

Pros and cons of pumping

Discussion of the many advantages and disadvantages of insulin pump therapy

Using a pump is not all easy going. Diana Maynard examines some of the pros and cons of insulin pump therapy:

Advantages

- **Flexibility of lifestyle.** You can get up when you want, go to bed when you want, eat when you want. You are no longer tied down by having to do things at set times, or plan things such as exercise in advance. You don't even have to plan a stressful event in advance!
- **Freedom with food.** It is much easier to eat exactly what you want, when you want, because you just bolus as you go. If you're using Humalog, you can look at your plate of food in front of you, gauge the carbs and bolus accordingly. Or even eat first and bolus afterwards. Change your mind and have a second helping? No problem, just take an additional bolus. Buffet meal where you pick at bits throughout the evening? No problem, either increase your basal rate for a couple of hours, or take several small boluses as you go.
- **Reduction of insulin doses.** Unless control has been exceptionally good pre-pump, most people find they need lower doses overall once on the pump, typically about 30–40% less. This is because higher insulin levels create insulin resistance, and therefore improved metabolic control on a pump will generally lower the need for insulin (1, 2).
- **No long-acting insulin.** This is a huge benefit for many pump users. Contrary to popular belief, sometimes long-acting insulins do not get absorbed in a regular, predictable way, so that the level of insulin can peak and fall at unexpected times. The amount of insulin reaching the blood from injection sites can actually vary by as much as 25% from one day to the next (3). Exercise can aggravate the problem as it can cause a large amount of insulin to be absorbed at once. No long-acting insulin is used in the pump, and the basal insulin is only administered in very small doses at a time, thus reducing the likelihood of this uneven absorption. Use of a pump can lower the variation in absorption to about 3% (4).
- **Ease of injecting.** Most people find it easier to press a button than have to fiddle around with injections. Nothing to carry around, and no strange looks from other people.
- **Fewer "injections".** With a pump, you only have to insert a needle (the infusion set) into your body 2 or 3 times a week, rather than 4 or 5 times a day. This is good if you suffer from injection bruises or site atrophy. However, infusion sets can also cause scarring in some people.
- **Better control.** Most people find they can improve their control on the pump, because they have access to fine-tuning mechanisms. For example, insulin is adjustable in very small increments (0.1 units). Also, you can correct high blood sugars as they occur, by taking an additional bolus.
- **Suspending insulin delivery.** In an emergency when you have taken too much insulin, you can suspend the pump and stop additional insulin. If you take too much long-acting insulin, on the other hand, you are stuck with it for the next 12–24 hours.
- **Dawn Syndrome.** Problems such as the Dawn syndrome (where the blood sugar level naturally rises in the early hours of the morning) can be dealt with more easily. Some 50–70% of people suffer from this (1). You can set your pump to give a higher basal rate in the early hours of the morning when the dawn syndrome hits, rather than being forced to adopt procedures such as getting up in the middle of the night to take more insulin, or suffering from nighttime hypos.
- **Hypo awareness.** Anecdotal evidence has shown that some people are able to regain their signs of hypo awareness which they have previously lost, because they can fine-tune their control. The incidence of severe hypos has been shown to be lessened on pump therapy (5). Hypos also tend to be less severe due to the more stable control, or due to the smaller doses of insulin being taken at one time (6).
- **Testing frequency.** Although frequent testing is a necessity when using a pump, anecdotal evidence has shown that some people may find they do not need to test as frequently as before, because their blood sugar levels are more stable.
- **Improved general health.** Improved control can often lead to improved general health, such as fewer colds, infections, improved healing, and improved general well-being.
- It's a **cool gadget!**

Disadvantages

- **Increased risk of DKA.** This is the most commonly cited reason that many doctors have against pumps. There is a potential risk of DKA, since if anything goes wrong, there is no long-acting insulin in your body to tide you over for the next 12–24 hours. Within several hours of not taking insulin, there is no insulin left in your body, and blood sugar levels start to rise. However, it would take a very careless person not to realise this in plenty of time to act. Assuming you carry spare insulin and a syringe with you, and test blood sugar levels frequently (or at least are aware of high blood sugars when they occur) this should not be a problem. Advances in pump therapy have made the risk of DKA less likely (7), and a recent study carried out at Yale showed no significant differences in episodes of DKA in adolescents using pumps and those using MDI (5).
- **Unhealthy eating.** For some people, the pump can lead to unhealthy eating and weight gain, because they now have the freedom to eat what they want, when they want. This is usually only temporary, while the new-found elation lasts.
- **Forgetting boluses.** Anecdotal evidence shows that some people find that the pump makes life so easy, they forget to take boluses etc. Again, this is usually short-lived.
- **Bad sites.** This is one of the most common problems with the pump – infections at the insertion site, or bad sites where absorption is not good. Again, if diligence is used, this should not be a problem. If you get an infection, change the site and treat the infection promptly. Some people are prone to infections, some have no problems at all. In the DCCT trial, a serious skin infection occurred once in every 1200 years of pump use.
- **"Pump bumps".** Some people get scarring or "pump bumps" at the insertion site. Usually the solution is to change the set more frequently, or try a different insulin/infusion set.
- **Set changing.** This can be a nuisance, as it's a lot more fiddly than taking an injection. If a set needs changing in the middle of the night, or at an inconvenient time, this can be annoying.
- **Expense.** Pumps and disposables (infusion sets, etc.) are not cheap, and in the UK are not generally funded by the NHS, though some hospitals or health authorities may be able to help with funding. A pump currently costs from £1000–£2000, and disposables cost around £10–£15 pounds a week.
- **Setting basals.** It can be difficult getting the basal rates set up correctly initially, and readjusting them as the need arises. However, it is usually worth it to get good results.
- **Frequent testing.** Because of the risk of DKA, it is important to test frequently, but if you are concerned enough about your control to use a pump, this shouldn't bother you.
- **Carrying around equipment.** It can be a nuisance to have to carry around spare equipment wherever you go. Most people routinely carry a spare set, insulin, syringe and testing equipment wherever they go, and going away for any length of time may mean taking a lot of equipment.
- **Medical professionals.** Even if your own consultant is happy and confident to have you using a pump, others may be less informed. For example, emergency medical staff may not know how to deal with your pump if you end up in hospital, and as an in-patient they may not be happy for you to remain on the pump while under their care.
- **Dependence.** Some people do not like the idea of being attached to something all the time. Some remedy this by taking short "pump breaks" where they return to injections for a little while.

References

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