skilled surgical specialists–will soon fall well within the skill level of the average community surgeon.

Shorter recovery time. With surgical robotics, patients who once spent months getting back on their feet will be up and playing racquetball in a matter of weeks.

Far less pain. When we marvel at modern surgery we tend to see only the dramatic results, not the suffering. Yet, consider the experience of a heart patient whose breast bone has been cracked open. Think of the knee patient whose every step is agony until the wounds heal. For patients who see the aftermath of surgery not as an abstract wonder but as a series of sleepless nights, the robot's "forgiving" nature may prove its most appreciated feature.

Smaller scars. No one wants a reminder of their own suffering every time they look in the mirror. With robotics, the scar is so short and thin that in time it can all but disappear.

Less chance of ancillary damage to the body. Because the robot compensates for even the slightest tremor in a tired surgeon's hand, there is far less danger of hitting a nerve, nicking a bone or bursting tiny blood vessels.

Less emotional impact. Greater confidence in the procedure should reduce anxiety before surgery. Simpler procedures typically mean less depression and memory loss afterwards.

Less blood loss. Losing only a couple teaspoons of blood, compared with as much as a liter in some traditional surgeries, means less weakness and less chance of infection from damage to the immune system. For older patients, people living with

HIV, hemophiliacs, anyone who takes blood thinners, and even patients barred from transfusion on religious grounds, robotics could mean the difference between surviving necessary surgery and going without.

Less trauma overall. Traditional surgery is a violent experience that leaves the patient's body, mind and spirit exhausted. With robotics, the patient even needs less anesthesia.

Dramatically improved outcomes. Fetal surgery, for example, now has a 90% failure rate, primarily due to the trauma to the womb. Expect amazing results in the coming years.

More of the human touch. Robots don't replace human caregivers; they set them free to focus more of their skill and attention on the patient's well-being.

Your Gift for Surgical Robotics Will Help…

… save lives and reduce suffering. More than 25,000 operations take place every year at Alta Bates Summit Medical Center. About 4,000 of these are now done through a surgical scope, somewhat less than the national average. With your help we will be able to increase the proportion of our minimally invasive procedures, with significantly improved outcomes.

…control health-care costs. Even considering start-up costs, the surgical robot is a bargain for our community. Faster recovery means briefer hospital stays and less need for post-operative care overall. A shorter, simpler operation also means lower personnel costs, because the new approach typically requires only one or two nurses in attendance, rather than three or four. Across time, robotics will mean big savings.

…minimize heavy demands on hospital infrastructure. To accommodate many of the new developments in health care, a hospital must undergo elaborate renovations, often with a costly domino effect on facilities. The da Vinci system, by contrast, sets down easily and quickly in any state-of-the-art operating room. Installation is essentially "plug and play."

… position Alta Bates Summit for the next century of community service. Because health-care consumers go elsewhere if their expectations are not met, urban hospitals survive only by keeping up. Within a decade, everyone will have robotics. Introducing it now at Alta Bates Summit will reinforce the medical center's reputation for innovation, increasing patient volume today and ensuring that local residents continue to have the latest care close to home.

…favorably influence recruitment and retention of health professionals. Even surgeons who have never mastered the scope will become experts at robotics in a matter of hours. They will find it less fatiguing than open surgery and less frustrating than the scope by itself. Most important of all, they will marvel at what robotics can do for their patients. Nurses too will gain a new perspective on their career in the operating room. At a time when surgeons and nurses are retiring in record numbers, this new equipment will give them a new incentive to remain in practice. It will also help attract the best and brightest to Alta Bates Summit.

… enhance surgical training. With robotics, the learning curve for surgical residents is 20 or even 30 percent shorter than with surgical scopes. Video records of unusual

cases will serve as valuable training tools. There is even the potential for a senior surgeon to act as a "telementor" for less-experienced colleagues, overseeing their work from a bank of monitors.

…reduce absenteeism in the workplace. With robotics, even open-heart surgery patients are back at work in less than a month. Employers will thank you for the gain in productivity.

…make history. Future generations will look back on the advent of the surgical robot as a turning point in the operating room. No longer "experimental," the robot is nonetheless just beginning to demonstrate its full promise. Your gift for robotic surgery at Alta Bates Summit will place you in the ranks of pioneers. This is a once-in-a-lifetime opportunity to play a pivotal role in revolutionizing health care