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

DAFNE Study Group

Abstract

Objectives To evaluate whether a course teaching flexible intensive insulin treatment combining dietary freedom and insulin adjustment can improve both glycaemic control and quality of life in type 1 diabetes.
Design Randomised design with participants either attending training immediately (immediate DAFNE) or acting as waiting list controls and attending "delayed DAFNE" training 6 months later.
Setting Secondary care diabetes clinics in three English health districts.
Participants 169 adults with type 1 diabetes and moderate or poor glycaemic control.
Main outcome measures Glycated haemoglobin (HbA_{1c}), severe hypoglycaemia, impact of diabetes on quality of life (ADDQoL).
Results At 6 months, HbA_{1c} was significantly better in immediate DAFNE patients (mean 8.4%) than in delayed DAFNE patients (9.4%) (t=6.1, $P<0.0001$). The impact of diabetes on dietary freedom was significantly improved in immediate DAFNE patients compared with delayed DAFNE patients (t= – 5.4, $P<0.0001$), as was the impact of diabetes on overall quality of life (t=2.9, $P<0.01$). General wellbeing and treatment satisfaction were also significantly improved, but severe hypoglycaemia, weight, and lipids remained unchanged. Improvements in "present quality of life" did not reach significance at 6 months but were significant by 1 year.
Conclusion Skills training promoting dietary freedom improved quality of life and glycaemic control in people with type 1 diabetes without worsening severe hypoglycaemia or cardiovascular risk. This approach has the potential to enable more people to adopt intensive insulin treatment and is worthy of further investigation.

Introduction

Self management is essential to successful treatment of type 1 diabetes, yet few patients alter their insulin from day to day or achieve the degree of glycaemic control known to be ideal.[1] The diabetes control and complications trial showed the long term benefits of strict glycaemic control.[2] However, the intensive approach used in the trial involved frequent outpatient visits with close supervision of insulin dose adjustment and has not been incorporated into general diabetes practice. The increased risk of severe hypoglycaemia in the diabetes control and complications trial may be unacceptable, and the staffing ratio of around three patients to each healthcare professional is beyond the scope of most healthcare systems.

Other reasons why intensified treatment has not been widely adopted may exist. Clinicians usually propose treatment goals formulated from the medical perspective, focusing on biomedical outcomes, whereas patients are more concerned about the immediate demands of treatment and how to integrate these into daily life.[3] Diabetes and its treatment have a negative impact on quality of life, particularly in terms of dietary restrictions imposed by traditional treatment regimens.[4 5] It has been argued elsewhere that an approach in which intensive insulin management is used to increase dietary freedom is likely to improve quality of life,[6] as well as biomedical outcomes, and may result in its wider adoption.

For over 20 years, a team from Dusseldorf has used a five day structured inpatient training programme in intensive insulin treatment, producing sustained improvements in glycaemic control without increasing severe hypoglycaemia.[7] Participants are taught to match insulin doses to their food choices, while keeping their blood glucose close to normal. In contrast to the diabetes control and complications trial, patients maintain this behaviour with minimal support from healthcare professionals.

We tested this approach in a UK multicentre randomised controlled study, the dose adjustment for normal eating (DAFNE) trial, in which we measured biomedical and psychological outcomes, including quality of life.

Methods

Participants and protocol

We recruited patients attending hospital diabetes clinics in Sheffield, Northumbria, and London. We considered patients to be eligible if they were aged over 18

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P+ *See web extra for details of study group members*

years with clinical features of type 1 diabetes, moderate or poor glycaemic control (HbA_{1c} 7.5-12%), and duration of diabetes of more than two years without advanced complications. Exclusion criteria included inability to understand written and spoken English, severe psychiatric illness, pregnancy, and complete unawareness of hypoglycaemia.

We recruited participants by a single invitation letter sent to all patients identified from clinic registers as fulfilling the eligibility criteria. Respondents were invited to an evening meeting to discuss the DAFNE approach.

After obtaining written informed consent, we randomised volunteers into a waiting list controlled trial, either to attend a five day training course delivered in groups of six to eight participants in each centre (immediate DAFNE) or to continue to receive usual care for six months as controls and then attend a course (delayed DAFNE). We randomised participants by using a computer generated random number list, prepared for each of the three centres. Before recruitment, one researcher in each centre transferred the assignments on to slips of paper and placed them within sealed, opaque envelopes. When provided with lists of names recorded in the order in which participants gave consent, the researchers assigned participants by opening the envelopes in order.

All participants received an explanation of DAFNE principles at enrolment, before courses were held. After participating in a course, patients returned to their usual clinic and, although free to contact the educators for advice, were not offered specific follow up. The local ethics committees of the three hospitals approved the study.

The skills course

An underlying assumption was that type 1 diabetes is an insulin deficiency disorder, best managed by insulin replacement as needed and not by dietary manipulation to match prescribed insulin. The course provided the skills to enable patients to replace insulin by matching it to desired carbohydrate intake on a meal by meal basis. This was taught as a five day (Monday to Friday) outpatient programme using principles of adult education with explicit learning objectives in a group setting. The educators aimed to build confidence and appropriate independence, with patient autonomy as a goal. Participants were intended to acquire the skills and confidence to adjust insulin to suit their lifestyle rather than being told to adapt the timing and content of meals to more fixed doses of insulin. The educational resources and curriculum were translated by the Dusseldorf team in collaboration with the UK educators.

Two or three educators (diabetes specialist nurses and dietitians) taught the course in each centre. Besides preparing the curriculum and teaching materials, the educators attended a training course run by members of the departments of education of the universities of Newcastle and Durham. Appraisers trained in educational inspection visited one course in each centre to ensure that the course was taught to high standards and was similar between centres. Courses were also peer reviewed by educators from other centres. A nurse educator from Dusseldorf observed and reported formally on at least one day of a course in each centre.

Primary outcomes

A central laboratory measured glycated haemoglobin (HbA_{1c}) by using a high performance liquid chromatography, diabetes control and complications trial aligned method (Eurogenetic Tosoh 2.2). The top of the reference range for people without diabetes was 6.1%. Patients recorded severe hypoglycaemic episodes (that is, episodes causing coma or requiring the assistance of another person) in blood glucose monitoring diaries.

We used the audit of diabetes-dependent quality of life (ADDQoL) questionnaire to measure the impact of diabetes on quality of life. This tool produces a diabetes impact rating weighted by importance for 18 potentially applicable domains of life, including dietary freedom.[5] The average weighted impact is a composite score of all applicable domains indicating individualised impact of diabetes on quality of life. Scores for single domains and average weighted impact can range from −9 (maximum negative impact of diabetes) to +9 (maximum positive impact of diabetes). The questionnaire also includes a single item measuring "present quality of life," with scores ranging from −3 (extremely bad) to +3 (excellent).

Secondary outcomes

We measured satisfaction with treatment by using the diabetes treatment satisfaction questionnaire (DTSQ),[8] which includes eight items, six of which form a scale (scored 0-36) in which higher scores indicate greater treatment satisfaction. Two individual items (scored 0-6) measure perceived frequency of hyperglycaemia and hypoglycaemia. Higher scores indicate greater perceived frequency. Psychological wellbeing was measured with the 12-item well-being questionnaire (W-BQ12),[9] which is scored from 0 to 36, with higher scores indicating better general wellbeing.

Weight was measured by using electronic scales. Blood pressure was measured by using a standard mercury sphygmomanometer, with phase 5 denoting diastolic pressure. Each of the three local laboratories used standard methods to measure serum cholesterol, triglycerides, and high density lipoprotein cholesterol. Patients recorded in their diaries the number of insulin injections, total insulin dose, and blood glucose monitoring.

Analysis

The study was powered on the expectation that 120 patients would be evaluated. This had 80% power to detect a difference of 1% in HbA_{1c} (based on 2% standard deviation in both groups; $P < 0.05$ two tailed). Data at each time point are expressed as mean (SD). We compared outcomes at six months by using unpaired *t* tests and 95% confidence intervals. We checked data for normality and transformed skewed variables by using square root, log, and inverse transformations where appropriate.[10] We used a χ^2 test to compare the proportions of patients experiencing severe hypoglycaemia in the two groups at six months and at 12 months. To examine longer term effects of training in the immediate DAFNE group, we also performed paired *t* tests with baseline and 12 month data.

Results

Recruitment

We sent letters of invitation to 1016 addresses, and 423 (42%) forms were returned. Of the 404 patients still living at the address, 299 (74%) expressed interest in the study and 105 declined. Of these 299, 138 attended an evening meeting, of whom 128 (93%) decided to participate; another 41 were recruited without attending a meeting. Recruitment stopped when the all the places on the courses had been booked.

Participant flow and follow up

One hundred and sixty nine patients were randomised, but 27 did not attend a course for reasons such as work commitments (fig 1). These patients did not attend further, so an intention to treat analysis was not possible. Only one person dropped out during a course. One participant in immediate DAFNE was found "dead in bed" six months after the course. One person did not attend the six month assessment, and four people did not attend the 12 month assessment. Thus we analysed data from 140 participants at six months and data from 68 immediate DAFNE participants at 12 months (fig 1). One hundred and thirty six (97%) participants completed questionnaires at baseline and six months; 62 (91% of 68) participants in the immediate DAFNE group completed questionnaires at baseline and 12 months.

Participants' mean age was 40 (SD 9) years, and the mean duration of diabetes was 16.6 (9.6) years. Seventy six (56%) participants were women. Fifty two (37%) participants had retinopathy, 19 (13%) had peripheral neuropathy, and two had nephropathy. No significant differences existed between the two groups at baseline in terms of participants' characteristics or primary or secondary endpoints or between the immediate DAFNE group at baseline and the delayed DAFNE group at six months (that is, immediately pre-course).

Primary endpoints

Table 1 shows the primary outcome data. At six months, HbA_{1c} was significantly improved in the immediate DAFNE group compared with the delayed DAFNE group (clinically important mean improvement of 1%). We found no significant difference in the proportion of the immediate DAFNE group who experienced severe hypoglycaemia compared with the delayed DAFNE group. For the quality of life measures, the immediate DAFNE group showed significant improvements in the negative impact of diabetes on dietary freedom in particular ("freedom to eat as I wish score") and the impact on quality of life in general (average weighted impact score) compared with the delayed DAFNE group.

The qualitative data collected illustrate the personal importance of these improvements to participants.

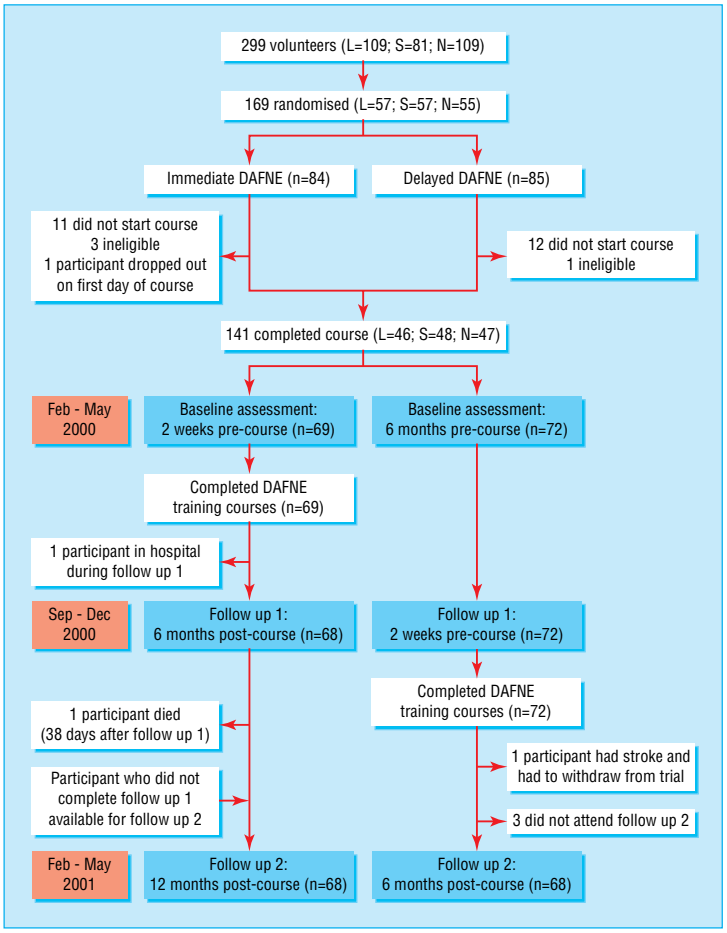

Fig 1 Flow of participants through study (L=London; S=Sheffield; N=Northumbria)

Table 1 Primary outcomes: differences between immediate DAFNE and delayed DAFNE groups at six months. Values are means (standard deviations) unless stated otherwise

Group	Glycated haemoglobin (HbA_{1c}, %)	Proportion of participants experiencing severe hypoglycaemia in previous six months* (No (%))	Audit of diabetes-dependent quality of life (ADDQoL)		
			Weighted impact of diabetes on "freedom to eat as I wish"†	Average weighted impact of diabetes on quality of life†	Present quality of life‡
Immediate DAFNE:					
Baseline	9.4 (1.2)	15/68 (22)	−4.8 (2.9)	−2.0 (1.6)	1.0 (0.9)
Six months	8.4 (1.2)	12/67 (18)	−1.8 (2.3)	−1.6 (1.6)	1.3 (0.9)
Delayed DAFNE:					
Baseline	9.3 (1.1)	8/72 (11)	−4.0 (2.9)	−1.9 (1.3)	1.1 (0.8)
Six months	9.4 (1.3)	11/72 (15)	−4.0 (2.8)	−1.9 (1.4)	1.0 (1.1)
Difference between groups at six months					
Mean (95% CI)	1.0 (0.5 to 1.4)	–	2.2 (1.3 to 3.1)§	0.4 (−0.1 to 0.9)§	0.3 (−0.1 to 0.6)§
Statistical values	t=4.4, P<0.0001	χ^2=0.17, P=0.68	t=−5.4, P<0.0001	t=2.9, P<0.01	t=1.7, P=0.095

*Percent of participants; χ^2 test performed for differences between groups at six months.
†Scored from −9 (maximum negative impact) to +9 (maximum positive impact).
‡Scored from −3 (extremely bad) to +3 (excellent); 0=neither good nor bad, 1=good, 2=very good.
§Confidence interval should be interpreted with caution as variables were transformed before parametric analysis was performed but natural data are reported.

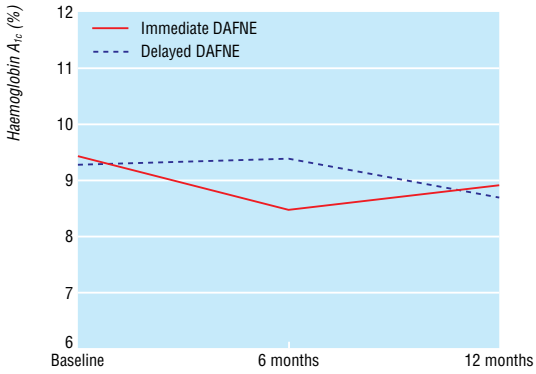

Fig 2 Glycaemic control as measured by glycated haemoglobin (HbA_{1c})

Examples included "I now feel able to travel abroad without worry about not eating or eating on time" (change in average weighted impact score=0.28); "I have found my whole lifestyle and outlook on life has improved" (change=1.08); and "Because I now have better control than ever before I will hopefully cut back on any complications I may have incurred in the future" (change=2.74). The difference in "present quality of life" did not reach significance at six months.

Twelve months after training (assessed only in immediate DAFNE) HbA_{1c} remained significantly improved (fig 2) compared with baseline (mean difference 0.5%, 95% confidence interval 0.2 to −0.9; t=3.5, P=0.001). One quarter (16/67) of participants maintained a fall in HbA_{1c} of >1.5%, and four (6%) showed a rise of >1.5%. The number of participants experiencing severe hypoglycaemia did not increase significantly.

Improvements in the impact of diabetes on dietary freedom were maintained between six and 12 months (fig 3), with highly significant improvements from baseline to 12 months (mean difference −2.7, −3.3 to −2.1; t=10.1, P<0.0001). The impact of diabetes on quality of life in general (average weighted impact score) was further improved (mean difference from baseline to 12 months −0.7, −1.1 to −0.4; t=7.2, P<0.0001) (fig 3). "Present quality of life" also continued to improve and reached significance by one year (mean difference baseline to 12 months −0.5, −0.8 to −0.2; t=3.6, P<0.001) (fig 3).

Secondary outcomes

Table 2 shows the data for the secondary outcomes. We found a significant improvement in psychological well-being and satisfaction with treatment at six months and a significant decrease in perceived frequency of hyperglycaemia. Twelve months after training psychological wellbeing had continued to improve to a mean of 24.7 (mean difference from baseline to 12 months −3.6, −5.0 to −2.2; t=−5.0, P<0.0001). Treatment satisfaction remained significantly higher, with a 12 month mean of 31.0 (mean difference from baseline to 12 months −7.5, −9.1 to −5.9; t=10.8, P<0.0001). Cardiovascular risk factors and perceived frequency of hypoglycaemia did not change significantly in either group across the trial. Mean blood pressure in the immediate DAFNE group was 133 (SD 16)/79 (9.5) mm Hg at baseline and 133 (14)/78 (10) mm Hg at 12 months.

The mean number of injections per day increased in both groups after DAFNE training—from 3.6 at baseline to 5.3 at 12 months (t=10.6, P<0.001) in immediate DAFNE and from 3.5 at baseline to 5.2 at 12 months (t=13.9, P<0.001) in delayed DAFNE. Average insulin dose increased by a small but significant amount in immediate DAFNE at 12 months compared with baseline (from 0.71 to 0.74 U/kg; t=−2.0, P=0.017) but was unchanged in delayed DAFNE (from 0.71 to 0.70 U/kg; t=0.7, P=0.47).

Discussion

Our data show that a structured training course (designed to maintain glucose control while enabling dietary freedom) teaching self management skills to patients with type 1 diabetes was effective over the short term in a British healthcare setting. DAFNE training significantly improved glycated haemoglobin, with no significant increase in severe hypoglycaemia. The training also produced sustained positive effects on quality of life, satisfaction with treatment, and psychological wellbeing, despite an increase in the number of insulin injections and encouragement to increase blood glucose monitoring. Despite increased dietary freedom (as shown by responses to the

Table 2 Secondary outcomes: differences between immediate DAFNE and delayed DAFNE groups at six months. Values are means (SDs) unless stated otherwise

	W-BQ12	Diabetes treatment satisfaction questionnaire (DTSQ)			Cardiovascular risk factors			
			Perceived frequency† of:					
Group	Total wellbeing*	Total satisfaction*	Hyperglycaemia	Hypoglycaemia	Weight (kg)	Total cholesterol (mmol/l)	HDL cholesterol (mmol/l)	Triglycerides (mmol/l)
Immediate DAFNE:								
Baseline	20.94 (5.8)	22.88 (6.2)	3.57 (1.4)	2.04 (1.2)	80.5 (16.7)	5.2 (0.9)	1.5 (0.4)	1.5 (0.9)
6 months	24.34 (5.7)	31.58 (3.9)	2.90 (1.4)	2.16 (1.3)	81.5 (16.9)	5.1 (0.8)	1.6 (0.4)	1.4 (0.7)
Delayed DAFNE:								
Baseline	21.09 (5.8)	23.21 (5.8)	3.60 (1.6)	2.12 (1.4)	77.4 (13.4)	4.9 (0.8)	1.5 (0.5)	1.5 (0.9)
6 months	21.37 (5.5)	22.82 (6.0)	4.03 (1.3)	2.40 (1.3)	77.3 (13.4)	5.0 (1.0)	1.5 (0.3)	1.5 (0.9)
Difference between groups at six months								
Mean (95% CI)	2.98 (1.06 to 4.89)	8.75 (7.02 to 10.48)‡	−1.13 (−1.59 to −0.67)	−0.23 (−0.68 to 0.21)	4.18 (−0.90 to 9.27)	0.15 (−0.16 to 0.45)	0.09 (−0.01 to 0.22)	0.12 (−0.41 to 0.17)
Statistical values	t=3.1, P<0.01	t=−10.3, P<0.0001	t=−4.88, P<0.0001	t=−1.0, P=0.31	t=1.6, P=0.11	t=0.95, P=0.34	t=1.46, P=0.14	t=0.83, P=0.41

HDL=high density lipoprotein; W-BQ12=12-item well-being questionnaire.
*Scored from 0 to 36; a higher score indicates greater wellbeing or satisfaction.
†Scored from 0 to 6; a higher score indicates greater perceived frequency of hyperglycaemia or hypoglycaemia.
‡Confidence interval should be interpreted with caution as variable was transformed before parametric analysis was performed but natural data are reported.

"freedom to eat as I wish" item in the audit of diabetes-dependent quality of life), we observed no deterioration in cardiovascular risk factors. These results are encouraging and suggest that people with established diabetes, when taught appropriate skills, will intensify management of their diabetes and that this can be (and perhaps needs to be) associated with improved quality of life.

As with any randomised controlled trial, a crucial question is how readily the observed effects might be transferred to the wider population of adults with type 1 diabetes. The participants may have been atypical in the impact of diabetes on their quality of life, their dissatisfaction with current treatment, and their willingness to inject insulin five times a day. However, the fact that a third of patients attending routine hospital clinics expressed interest in participating after a single unsolicited advertisement is encouraging. Other studies have shown that current management of diabetes in the United Kingdom leads to negative effects on quality of life comparable to those seen in our participants at baseline, indicating that many patients with type 1 diabetes stand to benefit from a more flexible approach with increased dietary freedom.[4 5] The presentation of the course to patients as a trial may have deterred some, but many patients who are reluctant to participate in research might attend training as part of standard treatment, especially once our findings are known.

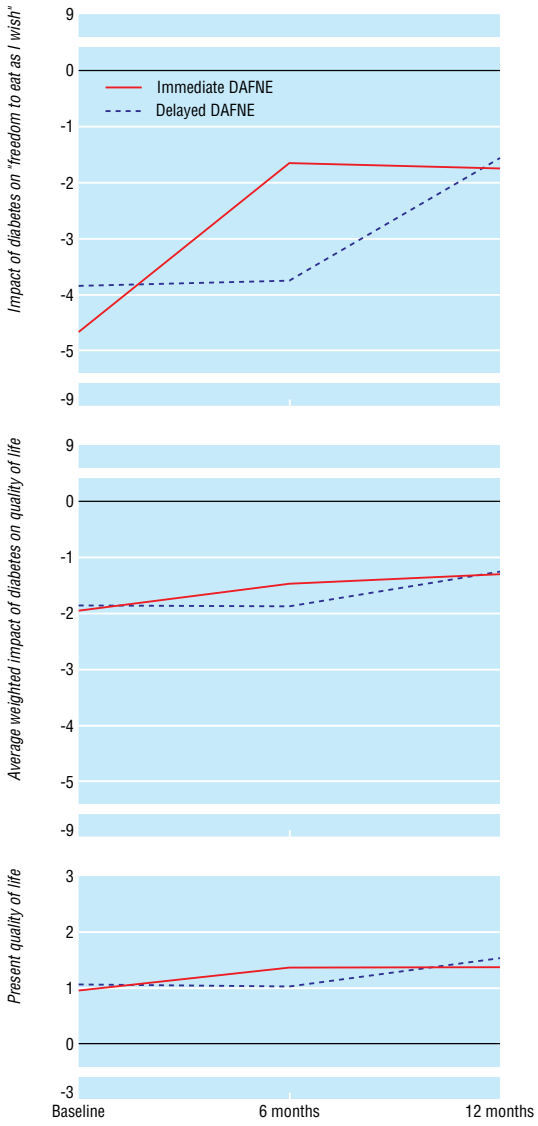

Fig 3 Reported impact of diabetes on "freedom to eat as I wish" (top; n=123), average weighted impact of diabetes on quality of life (middle; n=125), and present quality of life (bottom; n=122)

Many participants had a relatively long duration of diabetes, with well established, albeit imperfect, strategies for coping with the condition. Patients with a shorter duration of diabetes might prove even more receptive to a flexible, intensive approach. DAFNE training, by facilitating a more flexible lifestyle, might also encourage patients with tight glycaemic control (who were excluded from the trial), particularly those experiencing severe hypoglycaemia, to maintain tight glycaemic targets with greater safety and less damage to quality of life.

The fall in HbA_{1c} at the six month analysis was comparable to that reported in similar interventions. The Dusseldorf group reported a lower HbA_{1c} (by 1.5%) one year after training, compared with group teaching of diabetes related information alone,[11] and similar improvements have been maintained for three and six years.[12 13] We did not see this in the immediate DAFNE group at one year; HbA_{1c} rose slightly from the six month value, although it remained statistically and clinically significantly lower than at baseline. The UK participants had a longer duration of diabetes than those in earlier studies and were discharged to a healthcare system unfamiliar with this approach. We avoided proactive follow up by DAFNE educators in order to evaluate the effects of the course alone. We might have expected some deterioration without specific reinforcement or feedback of HbA_{1c}.

As with any complex intervention, it is difficult to know which aspects contributed to its effect. Control participants received only usual care, and it is possible that the benefits were merely the result of patients spending five days intensively focusing on diabetes, receiving attention from enthusiastic educators. However, the diabetes control and complications trial was unable to show any improvements in quality of life,[2] and evidence in type 2 diabetes suggests that improvements in audit of diabetes-dependent quality of life scores and HbA_{1c} cannot be achieved by empowerment alone.[14]

Not everyone with type 1 diabetes will wish to undertake intensive insulin treatment, even without dietary restrictions; some will prefer a simpler regimen with routine meal timing and fewer injections. Such options will still be needed. Nevertheless, as the only way of reducing microvascular disease currently is by maintaining tight glycaemic control, we need better ways of enabling patients to intensify their insulin treatment. This study builds on earlier work and shows that skills training and unrestricted food choices can be applied successfully across different healthcare systems. The follow up of our patients was, however, relatively short. We now need to establish whether similar results can be achieved in routine care and devise ways of sustaining improvement in glycaemic control.

What is already known on this topic

Current treatment of type 1 diabetes fails to engage many patients in intensive self management and is associated with poor glycaemic outcomes and impaired quality of life

An approach to intensive insulin treatment in which participants match insulin dose to unrestricted food choices has been developed in Germany

This approach has been shown to lead to sustained improvements in glycaemic control but has not been widely adopted elsewhere

What this study adds

Training in flexible, intensive insulin treatment can improve glycaemic control in the United Kingdom

This approach also leads to significant improvements in treatment satisfaction, psychological wellbeing, and quality of life measures

Conclusion

We have shown, in a group of volunteers, that skills training in insulin adjustment that provides patients with the ability to fit diabetes into their lives rather than their lives into diabetes improves quality of life and glycaemic control in the short term. The DAFNE approach has the potential to reduce the incidence of microvascular complications and thereby protect quality of life in the long term, as well as the short term, and is worthy of further investigation.

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Contributors: All members of the DAFNE Study Group developed the ideas for the trial, agreed the study design, recruited the patients, delivered the education courses, and collected the data. SA, CB, SH, PJ, S Roberts, and JS were members of the writing committee; they participated in the data analysis and wrote the paper. SH and JS are the guarantors.

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Competing interests: None declared.

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FACT SHEET ONE

What is DAFNE?

DAFNE is a high quality skills-based structured education patient programme in intensive insulin therapy and self management where people with Type 1 diabetes are taught to match their insulin dose to their chosen food intake on a meal by meal basis.

DAFNE provides 38 hours of structured group education and is delivered by specially trained diabetes specialist nurses and dietitians, to groups of between 6 and 8 over a consecutive 5-day period on an outpatient basis.

DAFNE is an evidence-based, evaluated, professionally delivered, quality assured, peer reviewed and audited education package for Type 1 diabetes. DAFNE meets the 5 criteria required to fulfil the NICE requirements, for further information on how DAFNE fulfils the criteria please refer to **Fact Sheet 3.**

DAFNE Mission Statement

Our vision is to improve outcomes for people with Type 1 diabetes through high quality structured education which is embedded in the Health Service.

We will use the DAFNE programme, including the DAFNE Educator Programme (DEP), DAFNE Doctor Programme (DDP), DAFNE Advisor Programme (DAP), Peer Review, Quality Assurance (QA) and audit as a framework in which to develop this patient centred model of care.

We will continue to improve and develop DAFNE through Research and Development (R&D) and collaboration with other groups, to understand the determinants of success.

What are the benefits of the DAFNE service?

DAFNE is a fully evaluated programme that has been proven to work.

DAFNE has a solid evidence base. The programme has been developed over more than 25 years of rigorous research. This includes a randomised control trial in Northern Europe and a feasibility trial and economic analysis here in the UK. Please refer to the **Fact Sheet 2** for further information.

DAFNE is all about quality.

A DAFNE course delivered in one centre follows the same principles and is of the same high standard as that delivered by others in a different centre. To maintain course standards all DAFNE centres subscribe to a quality assurance programme whereby their patient courses are peer reviewed and their anonymised DAFNE patient data is audited.

A recently published article[1] provides further detail about how the DAFNE Collaborative maintain the quality of the DAFNE programme during the roll out to new centres.

There is a web-based DAFNE database where all DAFNE specific data are entered at centre level, to enable audit. The database allows a centre to keep track on how well their patients are faring after DAFNE, and also enables a centre to compare its progress against other DAFNE centres.

The database also sends monthly monitoring reports to each centre detailing patients due for post course data collection within the next 6 months and those that are overdue for data collection. This is currently the only national database of its kind.

The NHS Next Stage Review puts quality at the heart of everything that we do in the NHS, with the need to take an evidence based approach to avoid unnecessary reinvention of the wheel. In 2009 as part of the Quality and Productivity Challenge the 'Establishing the Evidence' project an evidence database was established populated with real examples of the best available, quantified evidence and examples for quality and productivity improvements, provoking ideas and discussions about changes that can be made locally in the NHS. Of more than 200 applications the DAFNE programme was one of only 56 examples of evidence accepted and published as part of the first phase of the database and is currently the only example of evidence for Type 1 diabetes. The DAFNE evidence can be viewed under long-term conditions using the following URL: www.library.nhs.uk/qualityandproductivity

Public spending will come under increasing pressure and from 2011 the Quality and Productivity collection will help the NHS identify efficiency savings that can be made while continuing to deliver high quality care.

Fact Sheet 3 provides further information regarding the DAFNE QA and audit programmes.

[1] Oliver L, Thompson G. The DAFNE Collaborative: Experiences of developing and delivering an evidenced based quality assured programme for people with Type 1 diabetes. Practical Diabetes International 2009; 26 (9); 371-377

Healthcare professionals are trained in the delivery of DAFNE as a key component of quality.

The DAFNE Educator Programme (DEP), DAFNE Advisor Programme (DAP) and DAFNE Doctor Programme (DDP) are structured training programmes for healthcare professionals, with specific curricula and teaching aids. All new educators are assessed to ensure that the quality of the course they deliver is of the expected standard. Only healthcare professionals that have successfully completed the DEP can deliver the 5-day DAFNE course.

There are 8 regional DAFNE Educator Networks which promote the sharing of best practice. Each DAFNE centre is allocated to a local network, which meet twice a year.

Fact Sheets 3 and 4 provide further information about the DAFNE HCP training programmes.

DAFNE course curriculum and teaching aids were specifically developed and are of a high quality.

These are regularly updated to ensure up to date information is being passed onto patients in the most effective way.

Fact Sheet 3 provides further information about the DAFNE curriculum.

DAFNE has a central administration office, offering you full support.

A diabetes unit that offers DAFNE becomes a member of the DAFNE Collaborative and benefits from the national infrastructure and receives the full support of the Central Administration office which is responsible for:

- ✔ Co-ordination of the DEP, DAP and DDP.
- ✔ Running the DAFNE quality assurance programme.
- ✔ Organise audit.
- ✔ Production and distribution of the DAFNE specific resources.
- ✔ Organising DAFNE Educator Networks.
- ✔ Organising DAFNE Collaborative meetings.
- ✔ Providing support to DAFNE centres.
- ✔ Co-ordinating further research within the DAFNE group.

This ensures the quality and sustainability of the national DAFNE programme. Further information regarding Central Administration office can be found in **Fact Sheet 10.**

DAFNE has an established ongoing research programme

The DAFNE Collaborative is committed to the continued improvement and development of DAFNE through Research and Development. The DAFNE programme provides a unique test-bed to conduct research not only to improve Type 1 diabetes management but also to learn more about educational interventions in diabetes and long-term conditions more generally. Further information about current DAFNE research can be found in **Fact Sheet 11.**

What is involved in becoming a DAFNE centre?

Becoming a DAFNE centre involves commitment from the entire diabetes service. After completing a DAFNE course, patients are generally more autonomous and will require a different kind of diabetes service. Any diabetes service offering DAFNE must:

- ✔ Agree to be fully involved with the DAFNE quality assurance and audit system.
- ✔ Ensure all trained Educators maintain their Educator skills by delivering a minimum of one course every 26 weeks.
- ✔ Agree to help in the training of other healthcare professionals.
- ✔ Identify suitable diabetes specialist nurses and diabetes dietitians to train as DAFNE educators via the DAFNE Educator Programme (DEP) and doctors to complete the DAFNE Doctor Programme (DDP).

All DAFNE centres receive a starter pack containing all course materials and a copy of the DAFNE Centre Manual, which provides information on how to set up as a DAFNE centre and automatically become part of the DAFNE Collaborative. The DAFNE Collaborative is responsible for maintaining standards and there will be an option to become involved in further research and development of the DAFNE programme.

All DAFNE centres receive the full support of the Central Administration Office, receive up to date DAFNE course material and resources, information and help in setting up as a DAFNE centre.

What do DAFNE graduates say?

To date more than 15,581 people with Type 1 diabetes have completed a DAFNE course. Feedback from the DAFNE graduates is overwhelmingly positive. A small selection of typical comments can be seen below. Some graduates have written about their experiences of DAFNE and some of these can be found on the DAFNE website www.dafne.uk.com

"…You owe it to yourself to take quality time out to try this education course."

"My bottom line in life is to function and DAFNE gives me that ability. For me, it is not a diabetic treatment initiative, it is my life. It informs my hourly, daily, weekly, monthly, yearly decisions; continually improving my health and my contribution to life. I have lost weight and vastly improved my blood glucose control. Together, DAFNE and I are delivering the best results in diabetic care I've experienced in 25 years."

"The prospect of being relatively free of a 'fixed routine' is a concept that only a diabetic can fully understand, but this is extremely important. As the course progressed I gained confidence that this is now possible."

"I am now doing a new job which I could never have managed before DAFNE."

"Learned more about diabetes in 1 week than I have in the past 20 years."

"Thank-you for making my life so much better. I now know that there is a way to live without fear."

"I actually finished the course feeling empowered - I've taken control of a condition that had previously controlled me."

"The idea of spending 30 or so hours, in one week, with people who could identify directly with the issues of diabetic life management, was an exciting and for me unique prospect."

"An incredibly positive and life changing experience. One of the most frightening and exciting weeks of my life - thanks!"

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FACT SHEET THREE

Meeting the NICE Criteria

DAFNE was uniquely named as an example of high quality structured education in the NICE Technical Appraisal 60.

Subsequently a joint Department of Health and Diabetes UK Working Group developed quality standards for education and set out the key characteristics required to fulfil the NICE requirements. In 2011 NICE published the Diabetes in Adults Quality Standard; the first of the 10 standards being people with diabetes should receive a structured educational programme that fulfils the nationally agreed criteria. This document outlines how DAFNE meets the 5 key criteria.

Further detail on how DAFNE meets the key criteria can be found in the 'Structured Education Toolkit' completed for the DAFNE programme which can be downloaded from our website. In addition the article published in Practical Diabetes International[1], provides a further overview.

[1] Oliver L, Thompson G. The DAFNE Collaborative: Experiences of developing and delivering an evidenced based quality assured programme for people with Type 1 diabetes. Practical Diabetes International 2009; 26 (9); 371-377

Philosophy

The philosophy is the foundation upon which the DAFNE programme is based, it makes explicit the core beliefs, values and attitudes of the members of the DAFNE Collaborative.

The DAFNE philosophy is drawn from Therapeutic Patient Education from which the DAFNE programme was derived and person-centred philosophy that promotes active behaviour change.

The philosophy underpins the content and processes of diabetes care that guides and shapes the DAFNE programme, its delivery and ongoing development.

Structured written curriculum

The DAFNE curriculum is a comprehensive document underpinned by the DAFNE philosophy and those of therapeutic patient education. It is evidence based, with an on-going cycle of revision and audit to ensure reliability, relevance, and validity.

The DAFNE curriculum has been reviewed by:

- ✔ The lead nurse educator from Germany - verifying that the content accurately reflects the German course, which provides part of the DAFNE evidence base.
- ✔ Educationalists from the Universities of Durham and Newcastle upon Tyne for compliance with adult learning principles.
- ✔ All DAFNE Educators using the curriculum - feedback to enable updating as and when required to reflect current practice.

The updating, quality control and distribution of new editions of the curriculum is the responsibility of the Central administration office.

Each session of the curriculum:

- ✔ Sets out the aim and learning objectives of that session.
- ✔ Provides guidance on how the learning objective could be achieved.
- ✔ Lists the resources which help deliver the learning objectives.

DAFNE have developed high quality supporting resources for both the Educators and participants.

Trained Educators

The DAFNE Educator Programme (DEP) is a 7 part programme with its own curriculum and resources.

The DEP consists of over 100 hours of training (including 35 hours structured observation) and includes a full formal assessment of adult learning skills and competency at delivering the DAFNE curriculum to ensure continued quality in the delivery of the DAFNE programme.

The DEP was developed with the expert guidance of Educationalists from the Universities of Durham and Newcastle upon Tyne, and includes all the components necessary for an adult to learn a new skill (e.g. observation, practice, reflection, structured discussion) in the shortest period of time. Further details about the DEP can be found in **Fact Sheet 4.**

The DEP is the only 'train the trainers' course programme for a specific Type 1 structured education programme that includes the assessment of educator competencies.

Quality Assurance

The DAFNE Collaborative has developed a robust quality assurance (QA) programme and associated documentation. The DAFNE QA programme has three elements:

- ✔ Ensuring educator quality:
  - All DAFNE Educators receive a personal Professional Development file upon completion of the DEP, which contains all the documentation to commence the on-going internal element of the QA programme.
  - DAFNE Educator register and certification.
  - Peer review assessment during the DEP including the development of an individual DAFNE Professional Development Plan (PDP).
  - Specially developed training course for experienced DAFNE Educators to train to become DAFNE Peer Reviewers, includes how to complete the assessment documentation and how to provide constructive feedback to DEP trainees.
- ✔ On-going internal QA
  - Peer review observation by local DAFNE colleagues, all sessions to be peer reviewed within a 3 year period.
  - Additional training available on how to observe, complete the necessary paperwork and provide feedback to colleagues as a peer reviewer.
  - Continued professional development

- achieving development outcomes from PDPs and producing new PDPs.
  - All documentation completed and held in the individual's Professional Development file for 3 yearly external audit.
- ✔ External QA as part of the 3-yearly audit: The Auditor:
  - Assesses the implementation of internal QA including the completion of documentation.
  - Observes sessions of a DAFNE patient course to ensure that the DAFNE curriculum is being delivered and to standardise the internal QA process.

Audit

- ✔ The centre submits
  - Information on operational issues surrounding DAFNE (e.g. number of courses, patients trained, venues, recruitment, attendance and drop outs).
  - Outcome data (biomedical, psychological and economic).
  - Centre receives a comprehensive report scoring the outcome from audit and identifies areas for development and improvement.
  - Outcome data from external audits shared with the DAFNE Collaborative at the annual Collaborative meeting.
- ✔ DAFNE audit database.
  - Secure web-based data base accessible by issue of username and password.
  - Anonymised patient data entered at local level.
  - Database sends monthly email reports to each DAFNE centre, listing their patients (anonymised) due for post course data collection within the next 6 months and those over-due for post course data.
  - Enables a centre to check their progress and compare against all DAFNE centres. The DAFNE database is linked to an identical Australian DAFNE database enabling international comparisons to be made.
  - Will automatically generate the outcome data for the 3-yearly audit.
  - Is currently the only database of this nature.

In summary it can be seen that DAFNE meets the requirements to fulfil the NICE guidance in diabetes and Adults Quality Standard with respect to structured education. In addition to being the only programme to be named as an example of high quality programme for Type 1 diabetes in the actual Technical Appraisal 60 document. The National Diabetes Support Team also recognises DAFNE as a programme that meets the criteria.

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DAFNE

FACT SHEET FOUR

Healthcare Professional Training

Educators and Doctors have very different roles with regard to the DAFNE patient course and this is reflected in their respective training needs. The DAFNE Collaborative has developed two distinct training programmes for healthcare professionals – the DAFNE Educator Programme (DEP) and the DAFNE Doctor Programme (DDP).

Both the DEP and DDP were developed with guidance from educational experts and incorporate adult learning principles to train the individuals effectively to function in their role as either a DAFNE Educator or DAFNE Doctor in the shortest time possible. Participants consistently rate the DEP and DDP as very good to excellent.

Questions have been raised about the cost of the DEP and DDP compared to the training provided for other Type 1 programmes. It is important that any comparison of the DEP and DDP with other training programmes is not based purely on the cost, but includes a breakdown of what is included in the cost and the quality of training.

	DEP	**DDP**
Cost (2011-2012)	£2,715* per 2 trainee educators	£285* per trainee Dr
Number of training hours	105	45
Equivalent cost/hour/trainee	£12.93	£6.33
Training materials included in cost	Yes	Yes
Full assessment of educator adult learning competencies	Yes	N/A
Full assessment of competency to deliver specific programme	Yes	N/A

* Costs correct when sent to print

Costs for the DEP and DDP (2011-2012)

It costs £2,715 to train 2 DAFNE Educators and £285 to train a doctor via the DEP and DDP respectively. The fact that educator competencies are assessed and require additional training surrounding adult learning principles and skills is reflected in the difference in costs between the two programmes.

The duration of the DEP and DDP are consistent with expert advice and 8 years experience delivering theses programmes and the evaluation and feedback of the healthcare professionals that have completed the relevant programmes. Both the DEP and DDP effectively train the individuals to function in their respective roles.

Table 1 (previous page) summarises the cost, duration and what is included in both the DEP and DDP so that they can be compared to any other train the trainers programme for a non-DAFNE patient course.

Based on the number of training hours received for the cost of training, it can be seen that both the DEP and DDP are excellent value for money considering:

- ✔ All training materials are included in the cost of both the DEP and DDP.
- ✔ The cost of the DEP includes the quality assurance of the educator standards by the full assessment of educator competencies in adult learning principles and the delivery of the DAFNE curriculum.

The observation course

At 37½ hours, the observation of a full DAFNE course accounts for a significant proportion of the DEP and particularly the DDP. However, feed back from the healthcare professionals that have completed the DEP and DDP over the past 8 years reveal that this is an essential and highly valued part of both programmes.

The observation allows the trainees to go beyond theory into the practicalities of running a DAFNE course. The learning outcomes for the observation week are:

- ✔ Observe the delivery of the DAFNE course curriculum.
- ✔ Know how lesson plans are used to relate to the learning outcomes from the curriculum.
- ✔ Become familiar with the resources used during a DAFNE course, and know the importance of these in achieving the learning outcomes.
- ✔ Understand how adult learning principles are used to achieve a person centred and empowering style.
- ✔ Observe the important individual and group processes and understand what behaviours of the DAFNE Educators can promote or inhibit these.
- ✔ Understand key DAFNE principles of carbohydrate estimation and insulin regime/dose adjustment.

It is not envisaged how a doctor can fulfil his role as a DAFNE doctor or consult with DAFNE patient graduates in a clinical setting and support these individuals to self manage, if he/she has no concept of what the patient has experienced or have an understanding of the DAFNE principles.

Comments about the observation week from DEP and DDP trainees

Educators

- ✔ Valuable and possibly the most useful part of the DEP
- ✔ Enjoyed this very much. Listening to patients and seeing DAFNE "in practice"
- ✔ I enjoyed this and it helped me learn a lot
- ✔ This was excellent
- ✔ Could not have done the course (DEP) without it
- ✔ Motivating, very useful and inspiring week

Doctors

- ✔ Very valuable experience, helped to understand what life with T1DM is all about.
- ✔ Help to challenge/re-evaluate my own practice/fixed ideas.
- ✔ I learnt so much from patients I had been treating for years.
- ✔ Excellent… opportunity for discussion of issues.
- ✔ Doctors should be encouraged to attend the whole week to observe the evolution of the group through elation disappointment and, hopefully, empowerment.
- ✔ I only went for 2 days. It wasn't enough.
- ✔ I would recommend that the doctors do the full 5 days.
- ✔ Hearing patients ideas about diabetes and the problems they face was enlightening.

The DEP

The DEP was developed with expert input from Educationalist from the Universities of Durham and Newcastle-upon-Tyne to train Diabetes Specialist Nurses (DSNs) and Diabetes Specialist Dietitians to deliver the DAFNE patient course curriculum.

Although it is desirable that all DSNs and Dietitians embarking on the DEP possess additional adult learning (AL) qualifications (e.g. C7G 730, ENB 998 or equivalent), a significant number do not. Learning to be an educator is a skill in itself that requires time and practice to master. Therefore training in AL is a significant and essential part of the DEP.

The DEP now consists of 105 hours of structured training including 37½ hours of observation, in addition to around 38 hours of private study and preparation time.

The DEP includes a full assessment of the DEP trainee competence to deliver the DAFNE curriculum using AL principles. In addition the continued professional development of the DAFNE educator is ensured through the development of individual professional development plan (PDP) at the end of the assessment. It is this assessment (quality assurance) aspect of the DEP that is responsible for around 68% of the total costs for DAFNE Educators.

The provision of all training materials is included in the cost of the DEP. Each trainee receives:

- ✔ A copy of the DEP training file, which explores each of the 7 steps of the DEP in full, defining the learning objectives, teaching resources being provided, and expectations for and of the trainee. The DEP file also acts as a training portfolio.
- ✔ A patient course pack including:
  - Patient course handbook
  - Carbohydrate counting booklet
  - Blood glucose monitoring diary
  - DAFNE patient quiz
  - Goal setting sheet
- ✔ A copy of the DAFNE patient course curriculum.
- ✔ Personal DAFNE Professional Development file, which includes all documentation required to commence the ongoing internal quality assurance programme and develop the individual's DAFNE educator skills.
- ✔ An assessment of competencies by peer review.

Summary of the DEP

Step 1 - Orientation (1 hour)

Reading the DEP file.

- ✔ Knowing what is expected and being committed to the process.
- ✔ Agreeing a Learning Contract.

Step 2 - Background reading (3-5 hours)

Key DAFNE papers/relevant references.

- ✔ Know what DAFNE is, and how it is different.
- ✔ Using questions to clarify understanding.

Step 3 - Observe a DAFNE course (37½ hours)

Observe and understand how DAFNE is taught.

- ✔ Complete relevant session observation sheets.
- ✔ Prepare a case study, according to pre-defined guidelines.

Step 4 - Attend a training workshop (22½ hours)

Develop skills and competencies through exercises/discussions.

- ✔ Learn from others.
- ✔ Identify goals/barriers to professional development.
- ✔ Develop a personal plan to prepare for peer supported course.

Step 5 - Preparation (25½ - 32½ hours)

Planning and preparation for first DAFNE patient course.

- ✔ Recruitment and preparation of patients.
- ✔ Personal preparation, familiarisation with the DAFNE curriculum and resources, production of lesson plans and additional resources.

Step 6 - Deliver a week's peer supported DAFNE course (37½ hours)

Learn from experience, with a full assessment of Educator competencies by a trained Peer Reviewer.

- ✔ Benefit from feedback from the DEP Reviewer.
- ✔ Develop a professional development plan.

Step 7 - Follow-up Workshop and DAFNE Collaborative (7½ hours)

Peer learning to develop confidence and identify further needs.

- ✔ Feedback on DEP and Collaborative aims.
- ✔ DAFNE Collaborative: further training opportunities, QA and development.

The DDP

The general role of the doctor is to provide the management and clinical support that enables a diabetes service to:

- ✔ Train in and be able to apply DAFNE principles of diabetes self-management.
- ✔ Incorporate DAFNE into routine service delivery (including crucial administrative support).
- ✔ Support the DAFNE educators in individualising treatment goals and dealing with patient- specific clinical issues in each course.
- ✔ Conduct the Quality Assurance programme.
- ✔ Decide how best to contribute to the DAFNE Collaborative.

More specifically the doctor's level of knowledge will include the following learning outcomes:

- ✔ Know what the core principles and evidence base are for DAFNE.
- ✔ Understand principles and problems in counting carbohydrate equivalents and using algorithms.
- ✔ Be aware of the DAFNE Educators' role, and how to support it.
- ✔ Know the organisational issues (DAFNE Centre Manual) in running DAFNE.
- ✔ Have options for the role of the doctor during a DAFNE course.
- ✔ Have options for how a service follows up DAFNE patients.
- ✔ Have options for DAFNE awareness training for primary and secondary care staff.

The DDP has been designed to achieve the above learning outcomes whilst taking into consideration the variation of local circumstances. The DDP has the following components:

- ✔ Completion of the DEP from Step 1 to Step 3 with some minor amendments:
  - Step 1 - no need to agree a learning contract.
  - Step 2 - no need to read text on educational methods.
  - Step 3 - no need to report on a case study.
- ✔ Attendance at a 1-day workshop which builds on familiarity with the patient course to understand the implications of embedding DAFNE into their service and how best to support and facilitate this.

The DDP consists of 45 hours of training including 37½ hours of observation. All training materials required for the DDP are included in the costs. Each DDP trainee receives:

- ✔ A copy of the DEP training file with supplementary Doctor section, this file also acts as a training portfolio.
- ✔ A patient course pack including:
  - Patient course handbook
  - Carbohydrate counting booklet
  - Blood glucose monitoring diary
  - DAFNE patient quiz
  - Goal setting sheet

All Doctors are required to maintain understanding of the DAFNE insulin regimen and dose adjustment approach by observing a morning dose adjustment session of a course within their service at least once each year. Ideally the observation should take place mid week onwards as this allows theory to have been delivered and patients to be taken a more active role in discussions. This will form part of the assessment of the robustness of the internal QA process during external 3 year audit.

DAFNE Doctors as Educators

If a doctor wants to participate in the introduction and Question and Answer sessions they can do so and only need to complete the DDP.

If a doctor wants to deliver any session from the patient curriculum they must be assessed by a trained Peer Reviewer to ensure they are meeting DAFNE Educator competencies. The following additional training is required, depending upon the number of sessions the doctor plans to deliver.

1. Deliver Annual Review session only

- ✔ Step 1 - Complete the DDP
- ✔ Step 2 - Be successfully assessed, by DEP Reviewer, delivering the annual review session.

Note: additional training costs apply for Step 2 (peer review), provision of a course curriculum and Professional Development file.

If the required competencies are met the doctor will be registered to deliver this session only. The doctor will be provided with a Professional Development file and will be expected to fully participate in their centre's internal QA process and 3 yearly external audit.

If competencies are not met the doctor cannot deliver this session. If the doctor is keen to do so they can take remedial action consisting of:

- ✔ Attendance at day 2 of the next 3-day DEP workshop to cover adult learning principles followed by
- ✔ Re-assessment, by a DEP Reviewer, of the delivery of the session.

Note: additional training costs will be incurred for attendance at the workshop and repeat peer review.

2. Delivery of Annual Review PLUS other sessions.

- ✔ Step 1 – Complete the DDP.
- ✔ Step 2 – Complete day 2 of a 3-day DEP workshop.
- ✔ Step 3 – Be successfully assessed, by DEP Reviewer, delivering all sessions.

Note: additional training costs apply for Steps 2 and 3 above and the provision of a course curriculum and Professional Development file.

If the doctor does not demonstrate the required competencies during peer review they cannot delivery any sessions, although they will be offered further support and remedial training including reassessment if they wish to pursue Educator status, additional costs will apply.

All Doctors are required to maintain understanding of the DAFNE insulin regimen and dose adjustment approach by observing a morning dose adjustment session of a course within their service at least once each year. Ideally the observation should take place mid week onwards as this allows theory to have been delivered and patients to be taken a more active role in discussions. This will form part of the assessment of the robustness of the internal QA process during external 3 year audit.

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DAFNE

FACT SHEET FIVE

Costs (2012/2013)

The cost of introducing DAFNE into a service depends upon a number of variables:

- ✔ The number of educators and doctors to be trained.
- ✔ The number of patient courses the service plans to deliver per year which in turn will affect:
  - The degree of backfill for educators when courses are being delivered.
  - The administrative WTE required.
- ✔ The number of existing DAFNE patient graduates within the service.
- ✔ How the service decides to fund refreshments and lunches for the patients.
- ✔ Where the patient courses will be delivered and whether there will be a cost incurred.

Tables 1 and 2 outline the direct and indirect costs of participation in the DAFNE programme.

Table 1: Costs[1] payable by a Diabetes Service to the DAFNE Project for participation in the DAFNE programme 2012/2013

Activity	Year 1	Year 2	Year 3	Comments
Training - 2 Educators and 1 doctor	£3,000			Training costs only applicable in the 1st year unless the service decide to train additional Educators and/or drs.*
Central Administration	£3,650	£3,650**	£3,650**	Infrastructure and development plus QA and audit. Note amount of contribution years 2 and 3 is subject to change.
Course set up costs per service	£1,107			Food models, DAFNE flipchart etc. 1st year only, unless additional sets or replacements required. Includes patient resources for first 2 courses.
TOTAL	**£7,757**	**£3,650**	**£3,650**	
Patient training materials	Course materials, £4.82/patient Exiting graduates 72p/patient/ annum for replacement monitoring diaries			Expenditure would depend on how many patients would attend DAFNE in each service/annum and number of existing DAFNE graduates.

1 Costs accurate when sent to print, costs are subject to change.

* The cost of training additional Educators and doctors would be:
- £2,360 per Educator training singularly, or £2,715 for 2 Educators being trained together.
- £285 per additional Doctor

** Reviewed on an annual basis and subject to change.

Table 2: Suggested direct and indirect costs for provision of DAFNE programme 2011 - 2012

Activity	Detail	Implications	Suggested cost	Comments
Initial training	Educators x 2	Backfill monies	Educators: Band 6-7 depending on AfC	Educators: Initial taught and structured training takes place over 14 days plus preparation time. (refer to Fact Sheet 9).
	Doctor x1	Backfill monies	Doctor: At service's discretion	Doctor: Taught/structured training takes place over 6 days.
		Travel /accommodation		Courses will be non-residential. However they may not always be within travelling distance for day delegate attendance, requiring overnight accommodation in some cases.
Quality Assurance	All Educators	Deliver minimum of 1 DAFNE course every 26 weeks, and participate in continuous internal QA	See under 'Delivery of DAFNE	
Delivery of DAFNE programme	Educators x 2 (per course), providing a minimum of 1 course every 26 weeks	Backfill – 10 days/ course should be seen as cost saving - group education versus 1:1 consultation.	Band 6-7 depending on AfC	5-day course plus 5 days for preparation and data collection, debriefing and post course follow up and internal QA. Level of backfill required will depend upon number of courses delivered/annum.
		Venue Hire		Use secondary or primary care venues with no cost attached.
	Max 8 patients/course, occasionally accompanied by partners e.g. hypo session	Daily lunch and refreshments, for patients only	Will vary between diabetes services according to local catering costs.	Lunch is an integral part of DAFNE providing patients with the opportunity to practise dose adjustment under the supervision of DAFNE Educators. Depending upon local catering costs lunch may be fully/ partially subsidised / unsubsidised.
		Course stationery	Flip charts, pens, post-its, blue-tac, some food resources (actual food not food models)	Educators to advise. Food models provided via Central DAFNE Administration Office. Some local resources required.
Local administration	Approximately 3 days work per patient course. Will increase as number of graduates within centre increases.	Booking patients on to courses, record keeping; data entry	Band 3 depending on AfC	WTE required will depend upon number of courses delivered/annum.
Incidental expenses	Stationery, telephone postage etc.			

It can be seen that for £7,754 a diabetes service can set up as a DAFNE centre, training 2 educators and 1 doctor, receive all the materials and teaching tools required to deliver the DAFNE patient programme (including sufficient patient resources - handbook, quiz, carbohydrate portion booklet and diaries - for 2 patient courses), become part of the Collaborative and attend the annual Collaborative meeting in addition to receiving the full support of the Central DAFNE Administration office.

Note: The indirect costs of providing DAFNE may be linked to the savings identified by providing DAFNE in preference to some element of the existing diabetes services and the long term savings from reduced complications as identified in the economic evaluation of DAFNE[2].

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[2] C Shearer A, Bagust A, Sanderson D, Heller S, Roberts S. Cost effectiveness of flexible intensive insulin management to enable dietary freedom in people with Type 1 diabetes in the UK. Diabetic Medicine. 2004; 21 (5): 460-7

DAFNE

FACT SHEET SIX

Cost per patient 2012/2013

The economic analysis for DAFNE performed in 2002 by the York Health Economics Consortium (YHEC) and published in 2004[1] calculated the cost per patient as £550. A lay person summary of this published paper is provided later in this Fact Sheet.

However since the analysis was performed many of the DAFNE costs used by YHEC have decreased, i.e:

- ✔ Proposed QA programme was different and more expensive to that now employed.
- ✔ Level of educator and administration backfill is now believed to be less than originally assumed (YHEC also based their calculations on the assumption that the centre would deliver 15 patient courses per year).
- ✔ Educator and admin salaries were based on 13% on-costs; these now vary upon Agenda for Change grade between 21% and 23%.

1 Shearer A, Bagust A, Sanderson D, Heller S, Roberts S. Cost effectiveness of flexible intensive insulin management to enable dietary freedom in people with Type 1 diabetes in the UK. Diabetic Medicine. 2004; 21 (5): 460-7

*Costs correct when sent to print

Recalculated cost per patient based upon the same parameters used by YHEC in their calculation but using 2011/2012 costs*, structure and anticipated backfill, are detailed in the table overleaf.

Lay person summary of YHEC cost effectiveness study

The cost-effectiveness study used modelling techniques to estimate the morbidity, mortality, and economic outcomes of implementing the DAFNE programme.

Methods

Outcomes of standard practice for treating Type 1 diabetes (pre-specified insulin injections) were compared to those of the introduction of the DAFNE programme. Results were estimated over a period of 10 years post-treatment. Based on the UK DAFNE trial, glycated haemoglobin (HbA1c) levels remained constant for standard care, whereas HbA1c levels were assumed to decline over 12 months post-treatment in the DAFNE cohort by 0.9%.

The model used clinical data from three randomised controlled trials to simulate the progression of microvascular complications. The progression of complications over time and between severity levels was combined with mortality data to calculate total life years (LYs) gained for each

	Cost for 6 courses per year	Cost for 12 courses per year	Cost for 15 courses per year
Educator backfill @ 10 days per course based on AfC top band 7 incl. 22.3% on-costs	£11,333.40	£22,666.80	£28,333.50
A&C backfill @ 3 days per course based on AfC top band 3 incl. 22% on-costs	£1,611.36	£3,222.72	£4,028.40
Patient resources @ £4.82/patient	£231.36	£462.72	£578.40
Training 2 x Educators and 1 x Dr - 10% depletion of staff per year	£300.00	£300.00	£300.00
DAFNE set up costs - 10% depletion per year	£110.70	£110.70	£110.70
Central Administration contribution	£3,650.00	£3,650.00	£3,650.00
Total	£17,236.82	£30,412.94	£37,001.00
Number of patients	48	96	120
Cost per patient	**£359.10**	**£316.80**	**£308.34**

* Note: Costs correct when sent to print and are subject to change.

patient cohort. Quality of life weights were also combined with LYs to estimate quality-adjusted life years (QALYs) associated standard care and DAFNE.

NHS costs associated with standard care or DAFNE, and with the treatment of progressing complications were used to estimate a total cost for patients in each cohort over the 10 years of the model.

Results

Costs: The DAFNE cohort was estimated to have reductions in mortality, blindness, end stage renal disease, foot ulceration/ amputation, and episodes of ketoacidosis, as compared with standard care. These reductions in complications resulted in a mean saving of £3238 per patient over 10 years. The majority of cost savings occurred from avoiding foot ulcers and renal dialysis.

The cost savings as a result of reduced complications were partly offset by the cost of delivering the DAFNE programme (mean cost per patient over 10 years = £545) and the more frequent insulin injections required in the DAFNE cohort than in standard care (mean cost per patient over 10 years = £456).

Overall, it was estimated that the DAFNE programme would save the NHS £2,237 per patient over 10 years and would break even at approximately 4.5 years post intervention.

Cost-effectiveness: For the 10 years included in the model, DAFNE produces an additional 5 life years, 12 QALYs, or 9 QALYs for every 100 patients treated in comparison with the standard care. Given that DAFNE is more effective and less costly than standard care it is clearly cost-effective.

Conclusions and Impact

The results of this cost-effectiveness modelling study suggest that for an NHS centre implementing the DAFNE programme cost savings arising from a reduction in microvascular complications would outweigh the additional costs of providing the programme after approximately 4.5 years. In the long run, DAFNE could be a cost saving intervention for a provider to implement, whilst also yielding additional mortality and morbidity benefits over and above standard diabetic care. Further incentives for providing the DAFNE programme include its alignment with the National Service Framework for Diabetes and with the NICE guidance for the use of patient education in diabetes care.

For the latest information about DAFNE please check the website or email:
dafne@northumbria-healthcare.nhs.uk

www.DAFNE.uk.com
twitter.com/DAFNEUK
facebook.com/UKDAFNE

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FACT SHEET ELEVEN

The DAFNE Collaborative is committed to the continued improvement and development of DAFNE through Research and Development. The DAFNE programme provides a unique test-bed to conduct research not only to improve Type 1 diabetes management but also to learn more about educational interventions in diabetes and long-term conditions more generally.

The DAFNE Research group are currently involved in 3 research programmes:

1. National Institute for Health Research Grant

The £1.7 million research grant will fund a varied programme of research (A to F below) over a 5 year period, which will be underpinned by economic analyses to establish its cost effectiveness.

1.A Research Database

Further development of the DAFNE web-based database to examine the relationship between biomedical and psychosocial outcomes. We will record important health events to calculate cost-effectiveness.

Commenced:	December 2008
Centres involved:	10
No recruited:	1471 at end August 2011
Completion date:	September 2012

Update: Recruitment is ongoing until September 2011. Pre course data has been entered for the 1439 of the 1471 participants recruited to date and one year post course follow up data collection 659 commenced December 2008.

Research investigators are already planning and developing protocols for the utilisation of this data to answer a range of questions regarding the impact of DAFNE.

We are now actively encouraging DAFNE researchers to make use of the valuable data resource held within the DAFNE Research Database. Please contact the DAFNE Project Office (dafne.project@sth.nhs.uk) for more details. It is anticipated that the publications using the data will commence in 2011.

There was an oral presentation on the Research Database at the Diabetes UK Annual Professional Conference 2011.

Title: A research database for structured education (DAFNE)
Description: The development and potential use of a research database to undertake detailed studies of the

effects of structured diabetes education (DAFNE) in people with type 1 diabetes

1.B Mixed methods study

Undertake a combined quantitative and qualitative approach to understand factors which facilitate/impede self-management to help explain patterns and predictors of successful outcomes not only in Type 1 diabetes but will also inform programmes in Type 2 diabetes.

Commenced:	June 2008
Centres involved:	11
No recruited:	263
Completion date:	August 2010

Update: Recruitment completed. Follow-up data collection at 3, 6 and 12 months post course has been completed. Interim analysis of the 3 and 6 month data has been performed with 12 month analysis currently underway.

A subgroup of 30 patients and 12 educators from 5 of the 11 DAFNE centres took part in an in-depth interview (Qualitative) study. Some findings have already been published (refer to Fact Sheet 2).

1.C Comparison between DAFNE + MDI and DAFNE + CSII

Develop and conduct pilot study comparing DAFNE training plus continuous subcutaneous insulin infusion (CSII) against DAFNE plus multiple daily injections (MDI). DAFNE curriculum and patient resources developed to use with patients new to insulin pumps and training given to DAFNE educators.

Commenced:	December 2009
Centres involved:	3
No recruited:	55
Completion date:	September 2010

Update: 5 CSII courses and 4 MDI courses were completed during 2010. All follow up data, at 6 months post course, have been collected. Preliminary analysis of the results is underway. The experiences of this pilot have informed the development of a major RCT now funded by the HTA (refer to section 2. REPOSE for further information).

1.D DAFNE delivered over 5 consecutive days and 1-day / week for 5 weeks

Undertake a trial to establish whether intermittent training is as good as the 5 day course. This has the potential to allow those who cannot attend for 1 week to benefit from training and permit more flexible delivery where educators work part-time.

Commenced:	May 2010
Centres involved:	7
No recruited:	181
Courses ran:	June 2010 – May 2011
Final results of trial due:	September 2012

Update: 5-week course curriculum and resources have been developed. Educator training sessions completed in May/June 2010.

14 5-day (control) and 14 5-week courses have been run. Follow-up data is collected at 6 weeks, 6 months, final 12 months post

course data collection is currently under way and is due to be completed by May 2012.

1.E DAFNE Extra

Intervention: Post DAFNE course designed to support those with continued problems with hypoglycaemia by improving awareness of symptoms and strategies for avoidance. The course will be educator led and will be designed to help patients recognise and modify any unhelpful cognition/behaviours which may impede improvement.

4 courses to run: 2 courses at King's College London and 2 at Sheffield
Curriculum currently under development
Educator training in early 2012
Courses to be run Spring 2012
Results expected Autumn 2012

1.F User involvement

Resource and develop our existing users group, who will contribute to all aspects of this programme.

Commenced:	June 2009
Completion date:	September 2012

Update: 15 DAFNE Graduates elected by the DAFNE User Group to form an active group - DAFNE User Action Group (DUAG). Training in how Users can be involved with health research was provided in July 2009. Two DUAG representatives sit on each of the research groups.

Work to assess the impact of DUAG involvement in research has commenced with observations of research group meetings attended by DUAG members and interviews with DUAG representatives and researchers.

2. REPOSE: Relative Effectiveness of Pumps over MDI and Structured Education

An NIHR Health Technology Assessment (HTA) funded trial comparing optimised multiple insulin injection therapy (using rapid and twice daily long-acting insulin analogues) with continuous subcutaneous insulin infusion (CSII) in adult type-1 diabetic patients provided with high quality structured DAFNE. Patient course curriculum and resources development is complete. Educator training started, due for completion in January 2012.

Commencement:	Starting recruitment on 1 November 2011
Centres involved:	7
No to be recruited:	280 (140 MDI and 140 CSII)

3. The Irish DAFNE Study

3.A Ongoing care post DAFNE

Commenced:	October 2006
Centres involved:	6
No recruited:	437
Completion date:	October 2012 (5 year grant + 12 months no-cost extension)

In 2005 the Health Research Board in Ireland awarded the Irish DAFNE Study Group a five year programme grant under their Health Services R&D award.

Randomised controlled trial evaluating 2 methods of follow-up care post-DAFNE training, comparing structured group follow-up care with a return to usual clinical care.

- ✔ To develop a new model of ongoing care for DAFNE graduates based on group follow-up and peer support.
- ✔ To undertake an exploratory trial comparing this new model of care (group follow-up of DAFNE graduates) with "usual care", i.e. a return to one-to-one clinic visits following DAFNE training
- ✔ To incorporate a health economic analysis to inform future policy making
- ✔ A qualitative sub-study will also further inform patient experiences of group follow-up versus traditional one-ton-one clinic visits
- ✔ Current Controlled Trials Ltd registration: http://www.controlled-trials.com/ISRCTN79759174

Update:

- ✔ All baseline, 6, 12 and 18 month follow-up data has now been collected. Main results manuscript currently (24/10/2011) currently for peer-review with the *British Medical Journal.*
  - Dinneen SF, O'Hara MC, Newell J, Coffey N, Byrne M, O' Shea D, Smith D, Courtney H, McGurk C, O' Scannáil M, Breen C, for the Irish DAFNE Study Group. Group follow-up compared to individual follow-up after structured education for type 1 diabetes: the Irish DAFNE Study. Abstract accepted for oral presentation at the 47th European Association for the Study of Diabetes Annual Meeting, Lisbon, Portugal, 12-16 September 2011. *Diabetologia*, 2011, 54(Suppl 1):S33
  - O' Hara MC, Dinneen SF, Newell J, Coffey N, Byrne M, for the Irish DAFNE Study Group. Comparing the effect of 2 different methods of follow-up after structured group education on psychosocial measures in patients with type 1 diabetes: the Irish DAFNE Study. Abstract accepted for oral presentation at the 47th European Association for the Study of Diabetes Annual Meeting, Lisbon, Portugal, 12-16 September 2011. *Diabetologia*, 2011, 54(Suppl 1):S97
  - Qualitative and other psychosocial results have been presented at Diabetes UK Annual Professional Conference 2011, the European Health Psychology Conference, Crete, Greece, Sept 20 – 24, 2011, the 31st

Conference on Applied Statistics in Ireland, 18-21st May 2011 and 17th Qualitative Health Research (QHR) Conference Vancouver, British Columbia, Canada October 25-27, 2011.

International Comparison Study

Commenced : February 2010
Completion date: October 2012

Comparative exploration of patient behaviours and outcomes following structured education programmes for people with Type 1 diabetes: Ireland, UK and Germany. This Ph.D study aims to explore differences in type 1 diabetes outcomes in 3 separate cohorts of people from Ireland, the UK and Germany who have all participated in a SEP. An important component of the work will be to contextualise and evaluate healthcare and cultural organisation and structure in the 3 countries.

Quantitative study

A common dataset is being collected across ten centres in Germany who deliver the precursor of DAFNE, the Insulin Training and Teaching Programme (ITTP), ten DAFNE research centres in the UK and seven DAFNE centres in Ireland. Follow up data to be collected at 12 months post-DAFNE/ -ITTP training.

Qualitative study

Interviews will be conducted with 16 patients and 4 educators from each country before DAFNE/ ITTP with repeat interviews within 6 months following the course to explore their experiences, behaviours and opinions. Courses in all three countries will also be observed in their entirety with in-depth field notes accompanying the observations.

Future Research

We are now actively encouraging DAFNE researchers to make use of the valuable data resource held within the DAFNE Research Database. Please contact the DAFNE Project office dafne.project@sth.nhs.uk for more details.

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www.DAFNE.uk.com

FACT SHEET TWO

The Evidence Base for DAFNE

DAFNE has a solid evidence base. The programme has been developed over more than 25 years of rigorous research. [1, 2, 3, 4] This includes a randomised control trial in Northern Europe and a feasibility trial and economic analysis here in the UK.

The results of the DAFNE study were published in the BMJ [5] in 2002, and showed clinically and statistically significant improvement in:

✔ Glycaemic control, without increased severe hypoglycaemia.
✔ Quality of life.
✔ Treatment satisfaction.

Only 4 of the 141 participants in the feasibility study did not derive some benefit from DAFNE.

An economic evaluation of DAFNE by the York Health Economics Consortium showed that reduced complication rate expected of the observed improved diabetic control means DAFNE pays for itself within 5 years [6].

The following is a list of relevant references:

- Mühlhauser I, Jorgens V, Berger M, Graninger W, Gurtler W, Hornke L et al. Bicentric evaluation of a teaching and treatment programme for type 1 (insulin-dependent) diabetic patients: improvement of metabolic control and other measures of diabetes care for up to 22 months. *Diabetologia* 1983; 25: 470-6

Patients from 2 centres in Vienna and Dusseldorf were observed for 22 months following 5-day structured in-patient teaching in intensive insulin therapy. There was a reduction in HbA1c of around 1.5% and reductions in episodes of severe hypoglycaemia, emergency admissions to hospital and sick days off work.

- Mühlhauser I, Bruckner I, Berger M, Cheta D, Jorgens V, Ionescu-Tirgoviste C et al. Evaluation of an intensified insulin treatment and teaching programme as routine management of type 1 (insulin-dependent) diabetes. The Bucharest-Dusseldorf Study. *Diabetologia* 1987; 30: 681-90

Similar results were obtained in a RCT in Bucharest. The control group followed a similar knowledge based in-patient group programme, but was taught conventional insulin therapy.

- Pieber TR, Brunner GA, Schnedl WJ, Schattenberg S, Kaufmann P, Krejs GJ. Evaluation of a structured outpatient group education program for intensive insulin therapy. *Diabetes Care* 1995; 18: 625-30

Adapted for out patient use in Austria there was a reduction of HbA1c of 1.2% subsequently up to 6 years.

- Bott S, Bott U, Berger M, Muhlhauser

Intensified insulin therapy and the risk of severe hypoglycaemia. *Diabetologia* 1997; 40: 926-32
636 patients were studied in detail 1, 2, 3 and 6 years after attending a single course. The benefits on glycaemia were sustained for 3 years and partially for 6 and the effects on hypoglycaemia sustained throughout.

- DAFNE Study Group. 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. *BMJ:* 2002; 325:746

Presents the results of the UK DAFNE feasibility study. The results reveal that the approach pioneered in Germany can be successfully transferred to a UK healthcare setting and can improve glycaemic control. This approach also leads to significant improvements in treatment satisfaction, psychological well being and quality of life measures.

- National Institute for Clinical Excellence. Technology Appraisal Guidance 60. Guidance on the use of patient education models for diabetes. April 2003. Available from www.nice.org.uk/cat.asp?c=68326

DAFNE and the economic evaluation were considered by NICE as part of the initial consultation for NICE Technical Appraisal 60, in which DAFNE is the only programme named as an example of high quality structured education

- Shearer A, Bagust A, Sanderson D, Heller S, Roberts S. Cost-effectiveness of flexible intensive insulin management to enable dietary freedom in people with Type 1 diabetes in the UK. *Diabetic Medicine* 2004; 21 (5): 460-67

An economic evaluation of DAFNE by the York Health Economics Consortium showed that reduced complication rate expected of the observed improved diabetic control means DAFNE pays for itself within 5 years.

- Rogers H, Turner E, Thompson G, Hopkins D, Amiel SA. Hub and Spoke model for a 5-day structured patient education programme for people with Type 1 diabetes. *Diabetic Medicine* 2009; 26 (9): 915-920

The study revealed reductions in HbA1c and severe hypoglycaemia along with improved quality of life, demonstrating that the hub and spoke method of delivery of DAFNE is a feasible and effective model of structured education service provision in units unable to develop a full DAFNE service due to resource issues.

- Speight J, Amiel S.A, Bradley C, Heller S, Oliver L, Roberts S, Rogers H, Taylor C, Thompson G. Long-term biomedical and psychosocial outcomes following DAFNE (Dose Adjustment For Normal Eating) structured education to promote intensive insulin therapy in adults with sub-optimally controlled Type 1 diabetes. *Diabetes Research & Clinical Practice*. 2010; 89: 22–29

Follow-up of 104 of the 140 original DAFNE feasibility study cohort at 44 months post course show mean improvement in HbA1c from baseline was 0.36%. Quality of Life outcomes remained improved from baseline, with no difference between 12 and 44-month; revealing that the impact of a single DAFNE course on glycaemic control is still apparent in the long term. Improvements in QoL and other patient reported outcomes are well maintained over approximately 4 years.

DAFNE Audit findings

- Leelarathna L, Ward C, Davenport K, Donald S, Housden A, Finucane FM, Evans M. Reduced insulin requirements during participation in the DAFNE (Dose Adjustment for Normal Eating) structured education programme. Diabetes Res Clin Pract. 2011 May; 92 (2): e34-6. Epub 2011 Jan 26

Retrospective analysis of insulin dose changes associated with DAFNE training at one DAFNE service show significant reduction in total, quick acting and basal insulin doses post DAFNE, which would produce a cost saving of £60-£70 per annum/70kg subject.

- Gunn D and Mansell P. Glycaemic control and weight 7 years after Dose Adjustment for Normal Eating (DAFNE) structured education in Type 1 diabetes. Diabetic Medicine 2012; 29: 807-812

HbA_{1c} and weight data for 111 patients, who attended a DAFNE course at one DAFNE service between June 2002 to the end of 2003 were compared to a matched comparator group who had not undergone DAFNE training. Data revealed that uniquely DAFNE is associated with improved glycaemic control at 1 year post course which is persistent and clinically relevant 7 years post course.

- Hopkins D, Lawrence I, Mansell P, Thompson G, Amiel S, Campbell M, Heller S. One year outcomes of structured education in type 1 diabetes. Diabetes Care. In Press

A range of biomedical and psychological data collected pre and 1 year post DAFNE training for participants completing DAFNE training across the UK during 2005, revealed that DAFNE delivered in routine clinical practice improved HbA1c while reducing severe hypoglycaemic rate and restore hypo awareness, reduce psychological distress and improve perceived well being.

For the latest information about DAFNE please check the website or email: dafne@nhct.nhs.uk

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Facebook: www.facebook.com/UKDAFNE

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Type 1 Diabetes: Less guesswork.
More freedom. Better health.

DAFNE

Fact Sheet Seven
DAFNE Today

There are currently **630** trained DAFNE Educators, **416** DAFNE doctors and **78** DAFNE Advisors working in **77** DAFNE services delivering in **138** localities in the UK and Southern Ireland. The table overleaf lists the current DAFNE centres. Royal Berkshire is due to complete training in September 2013.

During the 2013/2014 financial year DAFNE are planning to deliver one DAFNE Educator Programme, one DAFNE Advisor Programme and one DAFNE Doctor Programme; with the capacity to train an additional 16 Educators, 16 Level-1 advisors and 14 Doctors.

In addition, DAFNE are planning to deliver one 5-week conversion workshop and one Pump conversion workshop, each with capacity to train 16 delegates.

Further details of these training programmes and current availability can be found under the Healthcare Professionals section of the DAFNE website.

International DAFNE

DAFNE have also provided awareness training to diabetes teams from Australia (2005), Kuwait, South Africa, Nigeria and Spain (2008). The awareness training included observation of the 5-day DAFNE course followed by a 3½ day workshop covering CP estimation, dose adjustment, adult group education, DAFNE QA programme and advice on how to introduce and embed the DAFNE approach into a health service in a systematic way.

Since attending this training the Australian (Oz DAFNE) and Kuwaiti teams have received additional support from DAFNE as they have introduced and assessed the impact of the approach in their own healthcare settings and have taken the entire DAFNE package including the essential QA element onboard.

Oz DAFNE is now delivered in 23 centres across Australia, New Zealand and Singapore. The Kuwaiti team have the backing of national officials for DAFNE and are the national Type 1 education programme in Kuwait.

Northern Ireland

✓ Royal Victoria Hospital, Belfast

✓ Lagan Valley Hospital, Co Antrim
- Lagan Valley Hospital
- Lisburn Health Centre
- Castlewellan Health Centre
- Downe Hospital, Downpatrick
- Ulster Hospital, Dundonald

✓ Northern Health and Social Care Trust, Belfast

Southern Ireland

✓ Endocrine Unit, St Columcille's Hospital, Loughlinstown, Dublin

✓ St Vincent's Hospital, Dublin

✓ University College Hospital, Galway

✓ Beaumont Hospital, Dublin

✓ St Luke's Kilkenny

✓ Midlands Regional Hospital, Mullingar, Co Westmeath

Scotland

✓ NHS Grampian
- Aberdeen Royal Infirmary
- Aberdeen and Dr Gray's Hospital, Elgin

✓ Dumfries and Galloway
- Dumfries and Galloway Royal Infirmary
- Crichton Royal Hospital
- Gatehouse of Fleet Surgery
- Galloway Hospital

✓ NHS Lanarkshire
- Monklands Hospital
- Hairmyres Hospital
- Wishaw General Hospital

✓ NHS Lothian
- St John's Hospital at Howden, Livingston
- Royal Infirmary of Edinburgh
- Western General Hospital, Edinburgh

✓ Glasgow
- New Victoria Infirmary
- Southern General Hospital
- Stobhill Hospital

Wales

✓ Betsi Cadwaladr University Health Board (BCUHB)
- Glan Clwyd Hospital

✓ Royal Glamorgan Hospital Diabetes Centre
- Royal Glamorgan Hospital
- Prince Charles Hospital, Merthyr Tydfil

North West

✓ East Lancashire Hospitals Diabetes Team
- Royal Blackburn Hospital
- Burnley Hospital

✓ Cumbria Diabetes
- West Cumberland Hospital, Whitehaven
- Cumberland Infirmary, Carlisle
- Furness General Hospital, Barrow-in-Furness
- Westmorland General Hospital, Kendal

✓ Wythenshawe Hospital, Manchester

✓ Pennine Acute Hospitals
- North Manchester General Hospital
- Royal Oldham Hospital
- Fairfield General Hospital

✓ Salford Community Health
- Salford Community Diabetes Team
- Salford Royal Hospitals
- Hope Hospital

✓ NHS Tameside and Glossop
- Tameside General Hospital
- Tameside and Glossop PCT
- Tameside Acute Trust

✓ Blackpool Diabetes Unit
- Victoria Hospital

Northern & Yorkshire

✓ Northumbria Healthcare Trust
- North Tyneside General Hospital
- Wansbeck General Hospital
- Hexham General Hospital
- Alnwick Infirmary
- Berwick Infirmary

✓ Scarborough
- Scarborough Hospital
- Scarborough, Whitby & Ryedale PCT

✓ Sheffield Teaching Hospitals
- Northern General Hospital
- Royal Hallamshire Hospital

✓ Hull and East Riding Diabetes Network
- NHS Hull
- East Riding PCT

✓ South Tees Network
- James Cook University Hospital, Middlesbrough
- East Cleveland Hospital, Brotton
- Redcar Health Centre, Redcar
- Poole House, Nunthorpe
- Friarage and Guisborough Hospitals

✓ North Lincolnshire
- Scunthorpe General Hospital
- Diana Princess of Wales, Grimsby

✓ Durham Diabetes Network
- Darlington Memorial Hospital
- University of North Durham
- Shotley Bridge Community Hospital
- Bishop Auckland Hospital

✓ Harrogate and District NHS Foundation Trust

✓ Rotherham General Hospital

✓ Mid Yorkshire Hospitals
- Pontefract General Infirmary
- Pinderfields General Hospital, Wakefield
- Dewsbury Hospital

✓ Leeds Teaching Hospitals
- Leeds General Infirmary
- Wharfdale Diabetes Centre

✓ Huddersfield Royal Infirmary

Eastern

✓ Cambridgeshire
- Addenbrooke's Hospital, Cambridge
- Princess of Wales, Ely

✓ North Bedfordshire Diabetes Centre
- Bedford Hospital NHS Trust

✓ Hinchingbrooke Hospital, Huntingdon

✓ Norfolk and Norwich University Hospital

✓ South East Essex Community Healthcare
- Southend Hospital, Westcliffe-on-Sea

✓ West Essex DAFNE Centre
- St Margaret's Hospital, Epping and those who have a West Essex GP

✓ The Ipswich Hospital, Ipswich

✓ South West Essex PCT
- Basildon Hospital, Basildon

✓ James Paget University Hospitals NHS Foundation Trust
- Lowestoft Hospital

✓ Hertfordshire DAFNE Centre
- Bull Plain Clinic, Hertford
- Herts and Essex Community Hospital
- Potters Bar Community Hospital
- Lister Hospital
- Cheshunt Community Hospital

✓ North East Essex
- Colchester Hospital

East Midlands

✓ Royal Derby Hospital

✓ Northampton
- Northampton General Hospital
- Kettering General Hospital

✓ Nottingham University Hospital
- Queens Medical Centre

✓ University Hospitals, Leicester
- Leicester Royal Infirmary
- Leicester General Hospital

✓ Derbyshire Community DAFNE Centre
- Derby City General Hospital

West Midlands

✓ Birmingham Community NHS Diabetes Team
- Finch Road Primary Care Centre
- City Hospital
- Fernbank Medical Centre
- PAK Surgery

✓ University Hospitals Birmingham NHS Foundation Trust
- Queen Elizabeth Hospital, Edgbaston

✓ Sandwell PCT
- Sandwell General Hospital

✓ Worcestershire NHS
- Worcestershire Royal Hospital
- Diabetes Centre, Smallwood House, Redditch

South West

✓ Royal Devon and Exeter Hospital, Exeter

✓ Taunton and Somerset Hospital, Taunton
- Taunton and Somerset Hospital
- West Mendip Hospital, Glastonbury
- Yeovil District Hospital

✓ Salisbury DAFNE Team
- Salisbury District Hospital
- North Dorset (Gillingham and Shaftesbury)

South East

✓ Darent Valley Hospital, Dartford

✓ Maidstone General Hospital

✓ Kent and Sussex Weald Diabetes Centre
- Pembury Hospital

London

✓ Central Middlesex Hospital

✓ King's College Hospital, Camberwell

✓ St George's Hospital, Tooting, London

✓ University College London Hospitals (UCLH)
- The Heart Hospital, London

✓ Guy's & St Thomas' London
- Guy's Hospital
- St Thomas' Hospital

✓ Chelsea and Westminster Hospital

✓ Barking and Dagenham PCT
- Marks Gate Health Centre

✓ North East London Community Services (NELCS)
- Long Term Conditions Centre, Harold Wood, Essex
- Redbridge Diabetes Centre, Ilford, Essex

✓ University Hospital, Lewisham

✓ Croydon NHS
- Mayday Hospital

✓ NHS Harrow
- Northwick Park Hospital
- Harrow PCT (Caryl Thomas Clinic)

✓ Hillingdon Hospital NHS Trust

✓ Bromley PCT
- Orpington Hospital

✓ Newham Diabetes
- Newham University Hospital, Plaistow

✓ South London Healthcare Trust DAFNE
- Queen Mary Hospital, Sidcup
- Queen Elizabeth Hospital

✓ Royal Berkshire

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For the latest information about DAFNE please check the website www.dafne.uk.com or email: dafne@nhct.nhs.uk

FACT SHEET NINE

Information for Service Managers

Training to become a DAFNE Educator, Doctor or indeed setting up as a DAFNE centre requires a considerable time commitment not only from the individuals being DAFNE trained but also from their colleagues. It is therefore essential that Service and Line Managers are fully aware of the time commitment involved so that necessary service demands can be met whilst ensuring that trainees are allocated sufficient time to train and adequately prepare for the delivery of their first DAFNE patient course as part of their DAFNE training.

The DAFNE Educator Programme (DEP) is an assessed course involving 105 hours of taught/ structured training (see Figure 1 overleaf). In addition to the taught components of the DEP (steps 3, 4, 5 and 7) a trainee is required to do up to 6 hours pre training preparation and 32½ hours preparation for the delivery of their first patient course which will be assessed (Steps 1, 2 and 6). Hence a DEP trainee may need up to 143.5 hours protected time out of service.

It is imperative that the trainee's service ensures that the trainee is enabled to do this personal preparation and planning required in Step 5, in order for the individual to successfully complete the training. Insufficient planning for the peer review course could result in the trainee failing the assessment, resulting in additional training costs to the service in order for the trainee to repeat necessary elements and be reassessed.

The amount of time required for preparation will vary slightly depending upon whether the trainees are from an established DAFNE centre or from a service that is setting up as a DAFNE centre.

Step 1 – Orientation (1 hour)
Reading the DEP file

Step 2 – Background reading (3-5 hours)
Key DAFNE papers/relevant references.

Step 3 – Observe a 5-day DAFNE course (37½ hours)
Observe and understand how DAFNE is taught.

Step 4 – Attend a 3-day training workshop (22 ½ hours)
Develop skills and competencies through exercises/discussions.

Step 5 – Preparation (25½ - 32½ hours)
Planning and preparation for first DAFNE patient course:

- Recruitment and preparation of patients.
- Personal preparation, familiarisation with the DAFNE curriculum and resources, production of lesson plans and additional resources.

Step 6 – Deliver a 5-day peer supported DAFNE course (37½ hours)
Assessment of trainee competencies.

Step 7 – Follow-up 1-day Workshop and DAFNE Collaborative (7½ hours)
Feedback on DEP, Collaborative aims, further training opportunities, QA and development.

Figure 1: Summary of the DEP structure

Trainees from Established DAFNE centres
Trainees from established DAFNE centres can rely upon their existing DAFNE Educators for support. In addition the administrative processes required for the identification, recruitment of eligible patients, finding course venues, organising catering etc will already be in place. This ultimately means that the preparation time required in Step 5 could be reduced.

Trainees from a new DAFNE centre
Trainees from a new DAFNE service will need to spend more time on the organisational and administrative issues on top of the time they require for personal planning and familiarisation with the DAFNE curriculum, resources and creating lesson plans and developing personal teaching materials.

New centres are supplied with a DAFNE Centre Manual which provides step by step advice on the planning process required to plan patient courses, recruit patients and patient pre course data collection, in addition to providing template recruitment letters, forms and a recruitment PowerPoint presentation for centres to use to guide them through the setting up as a DAFNE service.

Established DAFNE Educators
Once a DAFNE service has been set up and Educators are more experienced the time commitment required to prepare for DAFNE course delivery will reduce further as the need to plan for each course is reduced with increasing confidence and experience.

Table 1 overleaf provides an estimate of the time commitment required by trainee Educators from a new DAFNE service, and existing DAFNE service and established Educators at an established DAFNE centre, so that Service and Line Managers have an idea of what time commitment is involved in each case.

Further information regarding time commitment can be obtained from the National DAFNE team, contact details are provided below.

Central DAFNE
Diabetes Resource Centre
North Tyneside General Hospital
Rake Lane
North Shields
NE29 8NH

Telephone: 0191 293 4115
Email: dafne@nhct.nhs.uk

For the latest information about DAFNE please check the website www.dafne.uk.com or email dafne@nhct.nhs.uk

DAFNE Online is an independent community of DAFNE Graduates, Healthcare Professionals, Management and friends and family of those with Type 1 diabetes. Please visit the website www.dafneonline.co.uk to find out more.

Table 1: Estimated breakdown of time required for the planning of a DAFNE patient course

* Administrator could reduce time used by Educators significantly

		Duration								
		New Educators New Centre	**E**	**A**	**New Educators Established Centre**	**E**	**A**	**Established Educators Established Centre**	**E**	**A**
Recruitment*	• Read centre manual (Ed) • Waiting list/referral (Ad) • DAFNE awareness • Organise (Ad) • Deliver (3 hrs delivery) (Ed) • Recruitment evening • Organise (Ad) • Deliver (2 hrs delivery) (Ed) • Confirm courses (Ad)	10 hours	6	4	Reduced time at established centres. Systems in place for booking courses and presentations prepared for recruitment and DAFNE awareness training.	2	1	Reduced time at established centre. Systems in place for booking courses and presentations prepared for recruitment and DAFNE awareness training.	2	1
Data Collection	• 4 hours x data collection, including phlebotomy and questionnaire	4 hours ½ per patient plus admin	4		4 hours ½ per patient plus admin	4		4 hours ½ per patient plus admin	4	
Data input	• 2 hours per course	2 hours per course		2	2 hours per course		2	2 hours per course		2
Book pre assessment clinic	• 1 hour per course	1 hour per course		1	1 hour per course		1	1 hour per course		1
Admin for course*	• Set courses • Book venue/ catering • Contact individuals • Organise prescriptions • Resources/ room set up	4 hours can all be done by administrator with appropriate training and guidance		4	4 hours		4	4 hours		4
Reading/ familiarising with curriculum	• Educator only	2 hours	2		2 hours	2		2 hours	2	
Lesson planning	• 33%-66% per curriculum per educator	10-15 hours	15		10-15 hours	15		10-15 hours	15	

		Duration								
		New Educators New Centre	**E**	**A**	**New Educators Established Centre**	**E**	**A**	**Established Educators Established Centre**	**E**	**A**
Developing resources*	• Labelling models • Producing workshop games • Acetates	6 hours	6		0-1 hour As established centre resources already available	1		0-1 hour As established centre resources already available	1	
Miscellaneous	• Meeting as a team • Dealing with telephone calls	1 hour	1	1	1 hour	1	1	1 hour	1	1
Arranging follow-up*	• Venue (Ad) • Letters (Ad)	1 hour		1	1 hour		1	1 hour		1
Delivering follow-up	• 3 hours	3 hours	3		3 hours	3		3 hours	3	
	Total	**50**	**37**	**13**	**38**	**28**	**10**	**38**	**28**	**10**