

## Management of type 1 diabetes

### The importance of the healthcare professional in the management of diabetes



Adrian Scott,  
Consultant Physician  
in Diabetes and  
General Medicine,  
Northern General  
Hospital, Sheffield

At a time when healthcare professionals are faced with economic cuts that may jeopardise the viability of clinical services, it is perhaps appropriate for us all to begin to think how we can justify our existence.

How do you measure the value of a diabetes specialist nurse? Let's face it, it doesn't require a nursing degree to teach someone how to test their blood glucose or use an insulin pen device.

With "self-justification" in mind, O'Hagan et al's (2010; summarised alongside) study is timely. The authors

investigate the influence of the paediatric diabetes specialist nurse (PDSN) on glycaemic control in children and adolescents with type 1 diabetes.

Glycaemic control in children and young adults with type 1 diabetes is notoriously poor, particularly post-puberty. Multicentre observational studies – such as the Hvidovre Study (Danne et al, 2001), the Scottish Study Group for the Care of the Young Diabetic (2001) and a national audit from New Zealand (Scott et al, 2006) – show

significant between-centre differences in the mean HbA<sub>1c</sub> achieved in this age group. These differences are not explained by either deprivation or insulin regimen.

What O'Hagan et al have demonstrated is that the appointment of five PDSNs was associated with improvements in glycaemic control among young people with type 1 diabetes. Though some may question the quality of the tools used to manage type 1 diabetes in this study, what is highlighted

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So what is the message? Collect data on the efficacy of what you do and the value that is added

for people with diabetes. It may be the only way you avoid a P45 ...

Danne T, Mortensen HB, Hougaard P et al (2001) Persistent differences among centers over 3 years in glycemic control and hypoglycemia in a study of 3,805 children and adolescents with type 1 diabetes from the Hvidovre Study Group. *Diabetes Care* **24**: 1342–7

Scott A, Toomath R, Bouchier D et al (2006) First national audit of the outcomes of care in young people with diabetes in New Zealand: high prevalence of nephropathy in Maori and Pacific Islanders. *N Z Med J* **119**: U2015

Scottish Study Group for the Care of the Young Diabetic (2001) Factors influencing glycaemic control in young people with type 1 diabetes in Scotland: a population-based study (DIABAUD2). *Diabetes Care* **24**: 239–44

### DIABETES CARE

#### PDSNs improve glycaemic control in adolescents with T1D

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

- 1 It is unknown whether glycaemic control in children with T1D in Wales is improving.
- 2 The authors of this study sought to determine whether diabetes control has improved and what factors are associated with any improvement.
- 3 Twelve paediatric diabetes centres in Wales supplied routine clinic data collected during a 3-month period in 2001 and again in 2006.
- 4 Five centres appointed a paediatric diabetes specialist nurse (PDSN) after 2001, six centres already had a PDSN and one centre was too small for a PDSN.
- 5 The influence of centre, age-group (all <18 years) and appointment of a PDSN on glycaemic control over time was analysed.
- 6 ANOVA analysis showed differences between the centres ( $P<0.001$ ) and over time ( $P=0.001$ ) and differential change among centres over time ( $P<0.001$ ).
- 7 In the five centres that appointed a PDSN after 2001, HbA<sub>1c</sub> improved compared with HbA<sub>1c</sub> in the centres with no staffing change.
- 8 Glycaemic control was poorest in the older age group (>10 years) compared with children aged 5–9 and <5 years ( $P<0.001$ ); however, children >10 showed the most improvement, perhaps through PDSN support.
- 9 Age ( $P=0.003$ ) and insulin dose ( $P<0.001$ ) were positively and independently associated with HbA<sub>1c</sub>.
- 10 Appointment of PDSNs was linked with improved glycaemic control, especially among adolescents.

O'Hagan M, Harvey JN, Brecon Group (2010) Glycaemic control in children with type 1 diabetes in Wales: Influence of the pediatric diabetes specialist nurse. *Diabetes Care* **33**: 1724–6

### DIABETOLOGIA

#### Coeliac and thyroid antibodies increased in Down's syndrome

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

- 1 Glycaemic control and markers of autoimmune disease in 159 young people with Down's syndrome (DS) and diabetes versus 41 983 people with T1D were investigated.

2 People in the DS and diabetes group had fewer insulin injections per day and used less insulin than those with T1D; however, they had better glycaemic control ( $P<0.01$ ).

3 People with DS and diabetes had an increase in antibodies related to coeliac and thyroid disease; diabetes in young people with DS is more often related to autoimmunity than to insulin resistance.

Rohrer TR, Hennes P, Thon A et al (2010) Down's syndrome in diabetic patients aged <20 years: an analysis of metabolic status, glycaemic control and autoimmunity in comparison with type 1 diabetes. *Diabetologia* **53**: 1070–5

## DIABETIC MEDICINE

### CGM does not differentiate impaired awareness of hypoglycaemia

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

**1** Hypoglycaemia is a common side-effect of T1D treatment; self-management is dependent on recognition of the symptoms in order to prevent progression to severe hypoglycaemia.

**2** Some people with T1D have impaired awareness of hypoglycaemia (IAH), with associated asymptomatic biochemical hypoglycaemia.

**3** The investigators used continuous glucose monitoring (CGM) to determine the frequency of asymptomatic biochemical hypoglycaemia in people with IAH.

**4** The study comprised 74 people with T1D and normal awareness of hypoglycaemia and 21 people with T1D and IAH.

**5** Hypoglycaemia was assessed with a 4-point capillary home blood glucose monitoring (HBGM) device over  $\geq 96$  hours of CGM and self-reporting (severe hypoglycaemia); data were collected over 1 year.

**6** Results were analysed and episodes of biochemical and severe hypoglycaemia determined for both groups.

**7** People with IAH had a 3-fold higher risk of severe hypoglycaemia and a 1.6-fold higher incidence of biochemical hypoglycaemia than those with normal awareness based on weekly HBGM.

**8** CGM (for an average of 5 days) did not show any difference in biochemical hypoglycaemia between people with IAH and those with normal awareness of hypoglycaemia.

Choudhary P, Geddes J, Freeman JV et al (2010) Frequency of biochemical hypoglycaemia in adults with type 1 diabetes with and without impaired awareness of hypoglycaemia: no identifiable differences using continuous glucose monitoring. *Diabet Med* **27**: 666–72

## DIABETES CARE

### Incidence of DKA is higher in children <2 and 10–14 years

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

**1** The authors of this study looked at whether the incidence of diabetic ketoacidosis (DKA) in children newly diagnosed with T1D is affected by age.

**2** Data obtained from the Finnish Pediatric Diabetes Register and paediatric centres in Finland established that 1656 children aged <15 years were diagnosed with T1D over 3 years.

**3** DKA was defined as blood pH <7.3 and severe DKA defined as blood pH <7.1; data for DKA at diagnosis were available for 1616 children.

**4** At diagnosis, 313 children (19.4%) had DKA and 69 children (4.3%) presented with severe DKA.

**5** When considering age at diagnosis, DKA (and severe DKA) was present in 16.5% (3.7%) of children aged 0–4 (notably in 30.1% [7.8%] of children <2 years), 14.8% (3.1%) of children aged 5–9 and 26.4% (5.9%) of children aged 10–14.

**6** Children aged <2 and 10–14 were at most increased risk of DKA.

Hekkala A, Reunanen A, Koski M et al (2010) Age-related differences in the frequency of ketoacidosis at diagnosis of type 1 diabetes in children and adolescents. *Diabetes Care* **33**: 1500–02

## DIABETES CARE

### Improved survival for people with T1D receiving RRT

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

**1** Although the risk of end-stage renal disease (ESRD) in people with T1D continues to decrease, there is limited survival data on people with T1D receiving renal replacement therapy (RRT).

**2** This incident cohort study comprised 1604 people with

T1D and ESRD who had started RRT between 1980 and 2005 and followed-up until death or the end of 2007.

**3** Median survival time of people with T1D increased throughout the study, from 3.6 years in 1980–4, 7.24 years in 1995–9 to >8 years in 2000–5.

**4** After adjustment, the relative risk of death was 77% lower for those who began RRT in 2000–5 compared with in 1980–4.

**5** This increased survival suggests improvements in ESRD treatment, dialysis and management of diabetes.

Haapio M, Helve J, Groop PH et al (2010) Survival of patients with type 1 diabetes receiving renal replacement therapy in 1980–2007. *Diabetes Care* **33**: 1718–23

## DIABETOLOGIA

### Past poor glycaemic control can lead to retinopathy

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

**1** The 9-year Diabetes Control and Complications Trial, comprising 1441 people (aged 13–39 years) with T1D, compared the effects of intensive and conventional glycaemic control (GC) on the development of diabetic complications.

**2** The extended effect of poor GC control on the progression of retinopathy was examined.

**3** Poor HbA<sub>1c</sub> values 2–3 years previously had the greatest relative risk contribution to current progression of retinopathy. Values from 5 years previous had more effect than current GC and values from 8 years previous still had an impact.

**4** The authors concluded that pre-study HbA<sub>1c</sub> had more of an impact on the progression of retinopathy during the first few years than any trial intervention.

Lind M, Odén A, Fahlén M, Eliasson B (2010) The shape of the metabolic memory of HbA<sub>1c</sub>: reanalysing the DCCT with respect to time-dependent effects. *Diabetologia* **53**: 1093–8

**“People with impaired awareness of hypoglycaemia had a 3-fold higher risk of severe hypoglycaemia and a 1.6-fold higher incidence of biochemical hypoglycaemia than those with normal awareness based on weekly home blood glucose monitoring.”**