

An evaluation of insulin training for GPs and practice nurses

Lucy Chadder

The last decade has seen a shift of some diabetes services from secondary to primary care and with this shift there is a need to improve the skills of primary care staff. Insulin initiation in patients with type 2 diabetes is one aspect of care that is increasingly undertaken by primary care; however, evidence suggests that the initiation of insulin is often delayed (Meece, 2006). Multiple factors will play a part in this delay but one factor may be the concerns and barriers held by the clinicians. This article describes studies that were carried out to investigate the efficacy of structured courses in insulin initiation and insulin management for practice nurses and GPs.

There has been a shift of some diabetes services from secondary to primary care over the last decade. This has been driven by changes in health policy, the need to reduce costs and the increasing prevalence of diabetes. With this shift, there has been a requirement to improve the skills of primary care staff to take on aspects of diabetes care traditionally done by secondary care.

Insulin initiation for people with type 2 diabetes is one aspect of diabetes education that has increasingly been undertaken by GP practices (Downey, 2007) and requires training via a structured course. However, there is little published evidence regarding the effectiveness of these courses. Despite NICE (2009) recommendations to intensify treatment, insulin initiation is often delayed (Meece, 2006). Multiple factors play a part in this, not least of all concerns and barriers held by clinicians (see *Box 1*). With appropriate training and support, it is envisaged that many of these barriers and concerns can be alleviated to enable clinicians to initiate insulin effectively in primary care. The aim of this study was to assess the effectiveness of a structured course in insulin initiation for practice nurses and GPs.

Box 1. Clinicians' concerns and barriers towards insulin initiation.

- Colluding with patients to try harder with diet and exercise (Polonsky and Jackson, 2004).
- Lack of time, training, confidence and support (Greaves et al, 2003).
- Unclear guidelines and treatment targets (Haque et al, 2005).
- Wide range of insulin and devices (Shepherd et al, 2007).
- Side effects of hypoglycaemia and weight gain (Meece, 2006).
- Lack of time to counsel reluctant patients (Polonsky and Jackson, 2004).
- Having the right strategies to address patient's barriers and concerns including:
 - Sense of personal failure (Peyrot et al, 2005).
 - Injection-related anxiety (Meece, 2006).
 - Fear of restricted lifestyle (Polonsky and Jackson, 2004).
 - Cultural health beliefs (Meece, 2006).
 - Lack of positive gain (Peyrot et al, 2005).

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Article points

1. Insulin initiation in patients with type 2 diabetes is increasingly undertaken by primary care teams; however, evidence suggests that this is often delayed (Meece, 2006). This may be due to clinicians' concerns and barriers.
2. In this article, the author outlines studies that assessed the benefits of an insulin initiation training programme in Wandsworth Primary Care Trust.
3. The study concluded that training in insulin initiation is effective; however, it is important for practice nurses and GPs to carry out insulin initiation on a regular basis in order to maintain skills and confidence.

Key words

- Insulin initiation
- Insulin management
- Primary care
- Training

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Page points

1. If the person with diabetes has a poor experience at the time of insulin initiation and they are not taught correctly, this can lead to resistance and years of non-compliance.
2. Whilst evaluations of the effectiveness of insulin start training for primary care staff have been positive, it is not clear whether the training results in more insulin starts without the supervision of a DSN.
3. Wandsworth Primary Care Trust carried out insulin initiation training from 2006–2008. The training involved a 2.5-day course and then supervision from a community DSN during a minimum of three insulin starts.

Insulin initiation in primary care

Type 2 diabetes is a progressive condition, characterised by insulin resistance and reduction in beta cell function, with over 50% of patients eventually requiring insulin therapy (UK Prospective Diabetes Study [UKPDS] Group, 1995). NICE (2009) recommends that insulin should be considered when HbA_{1c} is ≥58 mmol/mol (7.5%). Early initiation of insulin is important in order to avoid complications (UKPDS Group, 1998).

There may be several advantages for patients starting insulin at their GP surgery, including easier access to GP surgery with variety of appointment times (Freeman, 2004) and continuity and familiarity for the patient with the same GP and practice nurse carrying out holistic management (Hill, 2007). Despite potential advantages for patients and locally enhanced schemes that encourage practices to take on insulin initiation, is insulin initiation carried out effectively? Starting insulin can be a major life event for the person with type 2 diabetes and it is crucial that clinicians have the right skills and knowledge to provide education and support. If the person with diabetes has a poor experience at the time of insulin initiation, for example, if they are not taught correctly or their fears are not allayed, this can lead to resistance and years of non-compliance.

The small amount of studies that have evaluated the effectiveness of insulin initiation training have used self-completion questionnaires post-course and log diaries. These training programmes appear to have been positively evaluated by course participants (Shepherd et al, 2007) and have demonstrated that insulin starts by primary care staff can lead to improvement in HbA_{1c} at 6 months (Burden and Burden, 2007; Dale et al, 2008). However, it is not clear how many insulin starts are done without the supervision of a DSN. In addition, there is a lack of published research comparing relevant outcomes in a group trained in insulin initiation and an untrained group.

Insulin initiation training in Wandsworth Primary Care Trust

From 2006–2008, the community DSN team in Wandsworth Primary Care Trust (PCT) ran the Warwick University 2.5-day course, “Intensive management in type 2 diabetes (Insulin initiation

in primary care)”, known locally as Wandsworth Insulin Start Programme (WISP). The aim of this course was to enable GPs and practice nurses to start patients on once-daily basal insulin, in conjunction with oral antidiabetes agents (NICE, 2009). Both a GP and practice nurse from the same practice were encouraged to attend in order to foster a team approach. Out of 50 GP practices, two participants from 13 practices attended the training. The course involved group work, presentations and case studies and the topics covered are listed in *Box 2*.

On completion of the 2.5-day course, a community DSN then supervised the practice nurse or GP undertaking a minimum of three and a maximum of 10 insulin starts within 1 year of the course. This would then allow the practice nurse or GP to carry out insulin initiation without community DSN supervision. An insulin start protocol (Wandsworth Diabetes Clinical Reference Group, 2013) was developed to guide the practice nurse or GP through three 45-minute appointments that completed an insulin start. Competencies were developed by the community DSN team for use in the assessment and mentoring process, which were based around the nationally accepted diabetes competency framework, *An Integrated Career and Competency Framework for Diabetes Nursing* (TREND-UK, 2011).

Box 2. Topics covered during insulin training.

- Identifying and addressing clinician/patient barriers towards insulin initiation.
- Insulin start protocol for people with type 2 diabetes.
- Insulin regimens.
- Delivery devices.
- Injection technique.
- Storage of insulin.
- Patient titration of insulin dose on a once daily basal regimen.
- Causes, signs and treatment of hypoglycaemia.
- Driving advice.
- Diet and exercise.
- Sick day rules.
- Travel with insulin.

Study aims

The objective was to investigate the effectiveness of WISP. The study examined whether structured training reduces perceived barriers to insulin initiation and increases willingness, confidence and the number of insulin starts; in particular the number of insulin starts done without the supervision. This study assessed the number of insulin starts, knowledge and attitude to insulin initiation amongst a group of trained GPs and practice nurses and compared these to an untrained group.

Method

The final data sets consisted of 25 trained and 25 untrained respondents. Both groups consisted of 12 GPs and 13 practice nurses, representing a response rate of 89%. Both groups had already attended the local education programme on the principles of diabetes management. Numbers of insulin starts, knowledge and attitudes towards insulin initiation were assessed by a self-completion questionnaire within 1 year of completing the course (see *Box 3*). The questionnaire used a 5-point Likert scale, ranging from strongly agree (5) to strongly disagree (1) and very willing/confident (5) to very unwilling/unconfident (1). The questionnaire was initially piloted on a small number of GPs and practice nurses outside Wandsworth and then refined to formulate the final questionnaire (*Box 3*).

Anonymous postal questionnaires were sent to participants, with a covering letter explaining the purpose of the study. Ethical approval was not required since the ethics committee advised the project was considered to be a survey. Mann–Whitney *U* tests were used to assess differences between trained and untrained group. Statistical significance was set at $P < 0.05$.

Results

The trained group reported significantly fewer perceived barriers towards insulin initiation compared to the control group ($P < 0.001$), as shown in *Table 1*. Within the trained group, practice nurses had significantly better understanding regarding patients' injection-related anxiety, cultural health beliefs and better knowledge of insulin and devices for individual patients' needs ($P < 0.05$). The trained group were more willing and confident compared to the control group

($P < 0.001$). Practice nurses in the trained group were more willing than GPs ($P < 0.05$) but neither practice nurses nor GPs were particularly confident ($P = 0.205$).

More insulin starts were carried out in the trained group (51 versus four in untrained group; $P < 0.001$). Closer analysis of these 51 insulin starts revealed variation amongst the 25 participants as shown in *Figure 1*. The majority of insulin starts were carried out by a minority of four practice nurses. Notably, only 15 out of 51 insulin starts (28%) were reported to be without community DSN supervision.

Box 3. Questions included in the questionnaire (rated 1–5).

Perceived barriers towards insulin initiation

Questions 1–9

- I understand when to start insulin in a patient's treatment plan.
- I understand the Wandsworth Insulin Start Protocol.
- I believe a patient will benefit from insulin therapy.
- The risk of hypoglycaemia affects my decision whether to start a patient on insulin.
- The risk of weight gain affects my decision whether to start a patient on insulin.
- I understand how often a patient should test their blood glucose on once-daily insulin.
- I understand what blood glucose targets a patient should aim for on once-daily insulin.
- I understand how insulin should be titrated to achieve these targets.

Questions 10–17

- I understand how to address potential patient barriers to insulin:
 - Cultural beliefs.
 - Injection-related anxiety.
 - Fear of restricted lifestyle.
 - Sense of personal failure.
 - Lack of positive gain.

- I have sufficient knowledge of insulin and devices.
- I would be more likely to delay insulin for a patient who was not adhering to their treatment plan.

Questions 18–23

- The cost of insulin affects my decision whether to start a patient on insulin.
- There is not enough time to counsel a patient who has concerns about insulin.
- There are not enough staff to start patients on insulin.
- I would refer a patient who needs routine insulin therapy to secondary care.
- I feel there is sufficient community diabetes specialist nurse support.

Willingness

- How willing are you to start a patient on insulin?

Confidence

- How confident are you to start a patient on insulin?

Page points

1. Overall, the GPs and practice nurses who had received training reported significantly fewer barriers towards insulin initiation than those who had not received training.
2. Within the trained group, practice nurses had significantly better understanding than GPs regarding patients' injection-related anxiety, cultural health beliefs and better knowledge of insulin and devices for individual patients needs ($P<0.05$).
3. Insulin initiation needs to be carried out by trained practitioners on a regular basis in order for them to maintain their skills and confidence (Hill, 2007).

Discussion

The study demonstrated that training in insulin initiation significantly reduces barriers to insulin initiation and increases willingness and confidence, which leads to more insulin starts compared to an untrained group. However, within the trained group of 25 participants, there was widespread variation in who performed insulin initiation. It is perhaps not surprising that seven out of the 12 GPs (58%) did not initiate insulin, as typically it is more likely to be the role of the practice nurse. It is more surprising that five out of 13 practice nurses (38%) who attended the training did not carry out any insulin starts. These practice nurses were significantly less willing and less confident towards starting insulin, self-reported less understanding of the insulin start protocol and were more likely to refer to secondary care ($P<0.05$).

Additional factors may further explain why these practice nurses did not initiate insulin. Although practice nurses undertake the majority of diabetes management in general practice (Everett, 2007), they have to juggle many other priorities and may be under significant time constraints. Therefore, it is important that they have a GP who is supportive of insulin initiation. In addition, there are variations in the prevalence of diabetes between practices and, consequently, some practices have fewer patients who may require insulin.

Only 28% of insulin starts were carried out without community DSN supervision. It was presumed these 15 unsupervised insulin starts, which were carried out by nine participants (three GPs and six practice nurses), should have been a reflection of those practice nurses or GPs who

had completed the competency-based assessment to carry out insulin initiation independently. Conversely, anecdotal evidence from the community DSNs who mentored the trained group reported that only three practice nurses had completed the competency-based assessment by the time the questionnaires had been returned. This inconsistency appeared to suggest that some practitioners were carrying out insulin starts without having completed the competency-based assessment.

Although the trained group were significantly more willing and confident in carrying out insulin initiation compared to untrained staff, this was not reflected in the number of unsupervised insulin starts. It is acknowledged that some practitioners may have needed to undertake more supervised insulin starts than others in order to complete the competency-based assessment. Nevertheless, given there was a maximum of 1 year post-training, the number of unsupervised insulin starts was disappointingly low. It is accepted there could have been a higher increase in the number of unsupervised insulin starts had the study duration exceeded 1 year. Even so, insulin initiation still needs to be carried out by trained practitioners on a regular basis in order for them to maintain their skills and confidence (Hill, 2007) and also have enough time to cover all vital aspects of patient education when initiating insulin. In addition, this inner London PCT has a mobile workforce as well as a mobile patient population and there is often a gap in service provision for people with diabetes when practitioners trained in insulin initiation leave the PCT.

Implications for practice

The results of this study enabled the community DSN team to consider whether training GP practices to initiate insulin was the best approach. Trained practitioners who are competent in insulin initiation and have the time to undertake this regularly will be maintaining their knowledge, skills and confidence, thus benefitting their patients; unfortunately in the study area, this is a minority of practices.

The community DSN team, whilst still supporting practice-based insulin starts, now undertake the insulin initiation either through

Table 1. Differences in barriers between the trained group and control group.

Q	Perceived barriers	Trained group		Control group		U value	P-value
		Mean	SD	Mean	SD		
1-9	Insulin initiation	4.15	0.48	3.36	0.51	60	<0.001
10-17	Patients and insulin	4.07	0.46	2.95	0.77	59	<0.001
18-23	Resources	3.34	0.53	2.65	0.57	126.5	<0.001

groups in community settings where numbers permit, or through individual insulin initiation. Evidence suggests that there are advantages to group starts, compared to individual insulin initiation. Yki-Jarvinen et al (2007) found that total time spent initiating insulin was 48% less in groups compared to individual insulin initiation. Greater treatment satisfaction (Erskine et al, 2003) and mutual support is a benefit expressed by patients who were started in groups (Hill and Gilroy, 2002). Cost effectiveness (Hill, 2007) and better use of resources (Everett, 2007) are other reported advantages.

In both group and individual insulin initiation, promoting patient self-management is an integral part of WISP. People with diabetes are taught how to self-titrate their insulin dose to target according to local protocol (increase by 2 units every 3 days until fasting blood glucose is 4–6 mmol/L). On completion of the programme, individuals are then discharged back to their GP practice if they are confident self-titrating.

However, insulin initiation is only one part of the journey towards improving glycaemic control. Supporting people with diabetes in achieving and maintaining glycaemic targets is important and, therefore, it is essential that GPs and practice nurses have the skills in insulin management to consider why an individual may not be achieving the target, or why glycaemic control may deteriorate. Such factors are listed in *Box 4*; it is important to consider these before a person with diabetes is switched to an alternative regimen in order to intensify treatment. Perhaps one of the most important factors to consider is non-adherence to insulin and medication and the potential reasons. One danger of not recognising non-adherence is that practitioners can recommend higher insulin doses, putting the person with diabetes at risk of hypoglycaemia if insulin is taken (Grant et al, 2003).

Insulin management training in Wandsworth PCT

Insulin training in Wandsworth PCT now focuses on insulin management instead of insulin initiation. To date, the Intermediate Diabetes Team has run seven cycles of the 1.5-day “Wandsworth Insulin Management Course” for GPs, practice nurses, community matrons and advanced nurse practitioners, with 70 participants attending so

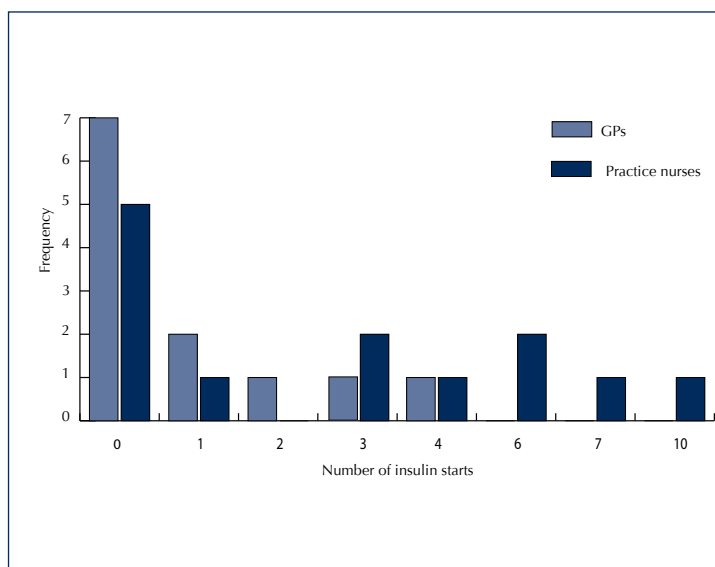


Figure 1. Trained group: The number of insulin starts amongst trained GPs and practice nurses.

far. The course content is similar to that listed in *Box 2*, but instead of initiating insulin, the aim is for practitioners to be able to support people with diabetes on insulin therapy and troubleshoot if an individual is having difficulty self-managing or glycaemic control is not to target. In addition, there is a focus on how to titrate insulin regimens other than once daily, what factors to consider before adjusting the dose, and when to consider referring patients for a change of insulin regimen or initiation of glucagon-like peptide-1 (GLP-1) analogues.

The course has been positively evaluated by participants on completion, but this has not determined how effective the course has been in subsequent months, since this requires opportunity to develop skills and ongoing experience. Diggle (2012) acknowledges that in order to become proficient in insulin management, practitioners need to be regularly dealing with an appropriate number of people with diabetes, which may not be possible for all practice nurses.

In Wandsworth, practitioners have the opportunity to put theory into practice and develop their experiential learning by participating in the joint tier-2 clinics (Healthcare for London, 2009), which are held monthly with the community DSN and practice nurse or GP in most GP practices. Tier-2 clinics (enhanced primary care) involve the more complex aspects of insulin management with people on varying types of insulin regimens and injectable

Page points

1. To evaluate the effectiveness of the Insulin Management Course, a survey recently took place to assess participants' confidence in adjusting insulin and supporting patients and knowledge of additional factors to consider before adjusting insulin dose.
2. Participants reported high confidence scores in titrating insulin regimens and supporting patients in aspects of insulin management and reported awareness of factors to consider before adjusting insulin.
3. Although people are taught to self-titrate their insulin dose to target when initially commenced on insulin, GPs and practice nurses play an important part in supporting this ongoing process.

therapy. Local guidelines support clinicians in titrating insulin and monitoring the effect of GLP-1 analogues.

Insulin management: Post-course survey

To evaluate the effectiveness of the Insulin Management Course post-completion, a survey recently took place to assess participants' confidence in adjusting insulin and supporting patients and knowledge of additional factors to consider before adjusting insulin dose. A 5-point Likert scale was used to measure responses ranging from strongly agree (5) to strongly disagree (1).

Fifty out of 70 participants who took the course were emailed the questionnaire. Twenty participants were not included as they had since left. Response rate was 24 out of 50 (48%), and included 12 practice nurses, nine GPs, two advanced nurse practitioners and one community matron.

Results

Participants reported being confident in adjusting once-daily, twice-daily and basal-bolus insulin regimens, although slightly more so with

once-daily insulin (mean score, 4.25). Participants reported being confident in all aspects of insulin management (3.95–4.62). They were most confident giving lifestyle advice (4.62), and slightly less confident advising on use of a pen device and travelling abroad with insulin (3.95), as shown in *Figure 2*. The three most commonly reported factors to consider when adjusting insulin dose were: checking injection sites; accuracy of the individual's blood glucose monitoring results and patient understanding of insulin administration.

Discussion

It is encouraging that participants reported high confidence scores in titrating insulin regimens and supporting patients in aspects of insulin management and reported awareness of factors to consider before adjusting insulin. The marginally increased confidence score in titrating once-daily insulin may be a reflection of the local insulin start protocol, where people are initiated on once-daily basal insulin. Although people are taught to self-titrate their insulin dose to target when initially commenced on insulin, GPs and practice nurses play an important part in supporting this ongoing process. Similarly, it is essential that weight gain or hypoglycaemia does not become problematic after insulin initiation, therefore it is encouraging that participants reported high confidence scores with lifestyle advice and management of hypoglycaemia.

Although participants reported confidence in using an insulin pen device, this was marginally less so than other aspects of insulin management and may reflect that it is usually the community DSN who does the insulin initiation and educates the patient how to use the pen device in the first instance. However, the *First UK Injection Technique Recommendations* (Forum for Injection Technique, 2011) and a practical session on use of pen devices are covered in the course to give participants the skills to help resolve any problems a patient may develop with insulin administration. Participants also reported being marginally less confident in advising patients if travelling abroad with insulin but this may be due to not needing to address this as frequently as other aspects of insulin management.

A limitation with this survey is that confidence levels are self-reported and do not

Box 4. Factors to consider before intensifying treatment.

- Non-adherence and causes (depression, poor understanding of treatment, concerns about weight gain and hypoglycaemia, difficulty in administering insulin).
- Appropriate titration of insulin.
- Accurate blood glucose monitoring.
- Injection technique.
- Lipohypertrophy.
- Storage and expiry of insulin.
- Illness/infection.
- Timing of injection.
- Activity levels.
- Eating patterns.
- Diet and alcohol.
- Worsening dexterity/vision.
- Weight gain.
- Hypoglycaemia.
- Other medication, such as steroids.

indicate how proficient a clinician is in insulin management, which would require a further comparative study. Competencies from the Diabetes Nursing Framework (TREND-UK, 2011) are discussed during the insulin management course and participants are encouraged to self-assess following the course, as there is no system in place for competency assessment. Despite this, the course appears to be a good foundation for developing skills in insulin management, enhanced by the opportunity to develop skills and confidence via tier-2 clinics with the community DSN.

Conclusion

Primary care training in insulin initiation is effective compared to no training. However, the number of insulin initiations carried out in this study was variable, thereby limiting the benefits of the training. Practice nurses and GPs need to be carrying out insulin initiation on a regular basis in order to maintain skills and confidence and have the time available to cover every aspect of education involved in an insulin start. In light of these findings, insulin initiation is carried out by community DSNs in Wandsworth and training for practice nurses and GPs now focuses on insulin management. Maintaining insulin management skills in primary care staff is paramount, given the increasing prevalence of diabetes and numbers of people who will benefit from early initiation of insulin and support to maintain target glycaemic control. ■

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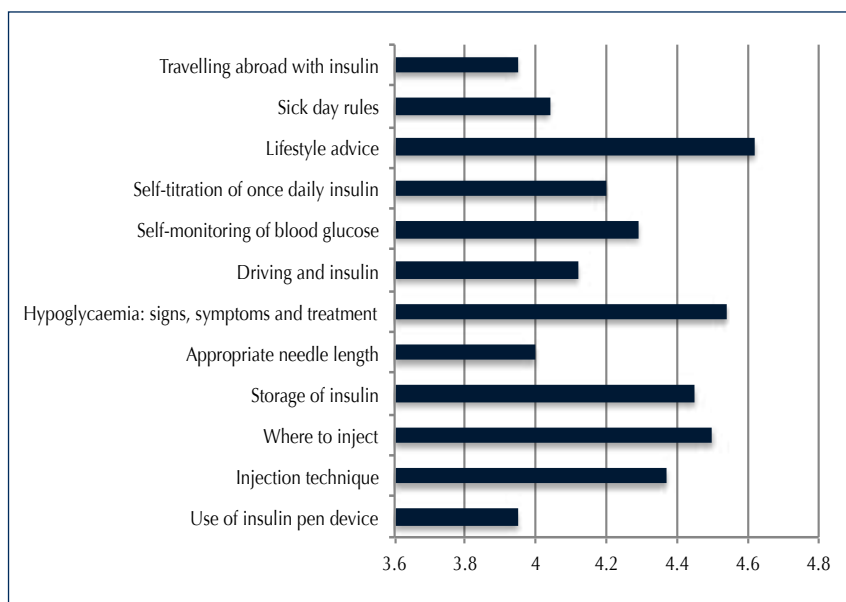


Figure 2. Confidence levels of GPs and practice nurses after completing training (1–5).

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