



## Facts about the Safe and Effective Use of Insulin Project

In November 2012, the Center for Transforming Healthcare launched its ninth project, which aims to improve the safety and effectiveness in the delivery of care associated with insulin. Insulin therapy can be lifesaving, but if used inappropriately, it can be life threatening. Hospitalized patients with diabetes who are taking insulin may be unable to manage their glucose readings and insulin administration, and staff may not be trained or available to help with these critical tasks.<sup>1</sup> In the United States, more than one in five hospitalized patients have diabetes<sup>2</sup> and an additional one in five patients who were not known to have diabetes have elevated hemoglobin A1c during hospitalization.<sup>3</sup> Glycemic control is not only fundamental to the management of diabetes, but is also essential to help prevent hyperglycemic events induced by critical illness, stress and medical treatment. The Centers for Medicare & Medicaid Services (CMS) includes poor glycemic management on its 2013 list of 15 hospital-acquired conditions (HACs) and will no longer reimburse hospitals for additional costs associated with these preventable medical errors.<sup>4</sup>

For many years, insulin errors have been associated with the highest risk of injury to patients and are identified as one of the top high-alert medications by the Institute for Safe Medication Practices. Approximately 40 percent of 888,000 identified adverse drug events (ADEs) reported to the Medicare Patient Safety Monitoring System and 25 percent of the reviewed 100,000 emergency hospitalizations of patients over age 64 for ADEs involved insulin or other diabetic agents.<sup>5,6</sup> Safe use of insulin to achieve optimal blood glucose has been directly associated with improved patient outcomes. Hypoglycemic events can result in a patient suffering symptoms ranging from moderate confusion to severe convulsions, coma and death.<sup>7</sup> Untreated hyperglycemia can result in ketoacidosis<sup>8</sup> and other serious adverse clinical outcomes, ranging from patient confusion, to seizures, to death;<sup>9</sup> prolonged length of stay in the hospital; and poor patient experience of their hospital treatment.<sup>7</sup> From the 2,685 medication error event reports submitted to the Pennsylvania Patient Safety Authority, the predominant types of medication error events associated with insulin were drug omission (24.7 percent), wrong drug (13.9 percent), wrong dose or overdosage (13 percent).<sup>10</sup>

The five leading hospitals and health centers participating in this project will work with the Center to identify the root causes that lead to poor glycemic control related to insulin administration and other factors. The participating organizations will find solutions that are unique to their organization's specific causes. These solutions will be tested and validated, and then spread to other organizations. The Joint Commission Center for Transforming Healthcare is using Robust Process Improvement® (RPI®) methods and tools to identify causes and develop solutions to reduce incidences of poor glycemic control. RPI® is a fact-based, systematic, and data-driven problem-solving methodology. It incorporates tools and concepts from Lean Six Sigma and change management methodologies. Using RPI®, the project teams will develop solutions to reduce incidences of poor glycemic control.

The results for this project are targeted for publication in 2015.

### Project team

Morristown Medical Center (Atlantic Health System), New Jersey  
New York-Presbyterian Hospital, New York  
Sharp HealthCare, California  
Texas Health Resources, Texas  
VA Connecticut Healthcare System, Connecticut

For more information about this project or its participants, visit the [project detail](#) page or the Center [website](#).

<sup>1</sup>Moore TJ, Cohen MR, Frberg, CD. Serious adverse drug events reported to the Food and Drug Administration, 1998-2005. *Archives of Internal Medicine*. 2007 September 10;167(16):1752-1759.

<sup>2</sup>Wexler DJ, et al. Prevalence of elevated hemoglobin A1c among patients admitted to the hospital without a diagnosis of diabetes. *Journal of Clinical Endocrinology & Metabolism*. 2008 November 1;93(11):4238-4244.

<sup>3</sup>Mazurek JA, et al. Prevalence of hemoglobin A1c greater than 6.5% and 7.05% among hospitalized patients without known diagnosis of diabetes at an urban inner city hospital. *Journal of Clinical Endocrinology & Metabolism*. 2010 March 1;95(3):1344-1348.

<sup>4</sup>Centers for Medicare & Medicaid Services. FY 2013 Final HAC List. [http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Downloads/FY\\_2013\\_Final\\_HACsCodeList.pdf](http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Downloads/FY_2013_Final_HACsCodeList.pdf) (accessed October 31, 2013).

<sup>5</sup>Classen DC, Jaser L, Budnitz D. Adverse drug events among hospitalized Medicare patients: Epidemiology and national estimates from a new approach to surveillance. *Joint Commission Journal on Quality and Patient Safety*. 2010 January;36(1):12-21.

<sup>6</sup>Budnitz DS, et al. Emergency hospitalizations for adverse drug events in older Americans. *The New England Journal of Medicine*. 2011 November 24;365(21):2002-2012.

<sup>7</sup>Sims J, Richardson T, Kerr D. Insulin errors in hospital: Time for a radical re-think on risk? *Clinical Risk*. 2010 May;16(3):89-92.

<sup>8</sup>Cohen MR. Pharmacists' role in ensuring safe and effective hospital use of insulin. *American Journal of Health-System Pharmacy*, 2010 August 15;67 (16 Suppl 8):S17-21.

<sup>9</sup>National Diabetes Information Clearinghouse. Hypoglycemia. <http://diabetes.niddk.nih.gov/dm/pubs/hypoglycemia/#what> (accessed November 7, 2014).

<sup>10</sup>Pennsylvania Patient Safety Authority. Medication errors with the dosing of insulin: Problems across the continuum. *Pennsylvania Patient Safety Advisory*. 2010 March;7(1):9-17.

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