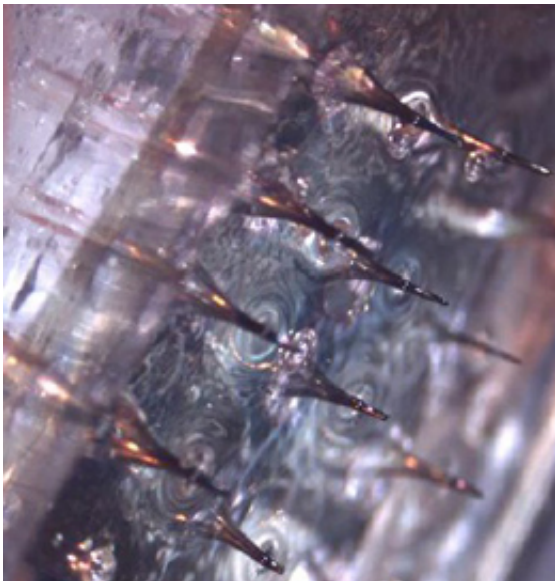


Better than a needle in the eye: New medical device offers hope and relief for patients

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A close-up photo of the microneedles found on the surface of a new McMaster-developed device that can deliver drugs to the back of the eye. The device could offer more effective treatment while sparing patients the excruciating routine of having drugs injected directly into their eyes via syringe every six to eight weeks.

(Medical Xpress) -- Researchers at McMaster have developed a new system for delivering drugs to the back of the eye - one that could offer more effective treatment while sparing patients with vision-related diseases the excruciating routine of having drugs injected into their eyes by syringe every six to eight weeks.

Instead, the new system could deliver medicine painlessly to the back of the eye through a flexible patch that would typically stay on the eye behind the lens for as much as a year at a time, slowly releasing controlled doses of medicine to the vitreous body of the eye through a group of "microneedles" too small to feel.

The rubbery patch is designed to conform to the eye's contour and the needles can be tailored to reach specific layers of the eye as needed. The patch would be attached on an in-patient basis and would not affect the patient's [eyesight](#) when in use.

The team of chemical and mechanical engineers tested the system successfully on eyes extracted from [cows](#), moving the concept a major step closer to being tested on humans. The innovation is described in an article in the online edition of the Journal of Biomaterials Applications.

The patch can be compared to medication patches used on the skin, but on a much smaller scale and using different materials adapted to the complex environment of the eye.

Such a patch would be a much more precise and effective vehicle for delivering medications to patients with such conditions as vision-related complications of diabetes and age-related [macular degeneration](#), both of which are becoming more prevalent.

"There's lots of potential for treating eye diseases that we didn't have even five years ago. It's really exciting," said the study's co-author, Heather Sheardown, a professor of chemical engineering. "There are medications out there to treat these diseases. As we develop better delivery methods, [blindness](#) isn't going to be something that has to happen. If we can catch the disease early and we can treat it early, we can stop its progression."

Sheardown's lab, which focuses on delivering drugs to the back of the eye, will turn next to developing a reservoir system to allow drugs in such patches to be replenished externally.

The technical challenge for the team that developed the patch device was not only to find a way to deliver drugs in such a challenging setting, but to use affordable materials so the system can compete with hypodermic [needles](#), explained co-author Ravi Selvaganapathy, an associate professor of mechanical engineering.

"All these stringent requirements were daunting. But the design solution that emerged was elegant," he said.

The researchers received funding from the Natural Sciences and Engineering Research Council of Canada.

Provided by McMaster University

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