

An anesthesiologist is an insider in the operating suite, yet on the fringes of the surgical action. Combining that insider-onlooker view with innate artistic instincts, Dartmouth College graduate Alfred Feingold offers unusual insight into the world of surgery at DHMC.

Photographs by Alfred Feingold, M.D.

Text by Laura Stephenson Carter

I like Vasarely's work because it's in blocks of colors. When you take digital images and enlarge them enough, that's all they are—blocks of colors. My images—when I'm moving things around and looking at blocks of color—sort of look like Vasarely's. I thought I'd mix the surgical attire with art, because that's basically what I do.

The operating room is a unique visual space, which engages the fascination of everyone who visits," says anesthesiologist Alfred Feingold, M.D. A 1962 graduate of Dartmouth College, he has been taking pictures in operating rooms for the past five years.

Feingold's interest in photography blossomed long ago. He was the photographer for his high school yearbook, and in college he was the photo editor of *The Dartmouth*, the student newspaper. But when he was in medical school at Tufts, a resident at the University of Chicago, and an anesthesiology fellow at Northwestern, he was too busy to take pictures. While he was working on a master's in biomedical engineering at Northwestern, however, he did pick up computer skills that would come in handy not only in his career in academic medicine, but later on when he once again picked up photography.

That's because he does more than just take pictures. Feingold captures an array of images with a digital camera and then uses Photoshop to combine and alter them, bringing forth an underlying message. It was Feingold's daughter, Helen, who got him into photography again. She is a high-school social worker, is very interested in art and photography, and is married to an artist. "She'd heard me talk about my life in the operating room so much over her childhood," Feingold recalls. "She suggested maybe I could try to capture some images of the operating room and describe this visual space to other people who were not familiar with it."

He has been influenced in his work by the renowned 20th-century medical illustrator Frank Netter—often referred to as medicine's Michelangelo—whose artwork filled Feingold's medical text-

books. "I'm basically a visual learner," Feingold says. "I could learn more from pictures and diagrams than I could learn from words. I guess my artistic contribution is realizing that I could tell a story by overlaying images. By using Photoshop, you could overlay them and tell the story."

He hopes his images help patients, who often "feel extreme vulnerability, particularly when they're coming in for surgery." The more people understand the OR environment and its symbols and icons, Feingold believes, the easier it is for them. "You look for icons" in a hospital, he says, "just as you look to a church for its icons—for its steeples, for its stained glass. You look to people and objects to give you courage," he says.

"The operating room is like a theater," he adds. "But the person for whom the show is being given is . . . scared. What I'm trying to do is show what an operating room theater looks and feels like."

Feingold has taken photos for several years at the two hospitals where he works in Miami, Fla.—Jackson Memorial Hospital and Cedars Medical Center. One photograph is on exhibit at each hospital for a week at a time. Given their medical subject matter, he says, "I think these images would be stranger to the public if it weren't for TV. *ER* and other television shows have tried to bring the public into this visual space." But, he adds, "I think my pictures may capture some feelings that you can't see on television."

Feingold spent two days at Dartmouth this past fall, taking pictures in the DHMC operating rooms as well as throughout the Medical Center and on the Hanover campus. "I looked at the buildings, I looked at the windows," he explains, "at all different objects that would rise to the level of being a symbol or an icon to then overlay with the surgical environment."

He uses a 4-megapixel Canon G2 camera and then combines and manipulates the images with Photoshop 7.0 on a Gateway Desktop 700X computer. It takes him between two and four hours to complete a single finished image. See page 53 for an example of "before" and "after" manipulation. The italicized comments throughout the article are Feingold's observations on the images; they were adapted from an interview conducted shortly after he completed the compositions.

So is the artist an anesthesiologist or is the anesthesiologist an artist? In the end, it may not matter. "I've seen some amazing operations," Feingold says. "And I have some amazing pictures."



PHYSICIAN-PHOTOGRAPHER: Feingold's daughter, Helen, took this picture of him. Behind him is a painting by Hungarian-French abstract painter Victor Vasarely, the father of the op art movement.

Feingold is a 1962 graduate of Dartmouth College and an anesthesiologist in Miami, Fla. Carter is the associate editor of DARTMOUTH MEDICINE. She accompanied Feingold for two days last fall as he roamed the ORs of DHMC (with permission).

Anesthesiologist & Artist



SENSE OF ACTION: The skylight above DHMC's main rotunda has been applied as a frame around these three individuals who are using a fiber-optic device to examine valves in a leg vein. From left to right are resident Michael Alvarado, M.D., technician Michael Poulen, and vascular surgeon Eva Rzcudlo, M.D. Alvarado is a 1998 graduate of DMS, and Rzcudlo completed a fellowship in vascular surgery at DHMC in 2002 and then joined the faculty.

This works because she's paused, she's in sharp focus. But the surgeon on the left, his hand is moving—you get a sense of action, of motion. That is not easily achieved. This was an operation on the whole leg, from the ankle up to the hip. I was trying to come up with an image to show the surgery, but I just couldn't get the long incision to fit. This is one of the images I came back to several times—and all of a sudden I looked at it again and remembered the picture of the rotunda and said, "Wow, the rotunda works." When we were walking down the mall, I recall saying, "Let's stop—I want to get a picture of this rotunda." And note that the earring identifies the surgeon on the right as a woman. Whenever I can I show jewelry—in fact, I will sharpen the highlights—so it's clear it's a woman.



RADIOLOGY AND RETINAS: Orthopaedic surgeon William Abdu, M.D. (right), and resident Eric Marsh, M.D., are performing a type of back surgery here—a laminotomy and intervertebral disc excision, meaning removal of the herniated portion of a disc through the lamina, the bony covering over the spinal canal. Feingold used the patient's x-rays and MRI scans to wallpaper the background of the image, contrasting the insight they offer with the insight offered through the surgeons' eyes. Abdu is an alumnus of DHMC's residency program ('85-90) and also earned a master's degree from Dartmouth's evaluative clinical sciences program in 2001.

X-rays make great backgrounds. This image tells the story of this operation—the fact that the diagnosis was made by x-rays. The eyes of the x-ray machine allow the surgeons to use their own eyes. There are two different types of sight—the x-ray sight and the surgeon sight. Here, you see the x-rays in black and white, and then you have the surgeons in color.



REPLACING A KNEE: Orthopaedic surgeon Philip Bernini, M.D., is performing knee-replacement surgery here; Eric Marsh (right) is again the assisting resident. The OR lights create drama in the way they have been superimposed on the image. Bernini has been on the DMS faculty since 1979; he did his residency at DHMC from 1973 to 1978 and then returned to Dartmouth after doing a fellowship at the University of Pennsylvania.

I like this one. It's just so sharp—everything jumps right out at you. After I finished the image, I felt it needed something else. I had a picture of the equipment trays that are used for this type of orthopaedic surgery, so I put them in the background. Isn't the yellow drape around the knee interesting? It's like Saran wrap, but it contains an antibiotic solution. First they wrap it on the leg and then they cut through it, so there's no skin exposed except at the incision. It's been an important innovation—it makes the incidence of wound infection, which is a real problem with joint surgery, much less.



PHYSICIAN AND PHYSICIAN ASSISTANT: Cardiothoracic surgeon Lawrence Dacey, M.D. (left), and physician assistant Ryan Hafner are replacing a heart valve. The foreground image was taken in the middle of the procedure, while the surgeon was using a suction catheter to siphon blood away from the incision. The background image, showing only the hands, was taken later, while the incision was being closed. Dacey has been on the faculty since 1993; he did some of his training at DHMC and also holds a master's degree from Dartmouth's evaluative clinical sciences program.

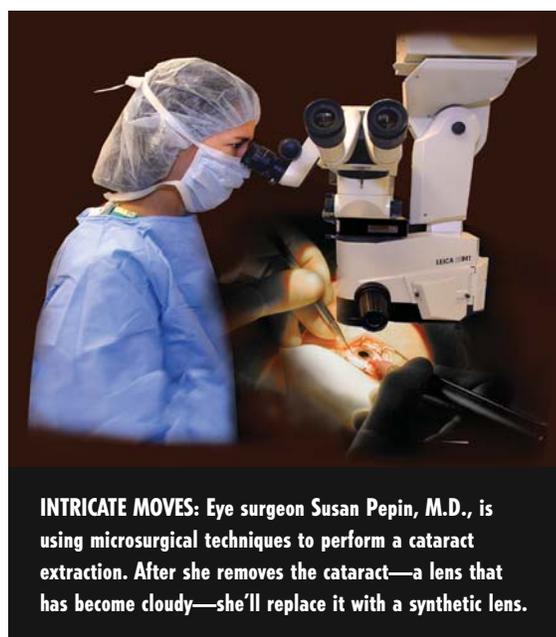
One of the hardest things to do is to get the right scale. If you back off to show the lights and the faces, then you lose the detail in the hands. And if you move in to show the hands, then you miss the concentration of the surgeons. This overlay allows me to do both. ORs are a very difficult area to photograph because in a lot of work, the meaning comes from the face—from the nose, from the lips. When you take surgical pictures, you lose this important dimension of human meaning. All I have is the eyes, the hands, and the body posture. It's not easy to tell a story with the nose and the lips covered.

I had an earlier image of Moen with a mask on. She looked just like anyone else. So when I saw this one with her mask off—and I saw it came out well—I knew I had to work with this image. The fluoroscope machine [on the left] shows what the operation was. It shows that there are small pins or nails that they put in the child's foot—that's the fixation device used in this operation.



UNMASKED: Orthopaedic surgeon Kathleen Moen, M.D. (left), is working here with resident Jorge Brito, M.D. (center), and Jessica Pelow, a fourth-year medical student at the University of Buffalo who was doing a surgical rotation at DHMC. They are not wearing masks because they've just finished a procedure; they're now putting a cast on after having removed an extra toe from a child's foot. A larger-than-life-size x-ray appears to be taped to the wall behind them. And the overhead fluorescent lights, angled in on both sides of the frame, resemble rays of sunlight.

The interesting thing about eye surgery is that the surgeon is almost motionless, as compared to other operations where the body and arms are moving around. Ophthalmological surgeons are almost frozen, with their hands making intricate, small motions. I got a picture of this surgeon looking through the operative microscope, and then dropped behind it a picture of her hands and the eye. With ophthalmologic surgery, the light is so bright that I don't need any other light. In fact, I have to stop down my camera to get a decent picture—otherwise the light wipes out the image.



INTRICATE MOVES: Eye surgeon Susan Pepin, M.D., is using microsurgical techniques to perform a cataract extraction. After she removes the cataract—a lens that has become cloudy—she'll replace it with a synthetic lens.



Here the foreground is being enveloped by the background. And notice the attention, the concentration, the body posture of the surgeon and the resident. You can tell this is a coronary bypass because these are the kind of catheters they put in the heart when they do a bypass. And the patient's on a heart-lung pump, too—you can see the spiral tube that sucks blood in and out of the heart.

FROM THE HEART: Resident S. Scott Lollis, M.D. (left), is helping cardiothoracic surgeon William Nugent, M.D., do a coronary artery bypass. Nugent has been on the faculty since 1983; Lollis is a 1998 graduate of Dartmouth College.



This is one of the images that I saw immediately when I walked into this OR. It's such a dramatic picture—this hand held open by the retractor. I want to draw people into the center, and this hand draws you right in. Any time you can pick a part of the body that everyone knows—faces, hands, eyes—there's a greater fascination. Most people don't know what a liver looks like, what a bowel looks like. But a hand everyone recognizes.

HAND SURGERY: These surgeons are repairing some tendons while excising a Dupuytren's contracture—a condition causing the fingers to contract into the palm due to a thickening of deep tissue that extends from the palm to the fingers. From the left are orthopaedic surgeon John Nutting, M.D., resident Jorge Brito again, and DMS student Nikhil Thakur. Nutting, who trained at DHMC from 1980 to 1985, has been on the DMS faculty since completing a fellowship in upper extremity surgery at Harvard in 1986.

There was a sign hanging on the door of this OR alerting everyone to the fact that the patient was sensitive to latex. So using Photoshop, I placed the sign in the sand in the lower right corner. Then I used transparency to give a sense that the surgeons are part of the mural. The hand in the background is holding a scalpel, while the hand in the foreground is suctioning.



SURGEONS AT SEA: Otolaryngologist J. Oliver Donegan, M.D. (left), and resident Matthew Zavod, M.D., are wearing non-latex gloves because they're operating on a patient with a latex allergy. This OR is usually used for pediatric procedures and so has a mural on the wall. Feingold said he'd never before seen a mural in an operating room.

Roberts is extremely well known. He's responsible for a lot of advanced instrumentation in neurosurgery. He uses the computer to map out the brain and decide where he's going to operate. So you're looking at a computer screen with the Windows icons, plus the three-dimensional computer-generated map that he's using to do the operation. Notice that there's one pair of hands coming out of the computer screen. I did that because the human becomes almost a slave of the computer. I made the microscope transparent so you can see the computer through it, and the plastic sheet on the right semitransparent. I do that sparingly; often it doesn't work, but here I think it worked very well.



MAPPING THE BRAIN: Neurosurgeon David Roberts, M.D., is performing stereotactic surgery, using three-dimensional coordinates to guide him to a target within the brain. Roberts, a 1975 DMS graduate, also did his neurosurgery training at DHMC and is chief of the neurosurgery section.



This is a tranquility shot. Anesthesiologists have to deal with the very high-tech anesthesia machine and the tension and difficulty of the operating room and of delivering anesthesia. But then there are also quiet moments where your mind can wander and there's peace.

TRANQUILITY: Anesthesiologist Steven Andrew, M.D., is keeping a close eye on this assortment of monitors indicating the patient's condition—even though he appears to be floating in a bank of clouds above the Connecticut River.



All I did to this image was blur the background somewhat. I didn't use any Photoshop tricks other than trying to separate the figure from the background so it stands out. I try to show people within a context that's relevant.

A STUDY IN CONCENTRATION: Operating room nurse Lisa Carter-White, R.N., is so intent on her work here that she seems to be oblivious to everything around her. An ability to concentrate is an important skill in operating suites, for they're bustling places.

This mural is one that I remember from when I was a freshman at Dartmouth. Orozco must have spent time in an operating room, because he got the lighting just right. It's almost like there are OR lights shining on that picture. All I had to do was overlay an actual operation and operating lights. I didn't do anything with the focus of the lighting. I'm convinced that Orozco spent time in a hospital, because if you look at some of his other murals—like one where he shows a woman in stirrups delivering test-tube babies—he had to know exactly what a delivery suite looked like. He got it right.



SACRIFICE: The Orozco frescoes—which adorn the walls of the reserve room corridor in Dartmouth's Baker Library—made a strong impression on Feingold when he was an undergraduate. Mexican artist José Clemente Orozco painted the murals in the 1930s when he was a visiting lecturer in the Department of Art. Feingold added the OR lights and superimposed a surgical procedure on this panel, which is titled "Ancient Human Sacrifice."

Anesthesiologists, pathologists, and radiologists work only in hospitals. When you come to a hospital, you don't usually choose your anesthesiologist or pathologist or radiologist; we are hospital-based. So for photos of anesthesiologists, I will sometimes use a general hospital scene as background—what patients see and associate with a good (or bad) experience in a hospital. By the way, that white roll hanging from the ventilator on the left might look like toilet paper, but it's actually adhesive tape. You've got to put your tape someplace secure, because you never know when you're going to need it. You don't want it rolling away, so you always stick it to something.



ON THE MALL: This picture appears to have been taken from the perspective of a patient lying on a gurney in the middle of the DHMC mall. Anesthesiologist Lisabeth Maloney, M.D. (right), is conferring with resident Peter Rauert, M.D. Maloney is a 1977 graduate of Dartmouth College and did her residency at DHMC ('81-84).



MAGICAL HANDS: Paul Kispert, M.D., a general surgeon, looks almost ghostlike here as he performs an exploratory laparotomy and resection of the small bowel. Feingold achieved the effect by rendering the background as a grayscale image, while leaving the hands and the surgical site in the foreground in full color.

It's almost like the hands in this image are separated from the body. That's sometimes the feeling I get with some of these really masterful surgeons—that their hands seem to be completely separated from their body. They're doing such wonderful work.

You could put this picture up and have a game to see who can identify the surgeons. The operating room is very used to games like that. Someone knows exactly who they are, though—one's wearing an identifiable headband. Nurses can often recognize doctors just by a piece of their ear.

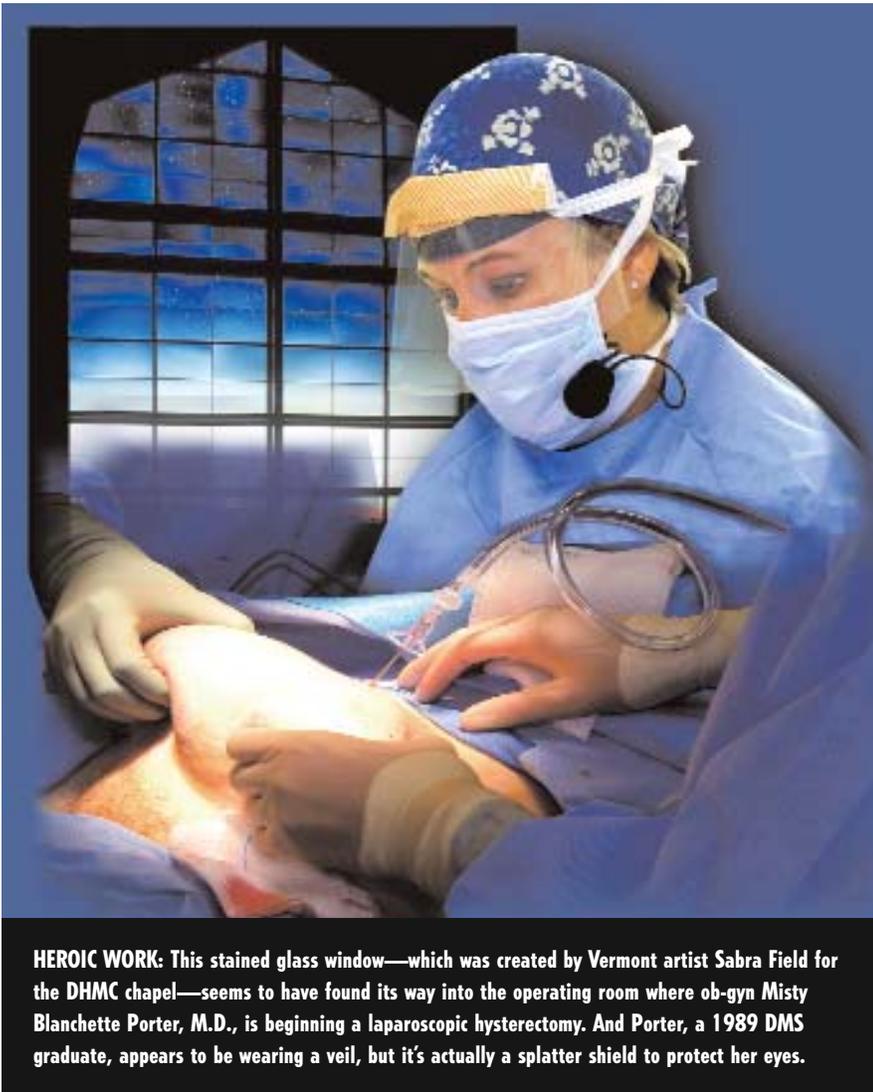


GUESS WHO: With everyone wearing masks, it's often hard to tell who's who in the OR. Here, vascular surgeon Robert Zwolak, M.D., and vascular surgery fellow Brian Nolan, M.D., are doing a carotid endarterectomy. But which is which?

What's unique about this operation is it's hard for the surgeons to get comfortable. They're working deep in the thorax or deep in the abdomen because the esophagus is right in the center of the body. It's physically demanding. You saw the ophthalmologist with her body completely quiet and her hands busily at work [see page 46]. Now here is the other extreme, with the whole body involved. At the end of the day, these surgeons are tired—very tired.



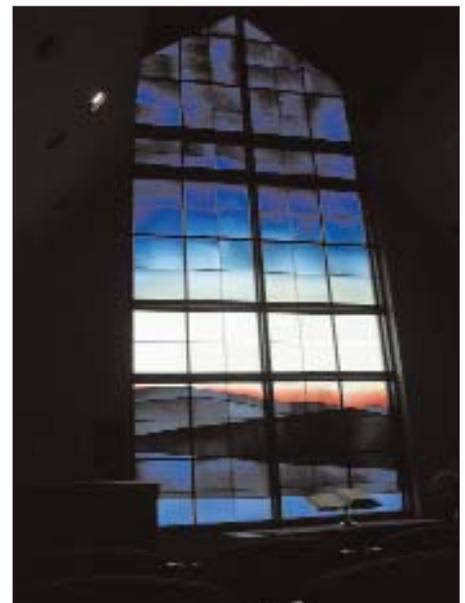
VERY TIRED: Feingold used to do anesthesiology for this procedure—esophagogastrectomy, which is performed on patients with esophageal cancer. Surgeon John Sutton, M.D. (left), is being assisted by resident Alexander Majors, M.D. Sutton, who is chief of trauma and acute surgical care, trained at DHMC from 1974 to 1983 and then joined the faculty.



HEROIC WORK: This stained glass window—which was created by Vermont artist Sabra Field for the DHMC chapel—seems to have found its way into the operating room where ob-gyn Misty Blanchette Porter, M.D., is beginning a laparoscopic hysterectomy. And Porter, a 1989 DMS graduate, appears to be wearing a veil, but it's actually a splatter shield to protect her eyes.

This is an example of using icons—things people can relate to. They may not be able to relate to this abdomen being pulled up as gas is injected into it so the patient can undergo laparoscopic surgery. But they can relate to the fact that there's a window there, that this is important work, that this is heroic work—spiritual work in addition to mechanical work. You can see that a hand is coming out of the chapel window, reinforcing a spiritual connection. After the abdomen is inflated, the surgeons insert their instruments into the space created by the air, then they look around and do their surgery.

BEFORE AND AFTER: The three “before” photos below demonstrate what is involved in Feingold’s artistry. These are the raw images that Feingold shot at DHMC. He combined elements of all three against a blue background that he enhanced with a shadow to increase the perception of depth. He also skewed the chapel window slightly; brightened the white of Porter’s left eye and enlarged the small points of reflected light in both eyes, to make them stand out a bit more; and adjusted some of the colors.

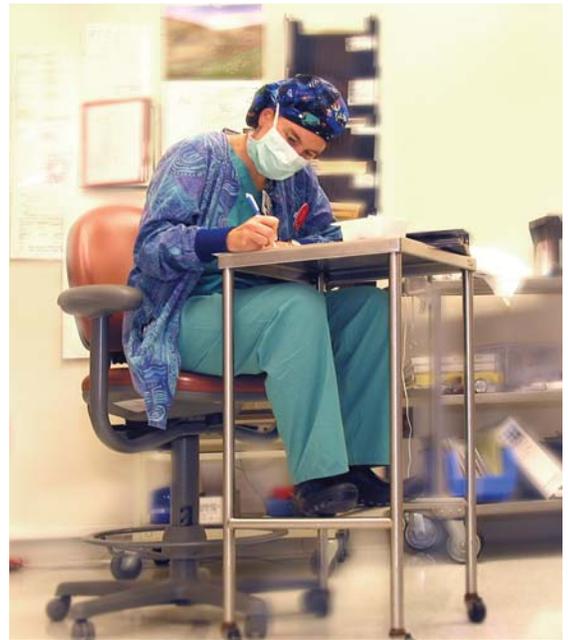


This patient is stable and the anesthesiologist is now in that quiet period when all she has to do is be aware if something untoward happens. She's listening to the monitors. It's like being the pilot of an airplane at 40,000 feet midway between Boston and San Francisco. There's another picture where you can see that the patient doesn't have any devices around his face, so that means he's awake and she's injected a medicine to make the operative area numb.



ON AUTOPILOT: Tabitha Washington, M.D., a resident in anesthesiology, is monitoring a patient who has been given a regional anesthetic to prepare for the removal of a golf-ball-sized aneurysm in his popliteal artery, in the lower leg.

I liked the fact she was in such a strange position—perched up there. It's not the way you would think of an operating-room nurse. She had raised the chair up high and found a place for her feet so she could work comfortably at that table. Operating rooms are shared spaces—there are very few things you can call your own. She doesn't have her own desk and her own chair. This was the table she had, so she raised the chair up to make it functional. ■



A SPACE OF HER OWN: OR nurse Tanya Fraser, R.N., B.S.N., is doing some pre- or postop paperwork here. All Feingold did to this picture was to blur the background.