As insulin pumps become increasingly popular in the management of type 1 diabetes, health professionals need to understand which patients are suitable for the therapy.

Identifying patients for insulin pump therapy

In this article...

- Why insulin pumps are used to manage diabetes
- Advantages and disadvantages of using insulin pumps
- Care of people who have insulin pump therapy

Continuous subcutaneous insulin infusion (CSII) provides a continuous delivery of rapid-acting insulin, which is programmed into a pump to meet individual requirements and supplemented with bolus doses of insulin as calculated by the user.

The use of insulin pump therapy is governed by National Institute for Health and Clinical Excellence (2008) guidance, which limits it to individuals with type 1 diabetes and highlights the need for specialist teams to initiate and manage CSII. However, as more health professionals are exposed to insulin pump therapy, it is essential they have an understanding of this intensive insulin-management system.

Insulin pumps
An insulin pump is a computerised portable external insulin delivery device that is about the size of a small pager. The pump itself is attached to the user by an infusion set, which is connected to a subcutaneous cannula or via “patch pump technology” and inserted by the user into subcutaneous tissue. Key infusion sites include: abdomen; upper, outer buttocks; loin areas and the legs (Walsh and Roberts, 2006). The pump itself can be secured to the user in a variety of ways such as being inserted into a suitable pocket, clipped to a waistband or even tucked into a bra (Walsh and Roberts, 2006).

Insulin delivery
A key difference between multiple daily injections (MDI) and insulin pump therapy is that a CSII does not require any long-acting or intermediate-acting insulin. The pump just requires the use of rapid-acting analogue insulin, such as lispro, glulisine or aspart (Colquitt et al, 2003). Although soluble insulin has been used in insulin pumps, evidence indicates that rapid-acting analogues provide better outcomes with regard to glycosylated haemoglobin (HbA1c) and episodes of hypoglycaemia (Colqitt et al, 2003; Bode et al, 2002).

The pump has a disposable reservoir, which can contain up to 300 units (3ml) of insulin. A plunger slowly and precisely delivers the insulin continually according to a dose-variable, pre-set programme, known as the basal rate. Extra doses of insulin can be given to correct an elevated blood–glucose level or when a rise in glucose is anticipated, for example when the user has consumed carbohydrates. These are known as bolus doses and are delivered in addition to the basal rate by the user, who calculates the dose and manually operates the pump to deliver the insulin.

Insulin delivery via a pump is more precise than MDI but, as with injections, insulin delivered via a pump is still infused into the subcutaneous tissue rather than the portal system as in normal physiology.

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5 key points

1. Continuous subcutaneous insulin infusion (CSII) delivers continuous rapid-acting insulin
2. An insulin pump is a computerised, portable, external device, the size of a small pager
3. The pump is programmed to meet individual requirements, which can be supplemented with bolus insulin doses
4. Insulin pump therapy can be used by people who experience glycaemic instability despite an optimised insulin regimen and those with a high level of self-care in diabetes management
5. NICE only supports the use of insulin pump therapy for people who have type 1 diabetes

Insulin pumps can help improve quality of life for some people with type 1 diabetes.

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