

More wit and wisdom for kids with diabetes
(and their parents)

What You Need to Know About Insulin Pumps

Is there anything you wouldn't do to protect your child from the devastation that diabetes can cause? Of course not. Unfortunately, the question of which tools, medicines, and processes to use for diabetes management can't be answered quite as easily.

So how do you decide how to get the best control? It's tempting to pick the most recently developed, or the most aggressive treatment. And these may be right for your child, or they may not be.

Choosing the right tools and treatment really comes down to this: If it works, it's great. If it doesn't, it's not. Regardless of how old or new it is, regardless of how well it works for someone else, regardless if you spend next to nothing or as much as your budget will allow. The most important thing is finding tools to help your child achieve the best possible control with a method or system that fits

into your lives (not the other way around!).


With that in mind, let's take a look at insulin pumps, so that you and your health care team can determine if a pump will help your child control diabetes.

The Name of the Game is Control

Not that long ago, the medical community had different opinions about what caused diabetes complications. One group believed that blindness, kidney failure, and nerve damage were just part of the disease and completely unavoidable.

Others argued that with good glucose management, complications could be reduced or avoided altogether.

Turns out the control side was right. In 1993, the Diabetes Control and Complications Trial (DCCT) proved




beyond doubt that keeping glucose levels close to those of a person without diabetes can prevent or slow the progress of many complications, giving extra years of healthy, active life.

Think Like A Pancreas

To get the kind of control that reduces complications, a way of treating diabetes was developed—"intensive therapy."

The idea behind intensive therapy is to deliver insulin in a way that's as close as possible to the way a healthy pancreas works. That means providing a low level of insulin at all times (called "basal insulin,") and extra insulin with meals (called "bolus insulin" or, simply, a "bolus.")




Pumps are designed to take care of both the basal and bolus needs of a person with diabetes. Using short-acting insulin, pumps can be programmed to release a small, steady amount of insulin throughout the day and night, and respond to commands the user sends to supply enough insulin to convert food to energy at meal times.


While pumps were once thought of as only for adults and teenagers, research on pumping in younger children has some diabetes care providers moving to pumps for preschoolers and even infants and toddlers.

Insulin Pumps, Outside In

Insulin pumps are computerized devices, about the size of a cell phone or pager. Most pumpers wear their pumps hooked to their belts, or in their pants or shirt pocket.



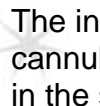
The internal workings of a pump are both simple and amazing. There's a reservoir that looks like a large version of a regular syringe. The reservoir typically holds a two to three day supply of short-acting insulin. (Since pumps supply a constant flow of insulin to the wearer, medium- or long-lasting insulins are not used.)




Just like a regular syringe has a plunger that's pushed to force the insulin out of the syringe, the reservoir has a plunger that's pushed by a small pump, which is why we call this device an insulin pump.

The pump must be told exactly what to do. So, for example, if the wearer's meal plan calls for five units to cover a meal, he or she enters that amount—the bolus-- on the pump's screen. With this command, the exact amount of insulin is pumped into a thin, clear plastic length of tubing that ends in a small tip called a cannula.


The cannula rests just below the skin in the fatty tissue of the pump wearer. The cannula is changed every two or three days-- With the aid of a small needle, the plastic is inserted through the skin into the fatty tissue and is taped in place. In the newer products, the needle is removed and only a soft catheter remains in place.




The insulin bolus empties out of the cannula and is absorbed into the body in the same way insulin injected through a syringe would be.



The place where the tube connects with the cannula is called the infusion set. The wearer can disconnect the






tube from the set for sports, showering, or other short-term activities.

The pump delivers basal insulin (the constant base line) in much the same way. Working with his or her health care team, the pump wearer programs the amount of insulin to be released throughout the day. Unless it's changed manually, the basal program releases the same amount every day.

What an Insulin Pump Is Not

Insulin pumps are not mind readers. Pumps have no extrasensory perceptions. An insulin pump is not an artificial pancreas.



True, these machines do a pretty good job of imitating a pancreas. But unlike a healthy pancreas, pumps can't decide for themselves how much insulin you need or when you need it. That means that the most important part of the pump is the person running it.

Every action a pump makes starts with the user. So everything that's important in managing diabetes with syringes is just as important when wearing a pump. To use a pump you must be willing to check your blood glucose frequently and learn how to make adjustments in insulin, food, and physical activity in response to those results.

As truly remarkable as a pump is, it is not the cure for diabetes. It is simply a different way to deliver insulin. And for some people, it's a better way.

The Upside of Using a Pump

Many people choose an insulin pump because they believe it gives them more flexibility.

The basal-bolus coverage that a pump provides removes the need for long-lasting insulin. While those insulins have worked well for some, they forced people to eat a set amount of food at a certain time of day in order to balance the insulin's peak. Since pumps use only short-acting insulin, the insulin isn't put into the body until it's needed. Which can mean fewer incidents of hypoglycemia.

A pump puts its user in control. Many brands of pumps allow the wearer to set different basal rates for different times of day to match various levels of activity, sleep, or to help deal with the high glucose levels that can happen just before waking.

It may sound odd that a machine that's almost constantly connected to you would provide more freedom, but many pump users believe that's true. In many ways, a pump is self-contained. Injecting at mealtime is a simple matter of pushing a button and letting the pump do the work. That's especially welcome outside the home - in the lunchroom, on dates, or on sleepovers, for example.

But the best thing about insulin pumps is that, for some kids, they simply improve glucose control. Whether it's the advanced technology, the flexibility, or the fact that you're involving the child in their treatment, for some people an insulin pump is the right tool for diabetes management.

The Downside of Pumping

But Insulin pumps aren't for everyone. They're exacting instruments. And

even though manufacturers have worked to make operating them simple, they may be too difficult for younger children.

For kids who are operating pumps themselves, emotional maturity is crucial. For all practical purposes, a pump is worn 24-hours a day, every single day. Being "kinda" committed to pumping isn't enough. In order to get the most from a pump, a child must understand the work involved, and be sold on the idea of wearing a pump.

Insulin pumps cost thousands of dollars. Many insurance providers will pay for at least part of that cost of the pump itself. It's a good idea to talk to your insurance company as soon as you start thinking about a pump for your child. Be sure to ask about coverage and reimbursement for supplies such as infusion sets, tubing, and reservoirs as well as for the pump itself.

Pumps are flexible, but they can be unforgiving. Because pumps use only short acting insulin, any disruption in the flow of insulin for whatever reason - from an empty reservoir to a kinked line or a loose set to low batteries - can cause blood sugars to quickly shoot dangerously high. Manufacturers have built-in alarms to avoid those dangers. But the wearer must be prepared to deal immediately with any trouble.

Most kids - especially teenagers - are concerned with fitting in—acting and looking a certain way. Keep that in mind if you're considering a pump at a time when body image is important. Talk with your son or daughter about how they'll feel about being hooked up to a pump.

Pump Differences

There are several outstanding insulin pumps to choose from. While they all work in a similar way, manufacturers offer unique programming options, battery types, infusion sets, reservoir styles, and warranties.

Here are some items to compare pump-to-pump as you narrow your search.

- Size
- Weight
- Battery life
- Infusion sets
- Number of basal rates available
- Basal range
- Smallest basal possible
- Obstruction alarm
- Over-delivery alarm
- Near-empty alarm
- Warranty
- Special features

What Now?

It's time to talk. Talk to your child's health care team to find out their attitude, experiences, and guidelines for kids and pumps. Here are some questions you might want to bring up.

- What have been your other patients' experiences on the pump?
- What has been your experience with insurance covering the costs of a pump?
- Are there benefits of using a pump over shots?
- How will continuous insulin affect diet and exercise?

- What kind of training will I and my child get?
- How often will blood sugars need to be checked?
- Does it hurt?
- What is involved in switching from shots to a pump?
- How will we determine how much insulin to use with a pump?

Talk to your insurance provider. If the cost of an insulin pump is too high, put your efforts into other intensive therapies, such as a basal-bolus combination of insulins that offers some of the same advantages as an insulin pump.

Most importantly, involve your son or daughter in the decision in a way that's appropriate for their age. They're the ones who'll wear the pump, control the pump, and ultimately determine whether this treatment works or not.

And remember, controlling diabetes is a lifelong challenge. So take your time. Stay open to new possibilities. And keep searching for medicine's best treatment - the one that works for your child.

To Learn More:

- ★ Learn more about insulin, pumps, syringes, and more in our comprehensive annual guide to diabetes products and services—the Diabetes Forecast 2005 Resource Guide. Check it out online at diabetes.org/ResourceGuide. Or become an ADA member and have the Resource Guide delivered straight to your mailbox each January.
- ★ Diabetes Forecast is a monthly magazine published by the ADA for people with diabetes and their

families. It's free to members of the American Diabetes Association. Pick up a copy at your local bookstore, or become an ADA member by calling us at 1-800-DIABETES.

- ★ **Wizdom:** If you don't already have it, request the American Diabetes Association Wizdom[®] kit. They're free to families dealing with diabetes. Get yours by calling us at 1-800-DIABETES (800-342-2383), emailing AskADA@diabetes.org or visiting us at diabetes.org/wizdom.
- ★ This piece is one in a series about kids and diabetes. We have titles about cooking for kids with diabetes, family issues, school, discrimination, and more. Call us at 1-800-DIABETES (800-342-2383) or download them by visiting diabetes.org/pod
- ★ For more information on kids and diabetes, log onto our Web site at diabetes.org/parents.
- ★ Subscribe to our twice-monthly Parents' E-newsletter by visiting us at diabetes.org/enews.
- ★ Questions or comments? Send us an e-mail: AskADA@diabetes.org.