



## Ocularist's Creations Wondrous

Your child keeps drawing increasingly intricate crayon masterpieces, full of movement and vivid color. When you hang these works of art on your refrigerator, you think to yourself that one day your baby may be an:

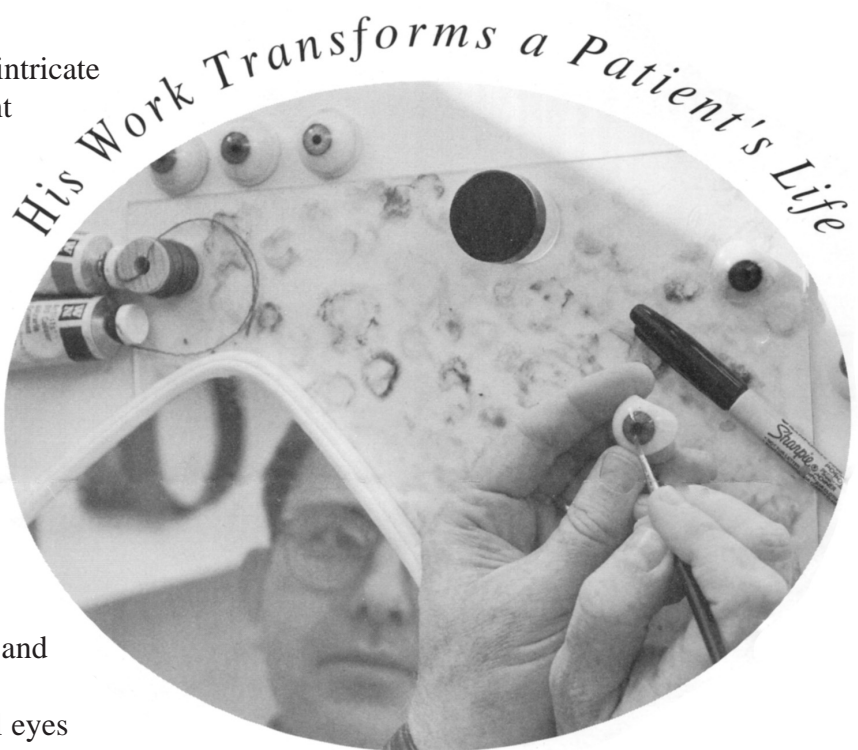
- Artist
- Architect
- Ocularist

Ocularist? This health care profession not only requires the skill to work one-on-one with patients whose illness and treatment can be very traumatic, but also demands the artistry to paint very detailed reproductions of eyes, ears, noses and other facial elements.

Put simply, an Ocularist makes artificial eyes and other facial prostheses. There are only about 250 – 300 ocularists in the whole of the United States - a ratio of about a million people to one Ocularist, according to Michael Hughes, the Ocularist who pays a weekly visit to UVA from his base office in Northern Virginia.

"It's very hard to get into this field," says Hughes, "probably because you never hear of it. I didn't grow up thinking, 'Gosh, I want to make artificial eyes.'" In fact, Hughes went to Penn State to train as an illustrator. "I loved art – particularly anatomy," says Hughes, linking together two fields that most people would consider unrelated.

After graduation, Hughes decided the life of a starving freelance artist wasn't for him. He had heard of a graduate program that accepted only one candidate every two years to learn how to ocular and facial prostheses. The program was run by the



**Ocularist Michael Hughes, reflected in mirror, puts his knowledge of anatomy and his skills as an artist to work on an artificial eye.**

Dental Department at Temple University. Hughes applied and was a finalist for the top slot, but lost out to an applicant from Louisiana. However, as luck would have it, that person decided to quit the program after only two days. "Maybe they didn't have Cajun cooking to his liking up in Philadelphia," jokes Hughes. "Luckily, they called me."

The Temple program has since closed down and, as far as Hughes knows, there's only one program in the country that trains ocularists – at the



**One of the things Michael Hughes likes best about working at UVa, he says, is the chance to be a part of a team.**

**continued from page 1**

### *Ocularist*

University of Chicago. So Hughes suggests that “if a young person wants to get into (the field), he or she would need to apprentice with someone.

Usually, every city has one person (who does this work).” After working a number of years with an Ocularist in Philadelphia, Hughes hung out his own shingle in Vienna, VA. He started working at UVA while still in Philadelphia, and has since added a stop in Richmond to his busy roster.

Many of Hughes’ patients are children or seniors. A high proportion of them are seeing Hughes because they had ocular tumors. Depending on the kind of tumor injury, a patient’s eye might be intact, but not “normal” looking, or the eye might have been removed. In cases of ocular cancers, complete removal, known as enucleation, is often

recommended.

Once a patient has healed from the surgery, Hughes begins the process of fitting the artificial eye or scleral shell (a thinner prosthesis that fits over an existing eye). The process is similar to having a mold or your teeth taken at the dentist’s office: a cream paste is used to take a mold of the eye socket. Hughes then makes a cast of that mold, duplicates it in wax, and using a process called the lost – wax technique, makes a replica of the person’s eye out of acrylic.

“They’re not glass eyes anymore,” Hughes notes, adding, “A lot of my older patients have a glass –eye story to tell, but plastics are very nice. They can look real.” He gestures toward a tray of astonishingly real – looking artificial eyes, saying “These are all hand – molded and hand – painted.”

This is artistry, indeed Hughes sits down in front of a patient

and, using the intact eye as a model, matches all the complex colors of an iris, estimates an average pupil size, adds fine capillary lines and whatever other details are needed. His creation will transform the life of the patient by making his or her loss almost unnoticeable. For those whose injuries are more traumatic, Hughes is able to create facial prostheses, including noses, ears, and eyes with surrounding skin tissue.

Hughes is often impressed with his patient’s resilience. “It’s tough enough to be in a car accident or have a BB – gun injury,” he says. “You’d be amazed and impressed at how strong most every patient is – especially some of those who undergo extensive surgery . . . They are really inspiring. One woman is a pilot for an airline and she’s had an artificial eye since she was three. (She see it as) just another thing to take care

continued from page 2

## Ocularist

of on the road of life.”

One of the things Hughes likes best about working at UVA, he says, is the chance to be part of a team, to have “a lot of interaction with colleagues, different opinions, a lot of sharing.” He repeatedly stresses the superb skills of the physicians in the Department of Ophthalmology with whose patients he most often works. They include Dr. Brian Conway, the department chair, and Drs. Sara Kaltreider, Steven Newman and James Tiedeman.

One particularly interesting project Hughes was drawn into at UVA involved a patient whose ocular tumor did not qualify her for the Collaborative Ocular Melanoma Study (COMS). Coordinated by Jonni Henofer, R.N., the study has two “arms” - one for patients with large tumors, and one for those with medium - size tumors. Of those with large tumors, half receive preoperative external beam radiation and the other half don't. The medium - size tumor patients either get an I - 125 radioactive plaque (which sits on the tumor and destroys it with radiation), or are randomized to having an eye removed. Consequently, many of the patients Hughes fits with eyes are participants in the study.

Describing the unusual case that did not meet the criteria for the COMS study. Henofer says, “One patient had a ciliary - body tumor - anterior - right up front in the eye near the iris. And so

we couldn't use the I - 125 plaque because it would fry the cornea. It would be a nightmare. So Dr. Conway, who is such a voracious reader, knew there had been some cases in Italy where they had used gamma knife radiosurgery for those ocular melanoma.”

The gamma knife, a radiosurgical technique pioneered at UVA by Dr. Ladislau Steiner allows for exquisite precision. The “stereotactic” technique uses three beams of ionizing radiation to pinpoint and destroy an intracranial target without opening the skull (or eye, in this instance), and without damaging surrounding healthy tissue. Having decided to use this technique to attack the patient's tumor, the concern was that because it was close to the front of her eye, one of the radiation beams might overexpose, or burn her eyelid.

“This,” explains Henofer, “is where Michael Hughes came in. “Dr. Conway said ‘Let's get Michael to make me a scleral shell to lift her lid up, so we can go ahead and deliver the radiation to the melanoma and spare the lid.’ So Dr. Conway drew this little diagram and said, ‘Make me this!’”

“Dr. Conway does this all the time.” She notes, “if he dreams up an instrument or wants a machine repaired.”

Henofer portrays Conway as a kind of Renaissance man, bursting with inventive new ideas and scribbling diagrams for his colleagues to follow. This particular

inventive idea saved the patient's eye, but not without some trial and error with the scleral shell.

After immobilizing the patient's eye with what are called “bridal sutures,” and getting her into the huge contraption (a helmet within a helmet) that comprises part of the gamma knife, Drs. Conway and Steiner decided that the first scleral shell wasn't thick enough. They had Hughes make a second one in “a very bizarre shape,” according to Henofer. The second scleral shell lifted the patient's eyelid out of harm's way, and the procedure went out forward. After the one - day treatment, the patient's tumor receded over time (the expected effect of the radiation), and her vision and health now are normal.

“I thought this was a blast - this creative collaboration, with Conway drawing pictures,” Henofer says of the collective effort to figure out how to make the procedure work. “And I'll tell you,” she says, “that's UVA for you - every day you've got some magic thing going on.” □