

VISIONARY

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Foundation Studies Laser Designed to Aid Eye's Acceptance of Transplanted Cornea

Like a well-prepared nation, the human body has its own army, assembled to repel any invader.

Unfortunately, this protective army can cause one of the most prevalent problems in a procedure that has revolutionized the treatment of many advanced eye diseases, corneal transplantation. That problem is the rejection of the new cornea.

Today, however, there is a new weapon to assist ophthalmic surgeons in the battle to retain the new cornea. The new device is the Laser Cell/Flare Meter, and it can aid in the treatment of the inflammation of the eye that leads to rejection.

The body's army, made up of white blood cells, races to protect its territory when an invasion takes place. The invader might take the form of a virus, bacteria or a foreign substance. In the case of corneal transplantation, the body perceives the new cornea as the foreign invader.

The white cells, nature's infection fighters, cannot tell whether the invasion is for good or bad. Unaware of the good intention of the cornea replacement, the white cell army speeds to protect the eye. The result is inflammation caused by an excess of white cells and protein in the clear, watery fluid called the aqueous humor, located in the anterior chamber directly behind the cornea, where the white cells have set up their positions for attack.

One method of controlling this inflammation is the use of corticosteroid eye drops. These drops resemble the body's naturally-produced cortisone.

While this is effective in reducing the inflammation in some cases, it has remained an inexact method because it has been impossible to determine the size of the concentration of white blood cells in the eye.

If the surgeon knew the size of the white cell army, the quantity of cells present, the eye drop treatment, with study and experimentation, could be adjusted to fit the individual need.

Now, the Laser Cell/Flare Meter opens a door to the mystery of the white blood cell buildup. Using a low-power, harmless laser beam directed
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Laser Cell/Flare Meter

From the Foundation . . .

The Cornea Research Foundation of America, located in Indianapolis, has a strong commitment to the advancement of research within the rapidly expanding field of corneal transplantation.

In the past, corneal transplants were the stuff of science fiction. Today, however, new surgical techniques developed by Francis W. Price Jr., M.D., and William E. Whitson, M.D., are being used by corneal transplant surgeons throughout the world to help restore vision to thousands.

The Foundation also is committed firmly to patient education and follow-up. During the past nine years, the two physicians have performed approximately 2,500 corneal transplant operations. Together, they are dedicated to ensuring their patients receive not only the best that technology can offer, but also are kept informed of the latest advances as they occur.

Their goal is to maintain a close patient follow-up on an annual basis. To achieve that end, the Foundation tries to keep track of every corneal transplant patient. Drs. Price and Whitson feel strongly that keeping continuing data on the surgical outcome of each patient is extremely impor-

tant in laying the groundwork for future research.

The Foundation is involved in many diversified and landmark research projects. One of the largest and most comprehensive studies on the survival of corneal transplants, conducted by Drs. Price and Whitson, was published in the March, 1991, issue of Ophthalmology. (See Report Shows Bright Outlook, this issue.)

Another study, recently accepted for publication in the same journal, concerns the rate and degree of visual recovery after corneal transplantation. Dr. Price notes that, while it is important for most individuals to have their corneal transplants remain clear, the most important aspect of the surgery is to restore useful vision.

One potential difficulty is that not all patients recover satisfactory vision, even though they may have a clear cornea. One of the goals of the study is to pinpoint those factors that may affect visual improvement.

Plans call for future studies to evaluate the results of the treatment of patients who have had corneal transplants as the result of corneal

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...Laser *(Continued from Page 1)*

into the aqueous humor, the meter unveils the concentration of the white cells.

Like dust particles in a shaft of sunlight, the cells reflect the laser beam, permitting a computer to count the cells. The higher the concentration of cells, the greater the degree of inflammation.

Armed with this knowledge, the surgeon can better judge the relationship between inflammation, the eye drops and transplant rejection. Obviously, more study is nec-

essary to determine the long-term effects of treatment.

That study now is in progress at the Cornea Research Foundation of America in Indianapolis. One goal of the study is to find a way to stop any inflammation caused by nature, surgery or trauma at an early stage, rather than having to treat the condition after it has become a significant problem.

According to Dr. William E. Whitson, who, along with Dr. Francis W. Price Jr., formed the Foundation, "We

want to help those patients at risk in the early stages after surgery. Vision is one of life's most precious commodities, and this technology can be of particularly significant and positive benefit for those patients."

While it has use of the Flare Meter temporarily, the Foundation hopes to raise enough money to purchase the equipment, hire the staff necessary to operate it and conduct continuing research. The research program will cost about \$175,000.

Founders' Corner

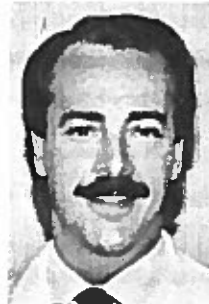
Education, Research Aims of Foundation

It's exciting to have this opportunity to share with you information about the activities and progress of the Cornea Research Foundation of America in *Visionary*, the Foundation's new newsletter.

We'll be telling you about interesting and important studies conducted by the Foundation. We'll also discuss the educational aspects of the Foundation's reason for being.



Dr. Francis W. Price Jr.



Dr. William E. Whitson

The Foundation is an outgrowth of our desire to compile information we believe important concerning the care and treat-

ment of ophthalmic problems.

We are hopeful some of the techniques utilized on our patients may prove beneficial to other surgeons and centers performing these procedures so that an improved success rate may be realized across the country and, hopefully, the world.

In this issue of *Visionary*, we discuss the study of a laser de-
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Report Shows Bright Outlook for Transplants

One of the largest and most comprehensive studies on the success of corneal transplants was published in the March, 1991, issue of *Ophthalmology*, the scholarly journal of the American Academy of Ophthalmology. The seven-year study, conducted between August, 1982, and June, 1989, involved more than 1,000 patients of Drs. Francis W. Price Jr. and William E. Whitson, and included those patients requiring corneal transplants for four of the most common eye problems.

The study evaluated the success rate of corneal transplants in patients with a diagnosis of Fuchs' dystrophy, keratoconus, and those who had previous cataract surgery where either an intraocular, or plastic, lens was left in place at the time of transplant surgery or a new lens implant was put in place.

Fuchs' dystrophy, which is hereditary, usually is found in older persons, though some may suffer as early as their 40s. It affects the endothelium, the innermost of five layers that make up the cornea. As a person with Fuchs' dystrophy grows older, the cells in the endothelium degenerate, lessening the ability of the layer to remove excess water and keep the cornea clear and transparent.

In a cornea afflicted with keratoconus, the eye's ability to focus light is diminished. Keratoconus causes the cornea to thin. The result is a bulging forward of the cornea until it loses its rounded shape and becomes cone-shaped. In the advanced stages of the disease, scarring occurs, further limiting vision.

The findings show a five-year success rate of more than 98 percent for corneal transplant patients suffering from keratoconus and Fuchs' dystrophy. This is not unusual in the case of keratoconus, but is markedly improved over previous figures for Fuchs' dystrophy.

The success for patients having had previous cataract surgery was 90 percent at five years. This represents a significant improvement over earlier published data, where the success rate was only 40 to 60 percent at three years.

According to Dr. Price, studies are continuing in an effort to determine differences in post-operative patient care and/or surgical technique that would account for the higher degree of success in this study.

...Founders' (Continued from Page 3)

vice that we hope will increase the likelihood of the eye's acceptance of a corneal transplant, we report on a study that shows the success of corneal transplant procedures being used for four major eye problems, and talk about studies being conducted to determine the results of the treatment of patients who have suffered a variety of childhood, hereditary and traumatic eye problems.

In addition, we're trying to pinpoint differences in the care of patients in our most recently published study versus others, to try to find out why the success rates are so much higher than in previous studies. Postoperative care probably is very influential, as is the use of advanced surgical techniques at the time of the transplant.

We'd also like to point with pride to our Foundation research staff for its diligence in reporting on the follow-up care received by patients in our most recent study. Ninety-five percent of all patients were seen continually over a five-year period.

But we must not lose sight of one idea: the whole purpose of the surgery and research we do is to restore vision.

With that in mind, we hope you find the information in Visionary helpful and enlightening. We'll report further Foundation progress in the Fall.

...Foundation (Continued from Page 2)

ulcers, corneal scars, chemical burns, hereditary corneal disorders and childhood diseases.

As testament to the Foundation's commitment to medical education, a one-day advanced surgical training course was sponsored in April, 1991. The course, designed for ophthalmologists, spotlighted new surgical techniques and advances in intraocular lens placement.

Visionary, this newsletter, will be published quarterly in order to enhance patient and public education.



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