



USING SOCIETY OF HOSPITAL MEDICINE
(SHM) MENTORS
TO JUMPSTART HOSPITALS
TO IMPROVE
GLYCEMIC CONTROL

Society of Hospital Medicine

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Note:

Abbreviations

SHM: Society of Hospital Medicine

NP: Nurse Practitioner

CDE: Certified Diabetes Educator

PA: Physician Assistant

RD: Registered Dietician

RN: Registered Nurse

Key Words:

Benchmarking

Diabetes

Glycemic management teams

Hyperglycemia

Inpatient

2 Figures and 2 Tables



Abstract

Background:

The purpose of this project was to see if the availability of Society of Hospital Medicine (SHM) mentors would assist hospitals in planning and implementing innovative strategies to improve glycemic control. After identifying best practices utilized in high-performing hospitals for inpatient glycemic control, SHM set out to test the practices in new hospitals with established glycemic teams.



Method:

11 hospitals that varied in size, location and type were selected to participate. Program participants scheduled conference calls with assigned mentors to discuss areas in need of improvement and steps to get there. Mentors worked in teams made up of a hospitalist or endocrinologist and a diabetes nurse practitioner or physician assistant. A key component of the mentoring experience was collecting, reviewing and benchmarking glycemic data to identify areas in need of improvement to formulate appropriate changes.

Result:

Successes varied from hospital to hospital, such as a substantial reduction in non-ICU hypoglycemia rates from 8 percent to 5 percent without a subsequent increase in rates of hyperglycemia, the development and implementation of focused insulin order-sets to address the needs of challenging populations and a protocol for managing patients on steroids.

Conclusion:

With the assistance of their mentors, 100 percent of the teams created and implemented glycemic control and care coordination protocols. Blood glucose analysis was key in driving change and evaluating outcomes. Opportunities to share ideas with mentors and other sites provided knowledge and support to improve glycemic control initiatives amongst participants.

Introduction

“In the past five years, more than 100 hospitals have participated in the glycemic control quality improvement program.”

The Society of Hospital Medicine (SHM) has been using mentors to guide planning and implementation of successful strategies to improve quality care in hospitals throughout the U.S.⁽¹⁾ These programs have focused on venous thromboembolism prevention, medication reconciliation, orthopedic co-management and glycemic control.⁽²⁾ In the past five years, more than 100 hospitals have participated in the glycemic control quality improvement program. As a result, a large database has been created that allows SHM to benchmark measures of glycemic control, such as mean rates of hypo- and hyperglycemia, so that hospitals can compare their performance to similar institutions across the country.⁽³⁾

Many factors make improvements in glycemic control challenging, such as coordinating timing of meal delivery with blood glucose monitoring and insulin administration, inappropriate use of oral antidiabetic agents in the hospital, preventing hyperglycemia for patients receiving steroids or enteral feedings, lack of clinician awareness of inpatient glycemic targets, clinical inertia secondary to fear of hypoglycemia and lack of institutional resources and support to implement changes.⁽⁴⁻⁹⁾ As more hospitals turn to glycemic management teams to help coordinate care and reach glycemic targets, SHM evaluated how these teams functioned to gain insight into successful strategies.

In 2012, SHM surveyed 19 hospitals that used an interdisciplinary approach consisting of some combination of physicians, nurse practitioners, physician assistants, nurses, dietitians and pharmacists as part of glycemic management teams. The results culminated in a White Paper that highlighted the function of these teams along with expert opinions proposing best practices among glycemic management teams.⁽¹⁰⁾ This subsequently led to mentoring of these sites in SHM's Care Coordination Mentored Implementation Program to help launch and evaluate these best practices (**Table 1**).

Table 1: Society of Hospital Medicine Best Practice Recommendations for Inpatient Glycemic Management Teams.

Team Characteristics/Structure	
	Interdisciplinary team led by glycemic champion(s)
Care Delivery Strategies	
	Regular team meetings; Clinician provider (often NP or PA) and/or educator see patients
Direct Medical Management Services and Strategies	
	Consult request or pre-specified triggers for team to see patient; recommendations conveyed to primary team and nurse
Glycemic Management Practices	
	Protocols for obtaining A1C; d/c oral agents; timing of BG checks, insulin dosing and meal delivery; management of hypo- and hyperglycemia, DKA, patient’s own insulin pump, transition IV to SQ insulin; Management algorithms for insulin drips and SQ insulin, enteral feedings and steroids
Education Delivery Methods	
Patient Education	Individualized Diabetes self-management education (DSME) and printed education tools
Provider Education	In-services; Web-based; printed materials; nurse competency; knowledge assessment
Transition to Outpatient Care	
	Identify hyperglycemia prior to d/c; use A1C to guide post-d/c DM meds; refer to outpatient DSME and PCP follow-up; access to DM meds and supplies post-discharge
Assessment/Measurement	
Metrics	Rates of hypo- and hyperglycemia, A1C results; appropriate use of insulins and protocols; insulin errors, use of orals, documentation
Outcomes	Length of stay; readmissions; infection rates; mortality; patient satisfaction; post-discharge data (A1C or readmission rates); knowledge assessment



Methods:

Nine out of 11 hospitals completed the yearlong mentoring process. All sites already have the original three components of best practices in place:

- 1) The existence of an interdisciplinary team that met monthly to address issues regarding inpatient glycemic control.
- 2) A member who received daily reports of hypo- and hyperglycemia and in some cases also received A1C results; these results were used to help guide interventions in real-time rather than wait for an adverse event or consult request.
- 3) Direct management services that were available for education and/or management of inpatient glycemic control.

Although the mentored programs had some features that were considered best practices, they still faced many challenges in achieving their goals and areas to improve care. By using standardized metrics,⁽¹¹⁾ SHM was able to track the effect of their work within their hospital system as well as compare it to other institutions that had already participated in the mentored implementation program nationally. By providing baseline metrics, each institution was able to assess areas in need of improvement and begin to measure change in the standardized format.

Given that all hospitals had varying starting points regarding metrics and tools in place, the mentoring was tailored to each hospital's needs after an initial assessment. Most sites chose to focus on glycemic management practices and assessment of metrics as their goal. At the end of the year the hospitals were able to share their success on a webinar with other participating hospitals. The following cases highlight three hospital teams and their focus/goals during the year of mentorship.

Case #1

Background

Consisted of a midsized urban community teaching hospital in the Midwest. Its in-patient glycemic management team includes three diabetes educators, two RNs and an RD. They also have an interdisciplinary Glycemic Control Steering Committee consisting of 20-30 members and co-chaired by a hospitalist and Nursing Outcomes Improvement Facilitator. An outpatient-based endocrinology team consisting of an endocrinologist and an NP-CDE sees inpatients on a consultation basis.

Barriers/Goals

At the initiation of the mentoring program, hyperglycemia rates were low, but at the expense of high rates of hypoglycemia. One of the major goals was to reduce initial and recurrent hypoglycemic events in both the ICU and non-ICU settings. Identifying the root cause of initial hypoglycemic events as well as staff adherence to the hypoglycemia protocol was prioritized.

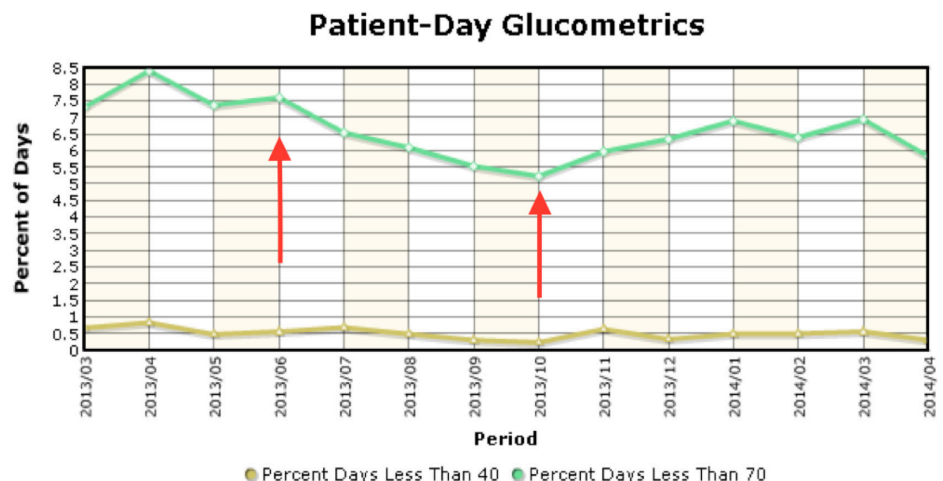
Achievements

Through a case study review to evaluate the causes of hypoglycemia in their institution, the team recognized that clinical inertia was playing a significant role and therefore focused efforts at:

1. Addressing data in real-time instead of retrospectively
2. Creating a glucose management page in the electronic medical record (EMR) to provide clinicians with all of the information needed to assess and address blood sugars in one place

By addressing data in more real-time (initially only 2-3x/week) the team was able to substantially reduce the non-ICU hypoglycemia rates from 8 percent to 5 percent without increasing the hyperglycemia rates. However, rates increased again after stopping their active surveillance mid-year, demonstrating a need for continued active surveillance. Overall hypoglycemia management improved with staff education and data presentation at monthly unit meetings (**Figure 1**).

Figure 1: Case 1. Hypoglycemic graph showing change over the year of mentoring. Arrows indicate start and end of active surveillance.



Lessons Learned

The benchmarking data provided by their participation in the Society of Hospital Medicine's mentoring program allowed this team to realize their challenges were shared nationally and provided the data needed to support their initiatives and successes. The mentoring process allowed this well-established glycemic management team to prioritize their goals and assisted them in developing action plans based on experiences shared by many teams from outside of their program.

Case #2

Background

Consisted of a midsize rural community teaching hospital in the South; the team consisted of both an outpatient Diabetes Case Management Team as well as an Inpatient Diabetes Clinical Team.

Barriers/Goals

Coordinating the implementation of integrated diabetes care during transitions is an important yet challenging goal. This hospital signed up for the mentoring project in the hope of learning more effective ways to abandon the well-established but inferior use of sliding-scale regular insulin and replacing this practice with the more effective use of basal-bolus insulin therapy on medical and surgical floors.

Achievements

These are highlighted in **Table 2**.

Lessons Learned

The mentoring process provided insight to the team that clinician adoption of insulin protocols is more likely with automated insulin dosing, as supported by other SHM mentored programs. Future plans include creating an insulin dose calculator link in the electronic medical record (EMR) as well as making glycemic control information more readily available in the EMR. This information was again provided by sharing findings from other programs.

Table 2: Case 2. Summary of Changes That Were Successfully Implemented During the Mentoring Program.

Medication	Technology Tools	Care Coordination	Outcomes
Designed and implemented first critical care insulin order-set in non-cardiac thoracic surgery patients	Created and launched decision support alerts that notify MD/NP/PA if no A1C is ordered	Automatic referral to Inpatient Diabetes Teaching Nurse on admission if certain criteria are met	Reduced patient-day mean blood glucose by 8 percent since beginning mentoring program
Re-designed and updated all insulin order-sets—SQ and IV insulin, NPO and TPN		System for provider feedback to hospitalists with blood glucose information	Improved hypoglycemia management in all categories by nursing staff
Implemented pharmacy-led transition service for IV to SQ insulin		Updated hypoglycemia protocols	
		System-wide nurse education on glycemic management	

Case #3

Background

Consisted of a midsize urban community non-teaching hospital in the West that is part of a four-hospital system; each individual hospital has separate glycemic control teams made up of a variety of team members who are supervised by one individual who oversees all four sites.

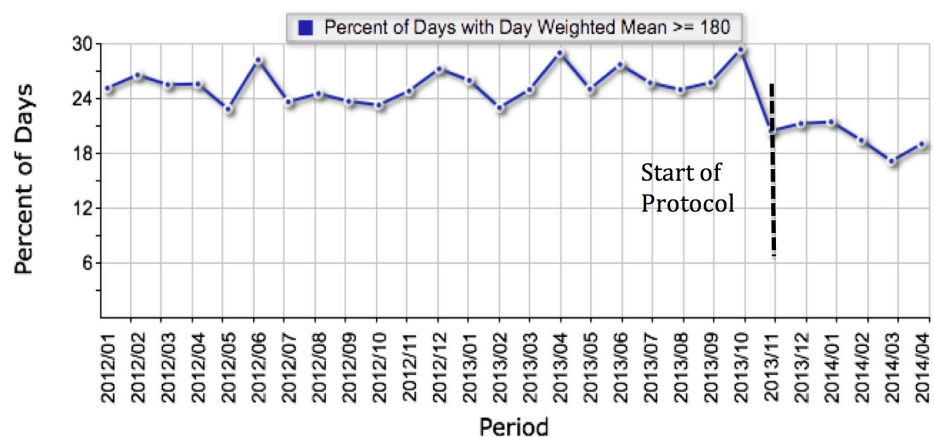
Barriers/Goals

Different insulin order-sets at each of the four hospitals had been an ongoing issue, as had a lack of coordination of available resources across sites. The hospital system chose their smaller community hospital to work with the SHM mentored implementation team. Prior to the mentoring process, they had achieved various successes, but had no real way to compare their internal numbers to other hospitals. With overall acceptable hypo- and hyperglycemia rates, they chose to focus on lowering the rate of severe hyperglycemia. Despite having their own robust internal “glucometrics,” they identified that they were not measuring the time it takes to recheck after treating a hypoglycemic episode and wanted to focus on measuring and addressing this metric as well.

Achievements

Through a comparison and evaluation of measured metrics, they were able to evaluate severe hyperglycemia but also were able to see that a large portion of those increased blood glucose values were correlated with concomitant steroid use. To address this, the teams developed a novel steroid-specific order-set and were able to make marked improvements in lowering severe hyperglycemia without increasing overall hypoglycemia rates. They did make other changes during the year that may have helped reduce their overall rates of hyperglycemia, including changing NPO insulin from regular q6hr to aspart q4hr, which helped introduce more frequent blood glucose checks as well as a renewed focus on meal tray delivery and insulin administration within 30 minutes of point-of-care blood glucose monitoring with meals (**Figure 2**).

Figure 2: Case 3. Graph of hyperglycemia before and after implementing a steroid protocol.



Lessons Learned

Even well-established successful teams can benefit from the mentoring process. Despite having experts in glycemic control on-site, they felt that the mentorship relationship gave them the support and insight to develop a timetable to accomplish tasks and that the national data from SHM added “credibility with providers and administration.”

Discussion

During the year of mentoring, all of the teams were able to develop, implement or update protocols to a greater degree than they had prior to their SHM support. Although the mentoring process was valuable in driving change, significant insight was gained through blood glucose data analysis and benchmarking with other participating sites nationally. Many sites felt sharing data and strategies with other sites allowed them to improve their knowledge, perspective and collaboration with other institutions, thus saving time and expediting positive change.

Inpatient glycemic control is difficult at best and can lead to adverse outcomes in hospitalized patients if not done cautiously. Glycemic management teams are a valuable resource that assists clinicians in improving glycemic control in patients during their hospital stay.⁽¹²⁻¹⁴⁾ How to do this effectively, efficiently and safely should be a priority at all institutions. SHM's mentoring program, benchmarking data and ListServe can help hospitals by sharing answers to common challenges.

Mentors were matched so that each pair consisted of a hospitalist or endocrinologist and a nurse practitioner or physician assistant. This was a key strategy in providing guidance over a broader frame of reference when identifying barriers and workable solutions when devising ways to improve glycemic practice. Mentoring provides critical external feedback and ideas that allow for unbiased information that can be used both by the glycemic teams themselves as well as for validating their efforts to stakeholders.⁽¹⁵⁾ The challenges faced by inpatient glycemic teams are mirrored across the country and the sharing of information allows mentors and their mentees to benefit from this knowledge through a Listserv as well as the mentoring process itself which decreases the need to 'reinvent the wheel.'

SHM highlighted three sites that were able to show more rapid definitive improvements in measurable outcomes with the mentoring program driving change through ongoing objective support, data collection and analysis. The information that is available to the sites not only from the mentors' own experiences but also via the SHM Listserv allowed the sites to move forward more rapidly and with greater confidence with more than 500 glycemic team members at their fingertips. Having personal site mentors helped the teams focus all of this information into obtainable and practical goals with the additional benefit of the mentors themselves having experience from their own glycemic teams.

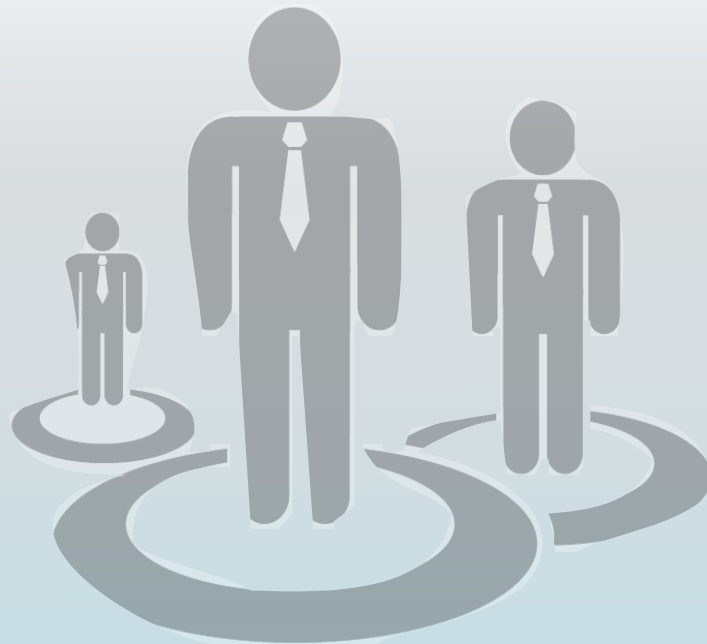
“The information that is available to the sites not only from the mentors’ own experiences but also via the SHM Listserv allowed the sites to move forward more rapidly and with greater confidence with more than 500 glycemic team members at their fingertips.”

Conclusion

Glycemic teams across the country seek to improve glycemic management based on recommendations from organizational resources such as the American Diabetes Association clinical practice recommendations,⁽¹⁶⁾ Joint Commission Inpatient Diabetes Certification⁽¹⁷⁾ and SHM's Glycemic Control Implementation Guide.⁽¹⁸⁾ Despite the availability of these and other recommendations, achieving glycemic control remains a difficult and complex process in the inpatient arena. Although there is some information available on how to accomplish these goals, mentoring offers opportunities for hospitals to receive the individualized guidance and support that they need to more quickly and efficiently implement necessary changes and improve outcomes. Benchmarking is one of the valuable tools available in the mentoring program to help identify and prioritize areas in need of improvement that allowed the participating sites to understand the extent of their weaknesses and strengths with a national perspective. The mentoring experience allows sites the benefit of additional experts 'at the table' to discuss barriers, identify solutions and set achievable goals.

Disclosure:

Dr. Maynard was the former chief medical officer of and Ann Nolan is an employee of the Society of Hospital Medicine, which offers some glucometrics products for a nominal fee.



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