# Improvement in Glycemic Control Using Algorithm-Guided Basal-Bolus Insulin Therapy in Hospitalized Patients with Type 2 Diabetes

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**Objective:**
Type 2 diabetes (T2D) treatment in hospitalized patients is often insufficient, resulting in sustained hyperglycemic or hypoglycemic events due to insulin dosing errors. Therefore, an algorithm-based decision support system (GlucoTab®, decide Clinical Software GmbH, Graz, Austria) was developed, to guide basal-bolus insulin therapy (BBI) in inpatient treatment of T2D. We aimed to analyze the effect of GlucoTab® BBI compared to standard care on glycemic control throughout inpatient stays on a general ward.

**Method:**
In a retrospective analysis, we obtained data of 153 patients with T2D admitted to a general medicine ward over 12 months for various admission indications. We compared patients treated using the algorithm-based BBI therapy to patients receiving standard diabetes care provided by treating physicians.

**Result:**
Among the 153 cases, there were 43 episodes with continuous algorithm-based therapy lasting a minimum of 3 days. 26 patients were treated using the algorithm continuously for at least seven days (maximum duration: 20 days). Overall there were 379 days of algorithm-based BBI treatment and 779 days of standard diabetes care including any given insulin therapy, resulting in a mean daily glucose of $159.9 \pm 40.6$ vs. $177.1 \pm 50.8$ mg/dL. For algorithm-treated patients we compared the first day of algorithm therapy with day 3 (n=43; $190.4 \pm 58.3$ vs. $161 \pm 35.3$ mg/dL) and day 7 (n=26; $195.1 \pm 66.8$ vs. $150.2 \pm 31.2$ mg/dL).

**Conclusion:**
Algorithm-guided BBI treatment safely titrates insulin dosage leading to a rapid improvement of mean daily glucose within three days. There was less glycemic variability, resulting in a decrease in hyper- and hypoglycemic events. Our analysis supports the use of algorithm-based decision support systems in hospitalized insulin-treated T2D patients.