Pre-Test

1 True or False? An insulin pump is only to be used by people with type 1 diabetes.

   T   F

2 Insulin pumps are used to:
   a. Replace insulin injection therapy.
   b. Automatically test your blood sugar level.
   c. Replace the need for daily exercise.

3 True or False? Once an insulin pump is attached, it can't ever be removed.

   T   F

4 The “basal rate” refers to:
   a. The dose of insulin given to correct a high blood sugar.
   b. A small, steady flow of insulin delivered by the pump throughout the day.
   c. The finance rate for insulin pumps provided by insurance companies.

5 True or False? The insulin pump is a “closed loop system.”

   T   F
Intended to supplement your curriculum, these talking points cover main themes of the segment to help lead class discussion. They also serve as a review of the pre-test answers.

An insulin pump may be a more effective way to control diabetes for some people because it more closely mimics the insulin production of a pancreas. An insulin pump is a compact, electronic device with an attached infusion set (or tube) that administers a small, steady flow of insulin to a patient throughout the day, known as a “basal rate.” Before eating, a pump user programs the pump to deliver a “bolus” of fast-acting insulin to cover the corresponding rise in blood glucose levels from the meal. Pump flow can also be manually adjusted by a user throughout the day as needed.

Insulin pumps are being used as alternate insulin delivery systems for people using insulin to manage their diabetes. They are small, sleek, and safe machines, about the size of a beeper. Just like a pancreas, an insulin pump releases small, continuous amount of insulin into the bloodstream. In pump terminology, this is known as “basal” insulin. And, just as a pancreas produces insulin quickly to counteract carbohydrate intake, an insulin pump allows its wearer to dial in additional insulin to cover the amount of carbohydrates ingested. This insulin is known as a “bolus” of insulin. However, an insulin pump does not automatically adjust insulin levels in accordance with blood sugars. It is not a “closed loop” system — the pump user must program the pump to deliver insulin to their preferences.

In an insulin pump, most often the insulin is delivered through a thin tube that is connected both to the pump and to the person wearing the pump, through a needle or catheter, placed under the skin. The tubing needs to be changed every 2-3 days, meaning the user only needs to feel a needle that often. Most pump users connect at the abdomen, although others use thighs, hips, upper buttocks, or even arms. The tube can be easily detached for some activities, such as showering, that are easier to do without the pump on. However, some pumps have no tubing and use a wireless PDA to program the desired functions. Many pumps are water resistant, allowing the pump user to stay attached while swimming if desired.

There are many different reasons to choose pump therapy over multiple injection therapy and the following are some of the most important reasons to consider this choice. Talk with your endocrinologist or certified diabetes educator if you think the pump might be right for you.

- **Poor glucose control (high A1c values).**
  At the June 2002 meeting of the American Diabetes Association, three studies demonstrated that pump therapy is the most effective way to maintain tight blood sugar control. If you are struggling to keep your sugars within a healthy range, the continuous flow of insulin that a pump offers may help you regulate your blood sugar control.

- **Frequent and/or nightly hypoglycemia.**
  One of the biggest advantages of insulin pump therapy is that you can adjust your basal rates for different times of the day. You may need more insulin during the evenings, and less while you sleep, or the reverse. By working with your doctor to establish your basal rates, you can avoid taking too much insulin and will never have to worry about insulin “peaks.” These factors help many people avoid frequent lows.
• Desire for a flexible lifestyle (sleeping late, skipping meals, etc.).
  Once basal rates are set correctly, you never have to eat to match your insulin again. If you want to
  skip a meal, you can. If you need to eat dinner at different times because of your work schedule, you
  can. If you need to postpone a meal, you need not rush to eat a snack. Pump therapy allows
  people with diabetes to make the same lifestyle choices as people without diabetes.

• Planned or existing pregnancy.
  Pump therapy is the preferred insulin therapy for women with type 1 who want to get pregnant. A
  pump allows the wearer to easily make the necessary insulin adjustments that the different stages of
  pregnancy require. If a woman is experiencing morning sickness, a pump allows her to give boluses
  based on the amount of food she is able to keep down. The ability to give precise dosing, down to
  fractions of a unit of insulin, also allows her to keep her blood sugars in the very tight range that
  pregnancy demands.

• Better weight management and control with exercise.
  Again, pump therapy means never having to eat to feed your insulin or having to take a snack so
  you don’t get low while working out. Rather, the fine tuning that a pump can allows means that you
  can adjust your basal rates as you take in fewer calories and lose weight, all while maintaining tight
  blood sugar control.

However, pumping is not for everyone. Using an insulin pump requires close monitoring of blood glucose,
  good diabetes record-keeping skills, and comfort with wearing an external device 24/7. Insulin pumping
  may also be a more expensive alternative to injection therapy, depending upon insurance coverage and
  other variables. If you think insulin pumping may be right for you, talk to your doctor to see how you can
  get started.

Pre-Test Answer Key: 1) F; 2) a; 3) F; 4) b; 5) F.

Post-Test Answer Key: 1) poor glucose control, pregnancy, frequent hypoglycemia, etc.; 2) c; 3) F; 4) c; 5) F.
1. Name three reasons that a person with diabetes may choose to use an insulin pump.

2. An insulin pump infusion set should be changed every:
   a. 24 hours.
   b. Two weeks.
   c. 2-3 days.

3. True or False? Every person with diabetes who is using insulin should be using an insulin pump.

4. The amount of insulin given to cover the amount of carbohydrates eaten is called a:
   a. Bandeau.
   b. Basal.
   c. Bolus.

5. True or False? Once you are using an insulin pump, you no longer need to test your blood sugar.
1 Sometimes the biggest hurdle in deciding to use an insulin pump is adjusting to the idea of using a machine to manage insulin. Invite representatives from different pump companies to visit your group and show the ins and outs of insulin pumping. Have your group discuss what they view the pros and cons of pumping to be, and how they can manage these feelings if they decide to pursue pumping.

2 Preparing to start on an insulin pump means getting familiar with carbohydrate counting and keeping good diabetes management records. Have your group develop logbooks that work for their management goals and discuss the importance of noting glucose trends and how they affect medication doses.

Additional Resources

- *Smart Pumping: A Practical Approach to the Insulin Pump.* Howard Wolpert. (Copyright 2005, American Diabetes Association)
