Managing diabetes can be a daunting task for patients with cancer. Empowerment-based diabetes education and motivational interviewing are complementary approaches. Oncology nurses may feel unprepared to teach patients and their families about self-care for diabetes, but they provide individualized information on symptom management of cancer throughout hospitalization and at discharge. The essential self-care issues include food, exercise, medication, blood glucose monitoring, prevention, recognition and treatment of hypoglycemia and hyperglycemia, and when and how to get additional medical and educational support. This patient-centered model of diabetes education differs from the older “compliance” model that covers many universal rules for all patients, which are predetermined by the nurse. Informing nurses about their role in care of patients with cancer and diabetes is critical.

### At a Glance
- Empowerment-based education and motivational interviewing are complementary approaches to diabetes patient education that have affected glycemic control.
- Knowledge about cancer and diabetes is essential in the delivery of individualized plans of care.
- Oncology nurses provide patients and families with skills and resources necessary to manage their cancer symptoms and to perform self-care of diabetes.

Shah, & Bettenhausen, 2006). Studies have indicated that 38% of all hospitalized patients have documented hyperglycemia, and patients with new hyperglycemia have increased length of hospital stays and higher mortality (Umpierrez et al., 2002).

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Managing diabetes can be a daunting task for patients with cancer. Empowerment-based diabetes education and motivational interviewing are complementary approaches. Oncology nurses may feel unprepared to teach patients and their families about self-care for diabetes, but they provide individualized information on symptom management of cancer throughout hospitalization and at discharge. The essential self-care issues include food, exercise, medication, blood glucose monitoring, prevention, recognition and treatment of hypoglycemia and hyperglycemia, and when and how to get additional medical and educational support. This patient-centered model of diabetes education differs from the older “compliance” model that covers many universal rules for all patients, which are predetermined by the nurse. Informing nurses about their role in care of patients with cancer and diabetes is critical.
Therefore, healthcare providers often test patients’ hemoglobin A1c (HgA1c), which measures glucose control over the previous two or three months. The test shows whether blood glucose levels are being controlled by the current treatment plan for an existing diabetes. The American Diabetes Association (ADA, 2007) recommends an HgA1c less than 7%, which reflects an average blood glucose of less than 170 mg/dl. The closer a patient is to that goal, the less he or she is at risk of developing microvascular complications (ADA). The target goal of less than 170 mg/dl may have to be assessed based on clinical presentation of the patient and existing health problems.

Oncology nurses care for patients with chronic diseases, cancer, and diabetes, and educating and supporting patients with diabetes are critical. Most patients with diabetes self-manage the condition through lifestyle modifications of healthful eating and physical activity, as well as medication adherence and collaborative problem solving using results from home blood glucose monitoring (Weiss & Funnell, 2007). Collaborative patient plans are essential for optimal results (Funnell, Anderson, Austin, & Gillespie, 2007). Hospital-based oncology nurses face ongoing challenges in teaching patients about glycemic control through self-management. Hyperglycemia increases morbidity and mortality in hospitalized patients and increases length of stay by one to three days (Van den Berghe et al., 2001). Alterations in blood glucose levels for inpatients with cancer can impair their ability to interact with caregivers and family members, which can lead to difficulty understanding self-management of diabetes. The ADA delineated inpatient education in its 2004 position statement with specialized educators focusing on diabetes education (Clement et al., 2004; Mensing et al., 2004) (see Figure 1).

Oncology nurses routinely provide patients and families with information about cancer (e.g., when to call a healthcare provider, signs and symptoms of a fever, ways to manage symptoms), but they also should educate them about prevention, recognition, and treatment of hypoglycemia and hyperglycemia. To provide oncology nurses with a foundation for inpatient diabetes education, this article reviews the pathophysiology of diabetes in patients with cancer and aspects of current diabetes self-management education (DSME): empowerment-based approaches and motivational interviewing.

### Pathophysiology

Diabetes is a chronic metabolic disease in which the body does not produce or does not properly use insulin, a hormone required to convert sugar, starches, and other food into energy for the body. The cause of diabetes remains elusive; however, genetics, environment, and lifestyle are major factors in disease development. The two most common categorizations of diabetes are type 1 and type 2. Type 1 is an autoimmune disease in which the pancreatic beta cells are destroyed. Without sufficient beta cell mass, insulin production is either nonexistent or insufficient to sustain life. A person with type 1 diabetes must take insulin regularly to survive. Typically, type 1 diabetes develops in children or young adults, but it can occur at any age. Type 2 diabetes is more common, accounting for 90%-95% of patients with diabetes. In type 2 diabetes, the pancreas continues to produce insulin, but the body becomes resistant to it. Over time, the insulin resistance exceeds the pancreas’s ability to produce sufficient insulin, resulting in rising blood glucose. Factors increasing insulin resistance include obesity, aging, sedentary lifestyle, and steroids. The risk of developing type 2 diabetes also is related to a history of gestational diabetes, family history, and ethnicity (ADA, 2007). As with other acute illnesses, when a diabetic patient also has cancer, normoglycemic control becomes more difficult (Lilley & Levine, 1998). Other adverse consequences of diabetes occur in patients with cancer, including increased neurologic ischemia, a higher infection rate, volume and electrolyte abnormalities, and impaired leukocyte function (Lilley & Levine).

#### Steroid-Induced Hyperglycemia in Patients With Cancer

Glucocorticoids are a major component of therapy for many cancers, either as part of the treatment regimen or for management of symptoms such as nausea, cord compression, and cerebral edema. For example, CHOP is used in non-Hodgkin and Hodgkin lymphoma. Dexamethasone is used commonly in antiemetic regimens as part of premedication for chemotherapy regimens. The half-life of dexamethasone is more than 48 hours, and the drug can have extended effects on serum glucose levels (Schwab & Porter, 2007). The increase in blood glucose comes from stimulation of hepatic glucose production and inhibition of peripheral glucose uptake, factors that increase insulin resistance. Thus, steroid use can lead to new hyperglycemia or compound the management of existing diabetes.

Oncology nurses have a central role in assessing the needs of patients with diabetes. Understanding that normal blood glucose is 70–100 mg/dl is key. The ADA recommends in the hospital setting targeting less than 110 mg/dl before meals and maximum two-hour postprandial blood glucose less than 180 mg/dl (Clement et al., 2004). If a blood glucose level is low or high, healthcare professionals must treat the patient and assess contributing factors (e.g., nothing by mouth for procedure, use of steroids, choice of foods and liquids). As noted earlier, steroids are a major component of oncology protocols and can increase activity and appetite, as well as affect sleep.

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**Figure 1. PredischARGE Instructions**

Note. Based on information from Clement et al., 2004; Joint Commission, 2009; Mensing et al., 2004; Nettles, 2005.
Nutritional Problems

Over the course of cancer treatment, many patients experience impaired nutritional intake. Indeed, a major side effect of chemotherapy and radiation is loss of appetite. Patients with cancer have unique eating patterns related to decreased appetite and chemotherapy-related nausea and vomiting. When eating is impaired, patients should be encouraged to eat foods and drink liquids that are high in calories. Assisting patients with creating individualized eating plans and administering antiemetics can decrease the risk of dehydration, hypoglycemia, and chemical imbalances. Patients with cancer also are at increased risk for depleted glucose stores, and blood glucose levels may not rise as expected with diabetic ketoacidosis or in response to treatment of a hypoglycemic event.

Diabetes Self-Management Education

In a survey of nurses’ perceptions about providing care to diabetic patients, 84% said that established guidelines in their facilities were extremely helpful in their decision making (McDonald, Tilley, & Havstad, 1999). However, they also indicated a need for more education and diabetes-management updates to improve patient care. Nurses should remain current in their knowledge and nursing practice (Nettles, 2005).

Oncology nurses may not be aware of the role of a diabetes educator or diabetes clinical nurse specialist (CNS) (Davis, 1990), but it involves patient education; development of online, computer-based learning modules; mentoring of staff nurse diabetes champions; updates for medical staff on current practices for glycemic control; and dissemination of diabetes patient education information within the institution through publications and presentations (Davis, 2000; Davis & Torququist, 1995).

Interdisciplinary communication is critical to ensure open dialogue among nurses, physicians, pharmacists, social workers, case managers, and diabetes CNSs as they provide care. All patients discharged from the hospital should be referred to an outpatient diabetes education program (Davis, Midgett, & Gourley, 1994), so that they can follow up with healthcare providers who will answer questions about diabetes regimens.

For patient education about diabetes to be successful and meaningful, the plan of care must be individualized (Anderson & Funnell, 2000, 2008). Oncology nurses can assist their patients by encouraging them to address their greatest concerns and fears. For example, a nurse might ask, “What is your biggest worry about taking care of your diabetes at home?” (Davis, Vander Meer, Yarborough, & Roth, 1999). Oncology nurses also can assist patients by asking questions and listening supportively (Anderson & Rubin, 2002). Components of diabetes education should be integrated into patient-nurse communication from the time of admission; insulin doses can be added to discharge plans at a later date.

The American Association of Diabetes Educators (2007) listed seven self-care behaviors for patients to help them manage diabetes (Boren, 2007) (see Figure 2). Inpatient oncology nurses can interact with patients and work with them to discuss needed lifestyle changes at home, emphasizing...
parts of the seven self-care behaviors that are most critical for inpatients to incorporate into their post-hospital lives. A major part of self-care is monitoring blood glucose at home. Nurses should instruct patients to write down their blood glucose levels or use blood glucose meters with memory features and take them to their follow-up appointments. A log book accompanies all blood glucose meters. Such records allow providers to assess trends in blood glucose levels and collaborate with patients to make changes to regimens. If patients report that their healthcare providers do not look at their logs or tell patients, “There is no pattern, but keep on testing,” they will not be motivated to continue self-testing. Providers cannot collaborate with patients to make changes to a diabetes regimen without blood glucose numbers to direct individualized care.

The rationale for glycemic control during hospitalization is evident because higher blood glucose levels are associated with poorer outcomes, including longer lengths of stay, higher costs of care, and greater mortality (Psarakis, 2006; Singer, 2007). The Diabetes Control and Complications Trial Research Group (1993) confirmed that keeping HgA1c under 7% significantly reduced microvascular complications in people with type 1 diabetes. Also, the United Kingdom Prospective Diabetes Study (UKPDS) Group (1998) demonstrated improved outcomes (e.g., glycemic) and blood glucose control with type 2 diabetes. Both of the studies reinforce the importance of controlling elevated blood glucose levels.

### Empowering Patients and Families for Home Care

Individualized inpatient diabetes education is essential. About 99% of diabetes care is provided by patients themselves through dietary and physical lifestyle modifications and medication (Funnell & Anderson, 2008; Tuerk, Mueller, & Egede, 2008; Weiss & Funnell, 2007). Oncology nurses can target areas for instructing patients before discharge by asking patients questions (see Figure 3). With empowerment-based diabetes patient education, nurses listen to patients’ concerns and engage them in collaborative problem solving. For example, patients and families may be concerned about the cost of nutritious foods, so nurses can provide information about heart-healthy, portion-controlled, carbohydrate-consistent food choices.

Oncology nurses also can help patients understand that they should not drink soda, sweet tea, or fruit juice between meals because such sweetened liquids affect blood glucose levels. Healthy food choices are important in managing people’s diabetes. Patients with cancer may need special nutritional considerations, and nurses can help them make choices to maintain caloric intake and balance insulin dosing. As noted earlier, common side effects of chemotherapy and radiation treatment are loss of appetite, nausea, vomiting, diarrhea, and constipation. Oncology nurses can educate patients and families about the importance of nutrition and correct the misconception that if a patient cannot eat but is hyperglycemic, then he or she still needs insulin. The body must remain nourished during and after treatment. An individualized plan fits a diabetes regimen to a patient and his or her cancer treatment; it does not fit the patient to a universal regimen.

Self-monitoring of blood glucose is the modern way to manage diabetes. Blood glucose meters can be found at all drug stores and through mail-order pharmacies. Private insurance, Medicaid, and Medicare assist with the cost of the meters; however, meter strips are the major cost in diabetes self-care, which may result in decreased monitoring. The number of times a person should test per day varies depending on the clinical condition. Encouraging patients to wash their fingers with warm water and soap instead of alcohol prior to glucose testing will reduce irritation and drying of the skin.

Early recognition of hypoglycemia is critical for early intervention. Oncology nurses can teach patients and families about the value of 15 g of carbohydrates found in three glucose tablets, which can be found in grocery stores and pharmacies. Patients and family members can carry the tablets when they are away from home. Patients may be tempted to stop taking insulin after one low blood glucose episode, but they should be encouraged to keep a record of their blood glucose numbers and note any trends.

### Motivational Interviewing

The goal of motivational interviewing (MI) is to increase patients’ internal motivation to change their behavior (Rollnick, Miller, & Butler, 2008). MI is a patient-centered approach that encourages discussion of targeted behavior changes. People learn to change behaviors when doing so seems personally important and achievable and has measurable benefits (Welch, Rose, & Ernst, 2006; West, DiLillo, Bursac, Gore, & Green, 2007). MI has been used to reduce psychiatric disorders, addictive behaviors, and risk of sexually transmitted infections.

Nurses can ask patients questions in a nonthreatening way.
- Do you mind if I ask you a few questions related to your diabetes?
- With your permission, I would like to propose a plan related to your diabetes.
- If you are willing, may I share some information with you?

The DCCT (1993) and UKPDS (1998) found that education by nurses and dietitians promoted glycemic control, and outcomes were achieved through individualized coaching. The two least productive statements used by providers are “watch what you eat” and “get more exercise.” The statements are not helpful and do not involve patients in decision making. Motivational messages that remain positive are more effective and result in better-controlled blood glucose (Anderson & Rubin, 2002; Davis et al., 1999).
National diabetes management is a critical challenge for healthcare providers, especially oncology nurses. They play a crucial role in educating and empowering patients in self-management of their diabetes. The unique eating habits and insulin requirements of patients with cancer remain a challenge, but the issues can be managed properly. When empowered, many patients better manage their diabetes after hospitalization. The unique eating habits and insulin requirements of patients with cancer remain a challenge, but the issues can be managed properly. When empowered, many patients better manage their diabetes after hospitalization.

Supportive coaching, which does require some re-education by healthcare providers, can take less time with patients than older methods of lecturing. A potential challenge faced by nurses is lack of time, which does not allow full assessment of a patient’s story. However, it takes less than five minutes for patients to share a concern about a targeted behavior (Levinson, Gorawara-Bhat, & Lamb, 2000; Welch et al., 2006). Also, oncology nurses can educate patients and families throughout hospitalization and not wait until the day of discharge.

Another challenge is delivering clear, concise, and relevant information to answer a patient’s questions and needs. Other challenges to inpatient diabetes education using the MI approach include low literacy and lack of understanding of diabetes management. Nurses must be cognizant that some patients have low literacy or are illiterate but may not be willing to share that information (Cotugna, Vickery, & Carpenter-Haelefe, 2005). Supportive coaching, which does require some re-education by healthcare providers, can take less time with patients than older methods of lecturing.

Together, the empowerment-based model and MI have demonstrated improvements in patient glycemic control (Funnell & Anderson, 2008; West et al., 2007). The techniques differ from older models in which nurses taught patients universal rules that often were difficult or impossible to follow. The collaborative MI approach helps patients to communicate their concerns about their behaviors. With the approach, oncology nurses can assist patients to feel empowered and in control of their diabetes (Welch et al., 2006). When oncology nurses have up-to-date knowledge of diabetes self-care, they are able to help patients with cancer self-manage their diabetes.

Individualized self-care plans with an emphasis on patient involvement can help patients with cancer cope better with their diabetes after hospitalization. The unique eating habits and insulin requirements of patients with cancer remain a challenge, but the issues can be managed properly. When empowerment-based education is integrated at all levels of the disease process, oncology nurses can be major influences in guiding, educating, and empowering patients in self-management of their diabetes.

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