

In Brief

Patients are released from hospitals and rehabilitation centers earlier in the continuum of care than ever before. Individuals with diabetes, either as a primary diagnosis or a comorbid condition, are no exception to this trend. This, combined with an end to the fee-for-service payment structure, has challenged home care clinicians to find effective ways of transitioning these patients from an acute episode of illness to a return to the community. Recognizing the impact of diabetes as an independent risk factor is key to achieving favorable health outcomes.

Managing the Care of Patients With Diabetes in the Home Care Setting

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Diabetes is ranked second behind congestive heart failure as the primary diagnosis at entry into home care. It is the leading diagnosis if primary and secondary diagnoses are combined.¹ In addition, the majority of patients referred to home care are over the age of 65 years. The projected increase in the size of this age group in future years, as well as the projected increase in the incidence of diabetes, underscore the importance of the home health care nurse as a member of the health care team.

The role of home health care nurses is increasingly important as patients are discharged from hospitals and

rehabilitation centers early in the course of illness and require more sophisticated nursing management at home. Home care nurses are the liaison among members of the health care team, patients, family members, and caregivers. These nurses are often the only professional who has a complete overview of a patient's medical regimen and, therefore, responsibility for the coordination of care.

Determining Patient Needs: The Outcome and Assessment Information Set

Patients are referred to home care agencies for acute episodes of care.

Table 1. Nursing Assessment: Considerations for Improving Diabetes Care

Factors That May Hinder Glycemic Control and Medical Management	Associated Risks
Age-related changes	<ul style="list-style-type: none"> • Poor nutritional intake/malnutrition • Dehydration/HHS • Cognitive changes (confusion, depression, social isolation)
Presence of neuropathies	<ul style="list-style-type: none"> • Gait abnormality and falls • Injuries to lower extremities • Incontinence and resultant embarrassment and social isolation • UTIs
Visual deficits and retinopathy	<ul style="list-style-type: none"> • Medication errors (omissions, inaccurate dosing) • Falls • Inability to test blood glucose • Other functional deficits
Polypharmacy	<ul style="list-style-type: none"> • Drug interactions • Inappropriate timing and action of medications (hypo- and hyperglycemia) • Omission of medications

The tool used to determine patient needs is called the Outcome and Assessment Information Set (OASIS).² Used correctly, the OASIS gives important information about a patient's functional deficits and skilled nursing requirements. Relevant clinical information, including patient medical history, prognosis, use of emergent care, and physical assessment/review of systems (ROS) is obtained and documented. Physical assessment data are gathered for speech and oral expression; neurological function; integumentary, cardiorespiratory, and genitourinary tract function; and neurological/emotional/behavioral status. Additionally, a life system profile is completed to identify factors that may affect outcomes. Such factors include living arrangements, support systems, potential therapy needs (a reflection of activities of daily living and instrumental activities of daily living), medication management, and equipment management (including oxygen, intravenous/infusion therapy, ventilator therapy, enteral/parenteral nutrition equipment, or supplies). The information gathered here is ranked and is a determinant of what paraprofessional services the patient may require.

Accurate identification and documentation of patient status is fundamental for a patient to receive the care necessary to achieve optimal health and functional status with maximum potential for desired quality of life. The OASIS provides standardized information, tracks patient outcomes, and is valuable for data collection and research purposes.

Nursing Assessment

Completion of the ROS and physical assessment section of the OASIS helps to identify factors that may hinder glycemic control and overall medical management. Acknowledgment of the presence of these factors and their associated risks can then be evaluated and incorporated into the individual plan of care (POC) for each patient (Table 1).

Age-Related Changes

Recognition of age-related changes in physiological functioning is crucial. These changes can mask the signs of hyperglycemia and alter clinical presentation. Decline in taste acuity and olfactory function may result in poor nutritional intake, including malnutrition (over- or undernutrition) or

deficits in specific nutrients. In addition, many individuals overuse salt and other seasonings, affecting other medical conditions that may be present. Changes in dentition also affect food choices, which in turn affect gastrointestinal functioning and nutritional status.

Dehydration is a serious complication of diabetes, often resulting from multiple factors. Diminished thirst perception and inability of the kidneys to concentrate urine in response to a fluid deficit may result in dehydration and progress to hyperglycemic hyperosmolar state (HHS). This serious condition is often precipitated by infection or another stressor and has a 15% mortality rate in older individuals.³ Other factors include thinning dermal layers with resultant loss of moisture through the skin and avoidance of fluid intake because of fear of incontinence or nocturnal polyuria. Dehydration also potentiates the blood glucose level and blood levels of medication. In addition to targeting improved glycemic control, the POC may include a mechanism to include cueing by the family or caregiver to encourage an intake of at least 48 oz of water daily.

Older individuals may exhibit cognitive impairment, but this must be evaluated carefully so that important yet subtle alterations in mental and emotional status are not missed. A literature review by Awad et al.⁴ found that, for individuals who were able to achieve and maintain good

glycemic control, type 2 diabetes had only a small impact on cognitive function before the age of 70 years. However, early cognitive deficits were noted in those who were diagnosed at comparatively younger ages with concomitant poorer glycemic control and micro- and macrovascular disease. For individuals over the age of 70 years, it appears that diabetes interacts with other dementing processes, such as vascular disease and Alzheimer's disease, to advance cognitive decline.

Dehydration is also known to affect reasoning ability. Changes in cognition may result in limitations in activities of daily living, undiagnosed depression, and social isolation. Normalizing blood glucose levels may restore a patient's ability to communicate effectively and participate more fully in diabetes self-management.

Presence of Neuropathies

The prevalence of neuropathy is dependent on the duration and severity of the disease. Population-based studies of neuropathy have found 60–70% of patients with type 1 or type 2 diabetes to be affected. Distal polyneuropathy is the most prevalent type, followed by carpal tunnel syndrome, other mononeuropathies, and autonomic neuropathy.⁵ The presence of one or more neuropathies may cause a decline in condition with a resultant incident that presents a need for home health care services.

Peripheral neuropathy may cause pain or numbness in the lower extremities, as well as difficulty determining where the foot is in relation to the floor. Intrinsic weakness in the small muscles of the feet can cause altered joint mobility and mechanical problems, resulting in abnormalities and balance deficits.⁶ This increases the risk for falling. When gait abnormality is observed, a physical therapy consultation should be initiated for evaluation and recommendation.

Primary sites for repetitive stress injuries are metatarsal heads and the great toe. Patients who are bed-bound are at risk for pressure ulcers of the heels, which are second only to sacral pressure ulcers in prevalence. Heels should be protected at all times from pressure that prevents vascular perfusion, which can lead to ischemia and tissue death. Limb loss is more likely to occur with heel ulcers than with forefoot ulcers. Functional disability is also more profound.⁷

Evaluation and intervention by a podiatrist and pedorthist can benefit patients by providing recommendations for foot care and orthotic footwear to offload pressure. Medicare provides benefits for covered individuals for routine podiatric care and therapeutic foot wear.⁸ A comprehensive foot exam should be included in the initial home health assessment and, at a minimum, repeated at each recertification period. Individuals who were previously identified as being at risk should be examined more frequently to prevent progression of diabetic foot complications and to promote early detection of vascular and nerve compromise in the lower extremities. This includes visual inspection of the feet, with color, temperature, pulses, hair growth, and condition of nails. A monofilament test for detecting the insensate foot should be included. Any changes noted should be documented, patients or caregivers should be notified, and a written report should be sent to the physician.

Autonomic neuropathies may be difficult to detect, but they have a variety of manifestations. Patients with symptomatic autonomic neuropathy have a three times greater 5-year mortality rate than those without autonomic neuropathy.⁷ For example, abnormal heart rate and orthostatic hypotension can be life-threatening. It is advisable to obtain a blood pressure reading while patients are sitting, fol-

lowed by a standing reading for patients who have noted problems with dizziness or lightheadedness when they are standing. Detection and preventive measures, such as wearing compression stockings or dangling the legs over the edge of the bed or chair before standing, can prevent serious outcomes.

Hypoglycemia unawareness can result from impaired glucose counter-regulation and may be an undetected cause of falls.

Gastroparesis and alternating bouts of constipation followed by explosive diarrhea are two common forms of gastrointestinal autonomic neuropathy. They impinge on quality of life and make glucose management difficult. Pharmacological options may be used to address these issues. It is important that the coordinator of care document findings and communicate with the physician.

Bladder dysfunction and urinary tract infections (UTIs) are related to diabetic neuropathy, poor glycemic control, and aging. Diabetic cystopathy is chronic and predisposes patients to UTIs. It is insidious, with the only early sign being increased intervals between times of urination. This leads to enlarged bladder, atonic musculature, and incomplete emptying,⁷ which increases the probability of UTIs. The usual signs and symptoms of UTIs are frequently absent in patients with diabetes, and the diagnosis may be missed.

UTIs are both a risk factor for and consequence of hyperglycemia. Incontinence increases the risk for falls, embarrassment, and resultant social isolation. Improved glycemic control will help to reduce this risk. Bladder training should also be considered.

Nephropathy and Dialysis

Diabetes is the leading cause of end-stage renal disease (ESRD). This is because of several factors, including an increase in diabetes prevalence, improved longevity, and an increase in the number of patients with ESRD being accepted into dialysis treatment programs, whereas some had previously been ineligible. More than half of the new patients in dialysis centers have type 2 diabetes.⁹

For individuals on hemodialysis and home care nursing, the nurse communicates with the dialysis center, coordinating transportation when appropriate and coaching the patient and/or caregiver regarding fluid

restrictions, dietary adherence, and prescribed medications. Communicating about home management, as well as monitoring body weight changes, blood pressure, and glucose control, closes the loop and keeps the entire health care team, especially the patient, actively involved.

Home care nurses can also be proactive in helping to prevent diabetic kidney disease by monitoring blood pressure and glucose and encouraging patients to communicate with their physicians regarding the need for an annual screening for microalbuminuria. In addition, because albuminuria is a marker for greatly increased cardiovascular morbidity and mortality in patients with either type 1 or type 2 diabetes, home care nurses can also promote screening for possible vascular disease and aggressive intervention to address cardiovascular risk factors.

Visual Deficits and Retinopathy

Many patients are able to disguise the fact that they are visually impaired when they are in their own environment. Patients frequently associate loss of vision with loss of independence and will avoid having their condition discovered for as long as possible. However, compromised vision can lead to medication errors, falls, and functional deficits.

Patients with impaired vision may benefit from adaptive equipment to assist with blood glucose monitoring and insulin administration. Patients with significant impairment may be eligible for referral to a low-vision center and for services offered through the Commission for the Blind. Local agencies such as The Lighthouse that work with the commission can provide patients with training to carry out activities of daily living and aid mobility. Referral to a certified diabetes educator or an American Diabetes Association-recognized diabetes self-management program, where available, should be part of discharge planning.

All home care patients with diabetes should be referred to an optometrist or ophthalmologist annually for a dilated eye exam.

Polypharmacy

Home care nurses have the unique opportunity to view patients' home settings and thereby record an inventory of all the medications a patient may be taking. Provision of care by a

variety of health care professionals often translates into a potentially unsafe situation in which multiple and competing medications are prescribed simultaneously. Patients generally assume that providers communicate with each other regarding their medication prescriptions, but this is often not true. In addition, many patients take a variety of over-the-counter medications and herbal products that may have adverse interactions with prescribed medications.

Adherence to the medication regimen is crucial to good diabetes control. Unfortunately, there are multiple reasons for why patients do not take their prescribed medications. Patients with diabetes often have multiple comorbidities, each treated with one or more pharmacological agents. Patients may feel that they have too many pills to keep track of, so they may just decide on their own not to take them.

Use of a 7-day pill box may help address this problem. Prefilling medications into the pill box may be a covered benefit of a few insurers, but many do not consider this a covered skill. Another option is to teach caregivers to fill the pill box weekly.

Cost may be a barrier to adherence because many patients are on fixed incomes and must choose between purchasing food to eat or their prescribed medications. They may be embarrassed to tell the physician that they cannot afford the medications but will share this information with a nurse. A referral to social work or to one or more of the pharmacy assistance programs may be a helpful consideration.

Another barrier to adherence is a lack of knowledge and understanding about when to take certain medications and why it is important to take them at the time indicated. Adherence to the medication regimen is not necessarily a matter of whether a patient will do what is medically indicated, but rather whether the patient has the knowledge, cognitive skills, finances, and physical ability to follow the recommendations.

Comorbid Conditions

Diabetes generally presents with several comorbidities that affect diabetes care and outcomes. Table 2 outlines those most frequently seen in home care populations, with suggested resources and referrals needed to address the problems.

Medical Nutrition Therapy and Home Care

Many individuals who qualify for home care services are nutritionally compromised and would benefit from a dietary evaluation by a registered dietitian (RD). Since the Medical Nutrition Therapy Act was signed into law, RDs who are Medicare providers are able to provide a valuable and reimbursable service to patients with diabetes or renal disease. Home care agencies may employ RDs on either a consultant basis or as part-time or full-time employees. In addition, RDs who are also certified diabetes educators may serve as diabetes case managers. While this is not generally a separate covered benefit during an episode of home care, insurers can be questioned, and a referral can be made to an RD as a community referral on discharge from the home care agency.

Regardless of whether the nurse or dietitian records the nutrition history, it is crucial that home care patients' nutritional status be noted and that dietary patterns be reviewed to identify omitted meals, sporadic intake, and other problems that warrant further investigation (e.g., poor food choices

or amounts that may exacerbate glycemic control).

Patients and family members may have dated information about recommended nutrition guidelines. For example, they may believe that "sugar is poison" but may be unaware of the impact of other carbohydrate-containing foods on blood glucose. In addition, family members with good intentions may also be limiting patients' food choices or intake, resulting in weight loss and promotion of malnutrition, which is present in many home-bound seniors. The Nutrition Screening Initiative's DETERMINE Checklist is a short, easily administered, validated screening tool that can help identify those at risk for malnutrition.¹⁰

Because of a variety of factors (e.g., financial concerns, limited access to care, lack of interest in diabetes education, newly diagnosed diabetes, limited social support), home care patients may not have had previous diabetes education. Referrals to a diabetes self-management education program or a nutrition education program can provide information and support for choices that promote desired glycemic control and improved health status.

Table 2. Diabetes and Comorbid Conditions

Comorbidity	Relationship	Possible Referral/Recommendation
Hypertension	<ul style="list-style-type: none"> Risk factor for diabetes and for micro- and macrovascular disease (ESRD, vision loss, cerebral vascular accident) 	<ul style="list-style-type: none"> RD Smoking cessation program
Coronary artery disease	<ul style="list-style-type: none"> Increased incidence of myocardial infarction and smaller vessel infarcts 	<ul style="list-style-type: none"> RD Exercise/cardiac rehabilitation post-coronary artery bypass grafting Physical therapy Smoking cessation program
Depression	<ul style="list-style-type: none"> High prevalence in diabetes Presence predicts poorer outcomes 	<ul style="list-style-type: none"> Social worker Mental health team
Wounds	<ul style="list-style-type: none"> Diabetes out of control in a vicious cycle with stress hormones and nonhealing wound 	<ul style="list-style-type: none"> Wound care team Physical therapy RD
Chronic obstructive pulmonary disease and other respiratory diseases	<ul style="list-style-type: none"> Medications prescribed increase insulin resistance Increased depression and anxiety 	<ul style="list-style-type: none"> Physical therapy Occupational therapy Social worker
Skeletal disease (osteoarthritis, osteoporosis)	<ul style="list-style-type: none"> Increased risk for falls Dexterity deficits Fractures 	<ul style="list-style-type: none"> Physical therapy Occupational therapy

Moving Toward Diabetes Self-Management

Home care clinicians have a unique opportunity to encourage their homebound patients to take charge of their diabetes. A perceived loss of control related to homebound status and need for home health services, as well as previous life experiences and familiarity with the more traditional model of medical care (with the locus of control centered with the physician) may cause these patients to feel ill-equipped to manage their diabetes. With coaching, patients can develop the skills and confidence needed to participate fully in their diabetes management. Patients who are self-directed but physically unable to fully participate in their self-management may be willing to have a family member or other caregiver assist with the process. It is important to allow patients to make the determination about involving others in their care.

Use of motivational interviewing can change the way clinicians approach behavior modification. It is not about what a home care nurse or other health care provider wants a patient to do, but rather what the patient sees as important and doable. Our paradigm

shift is in providing the tools and reasons for change, investigating and negotiating change strategies, assessing readiness for change, and identifying the barriers that prevent changes from occurring. The shift is not only in promoting patient autonomy, but also in educating clinicians to allow patient-focused goal setting. This may be the biggest challenge.

When a patient is no longer homebound, a follow-up referral to an outpatient diabetes self-management education program or nutrition services can be of great value. Episodes of home care are of relatively short duration. Ongoing support helps patients maintain momentum and improve their diabetes outcomes and quality of life.

References

- ¹Visiting Nurse Service of New York, Center for Home Care Policy and Research website. Available online at www.vnsny.org/research/homecare.html. Accessed 17 January 2005
- ²Center for Medicare and Medicaid Services website. Available online at www.cms.hhs.gov/oasis. Accessed 12 February 2005
- ³American Diabetes Association: Hyperglycemic crisis in diabetes (Position Statement). *Diabetes Care* 27 (Suppl. 1):S94–S102, 2004

⁴Awad N, Gagnon M, Messier C: The relationship between impaired glucose tolerance, type 2 diabetes, and cognitive function. *J Clin Exp Neuropsychol* 26:1044–1080, 2004

⁵Eastman RC: Neuropathy in diabetes. In *Diabetes in America*. 2nd ed. National Diabetes Data Group, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases (NIH publ. no. 95-1468) 1995, p. 339–348

⁶National Diabetes Education Program: Feet Can Last a Lifetime: Revised Kit. Bethesda, Md., National Diabetes Education Program, 2005

⁷Vinik A, Erbas T, Stansberry K: Gastrointestinal, genitourinary and neurovascular disturbances in diabetes. *Diabetes Rev* 7:358–378, 1999

⁸Porter D Jr, Sherwin RS (Eds.): *Ellenberg and Rifkin's Diabetes Mellitus*. 5th ed. Stamford, Conn., Appleton and Lange, 2001, p. 1054–1055

⁹American Diabetes Association: Nephropathy in diabetes (Position Statement). *Diabetes Care* 27 (Suppl. 1):S79–S83, 2004

¹⁰Nutrition Screening Initiative: Determine your nutritional health [article online]. Washington, D.C., Nutrition Screening Initiative, 2002. Available at www.aaafp.org/PreBuilt/NSL_DETERMINE.pdf

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