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CARING FOR DIABETES

# Glucose monitoring device would eliminate 'finger poke'

## UT professor's concept licensed to California firm

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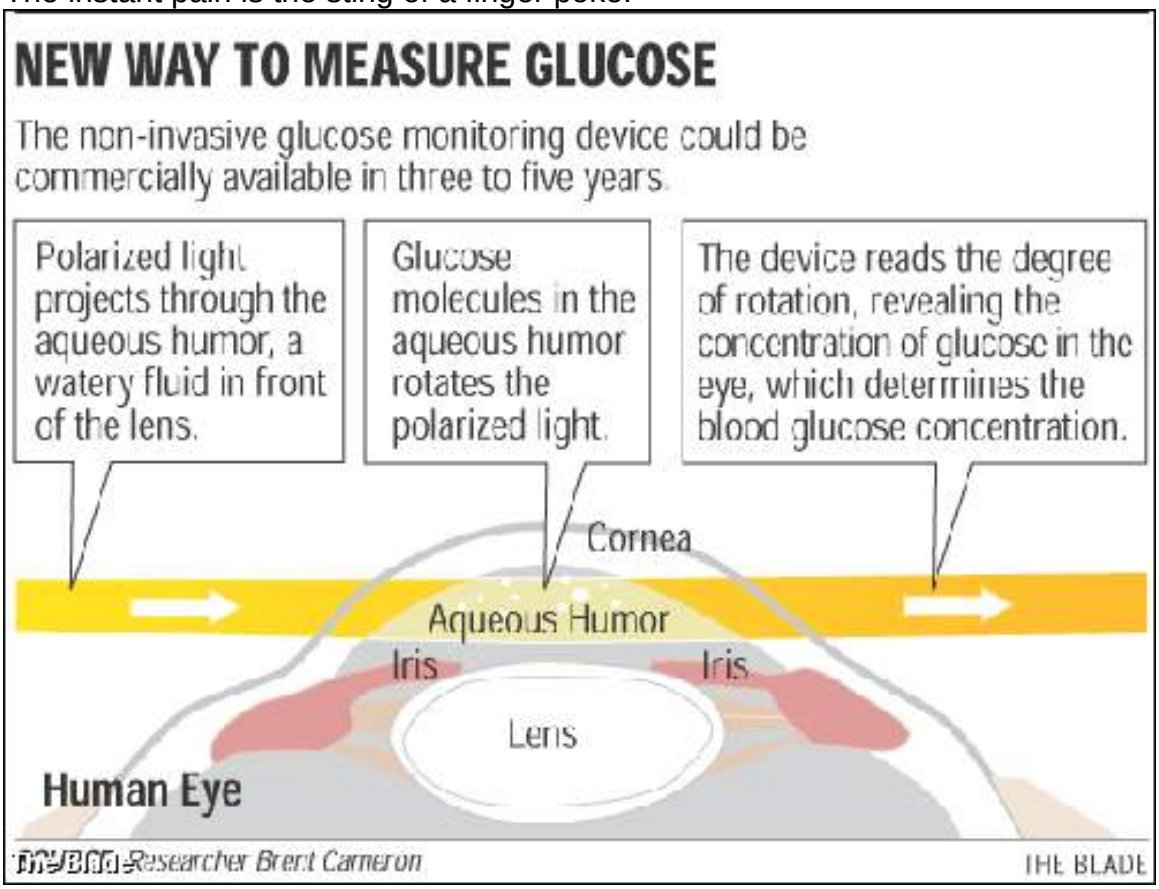
Mary Burnett's 7-year-old son was diagnosed with diabetes at 10 months.

The daily management of the disease is as natural to him as running or sleeping or watching TV.

But sometimes, Mitchell looks at his mother after testing his blood and grimaces: "It's that instant pain! That hurts!"

The instant pain is the sting of a finger poke.



Five, six, seven times a day, the Findlay first grader has to lance his finger to test his blood glucose level. So does his 15-year-old brother, Cory, and his father, Jason.

It's part of the life-saving routine of managing insulin-dependent diabetes.

"The finger pokes, oh my goodness!" Mrs. Burnett said. "They are so tired of it."

Brent Cameron, director of the Biomedical Optics Laboratory at the University of Toledo, has invented a device that may eliminate the painful ritual.

Professor Brent Cameron demonstrates the technology he developed for measuring blood glucose levels through the eye.

It reads glucose levels by directing a tiny beam of light into the eye, and a California firm has purchased a license from UT to develop it.

The invention depends on the fact that the eye's aqueous humor - the liquid between the lens and cornea - has the same glucose concentration as blood.

In fact, it is made from blood.

By shooting low-power polarized laser light through the liquid, it is possible to read the glucose concentration. When the polarized light interacts with glucose, the sugar rotates the light a tiny bit.

Nonpolarized light is messy.

If you could see its waves coming toward you, you'd see some were straight up and down, others at an angle, others laying flat.

When light is polarized, it is limited to a single plane, coming toward you, say, only straight up and down. Whenever that light hits glucose, it rotates a bit - it sort of tips - to the right.

The greater the tipping, the more glucose it must have encountered.
But the rotation is very tiny, as little as 0.004 degrees. So Mr. Cameron's first challenge was to create something that could detect a rotation that minuscule. When he took the precise new device and aimed it at the eye, he found that the protein in the cornea masked what was going on in the eye. So his next challenge was to create a way to see through the cornea's masking.

Mr. Cameron has worked on the puzzle since he began his master's degree at Texas A&M University.

In fact, early in his research, absorbed in the details of diabetes, he realized his father was diabetic. He noticed his father was always thirsty after drinking cola and suggested he go for testing. A diabetes diagnosis followed.

A number of suitors approached UT for the license to the glucose monitoring method, said Dan Kory, the university's director of intellectual property.

"Noninvasive glucose testing is kind of like the Holy Grail," said Craig Misrach, president and chief executive officer of Freedom Meditech Inc., the San Diego firm that won the license.

"We believe this technology has an inherent advantage" Mr. Misrach said. Although UT could not disclose financial details of the license agreement, Mr. Kory said it includes a small initial fee and an equity stake in the company.

Freedom Meditech will miniaturize the device and eventually seek partners for its manufacture and distribution. It will be the new company's first product.

"This would just be a godsend," Mrs. Burnett said. "This would be the best thing to hit diabetes research beside a cure."

But she can't help feeling a little cautious. The family watched with interest when a friend tried a device that was supposed to determine blood sugar through the skin's sweat glands. It was a flop.

"That was kind of a real big disappointment to all of us," she said.

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