

## Outpatient-to-Inpatient Transition of Insulin Pump Therapy: Successes and Continuing Challenges

Adrienne A. Nassar, M.D.,<sup>1</sup> Brenda J. Partlow, C.N.P., N.P.,<sup>2</sup> Mary E. Boyle, C.N.P., N.P.,<sup>2</sup> Janna C. Castro, B.S.,<sup>3</sup> Peggy B. Bourgeois, A.P.R.N., M.N.,<sup>4</sup> and Curtiss B. Cook, M.D.<sup>2</sup>

### Abstract

#### **Background:**

Insulin pump therapy is a complex technology prone to errors when employed in the hospital setting. When patients on insulin pump therapy require hospitalization, practitioners caring for them must decide whether to allow continued pump use. We provide the largest review regarding transitioning insulin pump therapy from the outpatient to inpatient setting.

#### **Method:**

Records of inpatient insulin pump users were retrospectively analyzed at a metropolitan Phoenix hospital between January 2006 and December 2009. Adherence to institutional procedures on insulin pump use was assessed, glycemic control was determined, and adverse events were examined.

#### **Results:**

We examined records on 65 patients with insulin pumps, totaling 125 hospitalizations. Mean (standard deviation) patient age was 55 (17) years, diabetes duration was 27 (14) years, pump duration was 6 (5) years, length of hospital stay was 4.7 (6.3) days, hemoglobin A1c was 7.3 (1.3)%, 85% had type 1 diabetes mellitus, 57% were women, and 97% were white. Admissions involving insulin pumps increased (23 in 2006, 17 in 2007, 40 in 2008, and 45 in 2009). Insulin pump therapy was continued in 83 (66%) hospitalizations. Among these hospitalizations, endocrinology consultations were obtained in 89%, consent agreements were found in 83%, insulin pump order sets were completed in 89%, admission glucose was checked in 100%, and nursing assessments of pump insertion sites were documented in 89%, but bedside insulin pump flow sheets were found in only 55%. Mean glucose of 175 (57) mg/dl was not significantly different than that in hospitalizations where insulin pumps were discontinued [175 (42) mg/dl] or used intermittently [177 (7) mg/dl]. There was one instance of a pump catheter kinking; however, no other adverse events (pump site infections, mechanical pump failure, diabetic ketoacidosis) were observed, and there were no use-related fatalities.

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**Author Affiliations:** <sup>1</sup>Department of Internal Medicine, Mayo Clinic, Scottsdale, Arizona; <sup>2</sup>Division of Endocrinology, Mayo Clinic, Scottsdale, Arizona; <sup>3</sup>Division of Information Technology, Mayo Clinic, Scottsdale, Arizona; and <sup>4</sup>PBB Associates, LLC, Baton Rouge, Louisiana

**Abbreviations:** (BedGluc<sub>avg</sub>) bedside glucose average, (CSII) continuous subcutaneous insulin infusion, (HbA1c) hemoglobin A1c

**Keywords:** continuous subcutaneous insulin infusion, diabetes mellitus, hospitalization, inpatient, insulin pumps

**Corresponding Author:** Curtiss B. Cook, M.D., Division of Endocrinology, Mayo Clinic, 13400 E. Shea Blvd., Scottsdale, AZ 85259; email address [cook.curtiss@mayo.edu](mailto:cook.curtiss@mayo.edu)

**Abstract cont.**

**Conclusions:**

Most patients using insulin pumps can safely have their therapy transitioned when hospitalized. A policy on inpatient continuous subcutaneous insulin infusion use can be successfully implemented. Compliance with required procedures can be achieved, although there was room to improve adherence with some process measures. Further study is needed to determine how to optimize glycemic control when pumps are allowed during hospitalization.

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