

Research Project of the Quarter

Seeking New Ways to Measure How Loss of Vision Affects Day-to-Day Activities

Veterans suffering a loss of vision due to a disease known as age-related macular degeneration or “AMD” are being sought to participate in a new study conducted by scientists at the Atlanta VA Medical Center’s Rehabilitation Research & Development (RR&D) Center. Dr. Claire Barnes, head of the research team, says the overall goal of the study is to determine new ways to measure how the loss of vision due to AMD is related to a person’s everyday functioning and their quality of life. If these new measurement techniques are found to be helpful, other research teams could then incorporate them into new research studies...such as the exciting recent clinical trials using new drugs like Lucentis.

“Previous studies have shown that clinical measures of visual acuity may be less sensitive to the effects of disease or normal aging than are functional vision measures such as reading, or face recognition,” says Dr. Barnes. “Furthermore, clinical trials rarely attempt to determine whether any observed visual acuity changes result in changes in the everyday activities or quality of life for the study participants.”

About the Researcher...

Dr. Claire Barnes is a Health Research Scientist at the Atlanta VA Medical Center’s RR&D Center and an Assistant Professor at Emory University’s Department of Ophthalmology.

As the recipient of a Career Development Award from the VA, Dr. Barnes is currently working on several projects. Her main study is entitled “Evaluating Functional Vision Measures for Medical Interventions”. The goal of this project is to identify new ways to measure how the loss of vision due to age-related macular degeneration (“AMD”) is related to everyday functionality and quality of life. Dr. Barnes earned a BSc. (with Honors) in Theoretical Physics and Applied Mathematics from McMaster University in Hamilton, Ontario, and an MSc and Ph.D. from the Department of Physiology at the University of Toronto.

During the first phase of the study, Dr. Barnes and her team of researchers are recruiting 60 individuals with AMD, but without other eye disease. These research participants will undergo a series of simple, non-invasive tests such as reading a variety of eye charts and completing questionnaires. Dr. Barnes notes that while many studies use basic eye charts to gauge the visual function of an individual with a loss of vision due to AMD, rarely do these studies include the *patient’s* evaluation of their own ability to perform day-to-day activities.

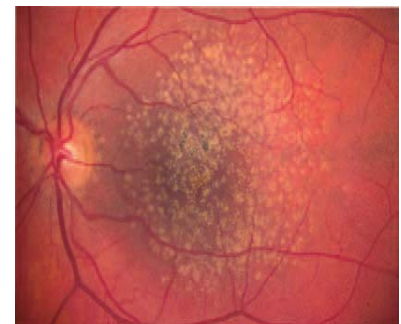
Six months and one year after their first visit, some of the participants will return to the RR&D Center for reevaluation, if they have had treatment for their AMD in the meantime, or if they feel they have experienced a change in their vision. The results of these reevaluations will then be compared to the results from the original tests.

The hope is that researchers can then determine which tests are most sensitive to the effects of AMD on everyday function.

Those test measures could then be used in later clinical trials. The same types of tests might also be well suited for clinical trials in other eye diseases someday.



Normal-looking retina
(back of the eye)



Retina with possible AMD



Dr. Claire Barnes

Finding New Ways to Diagnose a Leading Cause of New Blindness in Adults

Studies have shown that nearly half of all people with diabetes will suffer a significant loss of vision caused by retinal swelling, and sometimes bleeding, of small blood vessels in the back of the eye. This condition is known as “diabetic retinopathy” and it is a leading cause of new blindness in adults. The exact cause of this condition is unknown, but early treatment can minimize the overall loss of vision triggered by diabetes.

Currently, retina specialists identify diabetic retinopathy by either examining the back of the patient’s eye or reviewing photographs of the retina. The problem is that the diagnosis often comes at a time when damage has already occurred.

Dr. Claire Barnes, a research scientist at the VA’s Rehabilitation Research and Development Center is working on a new study that may allow doctors to diagnose diabetic retinopathy earlier in the disease process.

Using lab animals that have been made diabetic, researchers at the VA have demonstrated early changes in electroretinogram (ERG) recordings. An ERG is a clinical test that measures electrical signals from the retina in response to flashing lights.

Previously, ERG changes were only reported late in the disease process and, for this reason, ERG recordings are not typically used to diagnose or monitor diabetic retinopathy. However, the VA research team has discovered that by including dimmer light flashes in the ERG test, they can see tell-tale changes before the disease has made much progress. Dr. Barnes will be working with the research team to test whether the clinical ERG can be modified to show the same early changes present in the animal studies. These are exciting discoveries when you consider the new areas of treatment that are being explored.

Dr. Barnes plans to test up to 32 adults at Emory’s Eye Clinic for this study. The participants will be divided into three groups:

- Those who do not have diabetes...the control group.
- Those who have diabetes, but have not been diagnosed with diabetic retinopathy
- Those diagnosed with both diabetes and diabetic retinopathy

Dr. Barnes plans to test the participants in each group using the standard protocol for ERG testing,

supplemented by the same dimmer light flashes that were used in the lab animal studies.

Next, the members of the control group (those with no diabetes and no diabetic retinopathy) will undergo a test known as “fundus photography” where pictures are taken of the back of the eye to make sure there is no eye disease present.

In addition to the ERG, the second group (those with diabetes, but no known diabetic retinopathy) will undergo both fundus photography and another test known as “Optical Coherence Tomography” or “OCT”. OCT produces cross-sectional photographs of the retina, to show signs of swelling or damage to the blood vessels. Those participants with a diagnosis of diabetic retinopathy will only have an ERG.

The ERG results will be analyzed by research team members who don’t know which group a given participant was in, to see if there are ERG differences between groups. The goal is to determine if these new methods will enable doctors to make an earlier diagnosis of diabetic retinopathy – a leading cause of new blindness in adults.

Visual Rehabilitation Study Volunteers Wanted

The Atlanta VA Medical Center (VAMC) is looking for volunteers who have AMD, but who don’t have other eye diseases like diabetic retinopathy or glaucoma to help in a study of everyday visual tasks such as reading and recognizing faces. Testing for the study will take place at the VAMC, in one session lasting about 4 hours. After the test session, a set of questionnaires will be administered over the telephone. Study participants who are going to undergo treatment at the VAMC or at Emory University will be asked to consider returning to the VAMC for repeat testing 6 and 12 months later.

If you would be interested in learning more about this study, please contact: Dr. Claire Barnes or Wendy LiKamWa at the Atlanta VAMC, 404-321-6111, extension 2770 (Dr. Barnes) or 6189 (Ms. LiKamWa).

We Need Your Help With a Research Study!

The Atlanta VA Rehab R&D Center is investigating a test to help identify the early effects of diabetes on the eye. We are comparing eye function in people who have been diagnosed with diabetes and people who have not. This study requires one 3-hour visit to the Emory Department of Ophthalmology for a test that measures electrical responses from the eyes while you watch flashing lights. You may also be asked to have photographs taken of your eyes and an examination of your eye with a light. Your eyes will be dilated for these tests. You will be compensated for time and inconvenience. Transportation can be provided, if needed.

For information, please contact:
Wendy LiKamWa at
404.321.6111, ext. 6189