

## Prescription Checking Device Promises to Resolve Intractable Hypoglycemia

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### Abstract

#### **Background:**

Satisfactory glycemic control, meeting American Diabetes Association recommendations, is often accompanied by unsatisfactory hypoglycemia. The converse is also true. We hypothesize that this diabetes treatment dilemma may be resolved by repeated, objective, prescription checks. To do this, a new, two-part device has been developed. It includes a personal diabetes database for the patient and a built-in diabetes prescription checker for the provider. Its goals are to enhance diabetes education and improve patient care.

#### **Research Design and Methods:**

The device includes a database and supporting software, all contained in a standard USB flash drive. Using the medical prescription, body weight, and recent self-monitored blood glucose (SMBG) data, prescription checks can be done at any time. To demonstrate the device's capabilities, an observational study was performed using data from 11 patients with type 1 diabetes mellitus, on intensified therapy, with a mean glycosylated hemoglobin A1c <7%, and who all suffered intractable hypoglycemia. Patients had performed SMBG contours on successive days at monthly intervals. Each contour included pre- and postmeal as well as bedtime measurements. The replicated contours were used to predict the patient's glycemic profile each month. Applying a built-in simulator to each profile, changes in the prescription were explored that were consistent with reducing the recalcitrant hypoglycemia.

#### **Results:**

A total of 110 glycemic profiles containing 822 profile points were explored. Of these profile points, 351 (43%) showed risks of hypoglycemia, whereas 385 (47%) fell outside desired ranges. With the simulated changes in the prescription, the predicted risks of hypoglycemia were reduced 2.5-fold with insignificant increases predicted in hemoglobin A1c levels of  $+0.6 \pm 0.9\%$ .

*continued →*

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**Abbreviations:** (ACCORD) Action to Control Cardiovascular Risk in Diabetes, (A1C) glycosylated hemoglobin A1c, (Rx) prescription, (SMBG) self-monitored blood glucose

**Keywords:** algorithms, blood glucose control, disease management, evidence-based medicine, glucose monitoring, glycosylated hemoglobin, hypoglycemia, insulin resistance, intervention, outcome measures, remote monitoring, simulation, telemedicine

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**Abstract cont.****Conclusions:**

A novel support tool for diabetes promises to resolve the diabetes treatment dilemma. Supporting the patient, it improves self-management. Supporting the provider, it reviews the medical prescription in light of objective outcomes and formalizes interventions for maximum safety and efficacy.

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