Lessons from DAWN: Implementing Effective Insulin Therapy

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Citation

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Abstract

Negative attitudes to insulin therapy are common. Results from the Diabetes Attitudes, Wishes and Needs (DAWN) study show that barriers to achieving adequate glycemic control include misconceptions and concerns of patients and providers regarding the use of insulin. Data from DAWN highlight the importance of addressing psychosocial factors as an integral component of care for patients with diabetes. Strategies to deal with the initiation of insulin therapy can provide ways to overcome barriers to effective therapy and bridge the gap between diabetes targets and clinical practice. By identifying and addressing patient and provider concerns regarding initiation of insulin therapy, providers can facilitate effective self-management of diabetes and help patients achieve current targets for glycemic control.

EXAMPLE CASE – INITIATING INSULIN

A 56-year-old female with type 2 diabetes (T2DM) treated with maximum doses of metformin, glyburide and pioglitizone, comes to the office for a routine visit. Her A1C has been rising for the past year and today it is 9.7. Once again the provider recommends insulin to her as the next step in therapy. The patient refuses, saying “I don’t want to take shots.” Even though the provider explains to her that insulin needles today are less painful and insulin pens make injections easier, she still refuses. The provider feels frustrated and discouraged about the inability to help her.

INTRODUCTION

Approximately 24 million people in the United States (US) have diabetes; of these, nearly a quarter are unaware that they have the condition [1] . The high prevalence of diabetes is accompanied by a substantial economic burden. In 2007, the total estimated cost of diabetes to the US was $174 billion, including $116 billion in excess medical expenditures and $58 billion in reduced national productivity [2] .

From a clinical perspective, the aims of diabetes treatment are to prevent acute complications and to decrease the risk of long-term complications [3] . To achieve these aims, guidelines from both the American Diabetes Association (ADA) and the American Association of Clinical Endocrinologists (AACE) emphasize the importance of encouraging patients to achieve and maintain glycemic levels as near to the normal range as possible (Table 1), while taking into account individual patient considerations [34] .

However, diabetes care also requires that issues beyond glycemic control are addressed, and that psychosocial issues are taken into account.

Figure 1

Table 1. ADA and AACE Glycemic Goals in Adults with Diabetes

	ADA	AACE
Glycated hemoglobin (A1C)	<7.0%	≤6.5%
Preprandial glucose	70–130 mg/dl	<110 mg/dl
Peak postprandial glucose	<180 mg/dl	–
2-hour postprandial glucose	–	<140 mg/dl

AACE Diabetes Mellitus Clinical Practice Guidelines Task Force, 2007; American Diabetes Association, 2008b

TREATMENT

The United Kingdom Prospective Diabetes Study (UKPDS) found that at the time of diagnosis, individuals with T2DM had typically already lost 50% of their -cell function [5] . This loss of -cell function continues to progressively worsen, and, as a result, most patients with T2DM will eventually require insulin therapy to achieve and maintain glycemic control. Despite the increasing recognition of insulin as a highly effective agent to achieve glycemic targets [46] , a

significant disconnect exists between this concept and the initiation of insulin therapy in clinical practice for patients with T2DM. Investigating why practitioners are reluctant to prescribe insulin and why patients are reluctant to take insulin are key issues in understanding this disconnect. These issues were explored by the DAWN study.

DAWN is an international collaborative program that was initiated in 2001 by Novo Nordisk in partnership with the International Diabetes Federation and an international expert advisory panel [7]. This interview-based study was designed to improve outcomes of diabetes care at the patient level, by identifying a broad set of attitudes, wishes, and needs among diabetes patients, physicians and nurses, and helping to address the issues arising from these findings. Researchers carried out structured interviews in person or by telephone in 11 regions representing 13 countries, including the United States. Survey participants included 250 randomly selected generalist and specialist physicians per region (n=2750), 100 randomly selected generalist and specialist nurses per region (n=1122), and 250 randomly selected patients with self-reported type 1 diabetes (T1DM) per country and 250 patients with self-reported T2DM per country (n=5104). The professionals were chosen for participation because they were available and common in all of the participating countries in this international study. In spite of this limitation, data from DAWN provide a valuable resource for gaining insight into the factors affecting the behaviors of patients and healthcare professionals in diabetes management [8]. Results from the DAWN study are highlighted below alongside approaches to overcome reluctance to initiate and intensify insulin therapy, both from the patients' and healthcare professionals' perspective.

INDIVIDUAL BURDEN OF TYPE 2 DIABETES AND ROLE OF THE NURSING

Results from the DAWN study have confirmed that people with diabetes contend with many issues, with 41% of patients reporting poor psychological well-being and 33% of patients reporting that they felt stressed because of their diabetes [79]. The impact of diagnosis can cause feelings of shock, guilt, anger, anxiety, depression, and helplessness, with as many as 85.2% of patients reporting a high level of distress. Even many years after diagnosis (mean duration almost 15 years), problems of living with diabetes remained common, with 43.8% of patients reporting a constant fear that complications will develop and up to 14.7% of patients experiencing direct social and psychological burdens of managing their condition [78]. One of the key findings of DAWN is that psychosocial issues have an impact on self-management behaviors and ultimately outcomes, but are rarely addressed by providers.

In general, nurses have a high level of awareness of the psychological issues faced by patients [10]. Results from DAWN indicate that, compared with physicians (with the exception of diabetes specialists), nurses (generalists and specialists) perceived psychosocial problems as having a greater impact on diabetes self-care and glycemic control [11]. Further results from DAWN highlight the important role of non-physician health professionals, indicating that availability of a nurse is associated with better patient self-management [12]. Of the 5104 adults sampled, those individuals who had access to a nurse (40.8%) had a statistically significant positive effect ($p \leq 0.01$) on patient-reported outcomes, including diabetes-related distress, lifestyle behaviors, and medication taking.

Recent results of a subset of US responses in the DAWN study have shown that nurses and physicians are in agreement that nurses should take a larger role in managing diabetes [10]. Nurses were reported to provide better education, spend more time with patients, were better listeners and knew their patients better than physicians. Specialist nurses talk to patients about self-management, teach medication management, have a higher level of involvement in prescribing medications and are more willing to take on additional responsibilities. However, despite their willingness to take on additional responsibilities, only one-third of specialist nurses are involved in medication management [10]. Given the number of patients with diabetes and the limited time that generalists and specialists are able to spend during a routine visit, these data suggest that nurse skills are underutilized. Nurses therefore need to play a more active role as part of a multidisciplinary team in diabetes care. In particular, with their authority to prescribe medications, nurse practitioners are ideally placed to help patients add or intensify their medications in order to achieve desired therapeutic outcomes.

BARRIERS TO EFFECTIVE USE OF MEDICATION THERAPY

The successive failure of nonpharmacologic interventions and oral antidiabetic drugs (OADs) means that patients can incur a heavy burden of uncontrolled hyperglycemia over a period of years if effective treatments are not initiated promptly. A retrospective study indicated that A1C levels were well over 9% before physicians initiated a change in

therapy [13] . With regard to insulin initiation, in a study of 2891 patients with T2DM the mean interval between initiation of sulfonylurea and metformin oral combination therapy and initiation of insulin therapy was 54.6 ± 28.6 months, despite generally poor glycemic control during this period [14] . The result of patient and provider reluctance to initiate effective therapy exposes patients to prolonged periods of high glucose levels with possible irreversible damage [14] . For example, if a patient with T2DM were to progress from nonpharmacologic interventions to sulfonylurea or metformin monotherapy, then to oral combination therapy before initiation of insulin, they could potentially accumulate nearly 5 years of A1C burden over 8% and approximately 10 years of A1C burden of over 7% [15] .

Results from the DAWN study indicated that physician attitudes (generalist and specialist) play a role in delays in progressing therapy, particularly with regard to insulin initiation. Responses to the relevant statements in the DAWN study were scored from 1 to 6, where "fully disagree" is 1 and "fully agree" is 6. In response to the statements "Prefer to delay oral/insulin therapy until absolutely necessary," physicians scored 3.16 ± 1.63 in their attitude to oral therapy, and 3.67 ± 1.60 in their attitude to insulin therapy. Nurses also demonstrated these attitudes, scoring 3.45 ± 1.75 in their attitude to oral therapy, and 3.66 ± 1.80 in their attitude to insulin therapy [16] . Overall, nearly one in two providers (43.4%) preferred to delay initiation of oral medication until absolutely necessary. In response to the statement "Earlier introduction of insulin therapy would reduce costs of therapy," physicians scored 3.60 ± 1.63, and nurses scored 3.67 ± 1.75. In total, only half of health care providers (49.2%) providers believed that insulin use would decrease costs [7] . A US-based internet survey study has further assessed primary care physician (PCPs) attitudes towards initiation of insulin in patients with T2DM [17] . The greatest consensus was observed on attitudes regarding risk/benefits of insulin therapy, positive experiences with patients on insulin and patient fears or concerns about initiating insulin. The majority of PCPs agreed that the benefits of using insulin to prevent or delay complications outweighed the risks of hypoglycaemia and weight gains for most patients. However, a clear lack of consensus exists in attitudes about the metabolic effects of insulin, need for insulin therapy, adequacy of self-monitoring blood glucose, time needed for training and potential for hypoglycemia in elderly patients.

In terms of patients' beliefs about insulin therapy, the DAWN study provides more key insights. Responses to the statement "Taking insulin will help me manage diabetes better" scored 1.95 ± 1.01 on a scale of 1 to 4, where 1 = "fully disagree" and 4 = "fully agree." Only 26.9% of patients not taking insulin believed that insulin would help them manage their diabetes better [7] . Indeed, many patients are so reluctant to start insulin therapy that they may delay for significant periods of time [1618] . The prevalence of negative attitudes to insulin has been illustrated in a self-report survey of 708 insulin-naïve patients with T2DM, of whom 28.3% reported being unwilling to take insulin, if prescribed [18] . This survey explored common concerns among patients stratified by willingness, and found that negative attitudes were highly prevalent among unwilling patients, and were also seen in patients willing to consider insulin therapy. For example, many patients associated insulin therapy with personal failure (55.0% vs. 33.6%, unwilling vs. willing groups, respectively), showed lack of confidence in their ability to handle the demands of insulin therapy (58.1% vs. 39.7%), and expressed negative attitudes concerning restrictions of their usual activities, worsening disease, hypoglycemia, or anticipated injection pain [18] (Table 2). Patients may also be concerned that insulin will cause complications, such as blindness, or believe that they will gain weight [18] . Addressing the more complex social and environmental factors that contribute to behavior change are major challenges in diabetes self-management that warrant further attention and research.

Figure 2

Table 2. Patient Attitudes Twards Insulin Therapy, Unwilling versus Willing Subjects

	Unwilling to take insulin (%)	Willing to take insulin (%)
Worsening disease	46.7	35.4
Restrictions of usual activities	56.1	41.6
Needle pain	50.8	30.2
Problematic hypoglycemia	49.3	37.9
Unable to handle demands of insulin therapy	58.1	39.7
Personal failure	55.0	33.6

ADDRESSING PATIENTS' CONCERNS ABOUT INSULIN THERAPY

When insulin therapy is first being considered, the concerns of the patient need to be assessed and appropriate information and support that will allow the patient to

comfortably and safely initiate insulin therapy needs to be identified. Possible questions that can be used during the initial and follow-up clinical encounters are shown in Table 3 [19] . An important educational issue highlighted by the DAWN study is that many patients do not believe that taking insulin will help them manage diabetes more effectively. Strategies that providers, including nurse practitioners and physician assistants can use to address patients' concerns are discussed below; however, all of these concerns are best addressed through patient-centered strategies that include assessment, active listening and problem-solving in collaboration with the patient.

Figure 3

Table 3. Assessment Questions for Decision-Making about Insulin Therapy

• What is your greatest concern about your diabetes?
• What is the hardest thing for you in taking care of your diabetes?
• How satisfied are you with your current therapy for diabetes?
• How satisfied are you with your current level of glucose control?
• How interested are you in making a change in therapy?
• What do you need to know to consider insulin therapy?
• Do you think insulin will help you manage your diabetes better?
• What is your biggest fear about insulin?
• What problems do you think that you will encounter?
• What do you see as the biggest negative for you?
• What do you see as the most positive aspect for you?
• What supports do you have to overcome barriers?
• How faithful do you think you would be in taking your insulin?
• Are you willing to try insulin? If not, what would cause you to start taking insulin?

FEELINGS OF PERSONAL FAILURE

Results of patient attitudes from the DAWN study revealed that belief in the efficacy of insulin was low and self-blame for having to take insulin was high [16] . As strategies to prevent this misperception, providers can explain that T2DM is a progressive and chronic condition, where insulin secretion from the pancreas decreases over time. Starting insulin therapy is therefore a natural result of the disease course, and simply replaces the insulin that the body would naturally produce. Ideally, this concept is explained at the time of diagnosis of T2DM, and then subsequently reviewed throughout the course of the illness. Rather than telling patients that they have failed oral agents, providers should instead point out that the oral agents have failed them. Using insulin as a threat to encourage lifestyle changes promotes negative perceptions of insulin, and is generally ineffective as a motivational tool [8] .

LACK OF CONFIDENCE IN ABILITY TO HANDLE THE DEMANDS OF INSULIN

Insulin therapy can be a daunting prospect, and all providers need to understand the level of patient confidence with insulin therapy. In scenarios where an individual's confidence is lacking, the particular reasons for this need can be identified by listening to the answers given to the types of question suggested in Table 3. For example, patients may be most concerned that their insulin regimen will be complicated, or they may be worried about the potential embarrassment or stigma of administering an insulin injection in the workplace or other settings. The availability of various insulin preparations and insulin delivery devices means that insulin therapy does not have to be excessively complicated, and also means that insulin therapy can be personalized based on the patient's specific needs, schedule and lifestyle.

Providers can also discuss available resources and support. Potential social embarrassment or stigma may be minimized by using a once-daily basal insulin analog regimen (insulin detemir [Levemir ®] or insulin glargine [Lantus ®]), or by using an insulin pen. Many patients find insulin pens more portable and discreet than using a vial and syringe and, accordingly, these administration devices have been associated with high patient satisfaction and adherence [2021] . Dial-up dosing also makes using insulin pens easier and intrinsically more accurate then a vial and syringe.

RESTRICTIONS OF USUAL ACTIVITIES

Many lifestyle concerns relate to timing of insulin administration, difficulty in administering insulin when traveling, and loss of spontaneity and flexibility. If providers can help patients to clarify these concerns, they can then tailor insulin regimens and provide information about devices that offer maximum flexibility and strategies for traveling with insulin, and brainstorm with patients to identify strategies to increase flexibility and spontaneity. Patients can avoid having to administer insulin away from home by using a once-daily or twice-daily (morning and evening) basal insulin regimen, as described above. Basal insulin analogs provide stable insulin levels for up to 24 hours and, compared with intermediate-acting human insulins, provide advantages of relatively flat time–action profiles and lower risks of hypoglycemia [222324] . Use of a rapid-acting insulin analog (insulin aspart [NovoLog ®], insulin glulisine [Apidra ®], or insulin lispro [Humalog ®])

rather than regular insulin (Humulin R ® ; Novolin R ®) may allow for greater flexibility in planning mealtimes or for coping with unplanned meals, because of its more immediate onset. In particular, the shorter onset of action with these analogs allows insulin to be administered within 15 minutes of mealtime rather than the 30 to 45 minutes recommended when using regular insulin.

Whether traveling for work or recreation, simple precautions along with advanced planning should mean that patients with T2DM can travel whenever and wherever they chose. Ideally, patients traveling overseas should schedule an office appointment with their healthcare provider before they travel. This appointment will allow an opportunity to assess the patient's current level of diabetes control and to give specific advice regarding diabetes management and prevention of acute complications. In terms of insulin storage, insulin is stable at room temperature (less than 30°C, 86°F) for up to a month. In addition, insulin should not be allowed to freeze. When traveling by air, medications should be kept in the patient's carry-on luggage to avoid the extreme temperature changes that can occur in the cargo hold. For the same reason, insulin should not be kept in the trunk of a car. In certain situations when temperature fluctuations may occur, it may be advisable to store insulin in a thermal insulated bag. For longer trips, unopened vials should be stored in a cool bag when traveling.

HYPOGLYCEMIA

Because of experiences with family members and friends who take insulin, hypoglycemia can be a concern for many patients [25] . Some patients are reassured by information about decreased risk of hypoglycemia with insulin analogs. In contrast to the use of older insulin preparations, very few patients with T2DM experience severe hypoglycemia when using basal insulin analogs, insulin detemir and insulin glargine [42627] . For example, compared with NPH insulin, insulin detemir reduced the risk of major and nocturnal hypoglycemia by 69% and 46% , respectively ($p \leq 0.001$) [28] . Similarly, compared with NPH insulin, insulin glargine reduced risk of major and nocturnal hypoglycemia by 46% and 59%, respectively [2930] . To date, head-to-head comparisons of insulin detemir and insulin glargine show similar, low rates of overall and nocturnal hypoglycemia [31] . The less frequent rate of hypoglycemia in T2DM than T1DM is also worth emphasizing [32] . Providers can also teach patients strategies to prevent, recognize, and treat hypoglycemia so that they feel more confident in their ability to handle these situations.

WEIGHT GAIN

Weight gain is of concern for many patients and can be minimized through managing caloric intake and/or increased physical activity. Providers can offer a referral for the patient to meet with a dietitian if weight gain is a particular concern. In terms of insulin therapy, use of insulin analogs rather than human insulin can reduce the risk of weight gain [3334] . In patients with T2DM, both insulin glargine and insulin detemir have been found to be associated with less weight gain than insulin NPH [2635] . For example, in a study of 505 patients, mean weight gain observed over 26 weeks was 1.0 versus 1.8 kg for insulin detemir versus insulin NPH ($p=0.017$) [35] . Comparative studies of the basal insulin analogs also suggest that insulin detemir may be associated with less weight gain than insulin glargine [31] . In a one-year study, weight gain was 2.3 kg for patients completing a course of once-daily detemir versus 3.9 kg for patients completing a course of once-daily glargine ($p<0.001$) [31] . Results from a large observational study showed that mean body weight changes were reduced following switching of patients from NPH insulin or insulin glargine to insulin detemir. [36]

INJECTION ANXIETY

Injection anxiety is a common initial response, but is rarely the real cause of concern for patients or a major barrier. Although the tendency is to explain that the needles currently available are very fine and silicone-coated to minimize pain, a more useful approach may be to ask the patient "What is it about insulin shots that worries you?" For many patients, the anxiety is more often a concern about the link between insulin and complications or even death, or loss of a job, or feelings of failure, than about the pain of the injection. Very few patients have a true needle phobia; for these patients, psychological counseling is often needed and effective. For those patients who are truly concerned about the pain, guiding them through a mock injection in the office may prove beneficial. Patients are typically surprised by the minimal amount of pain they experience. Injection aids that conceal the needle can also reduce patient anxiety and pain perception. Some pen needles include automatic shields that conceal the needle, providing greater safety for both patients and health professionals.

ADDRESSING PROVIDERS' CONCERNS ABOUT INSULIN THERAPY

Although patient-identified barriers are the most often cited reason for the delay in initating insulin therapy, findings

from the DAWN study show that providers also have negative attitudes towards insulin therapy [16]. Along with helping patients overcome their barriers, providers can also implement strategies that can help them overcome their own barriers to insulin therapy.

PROVIDING SUSTAINED SELF-MANAGEMENT SUPPORT

Perhaps one of the most important strategies that the healthcare provider can implement is ensuring that the patient has access to a multidisciplinary team. Team care approaches are important for chronic diseases that require patients to be proficient in many self-care skills. In particular, studies have shown including programs of ongoing self-management to support the care delivered by the primary care physician improve diabetes outcomes [37,38,39,40,41]. Although team-based care has been shown to improve outcomes [42], this type of care is not always available in primary care settings. Providers in all settings, therefore, need to play an active and collaborative role in helping to reduce the burden of diabetes [43].

Defining distinct and complementary roles for physicians, nurses, dietitians, pharmacists and clinic staff may prove beneficial in order to clearly set out the roles of each of the team members. For example, diabetes nurse educators can play key roles in helping patients make the decision to initiate insulin therapy, teach the skills of injection, and hypoglycemia prevention and mangement and assist them in developing a titration schedule. Office staff may be particularly useful in supporting and reinforcing patients' self management efforts related to insulin therapy, particularly during early phases.

Both generalist and specialist nurses have important roles to play in this process as well by supporting patients' efforts. Both individual office nurses and advanced practice nurses need to working closely with patients during the initiation phase to adjust insulin doses based on blood glucose monitoring results either by frequent telephone calls or visits.

INSULIN EFFICACY AND TIMELY INITIATION

Results of the DAWN study showed that lack of clinical efficacy was the insulin-specific belief most strongly associated with provider preference to delay insulin therapy [16]. These findings highlight the need for efforts to improve awareness of insulin efficacy. Continuing medical education programs that focus on increasing knowledge about the progression of diabetes, the physiological effects of insulin as well as strategies and tools for successfully initiating insulin with patients who have T2DM are therefore required. As discussed below, many provider and patient concerns about insulin therapy can be addressed through the choice of an appropriate insulin regimen and titration schedule. Through active involvement in continuing education programs, providers at all levels can be assured that they are providing the most comprehensive treatment approach to help patients achieve glycemic goals and outcomes.

PATIENT–PROVIDER COMMUNICATION

Irrespective of the duration of the office visit, providers need to allocate sufficient time to ensure that they gain an understanding of the thoughts and concerns patients may have about insulin therapy. Adopting successful strategies used in other practices is one approach to improving patient-provider communication. For example, creating proactive methods to evaluate outcomes and to monitor results may translate into more efficient and effective use of the time spent with patients. Exchange of information using electronic methods may also facilitate a better relationship between the patient and provider. Utilizing all members of the staff in this process can help to relieve some of the burden on the provider while still offering the support needed by patient's for sucessful insulin use.

THE CHOICE OF INSULIN REGIMEN

Overall, many concerns relating to insulin therapy can be minimized by choice of an appropriate insulin regimen at initiation. Basal–bolus insulin regimens using multiple daily insulin injections or continuous subcutaneous insulin infusion most closely match physiological insulin secretion. However, many patients starting insulin therapy understandably may find such a regimen daunting. Therefore, initiating insulin with a simpler, less intensive, regimen is recommended, which can subsequently be adjusted when needed. Initial regimen recommendations include starting with bedtime intermediate-acting insulin or with a bedtime or morning long-acting insulin [6].

Simplified insulin titration algorithms have also proved a useful tool in helping patients handle the demands of insulin therapy, and so improve their confidence and ability to carry out the regimen. Two recent studies that evaluated simple insulin titration algorithms in predominantly primary care settings are the Glycemic Optimization with Algorithms and Labs at Point of Care (GOAL A1C) trial (Table 4) and the Predictable Results and Experience in Diabetes through

Intensification and Control to Target: An International Variability Evaluation 303 (PREDICTIVE 303) trial (Table 5) [364445] . In both trials, patients who started on a once-daily long-acting insulin analog (insulin glargine in GOAL A1C; insulin detemir in PREDICTIVE 303) as add-on therapy to oral agents were able to use the self-adjusted insulin dose titration algorithm and achieve significant improvements in glycemic control [4445] . In the PREDICTIVE 303 study, patients with T2DM who self-titrated insulin detemir achieved better glycemic control than patients whose doses were titrated by physicians, suggesting that self-adjustment of the basal insulin offers an opportunity to improve outcomes.

Figure 4

Table 4. Weekly Titration Algorithm for Insulin Glargine in the GOAL A1C Trial

Mean of Fasting SMBG from Preceding 2–4 Days	Increase of Insulin Dosage (units/day)*
≥180 mg/dl	8
≥160 mg/dl and <180 mg/dl	6
≥140 mg/dl and <160 mg/dl	4
≥120 mg/dl and <140 mg/dl	2
≥100 mg/dl and <120 mg/dl	0–2
Fasting SMBG ≤100 mg/dl and no hypoglycemia	No change
<70 mg/dl†	Dose decreased to the previous lower dose

*If the patient's A1C remains >8.0%, the physician may increase the insulin glargine dose by up to 5 additional units to meet glycemic targets.

†Upward titration to be stopped for 1 week after an occurrence of severe hypoglycemia.

Figure 5

Table 5. Titration Algorithm for Insulin Detemir in the PREDICTIVE 303 Trial

Mean of Three Preceding FPG Values	Change in Insulin Dosage*
>110 mg/dl	Increase by 3 units/day
80–110 mg/dl	No change
<80 mg/dl	Decrease by 3 units/day

*The insulin detemir dose is adjusted every 3 days.

EXAMPLE CASE – INITATING INSULIN, REVISITED

Ms. S. comes to your office for her follow-up appointment. Her blood glucose monitoring record does not show any improvement. The health care provider once again raises the possibility of insulin with her. Today, however, when she tells the provider that she does not want to take shots; the provider asks her what about insulin injections is concerning for her. She becomes quite tearful and says that she promised herself when she was diagnosed that she would manage her diabetes better than her siblings and not have to take insulin. She is disappointed in herself that she has not been able to keep off the weight she lost initially. After actively eliciting and listening to her concerns and feelings, the provider asks to talk with her about diabetes and why she needs insulin at this point. Ms. S. is told that needing insulin is not her "fault." After explaining the progressive nature of T2DM, the provider asks if she would be willing to try insulin for 10 days with the understanding that if it is too hard for her she will call and talk about the issues. She agrees and is taught how to give the injection and sets up a time for a phone call in 1 week. The provider notes to talk with her at her next appointment about her interest in meeting with a dietitian .

CONCLUSIONS

The DAWN study has helped to identify factors affecting the behaviors of patients and health care professionals that influence their ability to make optimal use of available treatments. Data from this study highlight the importance of dealing with the psychosocial concerns as an integral component of care for patients with diabetes. The DAWN study also highlights the need for a larger role for nurses in diabetes management as part of a team care approach. As the professionals who often spend the most time with patients, nurses, including advanced practice nurses, are ideally placed to assist patients with ongoing self-management in order to help them achieve treatment goals.

When insulin therapy is first being considered, the concerns of the individual patient needs to be assessed and appropriate information and support that will allow the patient to comfortably and safely initiate insulin therapy needs to be identified. Patient education is essential in ensuring successful insulin initiation. From the time of diagnosis, the patient needs to understand the progression of diabetes and the inevitability of the requirement for insulin to attain and maintain recommended outcomes. Using insulin as a threat in an attempt to motivate patients should be avoided as this type of communication will only lead to more difficulties in initiating insulin at a subsequent time point. With the availability of various insulin preparations, insulin delivery devices and simple titration algorithms, insulin therapy does not have to be excessively complicated; these tools also mean that insulin therapy can be personalized based on the patient's specific needs, schedule and lifestyle. Continued education and a collaborative team approach that includes

both health professionals and the patient, will ensure that the advances in insulin therapy are translated into the optimum treatment outcomes for each patient.

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