On the Horizon: Future Treatment Options for Type 2 Diabetes

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If you are one of the millions of Americans struggling with Type 2 diabetes, the most common form of the disease, the pharmaceutical industry is hard at work for you. New drug classes are in development, which will work differently from those currently on the market.

Still, it may take eight to ten years for the drugs to become available to the consumer. To ensure the safety and effectiveness of the new drugs, each must go through clinical trials, which are divided into three phases. In Phase I, the safety and dosage are determined in a small group of healthy volunteers. In Phase II, safety and effectiveness are tested in a small group of volunteers who have the condition the drug is meant to treat. In Phase III, adverse effects are tested in a large group of volunteers who have the condition. Phase III may last as long as three to four years. Then, the drug company can request approval from the Food and Drug Administration (FDA), which can take another two to three years.

Despite the arduous process, the new work being done is exciting and offers hope to people living with this challenging condition. PANCREATIC FUNCTION

Normally when you eat, glucagon-like peptide-1 (GLP-1) stimulates the pancreas to make insulin. Once sufficient insulin is available to handle the rise in blood sugars after meals, an enzyme called DPP-4 breaks down GLP-1 to prevent the overproduction of insulin. In people with diabetes, the secretion of the hormone GLP-1 is diminished. Therefore, new drugs called DPP-4 inhibitors reduce the enzyme to prevent breakdown of GLP-1 so enough GLP-1 is available to prompt the pancreas to make the right amount of insulin after meals and less in between meals.

The effect of DPP-4 inhibitors is comparable with Byetta®, a synthetic, injectable version of GLP-1. DPP-4 inhibitors will be available as a pill. Two compounds of this class have been submitted to the FDA for review. The compounds are sitagliptin (brand name JanuviaTM) and vildagliptin (brand name Galvus®). THE LIVER'S ROLE

The pancreas plays a major role in keeping blood glucose in the normal range, but the liver also plays as significant role. After food digestion, blood sugar levels rise. The pancreas immediately releases insulin. Insulin helps transfer sugar from the blood into the cells. At the same time, the liver takes up excess sugar and stores it as glycogen. Several hours after a meal, or during the night, certain enzymes in the liver break down glycogen and release sugar back into the blood.

In Type 2 diabetes patients, the liver may release too much sugar, causing high blood sugar levels. Metformin is a drug that helps stop the liver from releasing too much sugar. New drugs in development target enzymes to inhibit the breakdown of glycogen. One class of drugs is called the FBPase inhibitors, currently in Phase I and Phase II trials. THE KIDNEYS AND DIABETES

The kidneys also play a role in maintaining blood sugar levels. When blood sugars are in the normal range, the kidneys retain most of the sugar and very little is eliminated in the urine. In contrast, high blood sugar levels cause the kidneys to excrete more sugar in the urine.

One class of drugs, currently in Phase II trials, help the kidneys retain less sugar and excrete more in the urine, thus causing lower blood sugar levels.

In the future, multiple treatment options for Type 2 diabetes will be available, and you and your doctor may be able to mix and match different drugs to address your special needs.

SUPPORT GROUPS DIABETES
First Tuesday of the month, 9 to 10 a.m.* Call 760-773-1403.

DIABETES TEEN/TWEEN
Second Wednesday of the month 6 to 7:30 p.m. Probst Building, Suite 100 Call 760-861-8769.

INSULIN PUMP
Third Monday of the month 5:30 to 7:30 p.m.* No meetings in July or August. Call 760-346-1437. *Held at Annenberg Center for Health Sciences at Eisenhower.

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