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## **Eye-staining technique offers early detection for dry eye syndrome**

DALLAS – Aug. 20, 2007 – Lissamine green sounds like the latest cleaning sensation being hawked on television and probably not something you would want to get in your eyes.

But a few properly placed drops can reveal staining patterns that are key to diagnosing dry eye syndrome earlier than other methods, providing doctors more options for treating the potentially sight-stealing disease, new research at UT Southwestern Medical Center confirms.

Lissamine green is an eye-drop stain used by ophthalmologists to detect damaged cells on the eye's surface, flagging them green under special lighting.

“What this research showed is that the degree and pattern of staining was a good, objective indicator of the severity of the tear deficiency,” said Dr. James McCulley, chairman of ophthalmology at UT Southwestern and one of the world's leading experts on dry eyes.

Dry eye syndrome is one of the most common eye ailments. According to various estimates, it affects 10 percent to 30 percent of the world's population, including 10 million to 14 million Americans – mostly older women. Symptoms include eyes that burn or sting, blurred vision, frequent blinking, light sensitivity or a sandy or gritty feeling like something is in the eye.

In a study appearing in the July issue of the journal *Eye and Contact Lens*, Dr. McCulley and his colleagues found that the severity of the dry eye condition in patients correlates with where the stain patterns show up. Researchers identified three basic patterns that indicated progressively dangerous conditions:

- The least-severe condition is indicated by stains limited to the whites of the eyes between the lids toward the nose. This so-called nasal staining doesn't necessarily predict dry eye: it might be caused by environmental factors, such as pollution.
- The second level appears as stains in the white of the eye between the lids, but toward the ear. “That is fairly diagnostic of a tear deficiency,” Dr. McCulley said.
- The third and most severe level occurs when the stain also appears on the cornea.

“That's when things really get serious,” said Dr. McCulley, the study's senior author. “If the dry eye is significantly affecting the cornea, it deteriorates vision and adds a major risk factor for a person developing a bad infection.”

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Stains in the cornea indicate a break in the surface cells. Most bacteria require such a break in order to penetrate the eye, where the bacteria can cause an ulcer.

“When the surface is healthy, we’re protected against the vast majority of bacteria. But if there’s a compromise of the surface, then bacteria can invade,” said Dr. McCulley, who said the investigation was inspired by his many years observing staining patterns in the patients he treated.

Researchers examined the stain patterns in 22 patients with varying degrees of dry eyes and 11 patients without ocular disease, who served as control subjects. The research not only revealed the progressive pattern, but also underscored the value of using lissamine green stain over the more commonly used fluorescein stain, which doesn’t easily identify damage until it is more progressed.

“If an ophthalmologist uses the most commonly used stain, which is fluorescein, they’re going to miss the first two stages of the development of dry eye and consequently miss a lot of diagnoses,” said Dr. McCulley, director of the Theodore and Mary Beasley Laboratory for Ocular Surface Research and the Jean H. & John T. Walter Jr. Center for Research in Age-Related Macular Degeneration.

Earlier diagnosis is crucial in giving doctors more treatment options and preventing the disease from getting worse. Dry eye syndrome can also signal other conditions such as lupus or rheumatoid arthritis, further underscoring the importance of early diagnosis.

“The more severe stage is not only more problematic in affecting vision, but it is more difficult to treat and reverse,” Dr. McCulley said. “So it’s very important to diagnose at the mild stages because it can become a self-perpetuating disease if not effectively treated.”

Other researchers involved in the study were Dr. Igor Butovich, assistant professor of ophthalmology, Dr. Eduardo Uchiyama, technical staff associate and lead author of the paper, and Dr. Joel Aronowicz, technical staff associate.

The study was funded by grants from the National Institutes of Health and Research to Prevent Blindness.

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