

# Is an inter-professional education programme effective in promoting collaboration and improving diabetes care?

Daniel L Ching, Denise Forte, Liz Aitchison, Kenneth Earle

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## Article points

1. In this evaluation of the impact of an inter-professional education programme, all stages of the Kirkpatrick–Barr learning outcome hierarchy were met and sustained for at least 24 months post-completion.
2. An analysis of care and quality outcomes during the same time-frame showed a statistically significant decrease in referrals and improvements in outcomes.
3. The programme is feasible and effective in empowering a community of healthcare professionals to increase the scope of diabetes services.

## Key words

- Healthcare systems integration
- Inter-professional collaboration
- Inter-professional education

## Authors

Daniel Ching is a Medical Doctor, Medical School, St George's, University of London, London. Denise Forte is a Senior Lecturer, Medical School, St George's, University of London, London. Liz Aitchison is a Researcher at the Faculty of Health and Social Care Sciences, St George's, University of London, London. Kenneth Earle is a Consultant and Senior Lecturer in Diabetes Medicine, St George's Hospital, London.

**Active repatriation of patients with diabetes from secondary care is taking place throughout the UK as part of reformation of the NHS. However, the methodology to sustainably translate and transform existing practices to accommodate the changes in diabetes care provision in the community is under-studied and remains unclear. In this article, the authors report results from their mixed-method study of an inter-professional education programme, focusing on the qualitative outcomes of knowledge, attitudes and behaviours of participating healthcare professionals. The combination of a positive impact on patient outcomes and evidence of sustained professional behaviours in clinical practice could act to future-proof the devolution of diabetes care being promoted in the UK.**

Diabetes is the leading cause of renal failure, non-traumatic amputation and loss of vision in the Western world (Diabetes UK, 2012). The overall cost of diabetes to the UK economy is an estimated £23.7 billion, with the direct costs of £9.8 billion accounting for approximately 10% of the total NHS budget (Department of Health, 2010; Hex et al, 2012). These health-related and economic burdens are rising at a time when stringent fiscal constraints are being applied to provide services more cost-effectively (Edwards, 2009).

The nature of diabetes requires care to be provided by a team of specialists. This model, which traditionally operated from a secondary care setting, is now being replaced by “patient-centric” community-based care (e.g. NHS London Health Programmes, 2011). The change has, in part, been accelerated by the UK Government's Health and Social Care Bill, which came into effect in April 2013 (Department of Health, 2012). The new models of “intermediate” care will challenge non-specialist medical and nursing practitioners to extend the scope of their service provision. However, traditional training defines each profession

according to specific qualifying standards of knowledge and competencies, which comprise values, beliefs, attitudes, customs and scope of practice (D'Amour and Oandasan, 2005). These knowledge-related and professional boundaries could contribute to fragmentation of care and undermine the development of the new services (Hilton, 1995).

A potential means of overcoming the problem is through collaboration. Various ways of increasing collaboration have been suggested (Goldman et al, 2009). The present study explored the possibility of using an inter-professional education programme (IPEP) to improve collaboration between primary care and secondary care in diabetes. Our aim was to evaluate a method to transfer and translate specialist diabetes care expertise to primary care. We designed and implemented the IPEP and assessed what impact this would have on clinical behaviours and how this might relate to care outcomes. These findings add to the growing body of literature that is providing an insight into the impact that service redesign in diabetes care may have on practitioners and patients in the UK.

## Methods

This evaluation took place in Wandsworth, an inner-city borough in South London that has 60 general practices serving a total population of 260 000, of which 20% are non-white and 10 200 have a diagnosis of diabetes (Wandsworth Council, 2012). The IPEP was delivered to a cluster of 26 general practices that constituted a locality within the borough and were served by one secondary care centre.

### The programme

Face-to-face consultations were organised with groups of GPs and practice nurses (PNs) to identify the areas of diabetes they considered challenging. A Likert scale – from 0 (no confidence) to 10 (fully competent) – was used to document confidence to manage or organise care for people with newly diagnosed diabetes, hypoglycaemia, neuropathy, foot complications, hypertension, cardiovascular disease, and microalbuminuria and renal disease. These data and the feedback from discussions with the healthcare professionals were used to develop the IPEP curriculum (see *Box 1*).

The programme was made up of 10 consecutive, weekly, 3-hour (half-day) sessions in classes with a 50:50 balance of GPs and PNs. The learning objectives were met with interactive lectures and workshops, to which the participants contributed their own cases. The programme was endorsed by the Royal College of General Practitioners. It was also validated with an Objective Structured Clinical Examination format known as Objective Patient Evaluation Review and Assessment (OPERA), which consisted of a circuit of clinical scenarios (presented by trained actors and patients) and data interpretation stations. Participants received feedback on their performance after each station, and an overall score was provided with references to their peers. A certificate of attendance was awarded upon completion of 90% of the sessions and the OPERA.

The short-, medium- and long-term objectives of this programme were evaluated using qualitative and quantitative methodologies. In the short term, the aim was to create confidence among healthcare professionals in the community to deliver diabetes care. In the medium term, we

assessed whether there was a change in practice referral behaviour. In the longer term, we assessed whether any reported changes in attitudes, behaviour and clinical practice were sustained.

The ultimate goal of the program was to equip primary care to deal with more complex cases, reducing straightforward referrals to secondary care in accordance with the referral document, and thus freeing up resources in secondary care to deal with complicated cases. Having appropriate cases dealt with at appropriate levels will increase efficiency and effectiveness of the whole system (Iles, 2005). This is expected to provide quality improvement in diabetes care and reduce patient time spent in healthcare.

### Qualitative data collection

An in-depth analysis of the participants' attitude to this learning process and its potential impact on their clinical practice was conducted using semi-structured qualitative interviews. This format was preferred because the information would be relevant to the research objectives and at the same time give interviewees flexibility to raise issues (Browne and Green, 2005; Dearnley, 2005).

The interviews were conducted with eight GPs, eight PNs and two consultant endocrinologists in 2012, 2 years after a cycle of the programme in 2010. The main goal was to identify whether learnings were sustained post-programme. Interview questions were identified primarily through literature review and pre-identified themes based on Kirkpatrick and Barr's learner outcome hierarchy (see *Table 1*; Freeth et al, 2005; Gillan et al, 2011).

All questions were piloted and amended multiple times prior to use in the investigation. All interviewees who were recruited agreed to participate on the first request; there were no rejections. The interviews were audio recorded, and note taking was performed to ensure that non-verbal clues were captured. The interviews were transcribed twice to ensure accuracy. The non-verbal clues noted were combined with the transcripts to improve understanding of the data. Coding was performed according to pre-identified themes. Transcripts were coded iteratively and any disagreement between the researchers were identified, discussed and clarified.

### Box 1. Contents of the inter-professional education programme curriculum.

- Disease diagnosis and classification
- Prevention strategies and lifestyle advice
- Management of commonly encountered diabetic complications (cardiovascular disease, renal disease, foot care, eye disease and erectile dysfunction)
- Commencing, monitoring and adjusting insulin therapy

**Table 1. Themes and quotes from the follow-up interviews (24 months post-programme) in relation to the Kirkpatrick and Barr's learning hierarchy.**

Themes	Description	Quotes
<b>1 – Reaction</b>	Learners' views on the learning experience and its inter-professional nature	"I thought [the assessment] was excellent. It was very nerve racking [...] They weren't open with a lot of information; we needed to [search] for that. We needed to find the basis of their problems, which is true in diabetes care [too]" (a practice nurse)
<b>2a – Modification of attitudes or perceptions</b>	Changes in reciprocal attitudes or perceptions between participant groups Changes in perception or attitude towards the value or use of team approaches to caring for a specific patient group	"Invariably you will end up talking about certain case studies and putting your thoughts or point of view forward from your professional perspective [...] That's really nice for everybody to understand the issues a profession may have with that particular thing" (a GP)
<b>2b – Acquisition of knowledge, skills or both</b>	Including knowledge and skills linked to inter-professional collaboration	"After having more knowledge I really changed my practice enormously, as a result of attending the course. I'm much more confident at looking at scenarios and changing treatments [and] also getting the patients to focus more on themselves" (a practice nurse)  "Since [the programme] I have had newly diagnosed patients referred to me with off-the-scales HbA <sub>1c</sub> [levels], which I was being able to bring right down, which was very satisfying" (a GP)
<b>3 – Behavioural change</b>	Identifying individuals' transfer of inter-professional learning to their practice setting and their changed professional practice	"It's hard to be definitive [...] I think we definitely became a lot more aggressive about treatment [...] Before we probably let things bobble along for a long time" (a practice nurse)
<b>4a – Change in organisation practice</b>	Wider changes in the organisation and delivery of care	"There were changes in prescribing. We are concentrating on making prescribing uniform throughout the practice [and] changing to be more cost-effective [...] If combination therapy is available and cheaper then we change to them" (a GP)
<b>4b – Benefits to patients</b>	Improvements in health or well-being of patients	"[GPs] were referring more complex problems to us, and they're dealing with the more mundane problems [...] They know what to do with newly diagnosed [...] Patients are being better managed in primary care for longer times and targets are much better achieved now [...] This is really good for the patient" (a specialist)

**Quantitative data collection**

The diabetes registers of each of the 26 practices were investigated to extract data on diabetes outcomes according to the Quality and Outcomes Framework. We assessed whether blood pressure and foot reviews were performed according to local guidelines, which were aligned to those of NICE.

Contemporaneous data were collected from the secondary care centre with respect to referral from these practices, both before and 2 years after the delivery of the programme. Within-group comparisons were made by constructing contingency tables and performing either two-tailed Chi-squared or Fischer's exact tests using Prism 5.04 (GraphPad, San Diego, CA, USA). Ninety-five per cent confidence intervals were calculated for descriptive data, measures of centrality and differences. The number of referral cases and patient outcome measures were used to test the null hypothesis that the IPEP would not influence care.

The collection of data and interview processes was conducted according to the ethics body of St George's University of London. In accordance with this, all interviewees were provided with written information and signed a consent form for the interview to be used.

**Results Interviews**

The interviewees considered this to be a novel programme and one in which they were keen to participate. There was mutual appreciation of each other's contribution and this provided an opportunity for both parties to engage in the learning experience; For instance:

"I think the traditional values between nurses and doctors always come into play, but through this course because we've been taught at the same level [and] there was a sense of equal learning [...] I think [PNs] are effectively equal and have equal contributions" (a GP).

Most thought that the current level of collaboration between primary and secondary care was generally good. After the programme, GPs felt more confident with making referrals. A key theme to emerge was that adult learning is promoted when there is good collaboration between the learners and the facilitators. Some pertinent quotes are below:

“I would say the collaboration [between primary and secondary care] is good, but it could be better [...] After the course I now know better when to refer [and] what needs to be done before referring” (a GP).

“I never knew who I was speaking to over the phone or sending my letters to [...] I can now put a name to a face [...] I feel much happier in approaching a consultant when I have questions [...] This course will improve the quality of care for patients” (a GP).

Secondary care specialists gained an insight into the reality of delivering community-based care and were able to appreciate the provision of excellent care in the face of various constraints. As one specialist remarked:

“I came away very, very impressed [...] They see so many patients every day [but] they lack the multidisciplinary support we have [...] I have to say I was particularly impressed with the work done by the practice nurse.”

The programme was highly favoured by all participants and achieved all six levels of learner outcomes as outlined by the Kirkpatrick–Barr

model. The data showed that the programme was associated with a positive impact on the attitudes towards management of diabetes at both the organisational and personal level for at least 24 months. Improvements included an increase in confidence, behavioural changes and a transforming of diabetes management with a shift towards evidence-based practice. There were also beneficial changes for the general practice and an increase in collaboration with secondary care that improved quality of patient care (*Table 1*).

### Changes in diabetes referral and clinical outcome measures

The cohort of 26 practices served 4167 people with a diagnosis of diabetes. The mean age for men and women was 60 years (range 45–78) and 63 years (range 47–81), respectively. A diagnosis of type 2 diabetes was recorded for 85% of patients. The mean HbA<sub>1c</sub> level was 60 mmol/mol (7.6%; range 50–62 mmol/mol [6.7–7.8%]), and the proportion of patients below the standard of 57 mmol/mol (7.5%) was 43.8%.

An analysis of referrals at baseline and 24 months post-programme showed that the annual number of referrals to secondary care decreased from 1352 to 1290 cases (change, -4.6% [95% CI -3.2 to -5.9; *P*<0.001]). The proportion of patients receiving foot care review, being screened for microalbuminuria, having a total cholesterol level <5 mmol/L, and with a blood pressure <145/85 mmHg all had statistically significant improvements (*Table 2*). However, there was no statistically significant change in HbA<sub>1c</sub> level.

### Page points

1. A key theme to emerge was that adult learning is promoted when there is good collaboration between the learners and the facilitators..
2. The data showed that the programme was associated with a positive impact on the attitudes towards management of diabetes at both the organisational and personal level for at least 24 months.
3. The proportion of patients receiving foot care review, being screened for microalbuminuria, having a total cholesterol level <5 mmol/L, and with a blood pressure <145/85 mmHg all had statistically significant improvements.

**Table 2. Changes in key outcomes measures for people with type 2 diabetes at baseline and 24 months post-programme.**

	Foot care reviews	Microalbuminuria screening	Total cholesterol <5 mmol/L	Blood pressure <145/85 mmHg
Baseline (%)	48.9	33.2	42.2	58.0
Post-programme (%)	74.9	63.0	56.6	67.6
Difference (percentage points)	+26.0	+29.8	+14.4	+9.6
95% confidence interval	24.0–28.1	27.7–31.9	12.3–16.5	7.5–11.6
<i>P</i> -value	<0.0001	<0.0001	<0.0001	<0.0001

### Page points

1. The study demonstrates an association between collective learning and improved care for people with diabetes.
2. It remains unclear whether these results are generalisable to other healthcare professional communities.

### Discussion

Diabetes service redesign in the UK is raising concerns over the sustainability of managing increasingly prevalent and complex diabetes in the community. Our approach was to develop a programme aimed at addressing the challenges of providing an integrated diabetes service. We have shown that successful diabetes care can be achieved by creating a “learning community” of practitioners. To our knowledge, this is one of the first studies to show the benefit of using a combination of inter-professional education with experiential learning to alter clinical behaviours and improve quality in diabetes care.

We had considered that a potential obstruction to inter-professional learning was the barrier of professional hierarchy (Larme and Pugh, 1998; Barr et al, 2005; Hall, 2005; Beaulieu et al, 2009; Mosely et al, 2010). However, most GPs and PNs did not experience a problem with attending the course and learning together. All interviewees acknowledged that learning with different professions in the same classroom was beneficial to them. In addition, it was considered effective in increasing knowledge and promoting a working collaboration within the practice. We have found that participants in this programme respect, appreciate and have sound understanding of each other’s roles and contributions, all of which are essential to improving patient care.

It is also through this programme that GPs and nurses have the opportunity to interact with secondary care specialists, leading to stronger relationships and, hence, more effective inter-professional communication. The course was highly regarded for its practical nature since most sessions were taught with the concept of “learning by doing” and based on real scenarios. Our work supports the findings of others on participants highly rating their experiences of inter-professional education (Barr et al, 2000).

The fall in the number of cases referred to secondary care is notable. It supports the reported increase in confidence in primary care to increase the scope of care, something which is also supported by the qualitative interviews. This indirectly increases the resources available in secondary care to deal with complicated cases. Over the same period, there were significant

improvements in foot care, microalbuminuria screening, cholesterol and blood pressure control. The increase in services provided to people with diabetes and associated rise in desirable outcome measures is an indication of improvement in diabetes management. Tight control of diabetes is usually achieved with intensive treatment and needs high levels of resourcing (Selby et al, 2009; Fu et al, 2011). This level of intervention is unlikely to have developed in the first period of observation for this programme and could account for HbA<sub>1c</sub> not improving to a statistically significant degree.

Knowledge created through transformation of experience is a central concept of experiential learning (Kolb and Kolb, 2005). The learning community from this perspective is applicable for both the primary and secondary care practitioners to break down the barriers of the traditional service and training models. This programme played a powerful role in promoting the partnership for learning across personal, professional, sectorial and institutional boundaries. It has showed sustainable changes in behaviour lasting at least 24 months post-programme that are required to future-proof the redesign of services for long-term conditions such as diabetes.

Our work demonstrates an association between collective learning and improved care for people with diabetes. The authors are aware that this study has its limitations. This was not a controlled piece of research, and concurrent interventions at the level of the patient (e.g. patient education programmes) or healthcare professional (other educational experiences) could have confounded the results. The sample size for the qualitative interview was small and it is likely that “theoretical saturation” was not reached. This was a voluntary programme and one would expect that most participants may have had an existing interest in diabetes, which could have contributed to the improvement over time. Furthermore, the study is vulnerable to recall bias, considering that there was a 2-year gap. Conversely, it could also be argued that knowledge and benefits of the programme could have become internalised over time, with the research thus less able to detect improvements. It remains unclear whether these results are

generalisable to other healthcare professional communities.

This study hopes to generate further interest in an underdeveloped area of integration of care through the use of post-licensure inter-professional education. Further research is required to understand the role, application and comparative effectiveness of a translational education programme in transforming diabetes and other long-term conditions.

Based on the research results and feedback received, the programme is currently undergoing further redesigning in preparation for future cycles. There are plans for the development of a cluster-based randomised controlled trial.

## Conclusion

Translational diabetes care is an emerging methodology to transform service provision for people being managed in the community. This learning model based on inter-professionalism and experiential education is applicable to integration of care across primary and secondary care. This programme has been shown to be feasible and effective in rapidly empowering a community of healthcare professionals to increase the scope of diabetes service.

In this study, the programme was found to be a catalyst for personal change and integration of systems that were associated with improvements in the quality of care. The positive impact on patient outcomes, sustained professional behaviours and clinical practice could act to future-proof the devolution of diabetes care being promoted in the UK and could have widespread beneficial consequences for the health economy. Our study adds to the existing literature suggesting that IPEPs are effective at promoting service redesign and improving patient outcomes. ■

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## Declaration of interest

No financial support was received for this study. All authors report no conflicts of interest.

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