An intensive education programme for people with type 1 diabetes

In the year 2000, approximately 330,000 people in the UK had been diagnosed with type 1 diabetes (Williams and Pickup, 2000), and this number is growing yearly. It is usually diagnosed in children and young adults although it can occur at any age. The onset of diabetes is usually sudden and results from destruction of the insulin-producing cells of the pancreas leading to a total loss of insulin secretion. Insulin injections and dietary modification are necessary treatments after diagnosis. Some patients find these changes difficult – a case study used in this article illustrates the challenges they face.

**Delivering information** Rebecca Conway is 23 years old and was diagnosed with type 1 diabetes when she was eight. At the time, she felt she could not manage her insulin injections at school, so was prescribed insulin in the morning and evening. She was given a diet sheet outlining suitable foods and specific advice about the amount of carbohydrate-rich foods that she should eat. She was told to avoid sweets and chocolates unless she was hypoglycaemic but she could have a chocolate bar before sport at school. The complications of diabetes were explained to her and her parents.

When Rebecca was diagnosed with diabetes the advice given stressed that regular habits would help to control her blood-glucose levels. She was advised to take set doses of insulin at certain times each day. Dietary advice promoted regular meals based on similar quantities of starchy carbohydrate-rich foods, the avoidance of foods high in sugar and fat, and the taking of extra foods high in carbohydrates before exercise.

This advice aimed to maintain stable glycaemic control and avoid hyperglycaemia (high blood glucose) or hypoglycaemia (low blood glucose).

**Monitoring blood-glucose levels** When 13, Rebecca was invited to a friend’s birthday party and told she could eat everything except the chocolate biscuits and birthday cake. She was upset by this but filled up on extra sandwiches, crisps, and sausage rolls. When she returned home her blood glucose measured 18 mmol/L and she couldn’t understand how this had happened.

Diabetes is associated with an increased risk of cardiovascular disease and damage to the kidneys (nephropathy), eyes (retinopathy) and nerves (neuropathy). There is now unequivocal evidence from long-term trials that tight glycaemic control reduces these risks (Diabetes Control and Complications Trial (DCCT) Research Group, 1993). The DCCT (1993) first showed the benefits of tight glycaemic control for people with type 1 diabetes, but few people seem able to achieve this degree of control in clinical practice (Fitzsimmons et al, 2002). The DCCT suggested that to improve long-term outcomes, regular blood-glucose tests were needed with the aim of achieving levels of approximately 4–7 mmol/L before meals and HbA1c levels of six per cent.

Specific advice was given to the intervention group in the trial that recommended dietary change, insulin adjustment, increasing levels of physical activity, and blood-glucose monitoring. Seven years after the trial ended, despite intensive advice and support HbA1c levels have risen again in the intervention group (DCCT Research Group, 2002). This may be due to:

- Increased risk of hypoglycaemia;
- Unacceptable dietary restriction;
- Impairment of quality of life;
- Lack of health care resources.

**Difficulty in controlling diabetes** During her teens, Rebecca continued to eat regular meals and snacks, and was concerned by a gradual gain in weight. She tried to reduce her food intake but became hypoglycaemic. She joined a gym and began exercising three times a week. She found this difficult as she had to eat more before exercising or she became hypoglycaemic during or shortly after exercise. As a result, her insulin was changed to a basal bolus regime of one injection of long-acting insulin at bedtime and three injections of short-acting insulin before meals. Rebecca continued to have difficulty with her diabetes.

The challenge for diabetes teams is to develop a system of health care for people with type 1 diabetes that improves glycaemic control, minimises the risk of hypoglycaemia, improves quality of life and well-being, and does not place a huge demand on already overstretched health care resources.

**A new approach** Studies of type 1 diabetes have shown there is a significant relationship between the amount of insulin taken before a meal and the total carbohydrate content of the meal (Franz et al, 2002). There have been recent moves towards carbohydrate counting, a system of estimating the total carbohydrate content of each meal or snack and adjusting the pre-meal insulin dose to match (Gillespie et al, 1998).

The only validated programme in the UK supporting this approach is DAFNE – Dose Adjustment for Normal Eating – (DAFNE Study Group, 2002). This training programme teaches self-management skills that...
improve both quality of life and glycaemic control.

Many clinics in the UK do not have the resources to run this intensive programme, yet they are keen to apply the principles of carbohydrate counting and insulin adjustment. As a result, a number of alternative programmes have been designed to facilitate this approach and these services have joined a collaborative group organised by Diabetes UK.

InSight programme In Oxford we have developed a skills training course called the InSight programme. Based on the principle of experiential learning, it is being evaluated before its use in routine clinical practice.

We aimed to develop an interactive course based on partnership between health care professionals and people with diabetes, which focused on developing self-care skills. Our model was based on work by Brackenridge and Swenson (see ‘website’) and on the experience of a clinical psychologist who observed our clinical practice. This approach challenges traditional diabetes education.

Course content The course runs one afternoon a week for four weeks and enables people to develop new skills to estimate insulin doses for the amount and type of carbohydrate they choose to eat. This is known as carbohydrate counting and insulin adjustment (Boxes 1 and 2). The programme was designed to address the concerns of people with type 1 diabetes and to build on experiences gained every week during the course.

Course members were encouraged to use their own experiences and explore their understanding of diabetes to facilitate learning and reflect on things that could be preventing them from achieving good glycaemic control.

Calculating the insulin dose Rebecca heard about the DAFNE programme and contacted us to see if it was available in Oxford. She was invited onto the next InSight programme. During the course she reflected on what had happened several years before at the birthday party and realised that the carbohydrate content of the extra sandwiches, crisps and sausage rolls were higher than that of a small piece of birthday cake, and accounted for her raised blood-glucose levels.

This initiated group discussion about high blood-glucose levels and appropriate food choices. Many members were surprised that they could now eat sugary foods without compromising control if they calculated how much insulin they needed. The group members were surprised at the effect of starchy foods on glycaemic control. They were also able to explore feelings of guilt about eating ‘forbidden’ foods.

During week three, Rebecca realised she could be more flexible in terms of exercise and hypoglycaemia, and could utilise the InSight course’s principles to reduce her insulin dose to prevent hypoglycaemia, rather than just eating more before exercising.

Evaluation of the InSight course We have recently secured funding from Diabetes UK to run the course in three centres over three years. Changes in HbA1c and quality of life will be evaluated. In Oxford we have now run three courses and participants have been asked for subjective evaluation of each session (Table 1). This feedback has been used to refine course content.

Participants were also asked to rank the three most important strategies they had learnt. These were, in order of priority, counting carbohydrates, adjusting insulin, and reading nutritional labels.

TABLE 1. THE 24 PARTICIPANTS’ EVALUATION RESULTS OF THE FOUR COURSE SESSIONS

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<thead>
<tr>
<th>SESSION NUMBER</th>
<th>MEAN SCORE</th>
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<tr>
<td>1</td>
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| BOX 1. THE RESPONSIBILITIES OF PATIENTS WHO ATTEND THE EDUCATION COURSE |

- Attend all four sessions;
- Test their blood-glucose levels at least four times a day;
- Take short-acting insulin with food and longer-acting insulin once a day;
- Keep a detailed food and insulin diary for a month;
- Be prepared to share results and experiences with the rest of the group.

| BOX 2. CONTENT OF THE COURSE |

- Information about carbohydrate counting;
- Assistance to identify insulin requirements for the food they eat;
- Time to update their knowledge about diabetes (for example, hypoglycaemia and exercise);
- Help with decision-making;
- Support through discussion and activities.

| REFERENCES |


| WEBSITE |

The work of Betty Brackenridge and Kris Swenson can be seen at: www.diabetestraining.com