

## Patent issued for technology that improves eyesight dramatically

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(Medical Xpress)—A U.S. patent has been issued to the University of Rochester for technology that has boosted the eyesight of tens of thousands of people around the world to unprecedented levels and reduced the need for patients to undergo repeat surgeries.

The patent issued this week for work done by Scott MacRae, M.D., director of the Refractive Surgery Center at the Flaum Eye Institute, and Manoj Venkiteshwar, Ph.D., formerly a post-doctoral researcher at the University's Center for [Visual Science](#).

The pair invented the Rochester Nomogram, a complex formula that helps physicians determine how refractive surgery, such as LASIK, will affect a person's eyesight. The Nomogram adjusts the way a laser interacts with a person's eye tissue, vastly reducing the chances that the patient's eyes will be near-sighted or far-sighted after the procedure.

Thanks to the Nomogram, MacRae's team has been able to slash by two thirds the number of patients who need additional procedures to achieve the best vision possible. Currently, a remarkable 99.3 percent of MacRae's patients see 20/20 or better after refractive surgery. He presented the data earlier this month at a meeting of the

European Society of [Cataract](#) and Refractive Surgeons in Italy.

"Eyesight is crucial to everyone's quality of life," said MacRae. "As a physician, I am required to do everything in my power to make sure each

of my patients has the very best vision possible. There's nothing like the feeling of having a patient sit up after surgery, look at the clock on the wall, and exclaim that it's the first time in decades they've been able to tell the time without wearing glasses.

The technology has been licensed to Technolas Perfect Vision, a cataract and refractive laser company that is a product of a joint venture between Bausch + Lomb and 20/10 Perfect Vision AG. As a result, tens of thousands of people around the world have had vision procedures in which the Nomogram has played a role.

"It's also gratifying that our work is benefitting not only our own patients but also others around the world," added MacRae.

The patent is the latest development in a 20-year effort by University scientists and physicians to study and improve human vision.

In the early 1990s, scientist David Williams, Ph.D., director of the Center for Visual Science, began a series of experiments to [look into the eye in unprecedented detail](#), not only to see the organ's fine structures but also to understand how light moves around inside the eye.

His pioneering work opened the door, for the first time in history, to the possibility of fixing not only the three major flaws in the eye that reading glasses and contact lenses have corrected for decades, but also approximately 60 additional imperfections that were never known before. Nearly everyone has these flaws in their eyes to some extent; while most people don't notice them, they hurt our quality of vision in subtle ways.

MacRae, an internationally recognized refractive surgeon, moved to Rochester in 2000 from Portland, Ore., to help bring the developments to the bedsides of patients and give them a quality of eyesight that was

not possible before Williams' work. Through a series of clinical trials and work in the laboratory, the Rochester team did just that.

The team helped to create a field known as customized ablation, a form of LASIK that corrects subtle imperfections, bringing about a super-crisp quality of [eyesight](#). Beyond making vision on the order of 20/15 or 20/16 possible or even commonplace in some groups of patients, the technology also increases the eye's ability to see in situations where there is low light or little contrast.

Physicians like MacRae plays a crucial link in Rochester's thriving vision research, helping scientists working in the laboratory understand the challenges that practicing physicians and their [patients](#) face. Together teams at the Flaum Eye Institute and the Center for Visual Science tackle eye problems from many directions – MacRae and colleagues from the vantage point of clinical experience, and researchers from dozens of laboratories working on an array of experiments that are difficult for non-scientists to grasp. Sometimes, as with the [Nomogram](#), the teams meet in a place that improves the quality of life for people around the globe.

Provided by University of Rochester Medical Center

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