

The Role of the Diabetes Care and Education Specialist in the Hospital Setting

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The Association of Diabetes Care & Education Specialists

Abstract

It is the position of Association of Diabetes Care & Education Specialists that all inpatient interdisciplinary teams include a diabetes care and education specialist to lead or support quality improvement initiatives that affect persons hospitalized with diabetes and/or hyperglycemia. This encompasses not only patient, family, and caregiver education but also education of interdisciplinary team members and achievement of diabetes-related organizational quality metrics and performance outcomes.

Background

In 2017, a position statement supporting the role of the diabetes educator in inpatient diabetes management was published by the American Association of Diabetes Educators, now known as the Association of Diabetes Care & Education Specialists (ADCES).¹ Since this original publication, the impact of diabetes on the population of the United States has led to new research, policies, and care models. In addition, the title “diabetes educator” was renamed “diabetes care and education specialist” to better reflect the specialty’s aspects of clinical management and expertise beyond diabetes education. This article builds on the original article and presents an updated and expanded position of the Association concerning the role of the diabetes care and education specialist in the hospital setting.

In 2020, the Centers for Disease Control and Prevention reported that there were 7.8 million hospital discharges among adults with diabetes.² The highest number of diagnoses were attributed to cardiovascular disease, including ischemic heart disease and stroke (1.7 million). Other diagnoses included lower extremity amputation (130 000), hyperglycemic crisis (209 000), and hypoglycemia (57 000).² Research suggests that early and aggressive intervention to manage hyperglycemia and hypoglycemia in the hospital could significantly reduce morbidity, mortality, length of stay, and medical costs.^{3–10}

The 2021 Association of Diabetes Care & Education Specialists National Practice Survey reported that 23.8% of diabetes care and education specialists work in hospital inpatient services, an increase from 21% in 2017 (J. Kavookjian, PhD, unpublished data, 2021). It is the position of ADCES that all inpatient interdisciplinary teams include a diabetes care and education specialist to lead or support quality improvement initiatives that affect persons hospitalized with diabetes and/or hyperglycemia. This encompasses not only patient, family, and caregiver education but also education of interdisciplinary team members and achievement of diabetes-related organizational quality metrics and performance outcomes.

Guidelines for inpatient management of diabetes have been published to provide standards of care for health care professionals.^{11,12} Additionally, the Society of Hospital Medicine provides an online Glycemic Control Implementation Tool Kit, a tracking program, benchmarking, and other resources to support quality improvement efforts.^{13,14} Other publicly available resources are available from the American Association of Clinical Endocrinology.¹⁵

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Role of the Diabetes Care and Education Specialist in the Hospital Setting

Diabetes care and education specialists serve as valuable members of the interdisciplinary inpatient team and are uniquely prepared to serve as content experts who can facilitate change and implement processes and programs to improve diabetes-related outcomes.¹⁶⁻¹⁸ Diabetes care and education specialists provide leadership within the hospital setting to address quality improvement needs, identify and mitigate patient and/or diabetes medication and technology safety issues, and develop clinical tools and decision support to guide evidence-based best practice management strategies. The diabetes care and education specialist should be engaged in decision-making about aspects of hospital care that impact diabetes-focused outcomes.^{19,20}

Additionally, the diabetes care and education specialist's responsibility as a leader within the interdisciplinary team includes^{9,18,20}:

- delivery of and/or oversight for person-centered patient and family education;
- oversight and assistance in creating education materials and resources;
- care coordination and transitional care support;
- provision of nutrition therapy;
- implementation of glycemic management best practices, including medication therapy and hyperglycemia/hypoglycemia prevention and treatment;
- identification of quality improvement opportunities and coordination of projects;
- provision of care during natural disasters and/or pandemics;
- other role expectations, including professional education and professional advancement.

Patient, Family, and/or Caregiver Education

A hospital stay may be the only educational opportunity for some individuals with limited out-of-hospital care and follow-up. Newly identified conditions and diagnoses may also prompt a change in the self-care plan and influence patient/family motivation to learn. Education planning by the team should begin as soon as a learning need is identified during assessment. Early intervention provides time to identify and address barriers, offers opportunities for skills practice, and facilitates problem-solving and coping skills. The goal is to prepare the patient (or caregiver) to safely perform self-management skills by the time of discharge and recognize the importance and ongoing availability of posthospital self-management education and support.^{9,11,18} Inpatient diabetes education focuses on basic skills and knowledge and should serve as a bridge to ongoing outpatient education centered on the ADCES7 Self-Care Behaviors™.¹⁸

Best practices modeled by a diabetes care and education specialist regarding direct care include:

- performing learning needs assessments, including health literacy, health numeracy, and setting and prioritizing goals;^{9,18,21}
- assessing social determinants of health, disabilities, and cultural preferences that may impact self-management skills and behaviors, decision-making, problem solving, and individual preferences;¹⁸
- evaluating and updating prior diabetes knowledge;¹⁸
- structuring the environment and teaching approach to optimize learning (eg, focused, short sessions);
- educating and mentoring other health care professional team members about diabetes self-management education and support;^{22,23}
- ensuring teaching resources (eg, printed booklets, electronic health record [EHR] handouts, picture pages, device training kits) are available to all staff providing education and that those team members are coached on their use;
- focusing on self-management survival skills, including meal planning; safe medication administration; monitoring glucose and ketones (as appropriate), including targets, frequency, and technique; prevention and treatment of hypoglycemia and hyperglycemia; and follow-up care;^{9,11,18}
- documenting and communicating status of self-management education and identified needs to other health care professionals;¹⁸
- evaluating the ability of the patient/family to obtain diabetes supplies and medication (eg, financial resources, health insurance, competing priorities, access to obtain);^{18,22}
- providing referrals to community resources to continue diabetes self-management education and support.^{9,18,24}

Care Coordination and Transitional Care Support

Diabetes is a complex condition that requires ongoing care management through interdisciplinary collaboration across the continuum of care. There are 4 critical times to provide and modify diabetes self-management education and support (DSMES)—(1) at diagnosis, (2) annually and/or when not meeting glycemic and other treatment targets, (3) when complicating factors develop, and (4) when transitions in life and care occur.¹⁸

Any of these critical times may be relevant for hospitalized patients. A diabetes care and education specialist develops or adjusts person-centered self-management plans during hospitalization and communicates these plans to other care providers.^{9,18} Diabetes-focused discharge planning should begin upon admission and continue throughout hospitalization to prepare for a smooth transition from hospital to outpatient care.¹¹

The diabetes care and education specialist's role in coordinating care and facilitating transitions should include:

- communicating the status of diabetes self-management education, plan of care, and medication reconciliation to the next provider and/or site of care;^{11,18,25-27}
- utilizing a person- and family-centered approach;¹⁸
- collaborating closely with other team members, including clinicians, social workers, care and case managers, pharmacists, home care coordinators, and community health workers;^{9,20}
- empowering persons with diabetes and caregivers to actively participate in their care;¹⁸
- identifying social determinants of health and/or disabilities that could prevent follow-up care (eg, transportation barriers) or implementation of a treatment plan (eg, financial barriers to affording medications and other supplies);^{18,21,25,27}
- collaborating with other professionals to identify and implement best practices to prevent recurrence of hyperglycemia and hypoglycemia during times of hospital transitions such as moving from the emergency department to inpatient setting or from the intensive care unit to a noncritical care setting;
- providing a clear and feasible management plan at discharge based on clinical needs, patient preferences, goals, and abilities;^{9,18,27}
- facilitating referrals for outpatient DSMES and/or endocrine consultation and ensuring that a follow-up appointment for diabetes care is scheduled prior to discharge;^{12,27,28}
- establishing partnerships with community-based providers and services to address health and social needs;¹⁸
- identifying and mitigating risk factors for readmission by using key strategies such as providing diabetes self-management education and ensuring follow-up diabetes care, education, and support;^{27,29,30}
- evaluating outcomes of transitional care efforts such as readmission rates, postdischarge appointment rates, communication of self-management plans, medication errors, patient satisfaction with readiness for discharge, and postdischarge coping difficulty.^{26,29,30}

Nutrition Therapy

The primary nutrition therapy goals during hospitalization are to optimize glycemic targets in an acute care setting, ensure adequate nutrition and calories to meet metabolic demands, address food preferences, and create a discharge plan for follow-up nutrition care.¹¹

Some barriers to achieving these goals in the hospital setting include^{11,31,32}:

- interruption of meals due to tests, procedures, and surgery;
- changes in appetite and ability to eat secondary to medications, acute illness, and eating restrictions;
- inconsistent carbohydrate intake;
- food from sources outside of the hospital;
- meal timing and food choices that vary from those at home;
- suboptimal coordination of point-of-care glucose monitoring, meal delivery, and insulin administration;
- lack of understanding of current diabetes nutrition principles by staff, patients, and their families;
- variation in insulin requirements with enteral and parenteral feedings;
- decreased activity levels.

Consistent carbohydrate meal plans are preferred by many hospitals to reduce the variations in blood glucose levels that occur when carbohydrate levels differ from meal to meal.¹¹ Hospitals may implement carbohydrate-based

insulin dosing to improve accuracy in prandial dosing of insulin and the flexibility of meal plans to enhance patient satisfaction; however, this approach requires more intensive staff education.

The diabetes care and education specialist should work to optimize the coordination of glucose monitoring, food delivery, and insulin administration to optimize glycemic outcomes.^{11,31,32} Coordinating care with a registered dietitian nutritionist/registered dietitian is essential due to the many nutritional challenges in the hospital and the complexity of nutrition therapy for those with comorbid conditions.¹¹ Educating and involving patients and family members in meal planning throughout hospitalization will facilitate self-care behavior during and after the hospitalization.^{27,31}

Glycemic Management

The American Diabetes Association's Standards of Medical Care in Diabetes recommend that hospitalized patients, both critically ill and noncritically ill, have a target glucose level of 140 to 180 mg/dL (7.8-10.0 mmol/L) in most instances.¹¹

This recommendation is based on analyses of studies that indicated an increased risk of severe hypoglycemia and mortality for patients with targets less than 110 mg/dL (6.1 mmol/L).^{33,34} Glycemic targets 110 to 140 mg/dL (6.1-7.8 mmol/L) may be warranted in select patient populations if risk of hypoglycemia can be minimized.^{11,33} Ultimately, glycemic targets should be individualized based on clinical judgment and ongoing assessment.¹¹ Not only can diabetes care and education specialists guide decision-making about glycemic targets, they are also instrumental in helping to achieve these targets through medication management and hyperglycemia and hypoglycemia prevention and treatment orders and protocols.

Medication Therapy. Optimizing glycemic management in the hospital setting requires an understanding and use of effective and appropriate medications as well as consideration of cardiometabolic factors that influence the use of these medications. Diabetes care and education specialists have an important role in inpatient medication management by:

- leading interdisciplinary teams to establish glycemic targets, policies, protocols, and order sets that reflect current evidence;³⁵⁻³⁷
- developing and implementing hospital-wide policies and standardized order sets to guide providers in selecting appropriate medication regimens while avoiding adverse events;^{11,26,36}
- prescribing and/or recommending insulin and other glucose-lowering medications as well as medications used to treat other cardiometabolic conditions;^{4,11,38}
- identifying medications that can affect glycemic management, including the use of vasopressors, corticosteroids/glucocorticoids, fluoroquinolones, selected β -blockers, selected second-generation antipsychotic medications, and immune checkpoint inhibitors;^{4,11,26}
- participating in diabetes-related formulary and medical device decisions;³⁹
- evaluating and improving home diabetes medication regimens and promoting self-care;^{26,27}
- educating on self-administration of any diabetes-related injectable medication (especially those new to insulin or noninsulin injectables) as soon as possible under supervision.^{11,26,27}

Hyperglycemia and Hypoglycemia Prevention and Treatment. Hyperglycemia in the hospital may be caused by concurrent illness, newly diagnosed/untreated diabetes, medication errors such as insulin omissions, alterations in nutrition, and medications listed previously. Hyperglycemia can affect those with and without diabetes. Those with no history of diabetes who have hyperglycemia in the hospital setting may be at increased risk of complications.^{11,26,33,40}

Hypoglycemia may occur in hospitalized patients with or without diabetes, either as a result of the administration of insulin or other glucose-lowering therapies or potentially as a marker of underlying disease. The treatment regimen should be reviewed and changed to prevent further hypoglycemia when a value of 70 mg/dL (3.9 mmol/L) is documented.¹¹ Hypoglycemia can result in cognitive impairment; increased risk of falls, seizures, and other sequelae; the need for intensification of care; increased length of stay; death; and death within 1 year of discharge.⁴¹⁻⁴⁵ Thus, efforts must be made to mitigate the risk and incidence of hypoglycemia in the hospital setting. A

hypoglycemia prevention and treatment protocol should be developed and implemented by each hospital or hospital system.^{11,12,43}

The diabetes care and education specialist role in the management of hypoglycemia and hyperglycemia should include:

- providing leadership in the development and implementation of tools to prevent, assess, and treat hypoglycemia and hyperglycemia;^{11,43}
 - assessing glycemic history upon admission, including the threshold at which hypoglycemia symptoms are experienced (if at all);
 - assessing the treatment plan to correct hypoglycemia and hyperglycemia and guiding the interdisciplinary team in modifying the plan of care for those experiencing glycemic excursions;
 - establishing provider notification thresholds;
 - establishing standards for the documentation of all hypoglycemic events in the EHR;
- ensuring that hypoglycemia management orders accompany all orders for individuals on insulin and/or glucose-lowering medications;^{9,11-43}
- developing hypoglycemia surveillance measures to alert providers to the incidence of hypoglycemia and allow for the auditing of hypoglycemia events for frequency, appropriate treatment and resolution of events, and identification of suspected causes of events;⁴⁴
- establishing policies in collaboration with laboratory and nursing personnel for utilization of the hospital meter (and patients' home glucose meters simultaneously if appropriate);
- working in collaboration with other care providers to ensure reliable blood glucose test results, including policy development, staff education, quality control, blood sampling procedures, and communication regarding the limitations of point of care blood glucose testing in certain populations;⁴⁴
- systematically analyzing blood glucose data (glucometrics) for surveillance to evaluate outcomes and revising protocols/order sets as needed for patient care and performance improvement.⁴⁴

Use of Technology for Insulin Administration and Continuous Glucose Monitoring

Hospitals have long depended on a wide variety of technology for daily operations including but not limited to monitoring, diagnostic tests, respiratory therapy, communication, and general patient care. Hospitals may use a variety of different diabetes technology options, including computerized insulin infusion calculators and, most recently, continuous glucose monitors (CGMs).^{46,47} Diabetes care and education specialists should be involved with development and/or oversight of policies and procedures for the use, maintenance, and related practice issues based on regulatory requirements and device manufacturers' specifications.⁴⁷

Persons with diabetes sometimes bring their own devices into the hospital setting for continuous glucose monitoring and insulin administration (eg, insulin pumps), which are patient-managed and not maintained by hospital staff.⁴⁸⁻⁵¹ Often hospital staff are not trained to operate these devices. Patients may be asked to sign a waiver or consent form taking responsibility for their use. Other considerations for use include ensuring that persons with diabetes are alert and oriented and able to self-manage devices. The diabetes care and education specialist, as the content expert, is a valuable resource for individuals using devices in the hospital setting.

There are precautions that should be taken when patients are using devices. Patients undergoing diagnostic tests such as magnetic resonance imaging, computerized tomography, or other radiologic tests should remove their insulin pumps or CGMs according to manufacturer recommendations.^{51,52} Emerging evidence suggests, however, that certain devices may be worn during some tests without introducing safety risks to the individual or the device.⁵³ Until more evidence is known, organizations should follow hospital policy and manufacturer recommendations. Some medications interfere with CGM accuracy, such as aspirin, high-dose acetaminophen, Vitamin C, or hydroxyurea.^{52,53} Changes in skin temperature, tissue perfusion, and blood pressure will affect CGM accuracy as well.^{52,53} Because transmission of data is done wirelessly, there can be data interference issues and a potential risk of security breach of information.

The diabetes care and education specialist role in recommending and evaluating technology used in the hospital setting may include:⁵⁴

- collaborating with interdisciplinary teams to develop policies and procedures for use;
- collaborating to ensure protocols and policies are in place that promote safe use;

- providing staff education for those providing care to those using diabetes technology;
- serving as a resource for persons with diabetes and their families or caregivers who are using technology;
- identifying and educating persons with diabetes who could benefit from diabetes technology and integrating data into the electronic health record when possible.

Other Role Expectations

Diabetes care and education specialists have additional role expectations beyond direct and indirect patient care responsibilities. Improving the knowledge and skills of students and colleagues related to diabetes care and education is one of these expectations.⁵⁴ All staff who care for hospitalized patients with diabetes should receive ongoing diabetes management updates. This includes nurses, nurse practitioners, physician assistants, physicians, dietitians, pharmacists, case managers, and point-of-care testing personnel. With this goal in mind, inpatient diabetes care and education specialists may participate in the following educational activities:

- assessing staff diabetes knowledge and skill;
- enhancing staff competencies;
- providing education in a variety of settings, including staff orientation, clinical areas, and grand rounds;
- developing curricula to share with other members of the team;
- utilizing a variety of learning tools such as case studies, self-learning modules, journal clubs, simulation, survival skills toolkits, and pocket cards to accommodate all settings and learners' needs and preferences.

Topics should include types of diabetes, early recognition and screening for hyperglycemia, rationale for inpatient glycemic management, glycemic targets across settings and populations, nutrition therapy, and insulin therapy, including the types of and rationale for basal, bolus, and correction insulin. Additional topics include the use of bedside blood glucose monitoring data, oral agents in the hospital, acute complications, diabetic ketoacidosis, hyperosmolar hyperglycemic syndrome, perioperative care, hypoglycemia recognition, prevention and treatment, insulin pumps, and documentation, including type of diabetes and complications.

Diabetes care and education specialists commonly lead quality improvement projects, implement evidence-based practices and protocols, and participate in research. Clinical, process/implantation, and financial outcomes should be disseminated via publication or presentation (oral or poster) whenever possible to build the existing knowledge base supporting this role in the hospital setting.⁵⁴ Productivity measures may be useful in gaining additional organizational support, especially if able to capture the significant contributions of the diabetes care and education specialists beyond direct patient care. The breadth and depth of this role should encourage diabetes care and education specialists to pursue certification as a Certified Diabetes Care and Education Specialist (CDCES[®]) and/or for those with advanced degrees in eligible professions, the BC-ADM[®] (Board Certified-Advanced Diabetes Management) credential.

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