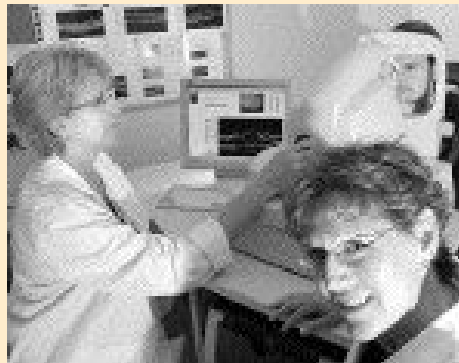


**Optical diagnostic tool quick and non-invasive:
Easier to perform than angiography, costs health system less, doctor says**

Illustration:

• **Photo:** Shaughn Butts, The Journal / Dr. Linda Uniat, foreground, uses optical coherence tomography on patient Bill McElhanney. The procedure combines the principles of ultrasound with the imaging performance of a microscope.



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EDMONTON - Edmonton lawyer Bill McElhanney woke up one morning last fall to find a big brown spot in the upper right corner of the field of vision of his right eye.

If that wasn't worrisome enough, the spot seemed to be growing. Within hours, after a visit to his optometrist and a referral to retinal specialist Linda Uniat, McElhanney, 48, was sitting in a room at the Royal Alexandra Hospital staring into a special camera.

The diagnostic procedure, called fluorescein angiography, involves an injection of a vegetable-derived dye into the hand. It takes about 10 seconds for the dye to reach the blood vessels in the back of the eye and then a technician begins taking photographs, a procedure which takes 10 to 15 minutes.

"It was like being in a bad 1970s discotheque with lights continually flashing," says McElhanney.

Last week, he was back in Uniat's office for a followup, but this time he didn't have to go to the hospital for another angiography. The photography was done in her office using a far different procedure.

Called optical-coherence tomography, or OCT, it combines the principles of ultrasound with the imaging performance of a microscope. It uses infrared light instead of sound waves and a computer to analyse the light reflected back to produce coloured pictures which provide far greater detail and more information than the black-and-white images produced by angiography.

"Looking at an OCT scan, you can actually see a slice of the retina. It's like a biopsy," says Uniat, who bought the \$100,000 device in

February. "It's so much more accurate in following patients."

It's also a lot easier on her patients, many of whom are elderly.

People sometimes experience nausea and vomiting and there have been instances of anaphylactic shock from an allergic reaction requiring a trip to the emergency department.

In contrast, the OCT scan is non-invasive and takes just a few minutes.

It also promises to save the health system money. Retinal angiography costs close to \$200 per session. Uniat says in her practice she would typically do 30 to 35 of them a week. Some patients still require angiography, but she estimates the new device has halved her angiography caseload.

So far, she's picking up the cost of using the OCT scanner. The technology is so new, Alberta Health has yet to decide whether to pay for the procedure. Uniat has the first such device in Alberta and there are only a handful in use across the country.

As far as McElhanney is concerned, the scanner is a huge advance over angiography. "This is far less intrusive."

The brown spot he was seeing was caused by a central retinal venous occlusion -- a mini-stroke in the eye, with a blockage in a vein.

A subsequent buildup of pressure caused some smaller blood vessels to burst and leak fluid into the retina.

Uniat used a laser to seal the leaky vessels to prevent further damage, along with Aspirin and cortisone to help clear up the blockage and swelling. McElhanney has responded well, but has lost some vision in the eye.

As someone who also had an eye problem -- a retinal detachment in my left eye -- which like McElhanney's occlusion seemed to come out of nowhere, I was curious to see what kind of shape my retina was in.

About five minutes later, I was holding a print copy of the scan which showed a cross-section of the macula, the central part of the retina which enables us to see fine detail.

It looked, thankfully, exactly as it should with several layers ranging in colour from blue-green to yellow-red indicating a higher density of cells. And at the fovea -- the dead centre of the macula, there was a small depression as there should be.

In contrast, a scan of an eye in which diabetes has caused severe damage to the macula from fluid buildup shows the fovea is raised and there are fewer red and yellow areas, indicating a thinning of the crucial light collecting cells.

Besides convenience, another advantage of the new system, says Uniat, is that it allows her to give patients more information.

"When a patient can see on the screen right away what you've done, the comprehension and understanding is far better."

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