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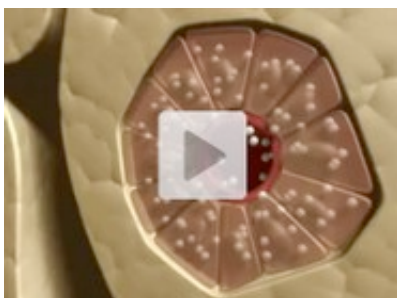
Advancements on Other Fronts

By *Lindsay Lyon*

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For a person with chronic diabetes, life can be a grueling battle to keep blood sugar levels close to normal. Novel tools, drugs, and scientific discoveries may prove vital.

Devices. The Food and Drug Administration's recent approval of sophisticated continuous glucose monitoring systems opens the door to better blood sugar control—with fewer finger-sticks. A small sensor inserted just under the skin tracks each dip and peak in glucose and triggers an alarm when these fluctuations exceed preset targets; a quick snack or a dose of insulin can set things right. The downside: Each system costs up to about \$1,000, plus \$300 a month for replacement sensors and other supplies, and is not covered by insurance. In combination with a conventional insulin pump and a high-tech computer chip—the latter still being refined—one of the new monitors could function as an "artificial pancreas." That suite of equipment would keep glucose levels balanced with little intervention by patient or doctor. Yale researchers have successfully tested an artificial pancreas made by Medtronic in a small group of teens with type 1 disease.



Video: What is Diabetes?

Medications. New drugs—including Byetta and the pill Januvia, both of which have debuted since 2005, and a third, liraglutide, that's well into development—don't appear to excessively lower glucose, which insulin and other treatments can do. Byetta has the added advantage of promoting weight loss, but it has to be injected twice a day and, unlike Januvia, must be used in combination with other drugs. These meds may also have undiscovered risks. "New drugs tend to look good in their first couple of years," says Daniel

Drucker, director of the Banting and Best Diabetes Centre in Toronto, "but it's only when we have a few million people taking them that we gain an understanding of what their long-term side effects will be." Recent research cast such doubts on Avandia; last week, the manufacturer revised that diabetes drug's warning label. Last month, the FDA warned Byetta users that the drug may be associated with acute pancreatitis in some patients.

Discoveries. Last week, at a conference in Miami, experts shared promising early results from ongoing clinical experiments, including the use of adult stem cells to reverse type 1 diabetes and the transfusion of young patients' own cord blood to slow the disease's progression. A human trial of a vaccine treatment for type 1 diabetes could begin as early as next year, says Denise Faustman, an immunologist at Massachusetts General Hospital in Boston. Her group has cured gravely ill mice with drugs that kill rogue immune cells. In both those animals and type 1 diabetics, such cells destroy insulin-producing pancreas cells.

Researchers' understanding of type 2 diabetes is also changing. The discovery that it's linked to a deficiency of a newfound hormone could lead to a novel injectable treatment. Researchers led by Gerard Karsenty of Columbia University Medical Center reported in the August issue of *Cell* that osteocalcin, a hormone secreted by skeletal tissue, helps the body control blood sugar. Diabetic mice treated with osteocalcin shed excess fat, produced more insulin, and used insulin more efficiently. But Faustman's and Karsenty's results shouldn't spur premature hope: What works in mice often fails in people.

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