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Navigating travel with diabetes

ABSTRACT

As the number of people who travel continues to increase, so too will the number of travelers with diabetes. This increase will come with new and more frequent requests for medical travel advice. This article equips clinicians with the tools to address patient concerns about travel and to empower patients to be prepared for emergency situations both abroad and at home. This includes encouraging patients to obtain a travel letter, bring enough supplies for the trip, and have a plan to manage time-zone changes.

KEY POINTS

Patients should pack all diabetes medications and supplies in a carry-on bag and keep it in their possession at all times.

A travel letter will facilitate easy transfer through security and customs.

Patients should always take more supplies than needed to accommodate changes in travel plans.

If patients will cross multiple time zones during their travel, they will likely need to adjust their medication and food schedules.

TRAVEL, ONCE RESERVED FOR wealthy vacationers and high-level executives, has become a regular experience for many people. The US Travel and Tourism Overview reported that US domestic travel climbed to more than 2.25 billion person-trips in 2017.¹ The US Centers for Disease Control and Prevention (CDC) and the US Travel Association suggest that, based on this frequency and the known rate of diabetes, 17 million people with diabetes travel annually for leisure and 5.6 million for business, and these numbers are expected to increase.²

It stands to reason that as the number of people who travel continues to increase, so too will the number of patients with diabetes seeking medical travel advice. Despite resources available to travelers with diabetes, researchers at the 2016 meeting of the American Diabetes Association noted that only 30% of patients with diabetes who responded to a survey reported being satisfied with the resources available to help them manage their diabetes while traveling.² This article discusses how clinicians can help patients manage their diabetes while traveling, address common travel questions, and prepare patients for emergencies that may arise while traveling.

PRE-TRIP PREPARATION

Provider visit before travel:

Checking the bases

Advise patients to schedule an appointment 4 to 6 weeks before their trip.³ At this appointment, give the patient a healthcare provider travel letter (**Figure 1**) and prescriptions that the patient can hand-carry en route.³ The provider letter should state that the patient has diabetes and should list all supplies the patient needs. The letter should also include specific medications used by the patient and the de-

Dr. Shubrook has disclosed consulting for Eli Lilly, Intarcia Therapeutics, and Novo Nordisk.

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[Patient name], [birthdate] has type 1 diabetes and will travel to the following countries:

She/he uses the following medications:

It is medically necessary for her/him to be allowed to carry these medications on her/his person during travel as she/he needs continuous access to these medications.

This letter is valid for 6 months from the date above.

Sincerely,

Provider name and contact information

Figure 1. Template for a travel letter.

Encourage patients to create a diabetes checklist for their trip

vices that deliver these medications, eg, Humalog insulin and U-100 syringes⁴ to administer insulin, as well as any food and medication allergies.

Prescriptions should be written for patients to use in the event of an emergency during travel. Prescriptions for diabetes medications should be written with generic names to minimize confusion for those traveling internationally. Additionally, all prescriptions should provide enough medication to last throughout the trip.⁴

Advise patients that rules for filling prescriptions may vary between states and countries.³ Also, the strength of insulin may vary between the United States and other countries. Patients should understand that if they fill their insulin prescription in a foreign country, they may need to purchase new syringes to match the insulin dose. For example, if patients use U-100 syringes and purchase U-40 insulin, they will need to buy U-40 syringes or risk taking too little of a dose.

Remind patients that prescriptions are not necessary for all diabetes supplies but are essential for coverage by insurance companies. Blood glucose testing supplies, ketone strips,

and glucose tablets may be purchased in a pharmacy without a prescription. Human insulin may also be purchased over the counter. However, oral medications, glucagon, and analog insulins require a prescription. We suggest that patients who travel have their prescriptions on file at a chain pharmacy rather than an independent one. If they are in the United States, they can go to any branch of the chain pharmacy and easily fill a prescription.

Work with the patient to compile a separate document that details the medication dosing, correction-scale instructions, carbohydrate-to-insulin ratios, and pump settings (basal rates, insulin sensitivity, active insulin time).⁴ Patients who use an insulin pump should record all pump settings in the event that they need to convert to insulin injections during travel.⁴ We suggest that all patients with an insulin pump have an alternate insulin method (eg, pens, vials) and that they carry this with them along with basal insulin in case the pump fails. This level of preparation empowers the patient to assume responsibility for his or her own care if a healthcare provider is not available during travel.

Like all travelers, patients with diabetes should confirm that their immunizations are up to date. Encourage patients to the CDC's page (wwwnc.cdc.gov/travel/) to check the list of vaccines necessary for their region of travel.^{4,5} Many special immunizations can be acquired only from a public health department and not from a clinician's office.

Additionally, depending on the region of travel, prescribing antibiotics or antidiarrheal medications may be necessary to ensure patient safety and comfort. We also recommend that patients with type 1 diabetes obtain a supply of antibiotics and antidiarrheals because they can become sick quickly.

Packing with diabetes: Double is better

Encourage patients to create a checklist of diabetes supplies and medications needed for the duration of their trip (Table 1).⁴

The American Diabetes Association recommends that patients pack at least twice the medication and blood-testing supplies they anticipate needing.³ Reinforce to patients the need to pack all medications and supplies in

their carry-on bag and to keep this bag in their possession at all times to avoid damage, loss, and extreme changes in temperature and air pressure, which can adversely affect the activity and stability of insulin.

Ask patients about the activities they plan to participate in and how many days they will be traveling, and then recommend shoes that will encourage appropriate foot care.⁴ Patients with diabetes should choose comfort over style when selecting footwear. All new shoes should be purchased and “broken in” 2 to 3 weeks before the trip. Alternating shoes decreases the risk of blisters and calluses.⁴

Emergency abroad: Planning to be prepared

It is crucial to counsel patients on how to respond in an emergency.

Encourage patients with diabetes, especially those who use insulin, to obtain a medical identification bracelet, necklace, or in some cases, a tattoo, that states they use insulin and discloses any allergies.³ This ensures that emergency medical personnel will be aware of the patient’s condition when providing care. Also suggest that your patients have emergency contact information available on their person and their cell phone to expedite assistance in an emergency (Table 2).

Urge patients to determine prior to their departure if their health coverage will change once they leave the state or the country. Some insurance companies require patients to go to a specific healthcare system while others regulate the amount of time a patient can be in the hospital before being transferred home. It is important for patients to be aware of these terms in the event of hospitalization.⁴ Travel insurance should be considered for international travel.

■ AIRPORT SECURITY: WHAT TO EXPECT WITH DIABETES

The American Diabetes Association works with the US Transportation Security Administration (TSA) to ensure that passengers with diabetes have access to supplies. Travelers with diabetes are allowed to apply for an optional disability notification card, which discreetly informs officers that the passenger has a condition or device that may affect screening procedures.⁶

TABLE 1

Carry-on checklist for travelers with diabetes

Diabetes medications (insulin, oral medications, other injectables)
If insulin, pack extra syringes and pen needles
If oral medications, pack with prescription in a clear and easily accessible zipper-reclosable plastic bag
Blood-testing supplies
Extra glucose test strips and lancets
Extra glucose meter
Extra batteries or charger for glucose meter
Alcohol swabs
Glucagon
Antinausea drugs, antibiotic ointment
Supplies to treat hypoglycemia, preferably glucose tablets, stored in both check-in and carry-on luggage

TABLE 2

Fast facts in case of emergency

Learn how to say “I have diabetes” and “Sugar or orange juice, please” in the language of the country you plan to visit.

Contact a visitor bureau before travel to receive information about local emergency rooms and pharmacies.

Consult the International Association for Medical Assistance to Travelers to find English-speaking foreign doctors (www.iamat.org, 716-754-4883).

Based on information from the American Diabetes Association and the American Association of Diabetes Educators.

The TSA suggests that, before going through airport screening, patients with diabetes separate their diabetes supplies from their luggage and declare all items.⁶ Including prescription labels for medications and medical devices helps speed up the security process. Advise patients to carry glucose tablets and other solid foods for treating hypoglycemia when passing through airport security checkpoints.⁷

Since 2016, the TSA has allowed all diabetes-related supplies, medications, and equipment, including liquids and devices, through security after they have been screened by the x-ray scanner or by hand.⁷ People with diabetes are allowed to carry insulin and other liquid medications in amounts greater than 3.4 ounces (100 mLs) through airport security checkpoints.

Insulin can pass safely through x-ray scanners, but if patients are concerned, they may request that their insulin be inspected by hand.⁷ Patients must inform airport security of this decision before the screening process begins. A hand inspection may include swabbing for explosives.

Patients with an insulin pump and a continuous glucose monitoring device may feel uncomfortable during x-ray screening and special security screenings. Remind patients that it is TSA policy that patients do not need to disconnect their devices and can request screening by pat-down rather than x-ray scanner.⁶ It is the responsibility of the patient to research whether the pump can pass through x-ray scanners.

All patients have the right to request a pat-down and can opt out of passing through the x-ray scanner.⁶ However, patients need to inform officers about a pump before screening and must understand that the pump may be subject to further inspection. Usually, this additional inspection includes swabbing the patient's hands to check for explosive material and a simple pat-down of the insulin pump.⁷

Patients should pack at least twice as many supplies as they anticipate they will need

■ IN-FLIGHT TIPS

Time zones and insulin dosing

Diabetes management is often based on a 24-hour medication schedule. Travel can disrupt this schedule, making it challenging for patients to determine the appropriate medication adjustments. With some assistance, the patient can determine the best course of action based on the direction of travel and the number of time zones crossed.

According to Chandran and Edelman,⁷ medication adjustments are needed only when the patient is traveling east or west, not north or south. As time zones change, day length changes and, consequently, so does the 24-hour regimen many patients follow. As a general rule, traveling east results in a shortened day, requiring a potential reduction in insulin, while traveling west results in a longer day, possibly requiring an increase in insulin dose.⁷ However, this is a guideline and may not be applicable to all patients.⁷

Advise patients to follow local time to administer medications beginning the morning after arrival.⁷ It is not uncommon, due to changes in meal schedules and dosing, for patients to experience hyperglycemia during travel. They should be prepared to correct this if necessary.

Patients using insulin injections should plan to adjust to the new time zone as soon as possible. If the time change is only 1 or 2 hours, they should take their medications before departure according to their normal home time.⁷ Upon arrival, they should resume their insulin regimen based on the local time.

Westward travel. If the patient is traveling west with a time change of 3 or more hours, additional changes may be necessary. Advise patients to take their insulin according to their normal home time before departure. The change in dosing and schedule will depend largely on current glucose control, time of travel, and availability of food and glucose during travel. Encourage patients to discuss these matters with you in advance of any long travel.

Eastward travel. When the patient is traveling east with a time change greater than 3 hours, the day will be consequently shortened. On the day of travel, patients should take their morning dose according to home time. If they are concerned about hypoglycemia, suggest that they decrease the dose by 10%.⁶ On arrival, they should adhere to the new time zone and base insulin dosing on local time.

Advice for insulin pump users. Patients with an insulin pump need make only minimal changes to their dosing schedule. They should continue their routine of basal and bolus doses and change the time on their insulin pump to local time when they arrive. Insulin pump users should bring insulin and syringes as backup; in the event of pump malfunction, the patient should continue to use the same amount of bolus insulin to correct glucose readings and to cover meals.⁷ As for the basal dose, patients can administer a once-daily injection of long-acting insulin, which can be calculated from their pump or accessed from the list they created as part of their pre-travel preparation.⁷

Advice for patients on oral diabetes medications

If a patient is taking an oral medication, it is less crucial to adhere to a time schedule. In fact, in some cases it may be preferable to skip a dose and risk slight hyperglycemia for a few hours rather than take medication too close in time and risk hypoglycemia.⁷

Remind patients to anticipate a change in their oral medication regimen if they travel farther than 5 time zones.⁷ Encourage patients to research time changes and discuss the necessary changes in medication dosage on the day of travel as well as the specific aspects of their trip. A time-zone converter can be found at www.timeanddate.com.⁸

■ WHAT TO EXPECT WHILE ON LAND

Insulin 101

Storing insulin at the appropriate temperature may be a concern. Insulin should be kept between 40°F and 86°F (4°C–30°C).⁴ Remind patients to carry their insulin with them at all times and to not store it in a car glove compartment or backpack where it can be exposed to excessive sun. The Frio cold pack (Ready-Care, Walnut Creek, CA) is a helpful alternative to refrigeration and can be used to cool insulin when hiking or participating in activities where insulin can overheat. These cooling gel packs are activated when exposed to cold water for 5 to 7 minutes⁵ and are reusable.

Alert patients that insulin names and concentrations may vary among countries. Most insulins are U-100 concentration, which means that for every 1 mL of liquid there are 100 units of insulin. This is the standard insulin concentration used in the United States. There are U-200, U-300, and U-500 insulins as well. In Europe, the standard concentration is U-40 insulin. Syringe sizes are designed to accommodate either U-100 or U-40 insulin. Review these differences with patients and explain the consequences of mixing insulin concentration with syringes of different sizes. **Figure 2** shows how to calculate equivalent doses.

Resort tips: Food, drinks, and excursions

A large component of travel is indulging in local cuisine. Patients with diabetes need to be aware of how different foods can affect their diabetes control. Encourage them to research

Conversion with insulin and syringes

Scenario 1

Patient has U-40 insulin with U-40 syringe.

Patient would take the same dose of insulin they would if they had U-100 insulin and a U-100 syringe.

Thus, if the dosage with U-100 insulin was 30 units, the patient would draw up 30 units with U-40 insulin and syringe.

Scenario 2

Patient has U-40 insulin and U-100 syringe .

Multiply U-100 insulin amount \times 2.5 = number of units of U-40 insulin

For example:

Usual dose of U-100 insulin is 10 units

U-100 syringe available

U-40 insulin available

Calculation:

$10 \times 2.5 = 25$ units

Thus, the patient would take 25 units of U-40 insulin compared with the normal 10 units of U-100 insulin.

Figure 2.

the foods common to the local cuisine. Websites such as Calorie King, MyFitnessPal, Lose it!, and Nutrition Data can help identify the caloric and nutritional makeup of foods.⁹

Advise patients to actively monitor how their blood glucose is affected by new foods by checking blood glucose levels before and after each meal.⁹ Opting for vegetables and protein sources minimizes glucose fluctuations. Remind patients that drinks at resorts may contain more sugar than advertised. Patients should continue to manage their blood glucose by checking levels and by making appropriate insulin adjustments based on the readings. We often advise patients to pack a jar of peanut butter when traveling to ensure a ready source of protein.

Patients who plan to participate in physically challenging activities while travelling should inform all relevant members of the activity staff of their condition. In case of an emergency, hotel staff and guides will be better equipped to help with situations such as hypoglycemia. As noted above, patients should always carry snacks and supplies to

Traveling east shortens the day, so less insulin may be needed; the opposite is true when traveling west

TRAVEL WITH DIABETES

treat hypoglycemia in case no alternative food options are available during an excursion. Also, warn patients to avoid walking barefoot. Water shoes are a good alternative to protect feet from cuts and sores.

Patients should inquire about the safety of high-elevation activities. With many glucose

meters, every 1,000 feet of elevation results in a 1% to 2% underestimation of blood glucose,¹⁰ which could result in an inaccurate reading. If high-altitude activities are planned, advise patients to bring multiple meters to cross-check glucose readings in cases where inaccuracies (due to elevation) are possible. ■

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