

# 3-D View of Surgery

## TrueVision specializes in high-def medical equipment

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Photos by Joseph A. Garcia / Star staff

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Sitting in a theater watching a 3-D movie, it's hard to resist reaching out to touch the falling snow that appears to be a foot in front of your nose.

But for a doctor performing a complex procedure on a delicate eye or navigating part of the brain, 3-D goes beyond novelty to offer a truer picture of the precise movements a surgeon makes while removing a cataract or a tumor.

TrueVision Systems Inc. in Santa Barbara provides a three-dimensional, high-definition system for seeing surgeries unfold on a large screen, without giving up the sense of depth and relative space needed for a procedure. "We are sitting on top of an opportunity to change and improve the way microsurgery is done today," said Forrest Fleming, chief executive of TrueVision.

The company is leading the way in 3-D, high-definition surgery. Most doctors look through eyepieces of a microscope during a surgery, sometimes using television screens to offer a blown-up, two-dimensional view of what is going on. The TrueVision camera takes the place of the microscope's eyepieces and feeds the digital data to two projectors on a cart.



Anesthesiologist Dr. Michael Hullander, right, watches Dr. Douglas Katsev, second from right, perform cataract surgery.

To the naked eye, the procedure on the screen is easy to follow, but creates the sense of slight double-vision. With a pair of special glasses, your eyes adjust to make the image pop out from the screen. You can see how an instrument reaches down an ear canal or passes through a cornea.

Doctors can continue to use the eyepieces or do the surgery looking solely at the screen.

Dr. Douglas Katsev remembers being blown away by how different TrueVision was when he first saw it in early development. At that time, the visual wasn't as good as the image that microscope eyepieces yield, but it quickly improved and is now almost as good, he said.

"It could become standard in the future," he said.

***"This will revolutionize the way a lot of surgery and medical procedures are performed."***

**Dr. Uday Devgan,**

Chief of ophthalmology at Olive View-UCLA  
Medical Center

The system is excellent for teaching and letting everyone in the operating room know what is going on, Katsev said.

"We're all watching the same thing," he said.

Dr. Uday Devgan is chief of ophthalmology at Olive View-UCLA Medical Center and in private practice in Los Angeles. Because he spends much of his time teaching, he responded to TrueVision's potential as an educational tool.

Devgan said the 3-D view is a huge benefit for doctors learning how to operate on the eye or honing a new technique.

"To explain how a procedure is done, you really need to show people in 3-D," he said.

Devgan will show an implantable contact lens procedure during a lecture at an annual conference in April. He had to slip the lens, which is about as thick as a human hair, in a space behind the iris that is less than 1 millimeter.

Using the TrueVision system, he was able to exaggerate the image on the screen to create more depth perception. He'll be giving the lecture using a 3-D recording so the doctors at the conference can see the procedure.

"This will revolutionize the way a lot of surgery and medical procedures are performed," he said.

Some digital software applications, such as overlaying measurement information on the real-time image and allowing viewing for eye surgeries with little visible light, move TrueVision beyond a conventional microscope, Katsev said.



TrueVision Systems Inc. is bringing high-definition 3D technology from the theater to the operating room.



Dr. Michael Hullander, anesthesiologist, watches cataract surgery on a TrueVision screen system at Santa Barbara Surgery Center.

He also likes that the system frees doctors from having to look at the same place, bent over the oculars, for every surgery.

He expected it to be even easier for the next generation of doctors.

"In the future, kids who are so used to video games will find that they're going back to what they expect," he said.

Though other 3-D competitors will no doubt arise, Fleming said TrueVision is well-positioned because it is the first to offer the technology, is well-protected by patents and continues to refine the physical machine and software applications.

Founder Michael Weissman, now the company's chief technology officer, invented the three-dimensional, high-definition system. An expert in digital stereoscopic imaging, Weissman is co-inventor of the first 3-D endoscope.

TrueVision Systems started in late 2003. Company officials attended their first medical conference in late 2006 to unveil the system and secured U.S. Food and Drug Administration registration for a Class I medical device that year as well.

The first systems were produced in March 2007 and were in operating rooms the next month.

TrueVision Systems has about 12 full-time employees and is just beginning to generate revenue. The company is moving out of the angel investor stage to institutional investors, Fleming said.

Doctors can purchase or lease the TrueVision machine — the base unit costs about \$90,000. But the true potential for growth lies in the different applications. One piece of software TrueVision already has released allows doctors to record and edit — a substantial feat for a machine that transmits 2 gigabytes of data a second.

A future application could let neurosurgeons overlay an MRI image on the real-time image of the brain to help guide how they navigate into the brain to cut out a tumor. Fleming said there is an infinite amount of possible applications for different specialties and procedures.

TrueVision also could be used in telemedicine, allowing a doctor to diagnose or even perform surgery from a remote location.

It will take some effort to win doctors over. Surgeons can be cautious about change.

Most doctors, without fail, will look back and forth between the optical lenses and digital image on the screen the first time the system is set up in their operating rooms, said Robert Reali, TrueVision vice president of sales and marketing.

Many will ask the residents they work with what they think of the image.

There is perhaps some benefit from the proliferation of 3-D entertainment in society because it isn't strange or foreign to doctors, Reali said. They are used to seeing it in movies or games, and they have come to expect increasingly better visuals as technology improves.

"This is naturally the next step," he said. "This is the tipping point for 3-D."

TrueVision relies on the doctors to guide further development. The company has used feedback to make changes that make the systems easier and more comfortable to use.

TrueVision not only holds medical potential in areas as diverse as neurology, ophthalmology or gastroenterology, it also has potential outside the medical field.



Dr. Douglas Katsev, performs cataract surgery at Santa Barbara Surgery Center. A TrueVision 3-D high-definition system allows the operating room team to view the procedure.

Fleming said a natural fit would be industrial applications, particularly as nanotechnology and microscopic assembly grows.

Fleming said the equipment would need to be cheaper to really fit industrial use, but the constant development of better technology at lower prices could eventually move the company into that area.

For now, there's plenty to do in the medical field.

"This is technology that is world-changing," Fleming said. "It's an exciting thing to be part of in its growth and development."

On the Net:  
<http://www.truevisionsys.com>