

5. Bernstein RK: Reversal of severe cardiac autonomic neuropathy and hyperlipidemia in two older patients, concomitant with long term normalization of glycosylated hemoglobin by low carbohydrate diet (Abstract). *Diabetes* 38 (Suppl. 2):143A, 1989
6. Stout RW: Hyperinsulinemia as an independent risk factor for atherosclerosis. *Int J Obesity* 6 (Suppl. 1):111-15, 1982
7. Fackelman KA: Hidden heart hazards: do high blood insulin levels foretell heart disease? *Sci News* 136:184-86, 1989

## Individualized Goal Setting for Diabetic Control

There is increasing evidence that hyperglycemia is a major cause of complications of diabetes and that achieving normal or near-normal glucose levels (tight control) in diabetic patients will reduce or eliminate these complications. This hypothesis is generally accepted by most diabetologists and is increasingly accepted by primary-care physicians (general internists and family physicians) who treat diabetic patients. Tools such as self-monitoring of blood glucose (SMBG) and glycosylated hemoglobin have clearly shown that "conventional" treatment of diabetes (1 injection of insulin/day, monitoring of urine glucose, and occasional laboratory blood glucose determinations) rarely results in tight control of glucose levels. The quest for normal or near-normal glycemia usually requires frequent and regular monitoring of blood glucose by the patient and multiple doses of insulin or continuous insulin infusion. There must be a committed partnership between patients and health-care professionals that involves a great deal of motivation, education, and support.

Tight control of blood glucose is not appropriate for all diabetic patients. Currently, there are few guidelines for identifying patients who should be encouraged to achieve tight control and how to best prepare those patients. Also, the desirable level of glucose control for patients who are not candidates for tight control is arbitrary. Often, the goal that is set for the patient depends as much or more on the resources available than on what is truly best for the patient. The diabetes specialist, realizing that tight control is a desirable goal and having resources available to help with the hard work of achieving that goal, may start all patients on the road to tight control, with much effort expended working toward a goal of tight control that may be inappropriate or unattainable. Alternatively, the primary-care physician, unclear about the benefits of tight control and unable to meet the needs of the patient to work toward that end, may deprive patients of the opportunity to reach their full potential.

### FUNDAMENTAL QUESTIONS

There are several issues that should be considered when deciding the target level of glucose control and the

amount of effort from the patient and health-care professionals to achieve that goal. Before a patient is considered a candidate for tight glucose control, three questions should be asked. First, will tight glucose control benefit this patient? The theoretical benefits of tight glucose control are unlikely for older patients, particularly for patients who have serious underlying diseases. Second, is tight glucose control safe for this patient? The risks of serious sequelae from severe and unsuspected hypoglycemia in a patient who lacks hypoglycemia awareness or has impaired counterregulatory hormone responses almost always outweigh the possibility that tight glucose control will prevent complications. Third, is the patient able to participate actively in treatment? (Does he/she have the financial resources for frequent blood glucose monitoring and the intellectual capacity and motivation to use the information obtained from SMBG to make adjustments in treatment?) Full participation by the patient is imperative for the attainment of tight control.

### CANDIDATES FOR TIGHT CONTROL

If the answer to any of the three fundamental questions is no, tight control is not advisable. The target glucose level and the amount of effort expended to reach that target should be determined based on individual circumstances. For these patients, a minimum level of patient effort for monitoring and frequency of insulin injections should be instituted to determine whether a satisfactory glucose level results. Almost all patients should be taught to perform SMBG, and most patients will accept and benefit from more than one daily injection of insulin. Compared with conventional treatment, this compromise is sometimes surprisingly easy; reasonable glucose control can often be achieved by the use of premixed insulins and a light schedule of SMBG, reinforced by fructosamine or glycosylated hemoglobin determinations, in conjunction with periodic visits to health-care professionals.

Patients who answer "yes" to the three fundamental questions should be strongly considered for tight glucose control. At this juncture, it is advisable to determine the best level of glucose control that the patient can accomplish with maximal effort. This requires a team effort, with a program to provide knowledge to the patient and to ensure that the patient uses their knowledge to best advantage.

The best glucose level that can be achieved for an individual patient is determined by 1) the patient's biochemical milieu (some patients are truly brittle and cannot achieve tight control despite all efforts), 2) the patient's motivation, 3) the patient's knowledge of diabetes management, and 4) proper application of that knowledge. While the best possible level of glucose control is being sought, the patient should be encouraged to focus on control of their diabetes as a primary goal and to put aside other major life issues temporarily.

Individual and group education sessions should be used to provide the patient with the necessary knowledge to fully participate in management decisions. Activity and dietary routines should be strictly regimented to minimize the major variables that affect insulin requirements. The patient should perform blood glucose testing  $\geq 4$  times/day, use these results to adjust the insulin dose (in consultation with the diabetes team at first, then independently), and have frequent follow-up visits with health-care professionals to be certain they are progressing properly. In this way, the patient finds out what level of glucose control can be achieved when maximal effort is expended.

However, diabetes management should not remain the focal point of the patient's life. After the best level of control is determined, the program should be geared to an acceptable level of effort that permits flexibility in life-style. Then it is time to determine the best balance between effort and results. For example, a 20% reduction in effort that results in a 2% worsening of glucose control would be most acceptable. Whatever the effort, it is important that the patient be willing to keep up this effort for life. Periodic reassessment is needed. If the patient feels well, is free from evidence of diabetic complications, and has good indicators of long-term control (i.e., fructosamine or glycosylated hemoglobin), no changes would be necessary. If clinically significant problems develop or if monitoring tools indicate a problem, the patient's program should be reassessed, and a second or third trial at maximum effort should be undertaken.

Programs should be developed to provide the necessary education, training, and support for patients to achieve tight control, when appropriate, and to allow for compromises when tight control is not the goal. These programs should be structured so that they provide flexibility. To be truly effective, these programs must be accessible to all patients with diabetes, not just patients of diabetes specialists.

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## Survey of Diabetes Curriculum in Schools of Nursing

The American Diabetes Association (ADA) Council on Education commissioned a Task Force on Nursing Curriculum to assess the need for developing diabetes education materials for use by nursing school faculty. The project goals were to 1) examine the extent to which diabetes care is addressed in schools of nursing, 2) characterize the clinical experiences by which nursing stu-

dents learn to apply knowledge of diabetes care, and 3) determine the interest of nursing faculty in a diabetes curriculum syllabus that would address concepts critical to the delivery of effective nursing care to people with diabetes.

A survey of diabetes education content in schools of nursing was conducted. The questionnaire asked faculty primarily responsible for teaching diabetes information to provide estimates of amount of time allotted to didactic content, the location (e.g., inpatient, outpatient) and type of clinical experiences (e.g., pediatric, elderly) to which students were exposed, the probability of students becoming familiar with the role of the interdisciplinary team, faculty interest in obtaining additional diabetes teaching materials, and involvement with ADA. Subjects were secured by mailing the questionnaire to a list of associate (ADN) and baccalaureate (BSN) schools of nursing accredited by the National League for Nursing (1,2). Alternate selection of programs from the listing resulted in a survey of 481 programs (ADN 233, BSN 248). A return rate of 52% (ADN 130, BSN 124) was achieved.

BSN programs tended to allot more time to each specific content area than did ADN programs, although the differences were not significant. In general, both BSN and ADN nursing programs tended to allot the largest amount of didactic time to pathophysiology of diabetes (5 h 54 min), followed by the therapeutic regimen (4 h 6 min) and education/psychology (3 h 24 min). In examining specific topic areas, diabetes physiology received the most didactic time (90 min), whereas exercise, patient adherence, and foot care received the least time (~30 min each). Topics most frequently omitted from nursing program curricula included cultural influences (22%) and research advances in diabetes (16%). Patient adherence, aging issues, and intensive insulin therapy were also omitted by ~10% of all programs.

Twenty percent ( $n = 48$ ) of faculty reported that students had 0–8 h of clinical experience with diabetic patients during their nursing education. Twenty-seven percent reported that students received <24 h of diabetes clinical experience, whereas 53% received >24 h of exposure to diabetic patients. In half of the programs, students definitely provided nursing care to patients with diabetic complications (51.4%) and completed case studies and care plans (50%) by program conclusion. Participation in diabetes patient education was assured in only 35% of the programs. It was unlikely that students would participate in interdisciplinary patient conferences (69%), refer patients to community diabetes education programs (46%), or care for newly diagnosed patients (41%).

Most clinical experiences occurred in the inpatient setting (67%), whereas community and outpatient settings were less frequently used (17 and 9%, respectively). Most patients for whom students provided care were >65 yr of age (44%), whereas <11% of patients were <18 yr of age. When ADN and BSN programs