Management of type 1 diabetes

What is the true cost of insulin pump therapy? What do we get for our money?

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The clinical dilemma we all have to deal with on a daily basis is: how do we translate the results of research studies into clinical practice? The conclusions from a restricted research protocol do not always extrapolate to real life. For better or worse we have the National Institute for Health and Clinical Excellence contributing to the decision-making process. Guidance produced by NICE is often contentious and hotly debated. However, I would suggest that, in the case of insulin pump therapy, it has been helpful.

Pump therapy is expensive to set up and run; however it is difficult to put a monetary value on reducing hypoglycaemia rates and a consistent reduction in HbA_{1c} (with the associated reductions in complications). NICE have said that if adequate glucose control cannot be achieved without disabling hypoglycaemia then the individual is entitled to an insulin pump. The argument is rather circular. As early studies did not show significant HbA_{1c} reductions, the main indication is severe or refractory hypoglycaemia. But as we are less likely to see a fall in HbA_{1c} in people with severe hypoglycaemia, future studies using NICE guidance are again unlikely to demonstrate a fall in HbA_{1c}. This is where the paper by Giménez and colleagues (summarised alongside) proves helpful. The guidance for pump therapy in Catalonia is similar to that of NICE. The study is relevant because, having followed these guidelines (with, perhaps some rule bending!) the results have shown significant reductions in HbA_{1c}. The main limitation of the study is that it is not controlled, but it will provide useful ammunition when the guidelines are reviewed.

Pump therapy is not simply about providing a more physiological method of insulin delivery. With an understanding of this, the selection of people for pumps and pumps for people is becoming more sophisticated. This will need to be reflected in future national guidance.

DIABETES CARE

Driving during hypoglycaemia

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓

1 It is important that people with diabetes decide not to drive when they are hypoglycaemic. This study investigated the relationship between driving and hypoglycaemia awareness.

2 Three different groups of participants were studied: those with T1D and a normal awareness of hypoglycaemia (T1 Norm group); people with T1D and impaired awareness of hypoglycaemia (T1 Imp group) and people with T2D and normal awareness of hypoglycaemia (T2 group).

3 They were each asked if they felt hypoglycaemic and whether they would drive during either euglycaemia (5.0mmol/l) or hypoglycaemia (2.7mmol/l).

4 Results were: 4.2% of the T1 Norm group, 42.9% of the T1 Imp group and 25% of the T2 group decided to drive during hypoglycaemia.

5 Better education is required, especially for people with T2D as they made potentially dangerous decisions even though they had a normal awareness of hypoglycaemia.

Stork ADM, van Haeften TW, Veneman TF (2007) The decision not to drive during hypoglycaemia in patients with type 1 and type 2 diabetes according to hypoglycaemia awareness. *Diabetes Care* **30**: 2822–6

DIABETIC MEDICINE

Two-year efficacy of CSII in Spain

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓✓

1 This study set out to determine the efficacy of CSII over 2 years, following the criteria for funding of the Catalan National Health Service.

2 A longitudinal, prospective, observational, single-centre study was conducted. One hundred and fifty-three participants with T1D and who had previously been treated with MDI were identified.

3 The data recorded at baseline were age, gender, duration of diabetes, body mass index (BMI), insulin dose, and indications for CSII.

4 Glycaemic control was assessed by the frequency of hypoglycaemic events and HbA_{1c}. Three different self-reported questionnaires were administered to assess QoL.

5 After 24 months of CSII, HbA_{1c} fell from 7.9±1.3% to 7.3±1.1% ($P \leq 0.001$). Compared with before use of CSII (0.70±0.20%) insulin requirements decreased significantly (0.55±0.21 U/kg body weight, $P \leq 0.001$).

6 Mild and severe hypoglycaemic episodes were significantly reduced *P* value. Diabetic ketoacidosis episodes remained unchanged. The scores from the diabetes QoL questionnaire were significantly improved *P* value.

7 CSII improves QoL and glycaemic control, with fewer hypoglycaemic episodes.

Giménez M, Conget I, Jansà et al (2007) Efficacy of continuous subcutaneous insulin infusion in type 1 diabetes: a 2-year perspective using the established criteria for funding from a National Health Service. *Diabetic Medicine* **24**: 1419–23

DIABETES CARE

Update of risk factors for nephropathy

Readability	✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 Assessment of the risk factors for nephropathy in people with type 1 diabetes, was the main aim of this Germany-based study.

2 Included in the analysis were 27 805 people from the prospective German Diabetes Documentation System survey.

3 Baseline characteristics: age at last visit 16.34 years (12.5–22.2), age at diagnosis 9.94 years (interquartile range 5.8–14.3), follow-up time 2.5 years (0.43–5.3).

4 In 26 605 people, there was normal kidney function; in 919 people, microalbuminuria was present; in 78 people, macroalbuminuria was present and in 203 people, end stage renal disease was present.

5 Risk factors for microalbuminuria were diabetes duration ($P<0.0001$), HbA_{1c} ($P<0.0001$), LDL cholesterol ($P<0.0074$), and blood pressure ($P<0.0074$). Childhood diabetes onset was protective ($P<0.0001$).

6 The authors conclude that as well as maintaining control of blood glucose levels, early diagnosis and fast treatment of dyslipidaemia and hypertension is very important for preventing development of nephropathy.

Raile K, Galler A, Hofer S et al (2007) Diabetic nephropathy in 27,805 children, adolescents, and adults with type 1 diabetes: effect of diabetes duration, A1C, hypertension, dyslipidemia, diabetes onset, and sex. *Diabetes Care* **30**: 2523-8.

DIABETES CARE

Causes of pregnancy loss in T1D and T2D

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓

1 This study compared the causes and rates of pregnancy loss in women with T1D or T2D.

2 Prospectively collected data from 1986–2005 on all pregnant women at a centre with a particularly high prevalence of T2D was used.

3 A total of 870 pregnancies in women with known T1D or T2D and 325 pregnancies in women with diabetes disgnosed during pregnancy were analysed.

4 Rate of pregnancy loss was similar in women with T1D and T2D (P=0.39), but the causes differed.

5 In women with T1D losses were mainly attributable to major congenital anomalies or prematurity; in T2D losses were mainly attributable to stillbirths or chorioamnionitis.

6 In conclusion, the main causes of pregnancy loss were different in women with T1D and T2D, and the causes of pregancy loss in women with T2D suggest that other features may be involved.

Cundy T, Gamble G, Neale L et al (2007) Differing causes of pregnancy loss in type 1 and type 2 diabetes. *Diabetes Care* **30**: 2603–7