

## Patient Management Strategies

### 41 T1D Administration of Biphasic Insulin Aspart 70/30 in Patients with Type 2 Diabetes Mellitus Not Achieving Optimal Glycemic Control on a BID Regimen

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**Objective:** To retrospectively determine whether optimal glycemic control is achieved by adding a third injection of biphasic insulin aspart 70/30 (BiAsp 70/30) just before lunch in older patients with type 2 diabetes mellitus (DM) who were not reaching optimal glycosylated hemoglobin (A1C) goals of <7.0% with a BID regimen.

**Methods:** A retrospective chart analysis was conducted. In 12 patients aged 52 to 80 years with type 2 DM for 5 to 24 years who continued taking some oral antidiabetic agents, a third injection of BiAsp 70/30 was added. When the total dose was >60 U BID, 16 U was added at lunchtime; otherwise, 20% of the daily dose was subtracted then added back at lunchtime. Change in A1C value, body weight, total insulin dose, and frequency of hypoglycemia were analyzed after 6 months of T1D treatment.

**Results:** Mean A1C level decreased from 8.4% to 7.2%, and 58% of patients attained an A1C level of <7.0%. Although total insulin dose increased by 11% with the T1D regimen, the prebreakfast and predinner doses decreased by 15%. No patients experienced major hypoglycemia with either BID or T1D dosing. No minor hypoglycemic events were reported by patients on the T1D regimen, and these patients' mean body weight decreased by 2.25 lb.

**Conclusions:** Adding a third injection of BiAsp 70/30 decreased A1C level, body weight, and incidence of hypoglycemia in 12 older patients with type 2 DM who were not achieving optimal glycemic control (A1C of <7.0%) on a BID regimen.

### 42 Safe and Effective Control with Glulisine in Patients with Type 2 Diabetes Mellitus Using 2 Mealtime Titration Methods

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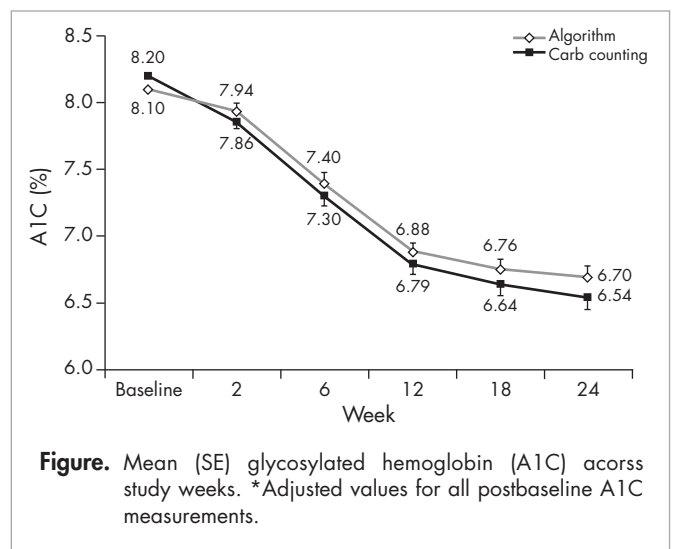
**Objective:** To test the safety and efficacy of insulin glulisine (GLU) using 2 mealtime titration methods in patients with type 2 diabetes mellitus (DM).

**Methods:** This open-label, multicenter, randomized, 24-week study tested the safety and efficacy of GLU in 273 patients with type 2 DM using 2 mealtime titration methods: (1) simple algorithm (ALG, n = 136), with titration based on the number of preprandial blood glucose (PBG) values above/below target and (2) simple adjustments (adding 1 to 3 U) versus carbohydrate counting (Carb Count, n = 137), with titration based on PBG patterns and insulin to carbohydrate (I:C) ratio and dose changes based on meal carbohydrate content. Patients (median age, 55.1 years; duration of DM, 13 years; body mass index, 36.7 kg/m<sup>2</sup>; glycosylated hemoglobin [A1C] level, 8.2%) had uncontrolled type 2 DM with ≥2 daily insulin injections. Patients were switched to basal-bolus therapy: daily insulin glargine (GLAR) titrated to fasting blood glucose of <95 mg/dL and premeal GLU ± metformin with targets of <100 mg/dL prelunch/predinner and <130 mg/dL at bedtime (adjusted weekly).

**Results:** At week 24, adjusted change in A1C value from baseline was significant for both groups (ALG, 1.46% vs Carb Count, 1.62%;  $P < 0.0001$ ). The proportion of patients achieving an A1C value of <7.0% (73.0% vs 69.2%) and experiencing weight gain (3.7 vs 2.4 kg) was also similar between groups. Patients in the ALG group used

higher doses of GLU (110.2 U) and GLAR (103.4 U) compared with patients in the Carb Count group (94.3 U GLU and 87.0 U GLAR;  $P = 0.04$  and 0.0001, respectively) and had less symptomatic hypoglycemia of <50 mg/dL (4.9 vs 8.0 events/patient-year;  $P = 0.02$ ). Both groups ended with a basal-bolus ratio of 52:48 and used 1.9 (ALG) and 1.7 (Carb Count) U/kg of insulin/day. Adverse events were similar in the 2 groups.

**Conclusion:** Both titration methods were safe and effective, demonstrating good glycemic control with a GLAR-GLU basal-bolus regimen. GLU adjustment based on the ALG method provides a simplified alternative to I:C ratios in patients with type 2 DM.



### 43 Shared Medical Appointments Are an Effective Intervention in High-Risk, Traditionally Nonadherent Veterans Who Might Benefit from Multiple-Injection Insulin Therapy

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**Objective:** To improve health care using shared medical appointments (SMAs) in a traditionally medication-nonadherent, high-risk, high-insulin-using population of veterans.

**Methods:** This retrospective study included 106 patients with a glycosylated hemoglobin (A1C) level of  $\geq 11.0\%$  and/or a documented history of medication nonadherence, psychiatric illness, and/or multiple diabetic complications. Documented history was established by previously validated search methods of electronic medical records or provider referrals. All patients were switched from once-daily or BID regimens employing regular human insulin, neutral protamine Hagedorn insulin, or 70/30 insulin combinations to multiple daily-injection therapy with once-daily insulin glargine and prandial insulin aspart. Patients were followed every 4 to 12 weeks in an SMA for  $\geq 6$  months.

**Results:** In 61 veterans (57%), A1C level decreased from baseline (mean decrease, 1.8%; range, 0.2% to 4.4%). In 45 veterans (43%), A1C level increased (mean increase, 0.9%; range, 0.1% to 3.3%).

**Conclusion:** SMAs appear to be an effective modality for treating high-risk, high-insulin-using, traditionally nonadherent patient populations likely to require a disproportionate share of Veterans Administration health services.

#### 44 Patient Perceptions of Insulin Detemir as Reported Through a Patient-Physician Communication Survey Study

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**Objective:** To examine patient-reported perceptions of the impact of insulin detemir on the treatment of diabetes mellitus.

**Methods:** In this ongoing naturalistic survey study, physicians identify patients appropriate for this treatment and provide them with study information. Patients voluntarily respond to a baseline survey before use of the medication and to surveys at 30 and 60 days after treatment initiation using interactive voice-response technology. Questions measure patients' perceptions regarding blood glucose (BG) control, confidence in avoiding symptoms, and medication satisfaction. The prescribing physician receives a report summarizing the patient's responses.

**Results:** To date, 531 adults have completed the study. Average age is 59 years; 64% are female. After an average of 35 days and again after 68 days of insulin detemir use, patients can more easily judge BG levels (average 6.6 and 7.0 of 10 [10 = much easier] at each follow-up survey, respectively) and keep good BG control (6.7 and 7.0). With insulin detemir, patients feel more confident about avoiding symptoms of hypoglycemia (average 6.8 and 7.1 of 10 [10 = much more confident]) and low BG at night (7.3 and 7.4). Thirty-one percent reported weight loss; 58% reported no change; 11% gained weight. Satisfaction with insulin detemir averaged 8.0 of 10 at both follow-up surveys.

**Conclusions:** With insulin detemir, patients feel more confident about their ability to manage BG levels, tend not to gain weight, and are quite satisfied. In addition, the individual patient data may help physicians monitor patients' perceptions and promote discussions about treatment with patients.

#### 45 Weight Management in Patients with Type 2 Diabetes Mellitus Receiving Intensive Basal-Bolus Insulin Therapy

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**Background:** Intensive insulin therapy generally aims for patient blood glucose (BG) levels between 90 and 130 mg/dL, with glycosylated hemoglobin (A1C) levels of  $< 7\%$ . In an observational study of disadvantaged rural Tennesseans receiving intensive basal-bolus insulin therapy for  $\leq 3$  years, weight gain was not a significant side effect of treatment.

**Objective:** To formulate hypotheses for subsequent controlled studies concerning weight management, achievement of normal BG levels, and awareness of dietary insulin requirements.

**Methods:** Our flowchart treatment algorithm targets BG levels between 70 and 120 mg/dL with A1C levels of  $< 6.5\%$  achieved through video-recorded, shared medical visits with peer mentoring for 2 hours/wk until sustained results are achieved. Video recordings are analyzed to develop psychosocial and weight-management themes.

**Results:** Initial results indicate that video-recorded, shared medical visits with peer mentoring significantly reduce weight gain in patients receiving intensive basal-bolus insulin therapy. A total of 263 patients ( $\geq 2$  A1C and weight measurements, with last A1C value taken within 150 days) did not change their average weight and were equally distributed in the 4 quadrants of a change in A1C level versus change in weight scatter graph. The points clustered around the origin where 20% of patients had  $< 2$  lb weight change; 40% had weight loss, and 40% had weight gain. The average change in A1C was  $-0.9\%$ .

**Conclusions:** As basal-bolus insulin therapy is titrated, video-recorded peer support and mentoring help patients develop self-awareness and confidence and make behavioral changes necessary to help control diabetes mellitus. Achieving normal BG levels positively influences weight management and physical activity, and awareness of dietary requirements promotes frugal carbohydrate consumption.

#### 46 Impact of Standardized Correction-Dose Insulin Order Sets in 3 Community Hospitals

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**Background:** In a move from sliding-scale to correction-dose insulin, standardized low-, moderate-, and high-dose order sets were developed and approved in 3 hospitals. These order sets incorporate glycemic goals and minimize provider variation. Initial order-set selection is determined by subjective patient factors. Two consecutive blood glucose (BG) values  $> 250$  mg/dL prompt nursing escalation to the higher-intensity order set. BG values  $> 250$  mg/dL on the high-dose order set mean that the physician is called.

**Objective:** To evaluate the safety and effectiveness of the order sets as part of a quality improvement project.

**Methods:** One year after order-set implementation, 30 patients with  $\geq 4$  days of therapy were randomly selected from each facility for review. BG values of  $< 60$  mg/dL were considered hypoglycemia, and BG values of  $> 180$  mg/dL were considered hyperglycemia.

**Results:** A total of 90 patients were evaluated. Seventy-seven (86%) were started on the correct scale, 51 (57%) were started on low, 32 (36%) on moderate, and 7 (8%) on high-dose insulin. Of the 2229 BG values, 1471 (66%) were at target, 32 (1%) were hypoglycemic, and 624 (28%) were hyperglycemic. Twenty-two patients (24%) required dose escalation to the next order set. On the high-intensity scale, 15 (17%) required physician intervention. The results from each individual hospital mirrored the aggregate data.

**Conclusion:** Our standard approach is an effective way to remove provider variation in management of hyperglycemia and move toward more appropriate glycemic goals without an increase in hypoglycemia.

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