

# Developing a pathway of preoperative assessment and care planning for people with diabetes

Louise Hilton, Marie Digner

Diabetes is a common endocrine condition affecting 1.4 million people in the UK, with an estimated 1 million undiagnosed (Diabetes UK, 2004). Approximately 11 000 people have diabetes in the Bolton area; and at any one time 15–20% of all hospital admissions are for people who have diabetes (Page and Hall, 1999). Surgery in people with diabetes is linked with an increased risk of surgical complications that can be reduced by professionals adhering to local and national guidelines (Department of Health, 2003). This article highlights the need for perioperative assessment of people with diabetes. Previous to the implementation of a care pathway, perioperative assessment had been done by junior medical staff, surgical ward nurses and anaesthetists on an ad hoc basis. A nurse-led pathway of assessment prior to admission and care planning for people with diabetes would ensure consistency and safety of care. This has resulted in an individualised perioperative care plan for the individual's hospital stay at Royal Bolton Hospital.

People with diabetes are at an increased risk of developing perioperative complications and mortality (Rahman and Beattie, 2004). In response to physical stress, such as that caused by surgery, the neuro-endocrine system releases counter-regulatory hormones (cortisol, epinephrine and growth hormone), which can result in insulin resistance (Pickup and Williams, 1996). The physical stress of surgery can also lead to acute hyperglycaemia by the suppression of insulin release, which could cause diabetic ketoacidosis (DKA; Stagnaro-Green et al, 1995).

Raised blood glucose levels can lead to delayed wound healing and an increased risk of contracting postoperative infections (Rahman and Beattie, 2004). Optimum care

that maintains stable blood glucose levels helps prevent the complications of surgery and reduce the inpatient's length of stay (Ahmann, 2004). Raised blood glucose levels in people with diabetes can lead to a prolonged length of stay, up to 3 days longer than an individual without diabetes admitted for the same reason (Ahmann, 2004). People who have to fast prior to surgery can become hypoglycaemic (Pickup and Williams, 1996).

People with type 2 diabetes often have cardiovascular and renal problems which can complicate surgery (Pickup and Williams, 1996). Therefore, effective and simple guidelines for the safe management of the person with diabetes undergoing surgery are essential. Standard 8 of the National Service

## Article points

1. People with diabetes are at an increased risk of developing perioperative complications and mortality.
2. A surgical audit was performed during 1995, the result of which led to the implementation of much needed guidelines. A re-audit was performed to establish its effectiveness.
3. Owing to the numbers of patients with diabetes identified at the preoperative assessment stage who required the input of a diabetes specialist nurse, a pathway of care was developed.
4. The new process ensures that these people receive a care plan dependent upon need, with the aim of reducing their length of stay and reducing their anxiety.

## Key words

- Preoperative assessment
- Pathway of care
- Perioperative care

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**Page points**

1. At Royal Bolton Hospital the treatment of diabetes on surgical wards used to be fragmented with little or no continuity in care.
2. Current guidelines at the hospital recommend two sliding scales and intravenous fluid regimens for those undergoing a surgical procedure or investigation.
3. A retrospective re-audit of perioperative care of people with diabetes in 2002/2003 showed poor adherence with local diabetes guidelines and incomplete preoperative assessment of their care needs.
4. Fifty-nine per cent of all staff recognised diabetes as a potential problem upon preoperative assessment; however, few commented on the presence or lack of complications of diabetes prior to surgery.

Framework (NSF) for diabetes addresses the need for such guidelines for the care of the person with diabetes during his or her stay in hospital (Department of Health, 2003).

**Problems on wards**

At Royal Bolton Hospital the treatment of diabetes on surgical wards used to be fragmented with little or no continuity in care. Current guidelines at the hospital recommend two sliding scales and intravenous fluid regimens for those undergoing a surgical procedure or investigation. Firstly, a glucose–potassium–insulin (GKI) sliding scale should be used for patients undergoing a short procedure who can eat within 6 hours postsurgery.

Secondly, a variable rate insulin regimen is used for people with diabetes who, following surgery, may not eat within 6 hours. This regimen has 50 units of insulin in 50 ml of normal saline solution in a syringe and 10% dextrose solution administered concurrently.

Although these guidelines were accessible, there was poor adherence to them by the multidisciplinary team. This highlighted confusion in terms of the appropriate regimen to use.

Previous to the implementation of preoperative assessment guidelines, there were frequent requests by nursing and medical staff for advice regarding the appropriate regimen to be used; more worryingly, the staff did not contact any member of the diabetes team, which resulted in inconsistencies in the treatment of diabetes during inpatients' hospital stays. With the publication of the NSF for diabetes and a drive towards day surgery it has highlighted the need for patients with diabetes requiring individualised care dependent on their diabetes treatment and complications prior, during and after surgery (Healy and McWhinnie, 2003).

**Audit**

A retrospective re-audit of perioperative care of people with diabetes in 2002/2003 showed poor adherence with local diabetes guidelines and incomplete preoperative assessment of their care needs. This was despite the fact that 6 years previously a surgical audit was performed,

the results of which led to the formulation and implementation of much needed guidelines.

The re-audit was conducted to establish the guidelines' effectiveness. One hundred and nine case notes were retrieved with support from the clinical audit department. This included people with both type 1 and type 2 diabetes undergoing major and minor surgery.

**Findings**

**Was diabetes recognised as a potential problem upon preoperative assessment?**

Fifty-nine per cent of all staff recognised diabetes as a potential problem upon preoperative assessment; however, few commented on the presence or lack of complications of diabetes prior to surgery. *Table 1* shows a breakdown by profession.

**Was a perioperative plan of management recorded?**

The re-audit showed that approximately 50% of all staff recorded a plan of perioperative management; however, it should be noted that in only 35% of these was the plan of management in line with the local guidelines. *Table 2* shows a breakdown by profession. Perioperatively, only 8% of patients were found to have had any involvement from the diabetes team and only 27.5% had any follow-up with regard to their diabetes upon discharge.

The results of this audit were presented to the consultant anaesthetists' forum at the authors' hospital. They recognised that there were issues with the perioperative care that patients with diabetes received which required urgent attention. These findings were despite the fact that the senior nurse and other members of the specialist team undertake professional education

**Table 1. Proportion of different groups of healthcare professionals who recognised diabetes as a potential problem upon preoperative assessment in 1995 and 2002/2003.**

	1995	2002/2003
Surgical staff	77%	63%
Anaesthetic staff	59%	30%
Nursing staff	90%	84%

**Table 2. Proportion of different groups of healthcare professionals who recorded a perioperative plan of management in 1995 and 2002/2003.**

	1995	2002/2003
Surgical staff	53 %	48 %
Anaesthetic staff	47 %	31 %
Nursing staff	—	72 %

of ward staff through various formal and informal sessions. Problems associated with staff education not cascading to other staff members include staff moving to other areas and trusts. Because staff education did not work in the authors' workplace, a decision was made to develop a nurse-led clinic.

Work was undertaken by a small task force, which included an anaesthetist, a diabetologist and a diabetes specialist nurse (DSN), in order to develop a pathway of care for perioperative care and inpatient stay. The draft guidelines developed by this task force were presented at the consultant anaesthetists' forum and fully supported by all stakeholders.

Concurrently, discussions took place with pre-assessment nurses for surgery regarding the care and management of the patient with diabetes. These discussions identified a lack of knowledge about diabetes and inconsistencies in the condition's treatment at the time of admission – pre-assessment nurses felt this affected their ability to appropriately plan the patient's care. It was often necessary to 'check' with the individual anaesthetist his or her preference for the fasting regimen and treatment plan for patients, with preoperative nurses often needing to contact the DSN for further advice.

To address this a study day was organised for preoperative assessment staff within the acute trust on types of diabetes, its complications and the impact of surgery on patients with diabetes. The head of nursing for surgery agreed that all preoperative assessment clinics could be cancelled to allow nurses to attend this high-priority training day. Without this it would not have been possible to release all relevant staff for the day. The day was facilitated by the multidisciplinary diabetes team, which

included DSNs, a consultant diabetologist and a podiatrist.

The draft proposal of the formulary guidelines for the perioperative care of patients with diabetes that had previously been devised was presented to the staff for constructive comments and feedback.

Owing to the numbers of patients with diabetes identified at the preoperative assessment stage who required the input of a DSN, a pathway of care was developed (*Figure 1*). The pathway includes the initial outpatient assessment by the preoperative nurses which identified the individual's type of diabetes, methods of treatment, level of glycaemic control (HbA<sub>1c</sub>), the presence of any diabetes complications, and the individual's ability to self-care.

### Implementation

The formulary guidelines (*Figure 2*) for the perioperative care of patients with diabetes were ratified by the trust's drugs and therapeutics committee.

The launch of the guidelines occurred over a period of 2 days within the pharmacy department. Two members of staff per clinical area were required to attend a 1-hour update session on the new guidelines. They were asked to bring all the original GKI charts with them so that they could be disposed of in order to prevent their continued use which could lead to possible errors. They were given copies of the new formulary and GKI chart for immediate use within their areas. These key members of staff were expected to provide cascade training of the guideline's use to facilitate its implementation.

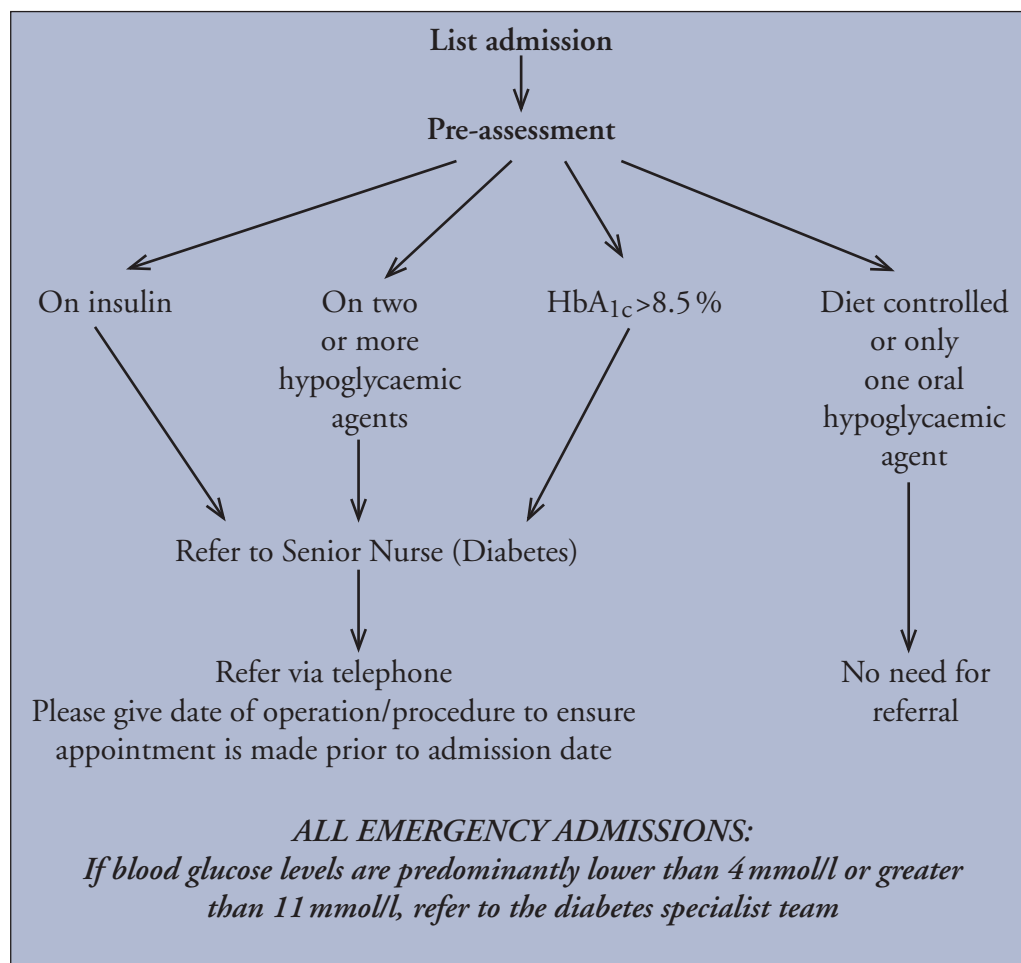
Patients with poor diabetes control and with related complications who are being treated with insulin, or with poor self-care were to be referred to a DSN-led clinic for preoperative assessment – the identification of these patients ensures that specialist nurses follow up complex cases throughout the inpatient's stay if required. This new nurse-led clinic has access to a consultant diabetologist for medical advice as and when required.

The primary author has undertaken a nurse

### Page points

1. Work was undertaken by a small task force, which included an anaesthetist, a diabetologist and a diabetes specialist nurse, in order to develop a pathway of care for perioperative care and inpatient stay.
2. Concurrently, discussions took place with pre-assessment nurses for surgery regarding the care and management of the patient with diabetes.
3. To address the lack of knowledge of diabetes a study day was organised for preoperative assessment staff within the acute trust on types of diabetes, its complications and the impact of surgery on patients with diabetes.
4. The launch of guidelines for perioperative care of patients with diabetes occurred over a period of 2 days within the pharmacy department. Two members of staff per clinical area were required to attend a 1-hour update session on the new guidelines.

Figure 1. Pathway for patients with diabetes undergoing surgery or any other procedures in Bolton Hospitals NHS Trust.



Page points

1. The DSN-led perioperative diabetes clinic for people referred from the initial outpatient assessment has now been operational for 12 months (at the time of article going to press this had risen to 15) – referrals have steadily increased as the service has become embedded into preoperative assessment practices.
2. The preoperative pathway of care gives the opportunity of educating patients, particularly about the importance of screening for complications, as the majority of patients had not previously been known to the specialist service and had been receiving their care within GP practices.

prescribing course enabling her to practice as an independent and supplementary prescriber. She undertakes a preoperative clinical assessment and prescribes perioperative treatment regimens.

To enable her to implement the guidelines the senior nurse in diabetes had to acknowledge that she needed to enhance her surgical knowledge and skills, and understand the process of preoperative assessment. Time was allocated to observe pre-assessment clinics in action. These included the specialities of ophthalmology, orthopaedics and general surgery.

**Results**

The DSN-led perioperative diabetes clinic for people referred from the initial outpatient assessment has now been operational for 12 months (at the time of article going to press this had risen to 15) – referrals have steadily increased as the service has become embedded

into preoperative assessment practices.

To date, 120 patients have been reviewed in the clinic. Thirty (25%) have been initiated onto insulin and 45 (37.5%) have either had their oral hyperglycaemic agent dose increased or have been commenced onto such an agent. Only five patients have required their surgery to be postponed to allow optimisation of diabetes control – these patients’ surgery would previously have been cancelled on the day of surgery because of uncontrolled diabetes, which has a knock-on effect on bed-space and waiting lists.

**Impact on patients and colleagues**

**Patients**

Informal feedback from patients who have had surgery on more than one occasion suggests that they like the new and improved system. It gives the opportunity of educating patients,

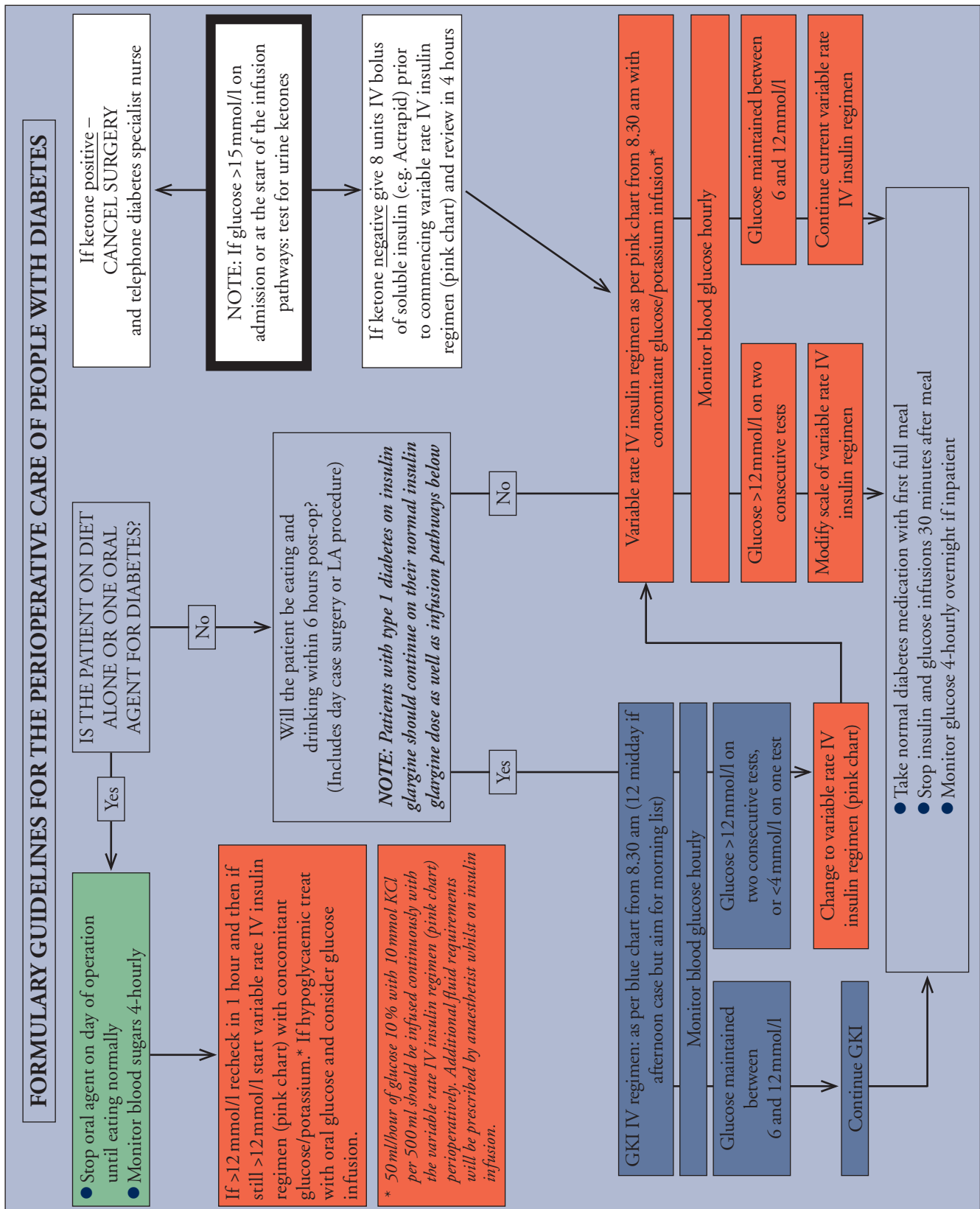


Figure 2. Formulary guidelines for the perioperative care of people with diabetes in Bolton Hospitals NHS Trust.

### Page points

1. Preoperative assessment nurses now have a clear pathway of care to follow. Those patients who require specialist nurse intervention preoperatively have access to the same.
2. Ward nurses also have a pre-planned path of care to follow. Infusion regimens and drugs are already prescribed when patients arrive for surgery thus reducing delays in the system.
3. Future plans include a re-audit to assess the effectiveness of the updated guidelines and health professionals' appropriate use of these and also a formal service user evaluation.
4. The development of preoperative guidelines within Bolton Hospitals NHS Trust have had an impact on the patient admitted for a surgical procedure.

particularly about the importance of screening for complications, as the majority of patients had not previously been known to the specialist service and had been receiving their care within GP practices.

Standard 3 of the NSF addresses empowering patients – this should continue while they are in hospital. Anecdotal feedback to date indicates that patients feel that their diabetes care is being addressed prior to their admission. In the authors' opinion, this is because an individualised care plan is made following a consultation assessing their type of diabetes and its complications in relation to the procedure being undertaken. There still is, however, a need to undertake more formal patient evaluation in the near future.

### Preoperative assessment nurses

Preoperative assessment nurses now have a clear pathway of care to follow. Those patients who require specialist nurse intervention preoperatively have access to the same. There is no need to chase up individual anaesthetists as practices have been standardised. The nurses are more confident in their role as their knowledge of diabetes has been improved and they are able to plan care for patients with diabetes more confidently and competently.

### Ward nurses

Ward nurses also have a pre-planned path of care to follow. Infusion regimens and drugs are already prescribed when patients arrive for surgery thus reducing delays in the system. Nurses are able to initiate treatment regimens at the most appropriate time for the patient rather than having to wait for the doctor to come and see the patients and prescribe the regimens.

### Future plans

Future plans include a re-audit to assess the effectiveness of the updated guidelines and health professionals' appropriate use of these and also a formal service user evaluation.

### Conclusion

The developments of preoperative guidelines at Royal Bolton Hospital has had an impact on the

patients admitted for a surgical procedure. The new process ensures that they receive a care plan dependent upon need, with the aim of reducing the patients' length of stay and reducing their anxiety. Anecdotally, patients who have been involved in the new process have commented on an improvement in practice and feel that their diabetes, during admission, is being addressed.

We will re-audit the guidelines once they are embedded in practice to establish their effectiveness. Although we have addressed the process of patients with diabetes undergoing a surgical procedure, further development is required for patients undergoing investigations, such as colonoscopies. ■

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