Insulin initiation in a general practice clinic: A questionnaire -based study

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UK policy is shifting the care of long-term conditions into the community, including the management of increasing numbers of people with diabetes. Initiating insulin in general practice may offer benefits of convenience and continuous care. A pilot questionnaire was completed by 49 people with type 2 diabetes who had attended a primary care insulin initiation clinic run by a GP and nurse practitioner both trained to initiate insulin. Respondents highlighted the importance of involving them in decision-making and of providing support as confidence is gained following initiation. This article describes a primary care based research questionnaire reporting quantitative and qualitative data on insulin initiation in a general practice clinic.

Diabetes is increasingly common, with UK prevalence estimated at 4%, 90% of whom have type 2 diabetes (Diabetes UK, 2010). Type 2 diabetes is a progressive condition characterised by insulin resistance and increasing beta-cell dysfunction (Poitout and Robertson, 2002). The UKPDS (UK Prospective Diabetes Study; Stratton et al, 2000; Holman et al, 2008) demonstrated that the risk of irreversible complications could be reduced by improving glycaemic control. Despite novel alternatives to insulin (NICE, 2009), some of which have a limited long-term evidence base, increasing numbers of people with type 2 diabetes will need to commence insulin therapy to achieve good glycaemic control. Primary care clinics managed by GPs and practice nurses can help facilitate insulin initiation while offering the benefits of convenience and continuity of care.

Managing diabetes: The shift to primary care

The shift of diabetes care into the community was partly driven by the 1990 GP contract (Department of Health [DH] and Welsh Office, 1989; Chisholm, 1990), which rewarded GPs providing health promotion and disease prevention, and stimulated the development of diabetes clinics in general practice. The introduction of the 2004 contract with stringent quality indicators

for HbA$_{1c}$ ≤7.4% (≤57 mmol/mol) (British Medical Association and NHS Employers, 2004), led to less tolerance of poor glycaemic control and increased recognition of the need for insulin. Historically, individuals requiring insulin were referred to secondary care diabetes specialists; however, the potential overload on these clinicians with associated costs led to a further shift into primary care supported by national initiatives (DH, 2000; 2003; 2006; Darzi, 2008), with insulin initiation being undertaken by GPs and practice nurses. This reduced referrals to specialist diabetes teams who could then focus on those with more complex needs.

The Whitstable Medical Practice initiative

The development of practice-based commissioning (PBC) enabled practices to develop innovative quality services to meet the needs of the local community. An in-house insulin initiation clinic, funded through PBC, was instigated in 2005 at the Whitstable Medical Practice (WMP) in Kent, by a GP (RB) and nurse practitioner (KE) who both received training through Warwick University's Insulin for Life Programme. This involved a study day followed by practical supervision in initiating insulin by an experienced diabetes specialist nurse.

WMP serves a population of around 32 000 with more than 1600 people on the diabetes

register. A systematic approach was adopted to identify people suitable for insulin initiation. Those with an HbA$_{1c}$ level ≥7.5% (≥58 mmol/mol) on optimum tolerated oral therapy were invited for assessment and discussion of the available treatment options, which included triple oral therapy with a thiazolidinedione or the addition of insulin. This has evolved to include the option of adding a glucagon-like peptide-1 (GLP-1) receptor agonist or dipeptidyl peptidase-4 inhibitor according to NICE (2009) guidance. Since 2005 more than 100 people with type 2 diabetes have started insulin therapy at the clinic (*Table 1*).

The WMP insulin clinic

The clinic structure, referral criteria and protocol are detailed in *Appendix 1* (published online at www.diabetesandprimarycare. co.uk). The insulin clinic leaflet and questionnaire is available on request. The clinic is now nurse-led, with good support from the GP. Individuals are taught how to administer and manage their insulin therapy during one 30-minute and two 15-minute appointments each a week apart, with additional telephone follow-up. To involve people in the decision to start insulin, a concordant approach is used at the point of referral and during clinic attendance. They are informed of the long-term health risks of raised blood glucose levels and the benefits versus risks of insulin treatment and, as appropriate, other treatment options. Following insulin initiation, individuals are shown how to self-manage their insulin by dose titration before returning to follow-up in their normal practice diabetes clinic.

Patient experience of insulin initiation

The patient experience of general practice consultations is an important subject of research: Mead et al (2008) argue that patient evaluations of consultations are important quality indicators. Indeed, research has demonstrated how patient satisfaction with diabetes services in primary care impacts positively on diabetes outcomes (Alazri and Neal, 2003; Lawton et al, 2005). Because of

Table 1. Number of people with diabetes and number treated with insulin in Whitstable Medical Practice Population in 2009.

Characteristic	Number	Percentage (%)
Practice population	32 463	–
All people with diabetes	1555	5
Type 1 diabetes	122	8
Type 2 diabetes	1433	92
Treatment in type 2 diabetes		
No insulin	1253	87
Insulin treated	180	13
Insulin initiated at the primary care clinic	88	49
Insulin initiated by the community diabetes specialist team	92	51

the insidious onset of hyperglycaemia, many will not experience symptoms and have no perceived benefits of improved glycaemic control with insulin treatment; indeed, they might even feel worse if they experience hypoglycaemia.

It is, therefore, important that people have a positive experience of insulin initiation in addition to improved glycaemic control. However, a literature search revealed an apparent paucity of published research of insulin initiation in general practice.

Aims

The authors aimed to explore the experiences, both general and specific, the perception of the decision-making process and confidence in self-management of people with type 2 diabetes starting insulin in a general practice clinic.

Methods

Study design

A postal questionnaire survey was sent to all people with type 2 diabetes who started insulin at the WMP in-house clinic since October 2005. Reminders were sent at 4 and 6 weeks.

The questionnaire

Using established methodology (McColl et al, 2001; Bowling, 2002; Boynton and Greenhalgh, 2004; Saks and Allsop, 2007), a three-section survey was designed to gather information about individuals' experiences before, during and after insulin initiation at the in-house clinic.

To determine how involved people felt in the decision to start insulin and establish their confidence in self-management of their insulin therapy, two validated questionnaires were included. Howie et al's (1998) patient enablement instrument (PEI) was adapted by specifying "diabetes" instead of "illness"; and "injections" and "adjusting your insulin" instead of "able to keep yourself healthy". Moss-Morris et al (2002) designed the Illness Perception Questionnaire (IPQ), encouraging researchers to adapt it to the particular illness

under study. This was undertaken by using the words "blood sugar" and "diabetes" instead of "illness", and "insulin" instead of "treatment".

Written comments were invited in response to questions regarding how people felt about starting insulin therapy, the insulin clinic, and suggested improvements to the service.

People with diabetes, clinical and administrative staff were involved in designing and developing the questionnaire. This included a presentation to the practice Patient Users' Group. The questionnaire was piloted on people from the practice with type 2 diabetes whose insulin was initiated by the community specialist diabetes team. Main amendments included type and size of font, phrasing, length and ordering of questions, and format for responses.

Identification of people with diabetes and recruitment

The practice database was searched in January 2009 for people with type 2 diabetes who had attended the practice insulin clinic since October 2005. People who were excluded comprised:

- Those unable to consent or who were seriously ill at the time.
- Those unable to complete a questionnaire in English.
- Those whose insulin treatment was managed by carers or community nurses.
- Those participating in another study.
- Those no longer prescribed insulin (at the time of the study, two had transferred from insulin to an incretin therapy).

Reducing the potential for researcher bias

Demographic and clinical data were entered on to a database of potential participants. This was then anonymised. The researcher was the nurse practitioner involved in the clinic, and to avoid influencing responses, the practice research administrator mailed and received the completed coded questionnaires, removing any identifiable details before forwarding them to the researcher. Data handling was conducted in a confidential and secure way.

Table 2. Characteristics of participants (n=49).		
Demographics	**Number**	**Percentage (%)**
Male	28	57
Mean age (years)	65.0 (SD 12.0)	
Smoking status		
Smoker	4	8
Ex-smoker	24	49
Never smoked	21	43
Ethnicity		
White British	45	92
Other	4	8
Lives alone	11	22
Employment status		
Employed	15	31
Retired	34	69
Clinical parameters		
Mean BMI (kg/m^2)	32.3 (SD 7.25)	
Mean HbA$_{1c}$ (% [mmol/mol])	7.8 (SD 1.28) [62]	
HbA$_{1c}$ ≤7.5%* (≤58 mmol/mol)	25	51
HbA$_{1c}$ ≤10%* (≤86 mmol/mol)	47	96
*QOF indicators (British Medical Association and NHS Employers, 2008)		

Research ethics and governance

Ethical approval was provided by East Kent Local Research Ethics Committee and governance approval from Eastern and Coastal Kent PCT.

Statistical analysis

The researcher entered anonymous quantitative data onto SPSS16 for analysis. Demographic data and clinical information were analysed using categorical and continuous descriptive statistics. Where individual questions were not answered, the total number of respondents (n=49) were used as the denominator to prevent an overestimation of individuals with positive experiences. Paired-sample t-tests were used to explore before and after differences in confidence about injecting and adjusting insulin. Pearson correlation coefficient was used to explore associations between variables including diabetes control and the decision to start insulin and confidence in self-managing

insulin. Cronbach's alpha coefficient was used to assess internal consistency reliability for patient enablement scores. Free-text comments were analysed using qualitative methodology (Saks and Allsop, 2007).

Results

Recruitment

The search of the practice database generated 78 names of whom 69 fulfilled the inclusion criteria. The 49 (71%) people who responded (*Table 2*) shared similar characteristics to the whole eligible study population demonstrating that the data is representative of this population.

Clinical outcomes

HbA$_{1c}$ levels improved following insulin initiation. Mean HbA$_{1c}$ level before insulin was 9.5% (standard deviation [SD] 1.56; 80 mmol/mol) and most recently: 7.8% (SD 1.28; 62 mmol/mol). Prior to commencing insulin, none of the participants had an HbA$_{1c}$ level ≤7.5% (≤58 mmol/mol). At their most recent test 25 (51%) had an HbA$_{1c}$ level below this threshold. There was a small mean increase in BMI of 0.7 kg/m^2.

While most individuals did not change their insulin (n=41; 84%) some converted to other regimens due to difficulty achieving glycaemic control (n=8; 16%).

Quantitative data

Decision-making

Figure 1 shows responses to questions adapted from the IPQ (Moss-Morris et al, 2002). The generally positive scores indicate that the majority of people held positive beliefs about their condition, the control they had over it and the active role they played in deciding on treatment options. For example, 88% considered that they were fairly involved or very involved in the decision to start insulin, and 82% agreed or strongly agreed that the decision to attend the insulin clinic was made jointly by them and the clinician, although the fact that 45% agreed or strongly agreed this decision was made mostly by the clinician suggests there may be some confusion over

wording of these questions. However, one person believed he had no option:

"I did not want to go on insulin. I felt that my treatment was adequate but that I had no choice." (Respondent 1, aged 58 years).

Enablement

Enablement scores from the PEI (Howie et al, 1998) show that positive results were shared by the majority. Nearly half scored very highly, reflecting a good understanding of their diabetes, ability to cope, confidence about managing their condition and feeling able to help themselves. A significant minority, however, indicated a need for more support.

Perceptions of confidence

Similar questions asked about confidence before and after initiation of insulin indicated a significant improvement. Confidence in injecting increased from 3.02 (SD 1.56) to 4.56 (SD 0.73), mean difference 1.50 (95% CI −1.95 to −1.05; $P<0.0005$). The score is a measure of confidence gained, from the patient enablement questions. It ranges from 1 (not at all confident) to 5 (very confident).

A similarly positive outcome was evidenced in the statistically significant increase in confidence with dose adjustment. Confidence in adjusting doses increased from 2.93 (SD 1.29) to 4.31 (SD 0.93), mean difference 1.38 (95% CI −1.90 to −0.86; $P<0.0005$).

Qualitative analysis

In total, 33 (67%) participants provided free-text comments, from which eight key themes were identified: perceptions of diabetes, how
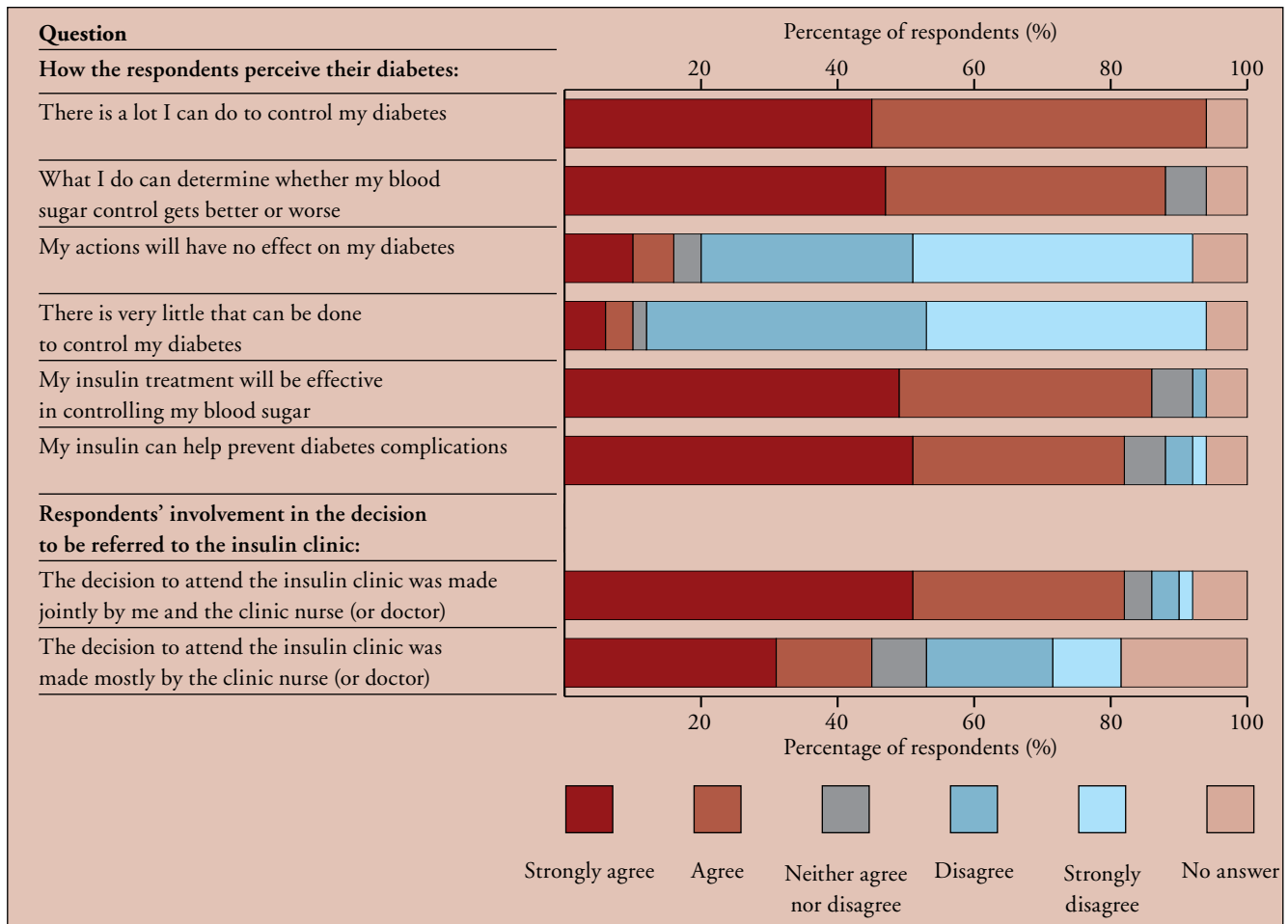

Figure 1. Responses to questions about the self-perception of diabetes and the decision to attend the insulin clinic.

insulin might impact on daily living, worries about side-effects of insulin, fear, family support, clinic care, information given and peer support.

Perceptions of diabetes

Most (*n*=37; 76%) respondents were aware of the progressive nature of diabetes, and 45 (92%) knew that good glycaemic control reduced the risk of complications. Despite this knowledge, the reality of starting insulin induced a number of pessimistic comments:

"It felt as if my diabetic condition had taken a major turn for the worse, even though my glucose levels had stuck rather than increased." (Respondent 25, aged 55 years)

"That life had ended." (Respondent 44, aged 57 years)

Impact on daily living

Some 73% (*n*=36) of respondents expressed concerns about how insulin might affect their daily life, and some gave specific examples:

"At first I was a little worried how this would affect my lifestyle ... after it was explained to me that it would be one injection a day, I was relieved, and have to say since my injections started it really has improved my lifestyle." (Respondent 68, aged 63 years)

Concerns focused on the practical impact of insulin on driving, travel and insurance:

"My greatest concern was not diabetes or insulin but that having to take insulin would affect how others apart from family and clinic, might react i.e. DVLA, car insurance, life insurance, etc." (Respondent 61, aged 72 years)

However, this person added that none of his anxieties had been realised.

Worries about side-effects of insulin

Only four people expressed specific concerns about side-effects, including worries about polypharmacy, hypoglycaemia, and weight gain:

"I was worried about the effects of the insulin with my other medication." (Respondent 23, aged 60 years)

"Being on my own and having a hypo. I now know how to go about this if it happens." (Respondent 27, aged 78 years)

"Having been told by lots of people that I would put on a lot of weight, which I did." (Respondent 65, aged 60)

Fear

While 18 (37%) indicated that they were afraid of self-injecting, a greater proportion suggested they were not. Self-administering dummy injections either before (in 22 out of 32 cases) or during (in 36 out of 39 cases) the insulin clinic consultation, helped reduce fear. Generally, initial fears resolved with experience, although not for everyone:

"I was very concerned about giving myself an injection but once I had got used to injecting myself I have not looked back." (Respondent 59, aged 41 years)

"Hated it and still do!!" (Respondent 7, aged 55 years)

Notably, 37% (*n*=18) of respondents reported being informed about insulin therapy when first diagnosed. Although nine respondents believed that early discussions about the possibility of insulin conversion facilitated their acceptance of insulin, it could cause anxiety:

"I think that if I thought that I would one day have to take insulin I would have had this on my mind all the time." (Respondent 59, aged 41 years)

Family support

Two people wrote of their family involvement, including:

"I am pleased when I attend the clinic. She [clinic nurse] has time for me ... and also explained everything to my husband which was very helpful for him to join in my healthy eating plan." (Respondent 23, aged 60 years)

Clinic care

Most felt able to contact clinicians if necessary (*n*=48; 98%) and were positive about the way clinicians communicated and supported them (*n*=46; 94%), helping to allay fears. Forty-one (84%) found telephone follow-up helpful after their first appointment and first injection. Comments included:

"I always feel I can phone if I need to be sorted out." (Respondent 65, aged 60 years)

"I found it very helpful and keeping the same nurse is very good." (Respondent 53, aged 46 years)

Two people expressed booking difficulties including:

"I would much prefer if appointments could be confirmed or arranged by email. 'Post-it' notes are very easy to lose." (Respondent 51, aged 60 years)

Patient information

Almost all of the respondents appreciated the leaflets – including a WMP Insulin Clinic Leaflet, which 43 (88%) found helpful and easy to understand – and a range of information published by pharmaceutical manufacturers. A few would have liked more information:

"Not enough time given for queries arising from problem areas, i.e. diet, time of meals and taking insulin in social events." (Respondent 1, aged 58 years)

"Perhaps more information for when you are travelling especially via different time zones." (Respondent 23, aged 60 years)

Three alluded to the need for more literature on insulin titration. This is an important area and can act as a reminder of how to adjust insulin doses over time as the condition progresses.

Peer support

Two people expressed an interest in peer support, including:

"Information on local support groups would be welcomed, as I would like to discuss my experiences and feelings with other diabetics." (Respondent 11, aged 44 years)

Discussion

These data suggest that the respondents considered their general practice clinic to be an appropriate place for initiating insulin, and the improvement in clinical outcomes suggests that it is an effective option. Perceptions of the clinic and follow-up support were generally positive, although some people had suggestions for improvement. The role of the patient in the insulin initiation decision-making process was established as mostly in partnership with the clinician. Confidence in self-managing the insulin treatment was found to be significantly increased following insulin initiation.

Limitations and strengths

The sponsorship of the training by the manufacturer of a branded insulin has raised concerns about inappropriate influence on prescribing (Cohen and Carter, 2010), however the imbalance in our use of two brands of long-acting insulin analogues is mainly because at the time our insulin clinic was instigated, only one product was licensed for use in addition to oral glucose lowering agents in type 2 diabetes.

The researcher, being a clinician in the insulin clinic, may have biased the responses. However, to mitigate this, participants were assured of anonymity and completed questionnaires were returned directly to the research administrator who removed any identifiable data before passing them on to the researcher.

People with positive experiences may have been more likely to participate, however the good response rate of 71% and the similar demography of responders compared to the population increases generalisability. As some people started insulin more than 3 years prior, their insulin would have become a way of life and they may have forgotten about their initial feelings, therefore some of the findings should be interpreted with caution. Closed questions can limit information obtained but free-text comments enhanced the study by providing

Page points

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context and background to the questionnaire responses. Despite careful design and piloting, wording of the questions about the decision to be referred to the clinic appears to have confused some respondents.

Finally, the results of the study are based on one insulin initiation clinic and results may not be generalisable to other settings. However, details are provided of the practice, the GP and nurse expertise to inform other practices who may be considering this approach.

What this study adds to existing research

The generally positive perceptions of people starting insulin in general practice clinics reflects other research (Jarvis et al, 2000; Greaves et al, 2003; Burden and Burden, 2007; Mannion et al, 2007; Dale et al, 2008) and the clinical outcomes provide reassurance that with appropriate training, GPs and practice nurses can satisfactorily initiate insulin. HbA_{1c} levels improved following insulin initiation and a small mean weight gain was observed (BMI 0.7 kg/m^2), in keeping with other research (Burden and Burden, 2007).

Although some studies have shown that most people are unaware of the progressive nature of type 2 diabetes (Phillips, 2007), the majority of respondents in this survey understood that the condition is progressive and that good glycaemic control reduces the risk of long-term complications. This is reassuring, as an important aspect of managing long-term conditions is helping individuals to understand the disease process and the role of drug therapy in reducing risk. The potential impact on everyday life was a major concern, with at least one person considering that "life had ended" when facing the change to insulin. However, in line with other studies, confidence significantly increased following initiation (Burden and Burden, 2007; Phillips, 2007).

Introducing the possibility of insulin early in the course of the condition may help some people accept the change, but a few thought that it would have added to the worry over an unnecessarily long period of time. Clinicians will need to tailor their approach

to the individual. Self-administering a dummy injection at the time of referral to the clinic helped to reduce fears of injecting and may help people to feel more positive about attending the clinic.

In Phillip's (2007) in-depth qualitative study of eight participants under the care of a diabetes specialist care team, the decision to start insulin was perceived to be made mostly by the doctor. In contrast, almost all the people in this survey felt fairly or very involved in the decision-making process, reflecting the clinicians' aims to develop a therapeutic partnership with the person.

Finally, respondents are currently seen individually in the clinic. The fact that some expressed an interest in discussing their experiences with others suggests potential benefits of insulin initiation in small groups. Indeed, structured group education is endorsed in national guidance (DH and Diabetes UK, 2005; NICE, 2009). Approaches, however, should be individualised, as while groups may benefit some individuals, others may prefer the privacy afforded by individual consultations.

Conclusions

This study suggests that a general practice insulin initiation clinic led by a GP and nurse with expertise is feasible and well received by people with type 2 diabetes. Respondents were generally positive about their experiences and believed that clinicians communicated well and were easy to contact if queries arose. Most found the printed information easily understandable and felt involved in the decision to start insulin. Confidence increased following insulin initiation, and self-administering dummy injections before or during insulin clinic attendance, helped to reduce fear.

Implications for practice

As a result of the findings, a plan was developed to address areas for improvement. Recommendations included: addressing fears of insulin therapy earlier on in the diagnosis, improving communication, informing people about local diabetes networks, continuing

to involve patients in decision-making and developing more patient information leaflets.

Future research

A qualitative study using interviews or focus groups could be developed to extend the research findings by exploring the issues raised in further depth. This could be conducted in a number of practices that initiate insulin in-house and this questionnaire survey could also be repeated in these practices. Another study could compare similar data of people whose insulin was initiated outside the practice for comparison.

The generally positive perceptions and outcomes of the present study's participants support the role of GPs and practice nurses in insulin initiation. Type 2 diabetes is increasingly common and, despite newer therapies, more people with the condition will require insulin to improve glycaemic control. In-house clinics can facilitate insulin initiation while offering the benefits of continuity of care. Moreover, they reduce referrals to diabetes specialists who can then focus on those with more complex needs. ∎

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Leaflet and questionnaire
To request an electronic copy of the insulin clinic leaflet or questionnaire please contact kathyellis@nhs.net.