



Innovative blood glucose meters make life safer for diabetics

The **sweet** danger

Diabetics usually have to measure their blood glucose level several times a day so that they can take the right amount of insulin to regulate it. Scientists working for Bayer HealthCare have now developed a new method that uses biosensors to reliably tell patients exactly how much insulin they need.

The name sounds innocuous, but the disease can have dramatic consequences: the Greek words 'Diabetes mellitus' literally mean 'sweet siphon', and individuals with this condition are at significant risk of heart attack and stroke. This metabolic condition leads to excessively high blood glucose levels and is a growing problem: experts estimate that there will be 366 million people with the disease throughout the world by 2030. There are two main types of diabetes, type 1 and type 2. About ten percent of people with diabetes have type 1 and must use insu-

lin to live. The rest have type 2; some of these also use insulin to treat their disease. Type 2 diabetes used to affect mainly elderly people, but younger individuals are now increasingly also being diagnosed with this form of diabetes. The main causes of type 2 diabetes are genetic, but environmental factors such as lack of exercise, poor diet and obesity also contribute.

All people with type 1 and about a third of people with type 2 diabetes inject themselves with insulin several times a day to keep their blood glu-

cose levels in balance. They need to measure how much glucose they have in their blood before each injection so that they can administer the correct amount of the hormone. This opens up considerable room for error. "Many conventional blood glucose meters have to be manually coded by the patient to match the batch of test strips," explains Dr. Joan Lee Parkes, who is responsible for the clinical trials on blood glucose monitoring systems at Bayer HealthCare, Diabetes Care, in Mishawaka, Indiana, USA. Equipment that is not correctly



Keeping a check on diabetes: the no-coding sensor in Bayer's Contour® monitoring device (photo) now allows diabetics to measure their insulin levels more safely and accurately. Bayer scientists Dr. Joan Lee Parkes (left) and Bern Harrison are improving diabetics' quality of life.

Do you have diabetes?

Various signs point to diabetes:

- ▶ Fatigue and listlessness
- ▶ Frequent urination
- ▶ Increased thirst
- ▶ Dry, itchy skin
- ▶ Impaired vision
- ▶ Wounds that fail to heal properly
- ▶ Genital organ infections
- ▶ Urinary tract infections
- ▶ Involuntary weight loss
- ▶ Numbness of the hands and feet

set can produce inaccurate readings, as a recent study in the United States has shown. As a consequence, patients may give themselves the wrong dose of insulin. This can have dramatic effects, because if blood glucose levels fall too low, patients can become hypoglycemic and in extreme cases become confused or lose consciousness. If glucose levels remain too high for an extended period, on the other hand, patients can suffer conditions such as arterial calcification, renal damage and nerve and sight disorders as a result.

Says Dr. Parkes, "Accurate measurement of blood glucose is vital to safeguard a diabetic patient's quality of life." But around 16 percent of patients make mistakes. "Properly setting the blood glucose meter when starting a new pack of test strips is a critical aspect of diabetes management." This is the conclusion drawn by Dr. Steven Edelman, Professor of Medicine at the University of California in San Diego, USA, from a study which he helped to launch and which was presented at the Sixth Annual Diabetes Technology Meeting in Atlanta.

Therefore the new Bayer glucose monitoring device Contour® is fitted with no-coding biosensors to minimize this source of errors and the risk of an incorrect dose. This feature automatically pre-sets the device to match the batch of test strips being used, making

the measurement process more accurate and ensuring that patients administer the right amount of insulin. Bayer's scientists use a chemical reaction with an enzyme in which electrons are transferred. The volume of these electrons is measured, and the flow of electricity is a direct measurement of the sugar content.

More accurate measurements for dialysis patients too

The new sensor technology also eliminates a factor that previously caused significant errors in the accuracy of measurements under certain conditions such as when patients were on peritoneal dialysis (dialysis given through the abdominal wall) and given solutions containing icodextrin or when patients were receiving immunoglobulin preparations containing maltose. These patients could get inaccurate readings on their blood glucose meters because maltose and other substances affected each other. "The new Contour uses a glucose-specific co-enzyme, which means that maltose no longer affects the results," explains Dr. Parkes. This is a boon to kidney patients, as they sometimes need to follow a course of treatment in which maltose components can appear in the blood.

Bern Harrison, a research scientist working on sensor technology for Bayer

HealthCare, explains another benefit of the new glucose sensors: "Red blood cell levels or hematocrit levels are no longer a factor that can affect the accuracy of the blood glucose monitoring system." This is excellent news for patients with leukemia or people who live at high altitudes. That is because these individuals have unusual levels of red blood cells (called hematocrit), which also used to produce false readings on old devices. An additional corrective electrode in the new sensor makes sure that any medication a patient might be taking no longer affects the result. "A safe, rapid and accurate method of measuring blood glucose is vital to the quality of life of every diabetic," Harrison explains. "The new biosensor technology in the Contour device helps them achieve this."

➔ www.unitefordiabetes.org/campaign/resolution.html
 This website operated by the International Diabetes Federation (IDF) contains more information on diabetes.