



“The rich data generated by this initial investigation is fueling more exciting work. I find research to be surprisingly creative, often involving collaboration with people smarter than I am, and always holding the promise of learning something new.”

Ronald Melles, MD - Ophthalmology, KP Redwood City

Morris F. Collen Research Award for Recent Publication

Dr. Melles has been interested in medical informatics since he was asked to review a patient's thick chart early in medical school. "Papers were falling out on the floor as I read through it," he says, "and I thought, why aren't these notes digitized?"

Wanting to improve health care through technology, Dr. Melles pored over programming books in his free time. After joining TPMG in 1992, he helped implement our electronic medical record system, and when he witnessed the ophthalmic data the system was collecting, he began studying statistics so that he could conduct research on the data.

In 2016 Dr. Melles heard a talk about TPMG's new diabetic retinopathy screening program, and, realizing it represented a significant shift in our model of care, proposed research that would quantify the program's success.

Approximately 250,000 KP members in Northern California have diabetes, and close to 35% of them will develop diabetic retinopathy, a common complication of diabetes that can lead to blindness. Early detection and treatment can improve outcomes.

The standard approach to this type of screening had been an in-person dilated fundus examination. More recently, retina fundus photography is used to screen for this

condition, eliminating the need to dilate a patient's eyes.

The Permanente Medical Group had already migrated to this newer model of screening, but prior to the implementation of the program, ophthalmologists were still screening all the retina photographs and communicating results to patients. The new program utilizes optometrists to perform the screenings via a virtual reading center.

Dr. Melles wrote the computer program used in the study to gather the retinal image data. Then he partnered with two of his retinal specialist colleagues to study whether images reviewed by trained optometrists could detect diabetic retinopathy as well or better than when those images were reviewed by ophthalmologists.

What they found was that the new program increased the sensitivity of screening from 44% to 66%. The quality of the photographs also improved because of ongoing feedback about image quality, even though the volume of screenings increased.

"Dr. Melles's study demonstrated the power of Permanente Medicine and just how well we were able to implement a new model of care that improves quality and efficiency," says Grace Firtch, MD, physician-in-chief at KP Redwood City.