

Preparing Students With Diabetes for Life at College

DAVID C. MELLINGER, MD

Editor's comment: Although few student health physicians at colleges probably read Diabetes Care, many of our readers care for the type 1 diabetic adolescent who matriculates into college. These practical words of wisdom from a physician who cares for these students during their college tenure should prove helpful while we counsel our young patients for their next (diabetes) challenges.

Each fall, ~2.3 million freshmen enroll in institutes of higher education in the U.S. (1). Of these, ~7,700 will have type 1 diabetes, based on an estimated prevalence rate of 1 of every 300 (2). As with all chronic illnesses, ongoing issues will certainly arise during the time of their enrollment, so providers need to be able to respond to some of the unique health care and educational needs of students affected by diabetes. This article will provide an overview of some of the situations that students face as they adjust to life at college. To help organize the material, the content that follows is broken down into things to do before matriculation, items to consider once on campus, and some ongoing issues regarding diabetes care while at college.

Before matriculation

Ideally, students with diabetes should meet with their primary care provider or endocrinologist before matriculating at an institute of higher education. Such a meeting enables the clinician to review all aspects of the student's medical care (3) and to educate the student about some issues that they may not have already considered. Before leaving the prematriculation visit, the student should have a clear

understanding of what relationship they will maintain with their home clinician's office and should ask for copies of their medical records to take with them. Ideally, the student and the clinician should contact the college's health facility to set up an introductory appointment for the student once they arrive on campus. Direct contact with the student health facility will also provide information regarding the level of service that can be provided so the student's health care status is optimized.

Before leaving for college, students need to ensure that they have all of the supplies needed to manage their diabetes while at school. Although most remember to take their blood glucose meter, monitoring strips, alcohol wipes, insulin syringes (or pump), and insulin, many will forget items that they can easily find at home (e.g., sharps container) or may not have considered (e.g., urine ketone test strips). Other items to pack include ready sources of glucose (such as small cans of juice and glucose tablets), glucose gel, Medic Alert identification, a copy of important contact phone numbers, and their insurance card. In addition, it is a good idea to assemble a medicine kit for use during times of illness. Such a kit should include a thermometer, nonperishable bland foods and liquids (such as Jell-O, Saltines, broth-based soups, juice, and sugar-free beverages), ketone strips, approved over-the-counter medications (including sugar-free cough drops, etc.), and a copy of their sick-day plan. It is also advisable to have more supplies than anticipated since accidents (such as dropping insulin vials) are not uncommon.

Students need to be reminded that their college dormitory will be quite different from their home environment; there may not always be a well-stocked refrigerator or a parent who can quickly go and get needed items.

The monetary costs associated with caring for someone with diabetes are quite large. If a student follows routine published guidelines for the management of their diabetes (3), the costs each month for diabetes supplies and scheduled health care would total at least \$270 (Table 1). Fortunately, many young adults with diabetes have health care insurance, which can substantially reduce its financial impact. But even with health insurance, the out-of-pocket expense can be significant (4). It is imperative that students review their own health insurance status before enrollment to see how their new status as a college student might have an effect. Many students can continue on their parent's health insurance policy until 25 years of age, as long as they are enrolled at an institution of higher education. Many policies, however, have a minimum credit hour requirement that must be met in order for the student to continue to have health care coverage. In addition, if the student were to marry, most policies will terminate them from their parents' policy, necessitating the search for their own insurance coverage.

A second issue that the student may not have faced before is what coverage is provided to them while they are away at school, outside of their local area. This is particularly important for students who are enrolled in health management organizations (HMOs) that may only provide emergency out-of-area coverage. Even if the college health service can provide routine and some emergency care, insurance companies might not cover prescriptions written by college health clinicians who are not considered preferred providers. In these cases, it is best for the student to have a plan for how they will get their supplies and prescriptions while at school, taking into consideration the restrictions that their health insurance provider might place on them. Many pharmacies, particularly national chains,

From University Health Services, University of Wisconsin Medical School, Madison, Wisconsin.

Address correspondence and reprint requests to David C. Mellinger, Assistant Professor, Department of Pediatrics, University Health Services, University of Wisconsin Medical School, University of Wisconsin-Madison, 1552 University Ave., Madison, WI 53726. E-mail: dcmellin@wisc.edu.

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A table elsewhere in this issue shows conventional and Système International (SI) units and conversion factors for many substances.

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Table 1—Monthly expenses for diabetes care*

Item	Cost (in U.S. \$)
Humalog insulin (1.5 vials)	70
Glargine insulin (1 vial)	40
Meter strips (120)	100
Ketone strips (1 box)	10
Alcohol wipes (200)	3
Syringes (100)	22
Ophthalmologist visit (prorated)†	15
Miscellaneous (glucose tablets, glucagons, etc.)	10
Total	270

*Prices from UHS Pharmacy, Madison, Wisconsin, as of 2003; †1/12 of cost of annual ophthalmology visit.

are willing to mail needed prescriptions and supplies anywhere in the U.S. at no charge. If this is not an option, family members might mail the items to the student themselves.

Another issue to consider before going to college is financial aid. It behooves the student to contact local resources and their educational institution to see whether any scholarship money might be available to them. At times, a benefactor may set up a scholarship fund at a college or in a local community for someone with a specific diagnosis such as diabetes. These scholarships may not be advertised and may go unused during the years that no one applies for them. Usually, but not always, such scholarships are for people with demonstrated financial need. Students applying for financial aid should list out-of-pocket expenses for their health care on their application for financial assistance. In cases where students are either uninsured or carry high deductibles, these expenses can be considerable. Finally, in regard to economic assistance, students might qualify for hardship programs run by most pharmaceutical companies. Such programs provide medications and/or supplies free or at greatly reduced cost to people who qualify by earning less than a certain amount each year. These programs are particularly applicable for older returning college students, graduate students, and others who are not financially dependent on their families.

The final critical element for students to review before going to college is their insulin regimen. College students' lives are often highly unpredictable, and they can have immensely varying daily schedules. On some days, students may need to

get up early to attend an 8:00 A.M. class, while on the weekend they may choose to sleep in, waking well after noon. Regular meal times are almost impossible and late-night snacks are usually not planned. Because of the variability from day to day, the insulin plan chosen by each student must allow for a great deal of flexibility. The two regimens which best fit into the college lifestyle are 1) the use of a very long-acting insulin (such as ultralente or glargine) (5) combined with a rapid-onset, short-acting insulin (e.g., lispro) (6) and 2) the use of continuous insulin infusion via an insulin pump. Ideally the student should be on such a regimen for a few months before coming to college so that they are comfortable with adjustments that may need to be made under various circumstances. If a student has excellent glucose control ($HbA_{1c} < 7\%$) on another, less flexible regimen, they may be unmotivated to change their insulin before coming to college. In this circumstance, a discussion about the options should still take place, and the student should be encouraged to consider switching if they discover that maintaining good glucose control on their regimen is difficult once they get to college.

After arrival at school

Once at school, one of the first things diabetic college students face is deciding who and what to tell others about their diabetes. At the least, it is highly recommended that they tell their roommate(s) and, if in a residence hall, their hall advisor. The talk should include a discussion about what diabetes is, hopefully dispelling any misconceptions that others might have, and that the student with diabetes plans on participating fully in the college

experience. It might be helpful to show the roommate(s) some of the supplies that are used, perhaps even providing the chance for them to test their own blood glucose and/or inject themselves with an empty syringe. As part of the interaction, there should be a discussion about the dangers of hypoglycemia and how to recognize it. The roommate(s) should also be instructed in what to do in case the student with diabetes becomes confused or unarouseable. At the very least, most roommates should be expected to call 911 and administer glucose gel when waiting for the arrival of medical personnel. If the roommate has a significant relationship with the student (e.g., long-time friends), they might be willing to administer glucagon as well. In such a situation, the roommate needs to be trained on how to administer glucagon and should know where it is kept.

As the need arises, the student may wish to tell others about their diabetes. Coaches and fraternities/sororities will probably need to know so as not to jeopardize the student's health and to assist the student if hypoglycemia occurs. As far as instructional personnel, it is probably only necessary to tell professors if the student needs some accommodation; this would probably be a rare instance.

Because food is an important aspect of diabetes management, it is recommended that the student make an early trip to the cafeteria where he/she plans on eating most of their meals. If not done already, they might ask the food service to post nutritional information, including grams of carbohydrate per serving, next to each entrée that is not already labeled. At a minimum, food service staff should provide the student with access to a document containing this information that they can easily consult. The student should make sure the food selection includes reasonable choices that are compatible with their meal plan. For students who eat out, there are free pamphlets that list all of the entrées available at many of the major fast-food establishments complete with nutritional information to help in meal and insulin planning. Books are also published that contain recipes for students who choose to cook for themselves. As a reminder, students should ensure that they have readily available sources of carbohydrate in their rooms and backpacks for hypoglycemic episodes.

Another federally mandated resource students need to know about is the campus disability center. Protection is afforded to people with diabetes under the Rehabilitation Act and the Americans with Disabilities Act. Although there has been a recent Supreme Court decision that has called into question the Americans with Disabilities Act's protection of people with diabetes, educational institutions are still required to provide reasonable accommodations for students with this disease. As an example, if a professor refused to allow a make-up examination for a student who had a significant hypoglycemic reaction before or during the scheduled testing time, the campus disability center would get involved to protect the student's rights. Fortunately, most instructors will not push an issue this far, but the student should at least know how to access the campus disability center if the need arises.

As mentioned previously, early after a student enrolls at college, he/she should make an appointment to see a clinician at the student health service. At this meeting, there should be time to review all aspects of the student's diabetes management and to educate them about the role the college health facility can play in their diabetes care. Other issues to cover include the following. 1) What services are available to the student and the cost (if any) of these (e.g., laboratory tests such as quarterly HbA_{1c} tests (7), routine sick care, dietitian visits, etc.). 2) How to communicate with the health service about health care issues (e.g., email, phone, and letters) and the type of messages that are best handled by each method of communication. 3) The location of pharmacies in town (including 24-h pharmacies, if available). 4) Where night, weekend, and emergency services are available and how to access them. 5) Information about any support groups found on campus or in the area.

Other topics to consider

Exercise is another important aspect in the management of diabetes and should be strongly encouraged for all patients in whom there are no medical contraindications (8,9). Aside from its beneficial effect on glycemic control, exercise also impacts favorably on other known risk factors for cardiovascular disease that patients with diabetes often have as comorbidities, including lipid abnormalities and hyper-

tension (10). Exercise can also boost self-esteem and improve a student's body image, factors that may be more motivating to college students than any of the previously listed benefits. Practical advice to share with students who engage in exercise includes always having a ready source of glucose available, the importance of adequate hydration, and the need to monitor for hypoglycemia during and after exercise. Concrete guidelines to share with patients with diabetes include the need to avoid exercise if their blood glucose is >250 mg/dl and ketosis is present or if their blood glucose is >300 mg/dl, regardless of whether they are ketotic. In addition, the patient should also consider ingesting carbohydrates if their preexercise glucose level is <100 mg/dl (11).

Because of the ubiquitous presence of alcohol in the lives of college students, a frank conversation about its safe use should be had with all students with diabetes, even those who state that they currently don't drink (12–14). In addition to the negative impact that high-risk drinking has on all college students, people with diabetes have additional concerns associated with alcohol use. Although alcohol can worsen or increase the risk of known diabetes complications (including neuropathy, retinopathy [15], gastrointestinal dysfunction, lipid abnormalities, and impotence), its most immediate impact is related to its effects on glucose metabolism (16). The most dangerous potential complication is that of alcohol-related hypoglycemia, both as a direct and indirect consequence of drinking (17). Alcohol-induced hypoglycemia occurs mainly in patients in the fasted state and is related to alcohol's ability to block gluconeogenesis, thus limiting one of the body's responses to a low blood glucose level. Indirectly, alcohol can impair judgment and cause people to forget to monitor their blood glucose or even eat. Some people with diabetes can also have diminished hypoglycemic awareness as a result of alcohol's effects on the central nervous system (18), which is another factor that can lead to significant consequences associated with a lack of appropriate response to a low blood glucose level. One can imagine a scenario in which a diabetic student's friends feel he/she is intoxicated when in fact that student is displaying the effects of hypoglycemia. If no help is provided, the hypoglycemic student could

progress to seizure, coma, or even death. For these reasons, advice about the safe use of alcohol should be shared with all diabetic patients. Practical suggestions regarding safer alcohol consumption include: 1) limiting alcohol use to 2–3 drinks per day, 2) not drinking on an empty stomach, 3) drinking with someone who recognizes and knows how to treat hypoglycemia, and 4) only drinking when in good metabolic control. One final alcohol-related item for diabetic patients concerns not taking into account the grams of carbohydrate contained in beer and the mixers used in combination with distilled spirits. Having the patient add up the carbohydrate and calorie count of an evening out may be an eye-opening exercise.

Sexual health is another topic that should be covered during an initial meeting with college students with diabetes. Aside from the effects that sexual activity can have on blood glucose levels (many report a decrease of blood glucose with intercourse), students should be educated about other factors in regard to diabetes and sexual health. Male students may have concerns about impotence, either because it is affecting them already or they are worried about the possibility of it in the future. A candid discussion about erectile dysfunction and options for management may provide the student with important information and might serve as a motivator for better blood glucose management. Women should be counseled about effective contraception and the need for excellent glucose control before conception to help prevent pregnancy loss and congenital malformations (19). The idea that pregnancy should be a planned event should be stressed. For women wanting to have children, this knowledge may serve as a motivating factor for tight glucose control and contraception use if sexually active.

Anticipatory guidance about sick-day management is another topic to discuss in an initial visit with students with diabetes (20). Each student should have a sick-day plan, including guidelines for adjusting insulin, the need for additional monitoring of blood glucose levels and ketones, and the need for adequate hydration when they are ill. Giving specific written instructions about when to call the doctor is often helpful because the student may not have had to think about this when they were still living at home. Guidelines

for when to call include incessant vomiting or diarrhea, a temperature that remains above 101°F, moderate or large ketones in the urine, or blood glucose level of <60 mg/dl or one that persistently stays >240 mg/dl. In addition, as previously mentioned, the student should have a sick-day kit with supplies that may be useful on days when they are ill. Finally, in regard to illness prevention, the clinician should remind the student with diabetes that it is recommended that they get a yearly influenza vaccine. A reminder before the yearly vaccine campaign may increase compliance with this highly effective prevention measure.

In conclusion, this article should serve as a starting point for providers who care for students with diabetes. With support, students with diabetes should be able to effectively make the transition to life at college and continue to have success throughout their college careers.

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