The latest advances in the diagnosis and treatment of glaucoma were presented at the 24th Annual Wills Eye Hospital Glaucoma Conference in early February. Four national glaucoma experts joined seven Wills glaucoma doctors, including Dr. Jonathan Myers, who organized the conference, to share encouraging news with the 60 specialists and general ophthalmologists gathered for the event.

Dr. M. Bruce Shields, Chairman of the Yale Department of Ophthalmology, in his keynote lecture reviewed the changes in our understanding of the potentially blinding disease over the past 150 years—from the time doctors were actually able to look into the eye with the newly invented instrument, the ophthalmoscope, to the present. Advances over the past 20 years have been particularly encouraging, and this momentum continues as researchers at Wills and other major centers work in the intriguing new areas reported at the Conference.

**New Ways to Diagnose and Track**

One of the central and most difficult problems glaucoma specialists face is finding out if a person actually has glaucoma and tracking its course. Even as recently as 20 years ago, most eye doctors believed diagnosing glaucoma was simply a matter of measuring the pressure in the eye. If a person’s pressure was above “normal,” that individual had glaucoma. But doctors began discovering people with glaucoma damage whose pressures were normal or even below normal, and still others who had above-normal pressures but with apparently no adverse effect on their vision.

(Continued on Page 10)
Staff has been hired and equipment is now in place at the new Glaucoma Research Center at Wills. Under the direction of the Director of the Glaucoma Research Center, Dr. William Steinmann, the Center is housed on the second floor of 901 Walnut, just across the street from the Hospital. Here the research team is hard at work—research administrator, Diana Meashey, scientific coordinator Joanne Fontanarosa, administrative assistant Madeline Vasquez, clinical coordinators Troy Bolgen, Cheryl Wizov, and Fillis Samuel, research fellows Undraa Altangerel, Muge Kesen, and Atilla Bayer, and screen-er-enroller Nataliya Harasymowycz.

The research is clinical, drawing on the Glaucoma Service’s huge patient base to answer questions the Service’s specialists believe most urgently need answering in order to improve the care of glaucoma patients, not only at Wills Eye Hospital, but worldwide. The resources are now in place and centralized to carry out the research process—from formulating the initial question, to the design of a study to answer the question, enrolling appropriate patients, actual performance of the study, and finally interpreting and publishing the results.

The studies are divided into well-defined categories, headed up by groups of Glaucoma Service doctors, in which Dr. Steinmann and the glaucoma specialists believe the Research Center has the best chance of establishing pre-eminence worldwide. The most active areas at present are:

• Evaluation of the Optic Disc—Drs. Spaeth, Henderer, and Schmidt—8 Studies
• Surgical Treatment of Glaucoma—Drs. Moster, Katz, Wilson, and Schmidt—13 Studies
• Medical Treatment of Glaucoma—Drs. Myers, Katz, and Henderer—22 Studies
• Genetic Basis of Glaucoma—Drs. Rhee, Myers, and Spaeth—3 studies

In January, Wills Eye Hospital began construction of a new medical center on top of the Walnut Towers building at 9th and Walnut Streets in Philadelphia. When completed in December 2002, it will be one of the most advanced eye hospitals in the world.

The new Wills will be an eight-story structure designed to deliver the full range of eye care services in a patient-friendly environment. The hospital will include an ambulatory surgical center, physician offices, clinics, and state-of-the-art facilities for ophthalmic education and research.

The Glaucoma Service and all other clinical activities now in the present building will be relocated to this ultramodern setting. The Glaucoma Service space is being specifically designed to promote a seamless integration of research and clinical areas. “We are all excited about this move,” said Dr. George L. Spaeth. “The new facility is a dramatic step forward that will allow us not only to serve our patients better, but also to fulfill our research and teaching responsibilities more effectively.”

The construction of the new facility is made possible by Wills’ sale of its existing building at 900 Walnut Street to Thomas Jefferson University. The eight-story, 230,000-square-foot facility has served as Wills Eye Hospital’s home since 1980.

Until the new facility opens, Wills will continue to operate in the current building and its physicians will continue to see patients and perform surgeries there. The Wills Emergency Service (treating over 12,000 people each year) will remain in its present location, and when patients require a hospital stay, they will be cared for in the existing facility.

“Inpatient hospital beds, for the most part, are obsolete in modern ophthalmology,” said D. McWilliams Kessler, Wills Executive Director and CEO. “By selling the current building we are able to design and build a world-class clinical, educational and research facility to meet the outpatient needs of the 21st century.”

The new facility will include many leading-edge advancements, including state-of-the-art education and conference facilities with broadband capabilities, a fully automated auditorium and breakout classrooms. The building plan also includes telemedicine potential and building-wide video links.
We are enormously grateful to the many friends and supporters of the Glaucoma Service Foundation who helped make 2000 the most successful fund-raising year in our history. During calendar 2000, more than 1400 individuals, foundations, corporations and estates donated a total of $477,620 to support the Foundation’s work.

Of special note was the substantial growth of the Annual Fund, which in 2000 raised $212,172. This was a 67% increase over the $127,044 raised in the 1999 Annual Fund. The number of individuals contributing to the Foundation between 1999 and 2000 also increased an impressive 39%.

We value every gift, since each contribution—regardless of its size—reflects confidence in our efforts to better understand and treat glaucoma. To all of our donors, thank you for your extraordinary generosity.

**SPECIAL THANKS**

We are especially grateful to the following donors for their generous support during 2000:

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Support Group for Parents of Children with Glaucoma Planned

The Foundation is pleased to announce the formation of a support group for parents of children with glaucoma. Wills glaucoma specialist Dr. Courtland Schmidt, who initiated the idea, explained: “Pediatric glaucoma is a rare disease and our present Glaucoma Patient Support Group does not meet the special challenges these parents face.”

The meetings will include an informal talk by one of the Wills Glaucoma Service doctors, a question-and-answer session, and an opportunity for parents to speak with one another. For more information, please call the Foundation office at 215-503-2986.
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Sister M. Theresa Thomasine
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Ms. Teresa Walakowitz
Ms. Dorothy Walfish
Mr. Kenneth H. Walker
Mrs. Kathryn F. Wallace
Mr. and Mrs. Thomas B. Walsh
On January 17 Wills glaucoma specialist Dr. Richard Wilson “chatted” with visitors to the Foundation Web site on the topic “Nutrition and Glaucoma.” Here are some highlights from that interchange:

Dr. Wilson: Unfortunately, we don’t know as much about nutrition and glaucoma as we would like. Mega doses of vitamins do not seem to make a noticeable difference. Certainly the general health of the patient, especially older patients, is crucial to resisting the deleterious effects of glaucoma. Nutrition plays a role in that. Theoretically, vitamin E can improve the optic nerve’s ability to resist intraocular pressure, but this has not been proven in human beings. Nevertheless, I advise my patients with normal tension glaucoma (NTG) to take 400 IU of vitamin E per day.

Participant (P): I have normal tension glaucoma, and my blood pressure is 90/60. I have increased my salt intake, but don’t know how much to take. Any guidelines?

Dr. Wilson: I, personally, have never prescribed tablets. Dr. Selim Orgul of Switzerland recommends starting with one gram of salt at bedtime and increasing to up to three times per day.

P: What about our intake of fluids?

Dr. Wilson: There are only moderate limits to the amount of fluids that can be consumed, as long as the fluid is spread evenly throughout the day and not loaded on the body in a short period.

P: Should glaucoma patients not drink 64 oz. of water per day, as is often recommended for good health?

Dr. Wilson: You should drink plenty of fluids; six to eight glasses a day are recommended. You should not drink three glasses in an hour unless you are dehydrated.

P: Is zinc contraindicated?

Dr. Wilson: Zinc is not contraindicated, but absorption of zinc is linked to copper, as I understand it. Increasing the zinc intake will displace copper, and may be harmful. Zinc has also been linked to Alzheimer’s disease, so I would not use much more than the RDA (recommended daily allowance).

P: I’m assuming the RDA is way above the amount in cold lozenges containing zinc. I find that Coldeze is effective in diminishing the intensity of a cold, or even preventing a cold, if taken when symptoms are first noticed.

Dr. Wilson: That is an acute intervention, not chronic usage. The zinc in the cold lozenge is way above the RDA.

P: So you’re saying it should be avoided, if possible?

Dr. Wilson: Not avoided, but not used much above the RDA. Taking cold lozenges for several days would probably be fine.

P: Doctor, how about vitamin B12?

Dr. Wilson: Vitamin B12 probably is not overly helpful unless you have pernicious anemia.

P: Is vitamin B12, 250 mcg daily, harmful in any way if I decide to continue taking it?

Dr. Wilson: Not that I know of.

P: What is your opinion about ginkgo biloba?

Dr. Wilson: Ginkgo biloba has several proponents. Most of the glaucoma community would like to see a well-designed study before putting our patients on ginkgo.

P: Is lutein, touted for macular degeneration patients, of any benefit to us?

Dr. Wilson: Not that I can tell.

Moderator: What if I maintain a bad diet? Will it make my glaucoma worse?

Dr. Wilson: A diet bad enough to hurt your health would probably minimize your resistance to elevated intraocular pressure (IOP) when you get older.

P: Is there any evidence that diet alone can influence the production or viscosity of aqueous?

(Continued on Page 10)
This startling conclusion led doctors to focus their attention on the optic nerve itself. While the ophthalmoscope remains a mainstay in looking at the optic nerve, more advanced technologies now permit doctors to examine the nerve and other retinal tissues more precisely, understanding in far greater detail the changes the optic nerve undergoes when a person has glaucoma.

Dr. Joel Schuman, Director of the Glaucoma Unit at the New England Eye Center in Boston, reviewed the latest instruments used to detect glaucoma and glaucoma progression, among them, the Heidelberg Retinal Tomograph (HRT), the Optical Coherence Tomograph (OCT), and the GDx—all being intensively studied at Wills. These technologies promise a greatly improved level of care for patients with glaucoma and those suspected to have it.

Another method used to determine if someone has glaucoma and to follow its course of development is more familiar to glaucoma patients—visual field testing. Wills doctors Jeffrey Henderer and Jonathan Myers, and former Wills Glaucoma Fellow Mark Lesk, now at the University of Montreal, explored advances in this area—testing that is less tedious for the patient but at the same time provides more accurate results. Evaluation of these new instruments is ongoing at Wills and other major centers.

New Medications
This progress in the diagnosis and monitoring of glaucoma is matched in many ways by advances in treating it. Doctors now know that intraocular pressure is not the only factor responsible for glaucoma. Nevertheless, controlling a glaucoma patient’s pressure remains an important means to limit damage to the optic nerve. The pharmaceutical industry, working with doctors at Wills and other national centers, has developed eye drops that are easier to use, more effective, and have fewer side effects. Drs. Richard Wilson and Jay Katz of the Wills staff spoke about several of the newer eye drops, including Merck’s CoSopt, Pharmacia’s Xalcom, CIBA’s Rescula, Alcon’s Travatan and Betaxon, and Allergan’s Lumigan and Alphagan with Purite.

Studies of these agents are ongoing at Wills. Also, Wills researchers are addressing more specific questions regarding these and other widely used medications. For example, since determining which eye drop is best for a particular patient is so important, a study is now under way aimed at determining whether Timoptic or Alphagan is best for patients with low-tension glaucoma.

Rescula is a good example of recent hopeful findings that some medications developed to control eye pressure, also may be beneficial to glaucoma patients in ways other than lowering pressure. In particular, early studies have suggested that Rescula also may increase retinal and optic nerve blood flow. This is good news to glaucoma patients, since, as highlighted in a talk by Dr. Peter Netland, Director of the Glaucoma Department at the University of Tennessee, increasing attention is being paid to the theory that...
insufficient blood flow to the optic nerve is an important cause of damage to optic nerve cells in glaucoma.

Other agents may also perform another highly pertinent function—protecting optic nerve cells from becoming damaged and dying. Some of these medications, originally used to protect nerve cells in other areas of the body—as in Parkinson’s and Alzheimer’s disease—are now being studied with specific reference to the optic nerve. One of the most promising of these—memantine, manufactured by Allergan specifically for the eye—is currently being intensely studied at Wills and other major centers. In this regard, Dr. Henderer briefed participants on his research on other potentially neuroprotective agents he is studying in an animal model.

Dr. Douglas Rhee, former Chief Resident at Wills, who will join the Wills Glaucoma Service in July after spending a year at the National Institutes of Health, spoke about his findings regarding “alternative” treatments for glaucoma, including bilberry, ginkgo, and other proposed herbal remedies. Although none of these as yet has been proved beneficial to glaucoma patients, hopes remain high, with studies ongoing at Wills and elsewhere.

New Laser and Surgical Techniques

Surgical methods to control intraocular pressure were also highlighted at the Wills Conference. Dr. Katz spoke about a new laser procedure to control intraocular pressure—selective laser trabeculoplasty. The instrument used to perform this operation is designed to focus laser energy more precisely, and therefore theoretically more safely, on the tissues that need to be altered to increase aqueous outflow. Dr. Katz is collaborating with Dr. Jorge Alvarado of the University of California at San Francisco to determine precisely how this promising new technology lowers intraocular pressure.

Drs. Katz, Wilson, Henderer, along with another Wills glaucoma specialist, Dr. Courtland Schmidt, also reviewed the latest advances in glaucoma surgery—the use of tube shunts to drain excessive aqueous from the eye, improved filtering surgery (trabeculectomy), and better ways of combining cataract and glaucoma surgery.

In concluding his review of the changing concepts of glaucoma, Dr. Shields affirmed that advances in genetics will eventually fundamentally change the diagnosis and treatment of glaucoma. Dr. Rhee talked about this exciting new area in more detail. Although these changes will not come in the near future, Wills and other leading centers around the world are intensifying their efforts to develop this understanding as quickly as possible in order to benefit glaucoma patients everywhere.
**Risk Factors for Glaucoma**

**Age:**
1. Less than 50 years old (no points).
2. 50 to 64 years old (1 point).
3. 65 to 74 years old (2 points).
4. Over 75 years of age (3 points).

**Ethnic Heritage:**
5. African American (2 points).

**Family History:**
6. None of my immediate family (i.e., parents or siblings) have glaucoma (0 points).
7. One or both of my parents have glaucoma (2 points).
8. One or more of my siblings have glaucoma (3 points).
9. One or both of my parents and one or more of my siblings have glaucoma (3 points).
10. My last medical eye examination was:
   a. within the past two years (0 points).
   b. two to five years ago (1 point).
   c. more than 5 years ago (2 points).

Add up your score: more than four points is high risk; three is moderate risk; two or less is low risk. All relatives of anyone diagnosed with glaucoma should be examined.

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**Glaucoma Patient Support Group Meetings**

- All programs are on Sunday afternoons from 1:30 PM to 3:00 PM in the Wills Eye Hospital auditorium on the first floor of the Hospital.
- Please always call the Foundation office, 215-503-2986, during the week before the scheduled sessions to confirm that they will still be taking place.

- **April 22:** Why Some People Go Blind From Glaucoma & How to Prevent It — Dr. George Spaeth
- **May 20:** Understanding Glaucoma Medications — Dr. Jonathan Myers
- **June 10:** What is Angle-Closure Glaucoma? — Dr. Marlene Moster