

Local application of CHO counting and insulin dose adjustment

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Introduction

The Dose Adjustment for Normal Eating (DAFNE) course has been shown to be effective at improving glycaemic control in people with type 1 diabetes. We have adapted some of the principles that DAFNE built on to fit the needs of our patients. This article describes the application of carbohydrate counting and insulin dose adjustment in our service. We have used patient feedback to evaluate the programme in its first 4 weeks.

The Dose Adjustment for Normal Eating (DAFNE) educational programme, which teaches people how to adjust their insulin injections to fit their lifestyle, rather than adjusting their lifestyle to a pre-set insulin regimen, has been shown to improve glycaemic control and quality of life in people with type 1 diabetes (DAFNE Study Group, 2002). However, the course is expensive and not easily accessible to everyone. Furthermore, diabetes care needs to take account of the local environment.

We therefore decided to adapt some of the principles that DAFNE built on to develop a programme at our own centre. We have called our programme InSight to signify insight into insulin adjustment, carbohydrate counting, self-advocacy and group support.

Our aims

Our programme was designed to focus on developing new skills for self-care. This includes calculating insulin ratios to facilitate more accurate adjustment of insulin and carbohydrate counting – the skills needed to enable individuals to eat normally and to be more active in decision making.

We wanted to the programme to be separate from the medical model, interactive and based on partnership. InSight was designed to enable patients to set realistic goals for the best possible self-care, i.e. we aimed to prepare people to live successfully with their diabetes. This part of the programme was based on work

by Brackenridge and Swenson (2003).

We feel it is important to help people share their ideas and understanding of diabetes. People often have misconceptions about the disease and these can be barriers to better self-care. Education can be wasted unless these myths are dispelled as they may stand in the way of success. Giving information alone may not change anything, whereas sharing experiences and interaction with others can often help.

The InSight course

The course took place one afternoon a week for 4 weeks. As the course has a strong emphasis on learning from each other and sharing of experiences, we opted for small groups of no more than eight people.

Letters were sent out to people with diabetes at our centre who had expressed an interest in carbohydrate counting and insulin adjustment. The letter explained that we were offering our own course on these topics and invited them to attend. It included details of what the course would involve.

For example, people had to agree to come to all four sessions, and be on a basal bolus regimen with rapid-acting insulin or be willing to change to this regimen. Patients also had to commit to frequent blood glucose monitoring, keeping food diaries and sharing their results. We tried to create an informal, welcoming environment.

The first session (week one) of the programme included 'getting to know each other'. We established the use of first

ARTICLE POINTS

1 The InSight course is based on DAFNE and focuses on developing new skills for self-care.

2 It aims to enhance patients' knowledge of carbohydrate counting and insulin adjustment.

3 A small group of patients was invited to our centre for one afternoon a week for 4 weeks.

4 The group felt confident with all the strategies learned except carbohydrate counting when eating out.

5 Patients judged all four sessions of the course to be helpful.

KEY WORDS

- Type 1 diabetes
- Glycaemic control
- Carbohydrate counting
- Insulin dose adjustment

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Figure 1. Group members using the visual tool.



Figure 2. Group members weighing food.



Figure 3. Group members working out their own insulin ratios.

names, the importance of sharing and the value of being safe and non-judgmental. We also reinforced the need for commitment to the whole programme.

We then started to explore participants' ideas and understanding of diabetes with techniques such as 'learning to think like a pancreas'. This involved using visual tools to introduce the idea of a normal insulin response to food. *Figure 1* shows participants tracking the digestion of a biscuit from entering the stomach to utilisation in the body's cells.

At the end of week one, 'tools for the job' were given out; these included blood glucose monitoring results, food diaries with plenty of space for comments, and weighing scales and calculators. Time was spent reviewing the information gathered, adding more details, and introducing the concept of carbohydrate counting, insulin ratios and correction doses. *Figure 2* shows two of the group practising these new skills.

The third session (week 3) allowed time for reflection and for adjustments before information about eating away from home, alcohol and exercise was introduced.

In the final session (week 4) we continued to use the group's own experiences as a learning exercise and then reviewed participants' knowledge of hypoglycaemic episodes and diabetic ketoacidosis.

Another exercise involved asking participants their views of a printed statement on a card. Statements included:

'I'm doing badly if my HbA_{1c} is over 7%.'

'Cakes, doughnuts and sweets are not allowed.'

'I'm bound to get complications.'

This game engaged the group in discovering and reflecting on things that could be preventing them from achieving good glycaemic control (Brackenridge and Senson, 2003).

Evaluation of InSight

We have only enrolled one group of eight people to date, so our evaluation does not take into account objective measures such as HbA_{1c}, body weight, blood pressure and lipid levels. This information is being collected and will be presented at a later date. Evaluation to date includes subjective measures from course members' comments.

Table 1. Ranking for confidence

Reading nutritional labels	3.7
Adjusting insulin	3.6
Using correction doses	3.6
Counting CHO at home	3.4
Adjusting insulin for exercise	3.1
Counting CHO away from home	2.6

CHO = carbohydrate

Table 2. Overall ranking from most important (1) to least important (8)

1. Carbohydrate counting
2. Adjusting insulin
3. Health professionals who listen
4. Eating what I want to
5. Effects of food on glucose
6. Hypos
7. Meeting other people
8. High glucose and ketones

During each of the four sessions, six topics were covered, and the group was asked to score each topic from 4 (very helpful) to 1 (very unhelpful). Session two seemed to be the most helpful, but all four sessions were judged as helpful or very helpful.

For another part of our evaluation we asked participants how confident they felt in applying the strategies that they had learned during the course. For this we used a similar scoring system, ranging from 4 (very confident) to 1 (very unconfident). *Table 1* shows the mean scores for each strategy that the participants learned. The group felt confident with all the strategies except carbohydrate counting when eating out.

Participants were also asked to rank the strategies they had learned in order of importance, from most important to least important.

- The two most important strategies were counting carbohydrate and adjusting insulin.
- Working with health professionals who listen to what they want to say was ranked third in importance, which suggested that our approach had been successful.
- The least important strategy was high

glucose and ketones. This could reflect the fact that the majority of our group had had diabetes for a number of years and perhaps felt very familiar with dealing with hypoglycaemia and looking for ketosis.

We kept a free text diary where participants could write down what they were thinking or feeling throughout the course.

During weeks one and two, when the focus was on carbohydrate counting and insulin adjustment, one man (who had had diabetes for 30 years) noticed that there was a big difference in weight between cornflakes and Shreddies. He always had the same volume of cereal every morning, but Shreddies weigh two to three times more than cornflakes, so he was having two to three times more carbohydrate when he chose Shreddies. This could explain the differences in his blood glucose levels during the morning.

During week three, when we talked about injection technique, we discovered that one woman, who had had diabetes for 32 years, had never had her injection technique addressed. She found that some guidance made a big difference to her glucose profiles.

We got a lot of positive feedback at week four. There were comments such as: "This is finally making sense and it is working." As two participants said a few weeks after the programme:

"Just to say a big thank you. I thought the course was truly marvellous and there is no doubt my diabetes is much better controlled, something I just couldn't have imagined a few months ago. I feel I can now eat something nice without feeling guilty and keeping control – bliss!"

"Everything is going really well. Thank you all for setting me free after 40 years." ■

Brackenridge B, Swenson K (2003) *Discovering Diabetes*. A program manual for self-care curriculum for type 1 and type 2 diabetes (course). DMTC. Phoenix, Arizona, USA

DAFNE Study Group (2002) Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: dose adjustment for normal eating (DAFNE) randomised controlled trial. *British Medical Journal* 325: 746-51

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PAGE POINTS

1 The group felt confident with all the strategies they had learned except carbohydrate counting when eating out.

2 The two most important strategies that people learned were counting carbohydrate and adjusting insulin.