



The Roadmap to Success:

Glycemic Management



Preparing for Your Journey



Any successful journey begins with planning and preparation. Three key areas should be addressed before beginning any quality improvement or patient safety initiative.



Leadership Commitment

The success of a project can be determined by the level of commitment and support from leadership. It is important for hospital leaders to communicate a consistent, frequent message in support of the project. The executive project champion can establish accountability, dedicate resources, and break through barriers.



Project Champion

It is important to have a person(s) who is a significant influence with frontline staff, physicians, and other key personnel. Frequently, we think of a physician as a champion as they are instrumental in garnering provider buy-in and practice change. However, depending on the project, it can be any key personnel with the authority and skills to influence change, lead by example, and assist in essential messaging of the goals and vision for a project.



Multidisciplinary Project Team

The project team should consist of representatives from key areas throughout your facility with the skills, knowledge, and experience in their fields of expertise. A team member should possess strong communication skills, have a collaborative mindset, and show a commitment to change. It is vital to **have representation from frontline staff who will be impacted most by the change**. It is also important to keep the size of your team manageable. Remember, a team can have ad hoc members whose role is to provide expertise in a specific area for a short period of time.

For more information on team forming, access the following resources at www.hsag.com/hqic-quality-series:

- Quality and Safety Series Video on Team Forming
- Quality Improvement Workbook

The following information is intended for educational purposes only. HSAG does not represent or guarantee that this information is applicable to any specific patient's care or treatment. This content does not constitute medical advice from a physician and is not to be used as a substitute for treatment or advice from a practicing physician or other healthcare provider.

Science-Driven Prevention and Treatment—Step

1

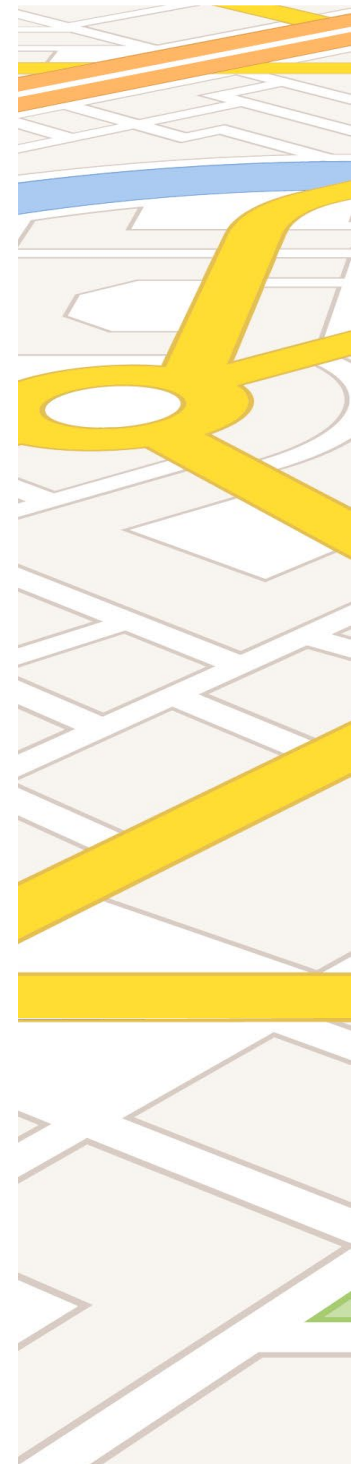
Promote a multidisciplinary, coordinated, and systematic approach to inpatient glycemic management with input from frontline staff, nursing leadership, diabetes educators, and hospitalists—as well as departments of endocrinology, pharmacy, dietary, quality management, risk management, clinical education, case management, and laboratory.

Rationale: An adverse drug event (ADE) is an injury resulting from medical intervention related to a drug.¹ This includes medication errors, adverse drug reactions, allergic reactions, and overdoses. ADEs are among the most preventable causes of death in hospitals, and ADEs involving hypoglycemic agents comprise 57 percent of all ADEs, making this the largest drug class contributing to ADE-related harms. Fifty percent of all medication errors involve insulin—including one-third of all that are fatal—and approximately one-quarter of all safety incidents involving insulin result in patient harm. Rates of emergency department (ED) visits and subsequent hospitalizations for insulin-related hypoglycemia and errors were highest in patients 80 years or older, so it is important that, prior to discharge from the hospital setting, patients and families understand how they will safely administer insulin at home.³

Strategies to Implement	Tools and Resources
<input type="checkbox"/> Screen patients with diabetes or a history of hyperglycemia on admission with A1C labs and monitor throughout hospitalization.	<ul style="list-style-type: none">• Institute for Safe Medication Practices (ISMP) Medication Self-Assessment for High-Alert Medications: https://www.ismp.org/sites/default/files/attachments/2018-01/EntireAssessmentWorkbook.pdf• American Diabetes Association (ADA). Standards of Medical Care in Diabetes—2021: https://www.diabetes.org/newsroom/press-releases/2020/ADA-releases-2021-standards-of-medical-care-in-diabetes• Patient Safety Movement. Blood Glucose Management: https://community.patient-safetymovement.org/solutions/glucose-management-severe-hypoglycemia/
<input type="checkbox"/> Avoid sliding scale insulin regimens. Avoid use of insulin pens in the hospital to prevent ADEs and cross-contamination.	
<input type="checkbox"/> Develop and implement standardized protocols/order sets that include: ^{4,5} <ul style="list-style-type: none">• Basal/bolus insulin with target glucose range identified for noncritically ill NPO (nothing by mouth) patients or those with poor oral intake.• Basal, prandial, and correction-treatment insulin with target glucose range identified for noncritically ill patients with adequate oral intake.• Specific goals based on patients' sensitivity to insulin¹ and clinical condition.²• Blood glucose monitoring using point-of-care testing (POCT).• Treatment of hyperkalemia.• Treatment of calcium-channel blocker overdoses with insulin.• Managing glucocorticoid therapy.• Monitoring and managing pregnant and post-partum patients with pre-existing diabetes.• Managing patients with symptoms inconsistent with current blood glucose value.• Communicating critical lab values.	

Strategies to Implement	Tools and Resources
<input type="checkbox"/> Screen all patients on insulin therapy for risk of hypoglycemia and hyperglycemia and target for preventive interventions if high risk.	<ul style="list-style-type: none"> • Basal bolus: slow-acting insulin while fasting with short acting insulin around mealtimes. Medical News Today. How to manage diabetes with basal-bolus insulin therapy: 2019. https://www.medicalnewstoday.com/articles/316616
<input type="checkbox"/> Prior to insulin administration: <ul style="list-style-type: none"> • Ensure appropriate indication. • Assess the current blood glucose value. • Assess patients for symptoms of hypoglycemia and hyperglycemia. • Assess patients' nutritional status. <ul style="list-style-type: none"> – NPO – Enteral nutrition – Parenteral nutrition – Oral intake • Assess patients for changes in clinical condition. • Perform nurse double-check before insulin administration. 	<ul style="list-style-type: none"> • Risk of hypoglycemia: low body weight, basal insulin doses > 0.25 units/kg, basal only dosing, concomitant oral diabetic therapy. Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/11647-hypoglycemia-low-blood-sugar
<input type="checkbox"/> Implement a nursing standardized procedure for hypoglycemia and hyperglycemia.	<ul style="list-style-type: none"> • Risk of hyperglycemia: infection, pancreatitis, trauma, alcohol abuse. Cleveland Clinic: https://my.clevelandclinic.org/health/diseases/9815-hyperglycemia-high-blood-sugar

1. Sensitivity to insulin: sensitive, average, resistant, and patients on concurrent steroid administration.
2. Clinical condition: terminal illness, severe comorbidities.
3. AMA. Stepsforward™. Medication Adherence. <https://edhub.ama-assn.org/steps-forward/module/2702595>
4. ISMP Medication Safety self-assessment for high-alert medications. Insulin, subcutaneous and intravenous. <https://www.ismp.org/sites/default/files/attachments/2018-01/EntireAssessmentWorkbook.pdf>
5. National Action Plan for ADE Prevention. <https://health.gov/sites/default/files/2019-09/ADE-Action-Plan-Diabetes-Agents.pdf>

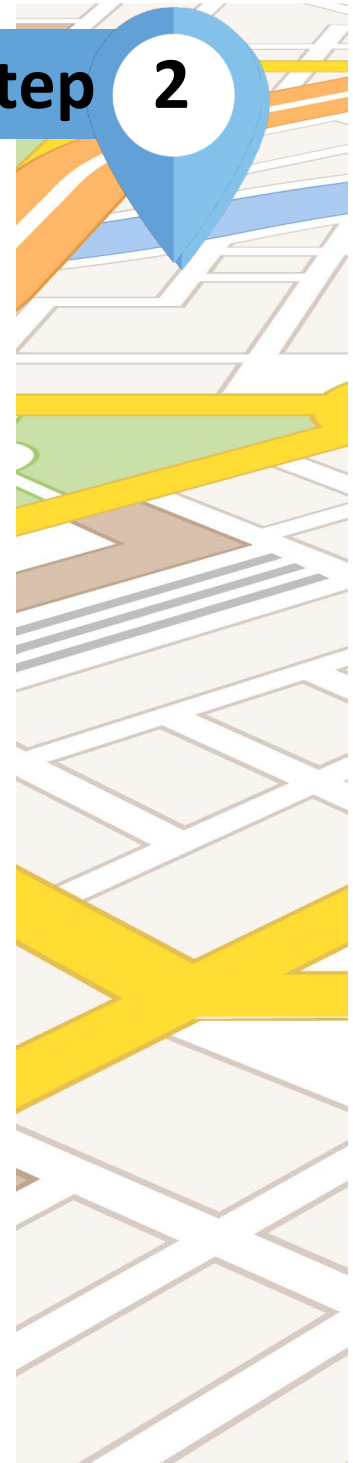


Promotion of Safer Care—Step 2

Educate providers and staff regarding standardized tools, protocols, and order sets.

Rationale: Glycemic ADEs can occur in patients with and without diabetes.

Strategies to Implement	Tools and Resources
<input type="checkbox"/> Improve provider and staff knowledge regarding all standardized protocols, order sets, and use of specialized equipment for glycemic management. <ul style="list-style-type: none">• Address knowledge gaps of providers and staff.• Educate staff regarding early signs and symptoms of hypoglycemia and hyperglycemia.• Use Tall Man Lettering (TML) to assist with differentiation of look-alike drug names.• Express combination insulins using the complete name and dose expression.• Have the pharmacist confirm appropriate insulin indication prior to verifying initial insulin orders.	<ul style="list-style-type: none">• Signs of hypoglycemia: Shakiness, dizziness, sweating, hunger, fast heart rate, difficulty concentrating, confusion, irritability, anxiety, headache. American Diabetes Association: https://www.diabetes.org/search?keywords=hypoglycemia• Signs of hyperglycemia: high blood sugar, increased hunger or thirst, blurry vision, frequent urination, headache, fatigue. American Diabetes Association: https://www.diabetes.org/search?keywords=hyperglycemia• U.S. Food & Drug Administration. FDA List of Established Drug Names Recommended to Use TML: https://www.fda.gov/drugs/medication-errors-related-cder-regulated-drug-products/fda-name-differentiation-project
<input type="checkbox"/> Consider tracking the following metrics: <ul style="list-style-type: none">• Blood glucose ≤ 50• Blood glucose >50 and ≤ 70• Blood glucose ≥ 180• Diabetic ketoacidosis that is not present on admission• Administration of D50	



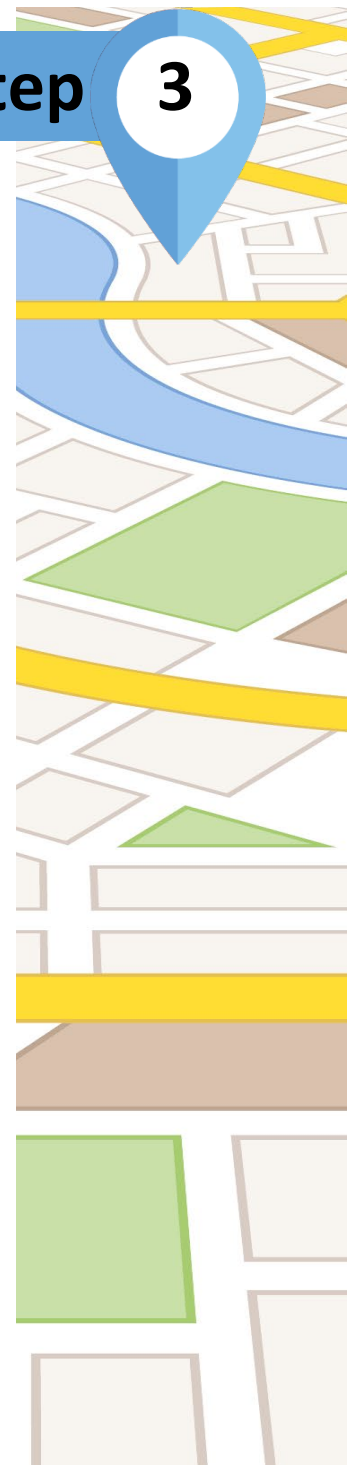
Effective Communication and Care Coordination—Step

3

Ensure multidisciplinary inpatient coordination.

Rationale: Diabetes is a complex disease process involving medication, lifestyle, prevention of diabetic complications, and support from the medical community and family members.

Strategies to Implement	Tools and Resources
<input type="checkbox"/> Establish a structured communication process (e.g., Situation, Background, Assessment, Recommendation [SBAR]) for communications related to glycemic medication and other high-risk medications.	<ul style="list-style-type: none"> • SBAR: http://www.ihl.org/resources/Pages/Tools/SBARToolkit.aspx • Patient Safety Movement. Hand-off Communications: https://patientsafetymovement.org/wp-content/uploads/2016/02/APSS-6_HOC-7.pdf • Society of Hospital Medicine. Multicenter Medication Reconciliation Quality Improvement Study (MARQUIS) Toolkit: https://www.hospitalmedicine.org/globalassets/clinical-topics/clinical-pdf/shm_medication_reconciliation_guide.pdf • HSAG HQIC 5 Whys: https://www.hsag.com/hqic/quality-series/ • HEAT Tool for review of hypoglycemic events: https://www.hsag.com/en/hqic/tools-resources/ade/ • IHI Global Trigger Tool for Adverse Events: https://oig.hhs.gov/documents/toolkits/933/II_Guidance_Document_-_Hospital_Trigger_Tool.pdf
<input type="checkbox"/> Establish an effective medication reconciliation process upon admission and discharge.	
<input type="checkbox"/> Optimize glycemic management: <ul style="list-style-type: none"> • Coordinate mealtime, blood glucose testing, and insulin administration. • Adjust therapy for changes in oral intake and needs for testing, procedures, and surgery. • Confirm proper transition from intravenous (IV) insulin to subcutaneous (SQ) and adjust the insulin dose for transition. • Monitor patient status and adjust insulin dose based on patient nutritional status, clinical status, changes in corticosteroid use, insulin resistance, creatine clearance, and concomitant medication therapy. 	
<input type="checkbox"/> <ul style="list-style-type: none"> • Ensure timely communication of critical laboratory values to the most appropriate recipient. • Consult an endocrinologist or insulin management practitioner (as determined by your facility) for patients with uncontrolled hypoglycemia or hyperglycemia. • Determine root causes of glycemic events with immediate feedback to stakeholders. • Ensure consistent use of tools, protocols, and order sets with immediate feedback to stakeholders when inconsistencies are identified. 	



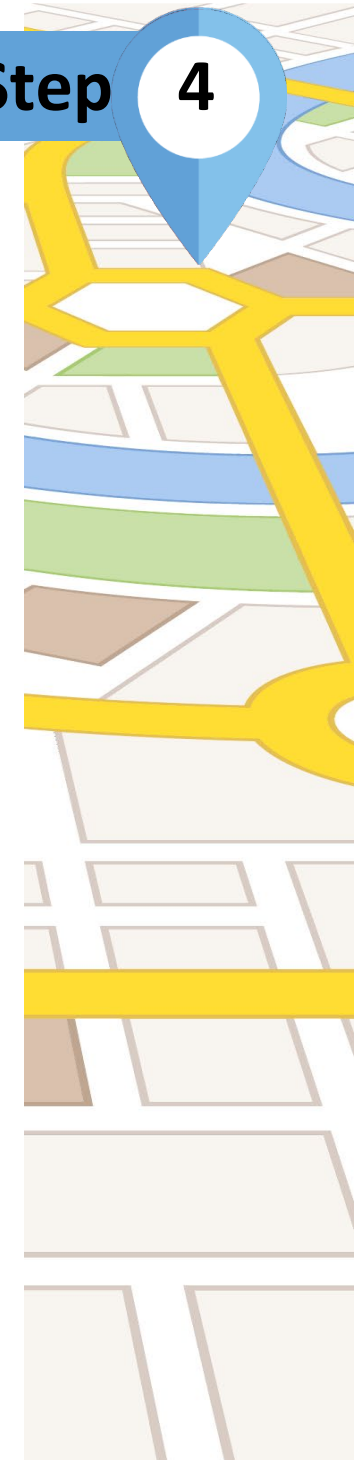
Patient and Family Engagement—Step 4

Engage in patient/family partnerships to create and meet individualized glycemic targets while patients are hospitalized. Also, ensure discharge planning that transitions patients' post-discharge diabetic treatment successfully.

Rationale: Diabetes is a complex disease process involving medication, lifestyle, prevention of diabetic complications, and support from the medical community and family members.

Strategies to Implement	Tools and Resources
<input type="checkbox"/> Educate patients and their families using the teach-back method.	<ul style="list-style-type: none"> Teach-Back: https://www.hsag.com/medicare-providers/care-coordination/teach-back/
<input type="checkbox"/> Develop an individualized patient plan of care with targeted goals. <ul style="list-style-type: none"> Recognize patient risk factors and share with patient/family.⁶ Include patient/family in shift huddle, bedside report and/or multidisciplinary rounds. Provide education on the definition of hypoglycemic and hyperglycemic ADEs and symptoms of hypoglycemia and hyperglycemia. Validate patient and family knowledge of the signs and symptoms of hypoglycemia and hyperglycemia and encourage ongoing dialogue with the clinical team during hospitalization. Address rationale for using insulin during hospitalization for achieving individualized glycemic control goals. Address timing of hospital meals and insulin administration. 	<ul style="list-style-type: none"> Centers for Disease Control and Prevention (CDC). Self-Management Education: Learn More. Feel Better: https://www.cdc.gov/learnmorefeelbetter/programs/diabetes.htm Cleveland Clinic. Discharge Checklist for People with Diabetes: https://my.clevelandclinic.org/health/articles/11716-discharge-checklist-for-people-with-diabetes
<input type="checkbox"/> Incorporate discharge planning key points for new onset diabetes : <ul style="list-style-type: none"> Demonstrate safe medication administration techniques and develop an individualized treatment plan. Explain blood glucose monitoring, including meter use, how often to check blood glucose, and how to keep a log of the blood glucose values. Demonstrate proper use and disposal of needles and syringes. Establish a home nutrition plan and resources to begin lifestyle changes, including referrals to a registered dietitian as needed. Address the importance of maintaining a proper diet and exercise plan, monitoring blood pressure, practicing good foot and skin care, evaluating eyes/vision, and managing stress. 	<ul style="list-style-type: none"> AHRQ. Working With Patient and Families as Advisors: https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/systems/hospital/engagingfamilies/strategy1/Strat1_Implement_Hndbook_508_v2.pdf

6. Risk factors for diabetes: sedentary lifestyle, consumption of fatty foods, tobacco smoking, high BMI, high low-density lipoprotein, high triglycerides, high total cholesterol, low high-density lipoprotein, hypertension, low income.

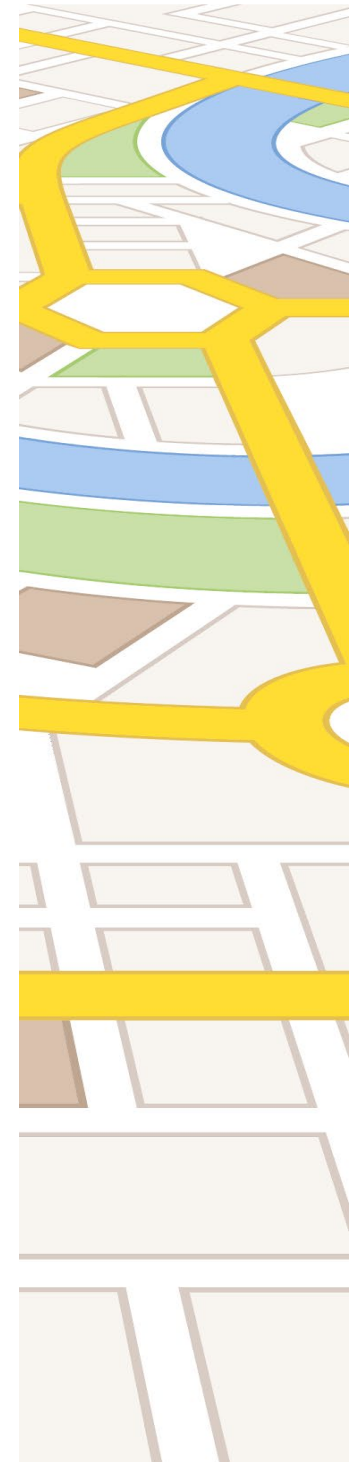


Strategies to Implement

- Discharge planning key points for **chronic diabetes**:
 - Address updates to the hospital treatment plan, include goals discussion and explanation for any differences from “usual home regimen.”
 - Prior to discharge, address updates and changes to home treatment plan, including: rationale for changes; nutrition, medication, lifestyle factors; and signs/symptoms of hyperglycemia and hypoglycemia.
 - Validate patient/family knowledge of home care, including safe medication administration practices, proper use and disposal of needles and syringes, importance of maintaining proper diet and exercise, monitoring blood pressure, practicing good foot and skin care, evaluating eyes/vision, and managing stress.
 - Assist patients in developing a daily visual schedule of their diabetic medications, meals, and blood sugar testing regimen.
- Include a patient family advisor (PFA) in your quality improvement efforts.
- Engage patients and families in disclosure communication following glycemic ADEs.

Tools and Resources

- AHRQ. Communication and Optimal Resolution (CANDOR) Toolkit:
<https://www.ahrq.gov/patient-safety/capacity/candor/modules.html>



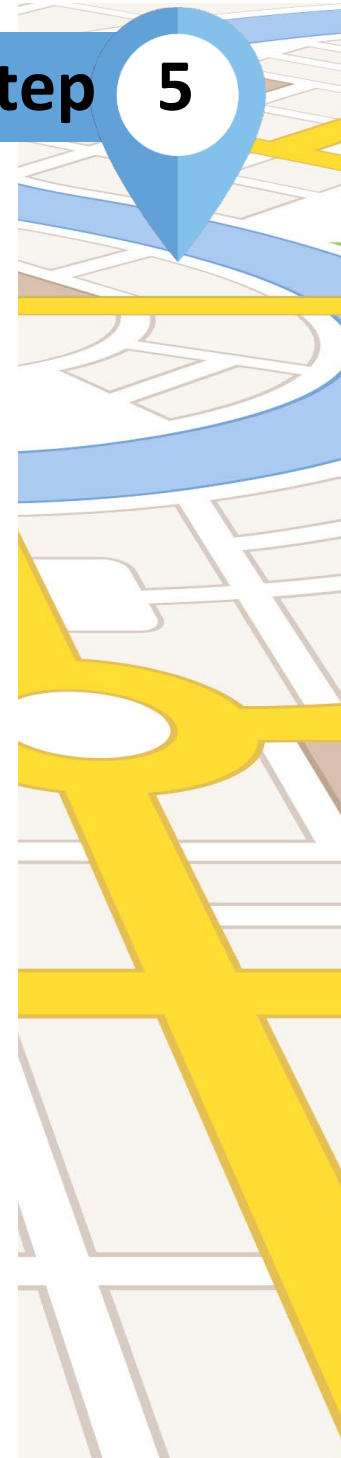
Promotion of Best Practices Within the Community—Step

5

Coordinate care with the community.

Rationale: Diabetes is a complex disease process involving medication, lifestyle, prevention of diabetic complications, and support from the medical community and family members.

Strategies to Implement	Tools and Resources
<input type="checkbox"/> Schedule follow-up appointments prior to discharge. This includes specialists, registered dietitian, wound care clinic, etc. Provide home health contact information (if utilized) to patient/family with expectations of when home health services will begin.	<ul style="list-style-type: none"> • Cleveland Clinic. Discharge Checklist for People with Diabetes: https://my.clevelandclinic.org/health/articles/11716-discharge-checklist-for-people-with-diabetes • Diabetes Zone Tool (English): https://www.hsag.com/globalassets/hqic/zonetool_diabetes_hqic.pdf • Diabetes Zone Tool (Spanish): https://www.hsag.com/globalassets/hqic/zonetool_diabetes_hqic_s.p.pdf
<input type="checkbox"/> Utilize post-discharge tools.	
<input type="checkbox"/> Assure equity in access to, and delivery of clinical care through: <ul style="list-style-type: none"> • Screening for social determinants of health. Key things to consider include: <ul style="list-style-type: none"> – Access to transportation. – Ability to afford prescribed medications. – Readability of discharge patient education materials. • Data collection and analysis of disparities. • Telehealth. • Interpreter/translation services. 	<ul style="list-style-type: none"> • Disparities Solution Center. Addressing Disparities in Diagnostic Errors and Medication Safety in the Home: https://5536401f-20a1-4e61-a28e-914fb5dcef51.filesusr.com/ugd/888d39_deb78f570d574e29819c44682946f669.pdf • Project BOOST. Better Outcomes by Optimizing Safe Transitions Implementation Guide: https://www.hospitalmedicine.org/globalassets/professional-development/professional-dev-pdf/boost-guide-second-edition.pdf



Your Final Destination



Now that you've reached your destination, it is important that your efforts are not futile. One of the most challenging aspects of quality improvement and change is sustaining the gains. These key tactics will help you ensure ongoing success.



Ensuring Your Process Is Stable

Most projects involve monitoring of both process and outcome measures. These data play an important role in identifying when you've achieved change. It is important to review your data to identify and address special cause variation; recognize positive trend changes (six to eight data points at or above goal); and achieve predictable, consistent results. Remember: *"Every system is perfectly designed to get the results it gets."*—W.E. Deming

For more information on data, variation, and change, access the following resources at www.hsag.com/hqic-quality-series:

- Quality and Safety Series Video on Data, Variation, and Change



Control Plan/Sustainability Plan

A control or sustainability plan is a method for documenting the key elements of quality control that are necessary to assure that process changes and desired outcomes will be maintained. At a minimum, this plan should include ongoing monitoring of process steps that are critical to quality, frequency of monitoring, sampling methodology, and corrective actions if there is noted variation.

For more information on control and sustainability plans, access the following resources at www.hsag.com/hqic-quality-series:

- Quality and Safety Series Video on Control and Sustainability Plans



Project Hand-Off

Depending on the size of your facility and resources that are available, it may be necessary to hand off your project to a "process owner." A process owner is a person or department responsible for monitoring a process and sustaining the changes according to the control or sustainability plan. The person or department should be the entity that will most significantly experience the gains of the improved process or project.

Tools and Resources:

- 5 Whys. <https://www.hsag.com/en/hqic/quality-series/>
- AACP. Medication Adherence Educator's Toolkit. https://www.aacp.org/sites/default/files/aacp_ncpa_medication_adherence_educators_toolkit_0.pdf
- AHRQ. Communication and Optimal Resolution (CANDOR) Toolkit. <https://www.ahrq.gov/patient-safety/capacity/candor/modules.html>
- AHRQ. How to Create a Pill Card. <https://www.ahrq.gov/patients-consumers/diagnosis-treatment/treatments/pillcard/index.html>
- AHRQ. Whole-Person Care Transitional Planning Tool. https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/systems/hospital/medicaidreadmitguide/mcaidread_tool9_trans_care.docx
- AHRQ. Working With Patient and Families as Advisors. https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/systems/hospital/engagingfamilies/strategy1/Strat1_Implement_Hndbook_508_v2.pdf
- American Diabetes Association—15. Diabetes Care in the Hospital: Standards of Medical Care in Diabetes. http://care.diabetesjournals.org/content/42/Supplement_1/S173
- American Diabetes Association. Diabetes Spectrum. (2005). Detection, prevention, and treatment of hypoglycemia in the hospital. <https://spectrum.diabetesjournals.org/content/18/1/39>
- Association of Clinicians for the Underserved (ACU)—Patient education materials. <http://clinicians.org/our-issues/acu-diabetes-patient-education-series/>
- BOOST. Project BOOST. Better Outcomes by Optimizing Safe Transitions Implementation Guide. <https://www.hospitalmedicine.org/globalassets/professional-development/professional-dev-pdf/boost-guide-second-edition.pdf>
- CDC. Self-Management Education: Learn More. Feel Better. <https://www.cdc.gov/learnmorefeelbetter/programs/diabetes.htm>
- Cleveland Clinic. Discharge Checklist for People with Diabetes. <https://my.clevelandclinic.org/health/articles/11716-discharge-checklist-for-people-with-diabetes>
- Cleveland Clinic. Hyperglycemia. <https://my.clevelandclinic.org/health/diseases/9815-hyperglycemia-high-blood-sugar>
- Disparities Solution Center. Addressing Disparities in Diagnostic Errors & Medication Safety in the Home. https://5536401f-20a1-4e61-a28e-914fb5dcef51.filesusr.com/ugd/888d39_deb78f570d574e29819c44682946f669.pdf
- IHI Global Trigger Tool for Adverse Events. https://oig.hhs.gov/documents/toolkits/933/IHI_Guidance_Document_-_Hospital_Trigger_Tool.pdf
- ISMP Medication Self-Assessment for High-Alert Medications. <https://www.ismp.org/sites/default/files/attachments/2018-01/EntireAssessmentWorkbook.pdf>
- Mayo Clinic. Diabetic hypoglycemia. Symptoms of hypoglycemia. <https://www.mayoclinic.org/diseases-conditions/diabetic-hypoglycemia/symptoms-causes/syc-20371525>
- MD Anderson Center. Hypoglycemia Management. <https://www.mdanderson.org/content/dam/mdanderson/documents/for-physicians/algorithms/clinical-management/clin-management-hypoglycemia-web-algorithm.pdf>
- Minnesota Hospital Association. Road Map to a Medication Safety Program. <https://www.mnhospitals.org/Portals/0/Documents/ptsafety/ade/Medication-Safety-Roadmap.pdf>
- National Institute of Diabetes and Digestive and Kidney Disease—Managing Diabetes. <https://www.niddk.nih.gov/health-information/diabetes/overview/managing-diabetes/4-steps#page2>
- Office of Disease Prevention and Health Promotion. National Action Plan for ADE Prevention. <https://health.gov/our-work/national-health-initiatives/health-care-quality/adverse-drug-events/national-ade-action-plan>
- Patient Safety Movement. Blood Glucose Management. <https://community.patientsafetymovement.org/solutions/glucose-management-severe-hypoglycemia/>
- Patient Safety Movement. Hand-off Communications. https://patientsafetymovement.org/wp-content/uploads/2016/02/APSS-6_HOC-7.pdf
- Preventing Adverse Drug Events: Individualizing Glycemic Targets Using Health Literacy Strategies is an eLearning course that teaches health care providers how to reduce hypoglycemic adverse drug events (ADEs) in patients with diabetes. <https://health.gov/hcq/trainings/ade-diabetes-agents/Intro-Welcome/slide01.aspx> (does not work with Internet Explorer) and <https://health.gov/hcq/training-prevent-ade.asp>
- SBAR. <http://www.ihl.org/resources/Pages/Tools/SBARToolkit.aspx>
- Society of Hospital Medicine. Multicenter Medication Reconciliation Quality Improvement Study (MARQUIS) Toolkit. https://www.hospitalmedicine.org/globalassets/clinical-topics/clinical-pdf/shm_medication_reconciliation_guide.pdf
- Teach Back. <https://www.hsag.com/en/medicare-providers/care-coordination/teach-back/>
- U.S. Food & Drug Administration. FDA List of Established Drug Names Recommended to Use Tall Man Lettering (TML). <https://www.fda.gov/drugs/medication-errors-related-cder-regulated-drug-products/fda-name-differentiation-project>

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- ADA. Living Standards Updates. <http://care.diabetesjournals.org/living-standards>
- AMA. Stepsforward™. Medication Adherence. <https://edhub.ama-assn.org/steps-forward/module/2702595>
- American Nurse. Quality improvement in action: revised critical blood glucose value. https://www.myamericannurse.com/quality-improvement-in-action-revised-critical-blood-glucose-value/?utm_source=sendinblue&utm_campaign=Nurseline_20210427&utm_medium=email
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