



COVID-19 Crisis: Why Now is the Time to Invest in Glycemic Management

Outcomes for patients with
COVID-19 and hyperglycemia:
increased mortality, longer
length of stay (LOS)





In the midst of the worldwide novel coronavirus pandemic, emerging data suggests that glycemic control for patients with and without a previous diagnosis of diabetes is a critical component for managing the care of critically ill patients.¹



Early data from a variety of sources identified that patients with diabetes appeared to be at risk for worse outcomes with COVID-19²⁻⁴, including greater incidence of ending up in the ICU^{4,5} and an increase in mortality when infected (compared to those without preexisting conditions).^{2,5-8}



Identifying patients with diabetes as being at high risk for poor outcomes was not surprising, as comorbidities are known to complicate treatment for critically ill patients.⁹ More data was needed to better understand how COVID-19 specifically impacted patients with glycemic management issues.

As an insulin management software company that works with nearly 300 hospitals, Glytec is deeply integrated with electronic medical record systems and leverages live patient data for clinical surveillance to identify patients that may be appropriate for insulin therapy.¹

The analysis revealed striking results:¹

- Patients designated as uncontrolled hyperglycemia (but with no apparent history of diabetes) had a mortality rate at 42% compared with the 15% mortality in the population of patients with diabetes. This is a mortality rate seven times higher than the population of patients without diabetes or hyperglycemia (6%).
- Among the patients who survived to discharge, the combined diabetes and uncontrolled hyperglycemia patient group experienced a significantly longer median length of stay (5.7 days) compared with patients without diabetes or hyperglycemia (4.3 days).

Given the evidence from this study, it's clear that hospitals and health systems should be paying close attention to their patients' blood sugar and should have a glycemic management strategy in place to treat critically ill patients.

Glytec's recently-released peer-reviewed observational study - the first of its kind - demonstrates that patients hospitalized with COVID-19 who develop acute hyperglycemia, irrespective of diabetes diagnosis, have a higher mortality rate than patients without hyperglycemia.¹

Treating Hyperglycemia on Admission:

Time is a Critical Metric for Reducing Mortality

Glytec followed up on the first COVID-19 study with a study focusing on the window of opportunity for treating hospitalized patients with hyperglycemia or diabetes.³³

The peer-reviewed study, published in *Diabetes Care*, the journal of the American Diabetes Association, found a higher risk of mortality for patients that did not achieve target blood glucose levels soon after admission.³³

Non-ICU patients with severe hyperglycemia after 48 to 72 hours had a 7x increase risk in mortality.³³

The study's results indicate the urgency and need to start hyperglycemia treatment on admission, and to treat glucose control as a critical aspect of COVID-19 patient treatment.

“This research suggests that blood sugars should be high on the order set for COVID-19 patients, irrespective of a pre-existing diabetes diagnosis. We can control blood sugars in the hospital, but for a variety of reasons, this study shows that it’s not happening or hasn’t been a priority for COVID-19 patients.

“Our findings strongly suggest that early intervention to bring blood glucose into a target range will reduce mortality rates in COVID-19 patients.”

GUILLERMO E. UMPIERREZ, MD

Chief of Diabetes and Endocrinology Grady Memorial Hospital

Many studies³⁴⁻⁴² have shown that target blood glucose levels can be consistently achieved within as little as six hours for ICU patients using intravenous insulin and within two days for non-ICU patients using standard subcutaneous basal-bolus insulin regimens. American Diabetes Association and the American Association of Clinical Endocrinologists recommend a target blood glucose of 140-180 mg/dL for a majority of hospitalized patients.⁴³

In this second COVID-19 study, however, more than half of patients in the ICU (56%) and non-ICU (53%) did not achieve target blood glucose levels within the first two or three days.³³

This exposes a missed opportunity to improve clinical outcomes and the analysis suggests that patients with COVID-19 should promptly receive treatment to improve glycemic control.³³

The opportunity window is a very important aspect of care, especially when you consider the number of people living with undiagnosed diabetes and the fact that steroids – which contribute to hyperglycemia – are being widely used to treat COVID-19 patients.³³

This study's results reinforces our knowledge that for many conditions like sepsis, coronary disease, pneumonia, stroke and the critically ill, hyperglycemia on admission is a marker for worse outcomes,^{38-39,41,44,45} and good glycemic management during the hospital stay leads to better outcomes.⁴⁶⁻⁴⁸

So, while it's not surprising given what is already known about the importance of glycemic management, this research is important for establishing best practices for COVID-19 patient care.

Best Practice for Inpatient Glycemic Management

Current recommendations for inpatient insulin management, from the American Diabetes Association's Standards of Medical Care in Diabetes 2020:¹

- Continuous IV Insulin is the most effective method to reach glycemic targets
- Insulin infusions should be administered with valid written or computerized protocols that:
 - Allow adjustments in infusion rate
 - Account for glycemic fluctuations
 - Account for insulin dose target

The ADA's recommendations are echoed by other professional organizations dedicated to improving glycemic management, including the American Association of Clinical Endocrinologists,¹¹ The Society of Critical Care Medicine,¹² and Endocrine Society,¹³ among many others.¹⁴⁻¹⁹

Despite these recommendations, about 90% of doctors, practitioners and nurses rely on one-size-fits-all, simplistic, insulin protocols (sliding scale) and "pocket-cards" to aid in deciding appropriate insulin doses for hospitalized patients.²⁰ For years this approach has been error-prone, difficult to scale, and is not able to be individualized for each patient.²¹

Change management may be difficult, but even before COVID-19 increased the number of critically ill patients in hospitals, up to one-third of all hospital patients experience glycemic issues due to diabetes, drug reactions, stress and other factors.^{22,23} Glycemic management improvements have the potential to help a large number of patients.

“This research confirms that diabetes is an important risk factor for dying from COVID-19. It also suggests that patients with acutely uncontrolled hyperglycemia — with or without a diabetes diagnosis — are dying at a higher rate than clinicians and hospitals may recognize. It is paramount that we treat hyperglycemia in COVID-19 patients as directed by national guidelines, with subcutaneous basal-bolus insulin in most non-critically ill patients, and with IV insulin in the critically ill.”¹

BRUCE BODE, MD, FACE, DIABETES SPECIALIST AT ATLANTA DIABETES ASSOCIATES AND ADJUNCT ASSOCIATE PROFESSOR OF MEDICINE AT EMORY UNIVERSITY SCHOOL OF MEDICINE

What action can you take NOW to improve your hospital's glycemic management strategy

Glytec is the insulin management software company for healthcare providers focused on improving the quality and cost of care. Its FDA-cleared titration software²⁴ and proprietary algorithms power Glucommander, the only solution capable of delivering personalized diabetes treatment recommendations across the continuum of care, from hospital to home.²⁵

✓ Quality and Safety

Glytec's solutions have served to reduce severe hypoglycemia by as much as 99.8%, 30-day readmissions by 36% to 68% and lengths of stay by up to 3.2 days.²⁵⁻²⁷

Glucommander reduces time to target blood glucose by 10 hours over standard care — the average time to target blood glucose under standard care is 14.9 hours, compared to 4.9 hours with Glucommander.²⁸

✓ Cost Savings

Within the hospital setting, studies have shown enterprise-wide utilization of Glucommander at, or above, 95% of eligible patients and annualized cost savings as high as \$20,000 per licensed bed.^{26,29}

✓ Comorbid Condition Readmission Rate Improvements

Glycemic control using Glytec's Glucommander can effectively reduce the rate of readmission for patients with cardiovascular disease who are in need of insulin management. In one study, AMI, CHF, and CABG patients (respectively) saw a 36%, 65%, and 68% reduction in 30-day readmission rates when they were treated with eGMS (Glucommander) compared to standard care.⁹

✓ Nursing Time Savings

Our solution simplifies workflows for clinicians and nurses, enabling them to deliver better care and spend more time with patients.²⁹

Prescribers saved an average of 199.5 minutes with each patient over the course of their stay, and saved on average 30 minutes per shift by using computer-guided decision support rather than manually titrating daily basal bolus insulin.²⁹

✓ FDA-Cleared and Used in Nearly 300 Hospitals

Glytec is used in nearly 300 hospitals and healthcare facilities and was used in treating 150,000 patients in 2019 alone.³⁰

Glucommander, powered by Glytec, has been proven effective over 14 years of use and was the first insulin titration software to be cleared by the FDA for adult IV use.³¹ Glucommander has 4 FDA clearances²⁴ and 70+ studies showing efficacy.³²

Work with Glytec

With ongoing support from its team of doctors, nurses and technologists headquartered outside of Boston, Glytec improves outcomes and controls costs for the large population of patients requiring insulin treatment – including those with and without a diagnosis of diabetes.

It's now faster and easier than ever to install Glucommander in your facility - Glytec offers expedited and fully remote implementation.

We'd love to discuss how Glytec can help your team — reach out to discuss your needs or request a demo.

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Glytec®

The eGlycemic Management System® is a modularized solution for glycemic management across the care continuum that includes Glucommander™. Glucommander™ is a prescription-only software medical device for glycemic management intended to evaluate current as well as cumulative patient blood glucose values coupled with patient information including age, weight and height, and, based on the aggregate of these measurement parameters, whether one or many, recommend an IV dosage of insulin, glucose or saline or a subcutaneous basal and bolus insulin dosing recommendation to adjust and maintain the blood glucose level towards a configurable physician-determined target range. Glucommander™ is indicated for use in adult and pediatric (ages 2-17 years) patients. The measurements and calculations generated are intended to be used by qualified and trained medical personnel in evaluating patient conditions in conjunction with clinical history, symptoms, and other diagnostic measurements, as well as the medical professional's clinical judgement. No medical decision should be based solely on the recommended guidance provided by this software program.

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