The U-M Kellogg Eye Center held the first meeting of Argus II® Retinal Prosthesis System (Argus II) Investigators this spring—drawing over 50 surgeons, researchers, and rehabilitation professionals from around the world to share experiences with the goal of improving patient outcomes.

In 2014, Kellogg retina surgeons performed the first four Argus II procedures in the United States to implant an artificial retina, or “bionic eye,” since the U.S. Food and Drug Administration approved the device in 2013. To date, Kellogg has performed five additional procedures for patients with retinitis pigmentosa, a degenerative and blinding eye disease. Worldwide, Argus II has been implanted in over 130 patients in 29 centers in the United States, Europe, and Middle East.

Initial experiences with the Argus II implant have delivered favorable results, as well as new challenges. The meeting focused on four areas of optimization—patient selection, surgical technique, device fitting, and visual rehabilitation.

“This was a significant event, the first of its kind—marking a critical juncture for all of us to share experiences, highlight challenges, and reflect on what we’ve learned,” says K. Thiran Jayasundera, M.D., Assistant Professor, Department of Ophthalmology and Visual Sciences. “The need for open communication is central—not just between different segments of people in one institution, but across institutions—so that as a group we can refine this process that will ultimately benefit our patients.”

Jiong Yan, M.D., Associate Professor of Ophthalmology, Emory Eye Center, was among the attendees at the meeting. “The fact that Kellogg has implanted nine patients, as an institution, provides a model and a leadership for the rest of the country to move forward,” she says.

Robert J. Greenberg, M.D., Ph.D., Chairman, Second Sight Medical Products, the device manufacturer, noted that the meeting marks an important milestone. “This is the first time that a critical mass from around the world is together sharing their great experiences with the technology,” says Dr. Greenberg. “There is a real sense of excitement.”
Kellogg Offers A New Option For Cataract Surgery

Cataract surgery is the most common surgical procedure in the United States with 95 percent of surgeries producing positive outcomes. In hopes of pushing this percentage even higher, Kellogg surgeons are offering a new option in cataract surgery—laser cataract surgery.

This new technology allows surgeons to use a laser for many of the steps of cataract surgery, resulting in high levels of precision and accuracy, and often a quicker recovery period. Kellogg surgeons continue to perform traditional cataract surgery, which is highly effective, but also offer interested patients—at an out-of-pocket cost—the latest technology for cataract removal.

“Laser cataract surgery involves some of the steps of cataract surgery being performed with a computer-controlled laser, as opposed to handheld tools,” says Kellogg comprehensive ophthalmologist Joshua P. Vrabec, M.D. “This potentially provides an extra layer of safety for some of the steps involved in surgery as well as faster recovery for the patient.”

During cataract surgery, surgeons can use the laser to 1) create a 3D map of the eye which results in precise measurements for each step of surgery; 2) create a circular opening in the lens capsule, which allows for precise placement of the new lens; 3) make specialized incisions to correct astigmatism; and 4) soften the cataract and break it into smaller pieces, which allows for gentler, easier removal.

The surgery takes about 30 minutes from start to finish, with the laser portion taking just a few minutes. Once the cataract is removed, patients receive a new lens, which is selected to best suit their lifestyle. After surgery, patients have very few restrictions and can return to normal activities within a week.
Researchers at the University of Michigan Kellogg Eye Center and the University of California, Davis have partnered to solve a mystery that has afflicted generations of three unrelated families with eye malformations, including small eyes with poor vision and the absence of eyes. Until now, no one could decode the genetic basis for these conditions.

The study, published in *Cell*, began when Christine C. Nelson, M.D., the Bartley R. Frueh, M.D., and Frueh Family Collegiate Professor in Eye Plastics and Orbital Surgery, discovered that two of her young patients with similar eye malformations were related. The research gained momentum when the family patriarch presented Dr. Nelson with a hand-drawn family tree, in which he noted eye abnormalities from generation to generation.

Dr. Nelson collaborated with Tom Glaser, M.D., Ph.D., formerly professor of Human Genetics at U-M and now professor of Cell Biology and Human Anatomy at UC Davis. By mapping and sequencing family DNA, a team of researchers in Dr. Glaser’s laboratory found mutations in a protein (RBP4) that transports a form of vitamin A—retinol—an essential nutrient for eye development. The mutated proteins fail to transport retinol to the developing embryo, and they also block the cell surface receptor for RBP4 (called STRA6), keeping healthy proteins from delivering their nutritional payload. The result is severe retinol deficiency and subsequent birth defects.

“While further clinical research is needed, it appears that we might be able to save a child from blindness with a simple and inexpensive treatment, an extra vitamin A pill,” says Dr. Nelson. “This supplementation relies on an alternate pathway, independent of RBP, that delivers another form of vitamin A, called retinyl ester, that bypasses the mutations altogether.”

Dr. Nelson suggests that women with a family history of eye malformations, or those who learn that they carry the RBP4 mutation, speak with their obstetrician about taking vitamin A supplements—in addition to prenatal vitamins—during pregnancy. Since major steps in eye development take place in the first two months of gestation, the best time to have this discussion is before pregnancy.
Welcome to Kellogg’s New Faculty

Angela R. Elam, M.D., clinical lecturer, has joined the faculty of the Glaucoma, Cataract, and Anterior Segment Disease section and sees patients in Kellogg’s Northville and Ypsilanti offices. Dr. Elam earned her medical degree from Duke University and completed her residency at the University of Pittsburgh. She then completed her fellowship in glaucoma at the University of Michigan Kellogg Eye Center. Dr. Elam’s research focuses on disparities in eye care, eye care utilization, and health services.

Yannis M. Paulus, M.D., assistant professor, has joined the faculty of the Retina and Uveitis section and sees patients in Kellogg’s Grand Blanc office. Dr. Paulus earned his medical degree and completed his residency at Stanford University. He then completed a medical and surgical vitreoretinal fellowship at the Wilmer Eye Institute at Johns Hopkins University. Dr. Paulus holds a joint appointment in the U-M Department of Biomedical Engineering and his research focuses on the development of novel retinal imaging systems and therapeutic techniques and technologies, including photoacoustic imaging, molecular imaging, restorative retinal laser therapy, and surgical techniques.

Julie M. Rosenthal, M.D., clinical instructor, has joined the faculty of the Retina and Uveitis section and sees patients in Kellogg’s Grand Blanc office as well as at the VA Ann Arbor Healthcare System. Dr. Rosenthal earned her medical degree from the University of Pennsylvania and completed her residency at the Wills Eye Institute at Thomas Jefferson University. She completed her fellowship in vitreoretinal surgery at the Casey Eye Institute at the Oregon Health and Science University and, before joining Kellogg, Dr. Rosenthal served as a retina specialist at Retinal and Ophthalmic Consultants, P.C., in Northfield, New Jersey.

Manjool Shah, M.D., clinical instructor, has joined the faculty of the Glaucoma, Cataract, and Anterior Segment Disease section and sees patients in Kellogg’s Ann Arbor and Grand Blanc offices. Dr. Shah earned his medical degree from Washington University in St. Louis and completed his residency at the Casey Eye Institute at the Oregon Health and Science University. He then completed a fellowship in glaucoma and advanced anterior segment surgery at the University of Toronto.

Since July 2014

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