Improving emergency and inpatient care for people with diabetes

March 2008

‘On several occasions I found food delivered...to eat when...blood sugar was high and no insulin had been given and the insulin dose was not given for up to another hour...had to let the food get cold and wait for the insulin...On other occasions insulin had been given when...blood sugar was at a moderate or low level and there was no food in sight...and I ended up taking control of my injections as the nurses either did not seem to know what to do, or would arrive long after my meal had been set down in front of me’. (Person with diabetes)

‘I had taken all my medications with me, insulin, blood pressure tablets, statins, aspirin, etc so they would know. These were all taken off me on ward admission. I have some understanding of why they do that but of course you then start to feel that you are losing control. I was traumatised by the whole experience, the loss of my control, the feeling of not being listened to; you are so vulnerable. I know as I get older chances are I may need in patient care again and I am genuinely frightened by the prospect; no one knows you better than yourself’ (Person with diabetes)

The Report of a Working Party of representatives of the inpatient and emergency care community in partnership with the National Institute for Innovation and Improvement1
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All the references in this document can be seen in the document Inpatient Report References at www.diabetes.nhs.uk
Foreword

With an estimated 2.35 million people with diabetes in England and, as the recent Quality and Outcomes (QOF) statistics indicate, the number diagnosed increasing by about 1,300 each week, it is clear that diabetes poses considerable challenges to the NHS. These challenges encompass all of the elements that constitute health care provision in England – from Public Health, through primary and specialist care, to ambulance services and those who commission such services. To deliver safe, effective patient centred care that meets the Diabetes NSF standards requires a significant degree of coordination between these elements. A key part of that effective care is focused on emergency and inpatient services with an emphasis on reducing admissions, reducing length of stay and improving patient experience.

With about 10% of all hospital beds in England occupied by someone with diabetes, and more than this in high risk groups such as older inpatients or those with an acute coronary syndrome (ACS), strategies to reduce both admissions and length of stay would have considerable benefits. Most people with diabetes in hospital have been admitted with diabetes, rather than because of diabetes, and having it generally means a longer stay in hospital, whatever the reason for admission. Being in hospital has a significant impact on people with diabetes and evidence shows that they are often very unhappy about the management of their diabetes in hospital. It is not uncommon for them to lose control of their insulin treatment, the timing and quality of their meals, blood glucose monitoring, and overall control of their condition. Many people with diabetes know more about managing their condition than the hospital staff looking after them. Hospital staff may have had little training or experience in diabetes, and it is usual for inpatients with diabetes not to have the opportunity to be seen by the hospital specialist diabetes team.

Commissioners of diabetes services need to examine all of the support and care people with diabetes in their locality need. However, the needs of people with diabetes in hospital and those treated as emergencies must not be overlooked. As this report shows, there is strong evidence that care models for inpatients co-ordinated by specialist teams improve patient outcomes, and provide good value for money.

Improvements which may prevent attendance at or admission to hospital can also be made in the care of people in emergencies. The role of the ambulance service in diabetes care is sometimes overlooked but they are often the first port of call for people who experience difficulties managing their condition. There are an estimated 100,000 emergency 999 calls a year for diabetes emergencies and of them 35% cent come from just 11% of addresses meaning that there are many repeat callers. With the resulting knock-on effect of these calls often leading to Accident and Emergency visits and emergency admissions, better care for the person at home would have a significant impact on patient experience and reduce admissions.

Although not all diabetes emergencies can be prevented entirely it is obvious that any report that focuses on inpatient care and emergencies needs to mention the role of patient education in enabling people to manage their condition more effectively. The contribution of better coordination between primary, specialist and ambulance services is also enormous. There is also a recognition that the skills of all hospital staff, not just diabetes specialists, need to be enhanced to deliver better care on the wards. However, these are enormous topics in their own right and this report does not attempt to cover them comprehensively. What it does do is pull together many strands of work focusing on emergency and in
hospital care for people with diabetes. We have focused on a few key areas, where the evidence base is strongest, and where we think improvements could be made quickly. These are:

- Preventing diabetes emergencies out of hospital, and emergency admissions, with a emphasis on ambulance services
- Improving quality and value for money for people in hospital with diabetes
- Preventing and treating acute foot problems in hospital: strategies for improvement

It is heartening that, despite all the many challenges, local teams are designing and delivering better ways to support people with diabetes in hospital and in emergencies. This reinforces the view that better care can often be delivered through better coordination of existing services and resources. We are sure that with the support of the diabetes community, the experiences of people with diabetes in these key areas will improve.

This document has been informed throughout by the inpatient experiences of people with diabetes gathered by Diabetes UK, by information from UK professional groups, from a large ‘Challenges and Solutions’ workshop of diabetes healthcare professionals and people with diabetes, and by overlapping work undertaken by the National Institute of Innovation and Improvement. Our thanks go to them all and everyone who has contributed their time and knowledge to this report.

This document is not intended to present clinical guidelines, but to inform discussions between clinical teams, acute trusts and commissioners on these key aspects of inpatient diabetes care.

Mike Sampson,
Chair of the Working Party

Sue Roberts,
National Clinical Director for Diabetes
1. About 10% of all hospital beds in the UK are occupied by people with diabetes, and this approaches 20 – 25% for high risk groups. People with diabetes are twice as likely to be admitted to hospital, and 20% have experienced a hospital admission in the previous year.

2. Inpatients with diabetes stay in hospital longer, whatever the cause of admission, and this excess length of stay can be substantial. This excess length of stay is most marked in younger inpatients; those less than 75 years old.

3. Diabetes bed occupancy based on Health Resource Group (HRG) data suggests about 165,000 diabetes discharges from English Hospitals per annum, with bed occupancy of 1.34 million bed days. Few people with diabetes are reviewed by the specialist team during their stay. Unit cost per bed day estimates suggest a total unit cost for diabetes bed occupancy of about £465.25 million per annum.

4. About 6,000 people are admitted each year to English hospitals with diabetic ketoacidosis (DKA), the most dangerous metabolic complication of diabetes.

5. About 100,000 people with diabetes make emergency ‘999’ calls to ambulance services each year, mostly due to extremely low blood glucose levels (‘hypoglycaemia’). Perhaps 40% of these are transferred to Accident and Emergency Departments, and about 10% admitted overnight.

6. Inpatients with diabetes are commonly unhappy about the standard of diabetes care they receive in hospital, due to loss of control over their own self – management, and the level of staff knowledge and competencies.

7. Acute admissions for inpatient care with diabetic foot disease account for a significant amount of NHS spending. In the UK the estimate for foot complications including amputations was £252 million per annum.

8. There is now substantial evidence for proven care models that reduce the incidence of: hospital admission, excess length of inpatient stay, acute metabolic complications, diabetic foot disease and amputation.

9. The application of these care models across the UK is variable with substantial gaps in service. They are based on a specialist diabetes team commissioned to deliver an enhanced inpatient diabetes nurse, dietetic and foot care service for highest risk inpatients, educational programmes for all staff, and better care pathways between the ambulance service and the specialist diabetes team.

10. These care models are relatively low cost and good value for money. The models are described in this report, and outlined in the recommendations section.
Chapter 1
Introduction and policy context

National Diabetes Framework
The National Diabetes Framework (NSF) published by DH in January 2003, was established to drive up service quality and tackle variations in care. It sets out twelve standards to be achieved by 2013.

The Diabetes NSF describes better liaison between the specialist team and ward staff as a Key Intervention and notes the benefits of employing inpatient diabetes specialist nurses. While the number of these staff has doubled variation still remains and service gaps exist in UK hospitals. Standards 7 and 8 of the Diabetes NSF highlight the importance of caring for people with diabetes when they are ill or when their condition is unstable, either because of diabetes itself or for some other medical or surgical reason.

Five years on from the publication of the Diabetes National Service Framework (NSF) Delivery Strategy, considerable progress has been made in improving routine care for people with diabetes. However, people with diabetes, admitted to hospital for whatever reason, are often unhappy with the quality of diabetes care they receive as inpatients. This has been recognised as a leading concern of people with diabetes and clinicians for many years. Hospital and emergency services still face substantial challenges in ensuring that people with diabetes experience a uniform level of care that meets NSF standards.

Diabetes NSF standard 7 – Management of diabetic emergencies

‘The NHS will develop, implement and monitor agreed protocols for rapid and effective treatment of diabetic emergencies by appropriately trained health care professionals. Protocols will include the management of acute complications and procedures to minimise the risk of recurrence’.

Emergency admission to hospital and use of emergency services by people with diabetes can be reduced and in many cases prevented. The provision of well-designed patient education for everyone is key in helping avoid diabetes emergencies, but still only a minority of people with diabetes are receiving quality assured structured education.3

Good out-of-hours support services can reduce the need to call out ambulance services. Identifying those who are frequent users, or who are at high risk of emergencies, means that they can be targeted for preventative measures. Ambulance services themselves are increasingly developing specific support for people with diabetes, to prevent and reduce admission, and are auditing what they do. Local coordination between proactive ambulance services and well structured and responsive local diabetes service arrangements would mean that many more people could benefit from this.4

Diabetes NSF standard 8 - Care of people with diabetes during admission to hospital

‘All children, young people and adults with diabetes admitted to hospital, for whatever reason, will receive effective care of their diabetes. Wherever possible, they will continue to be involved in decisions concerning the management of their diabetes.’
Most inpatients with diabetes report that hospital staff are aware they had diabetes, but a substantial minority are aware that the staff looking after them lack the appropriate knowledge and skills to deliver good diabetes care. This may contribute not just to unnecessary problems with blood glucose control and prolonged inpatient length of stay, but anxiety and distress for inpatients with diabetes. Most patients with diabetes receive no direct input from the specialist team.

This document provides guidance for commissioners, acute trusts and clinical teams on quality measures, key outcomes and supporting examples of good practice to improve diabetes inpatient and emergency care. There are various service models that currently demonstrate improved outcomes, and an objective of the project has been to provide support to local services to enable them to ‘map their service’ and develop new ways to support inpatient diabetes care.

**Making Every Young Person with Diabetes Matter**

This report (April 2007, DH), was aimed at everyone involved in improving services for children and young people with diabetes. It provides guidance on the commissioning, organisation and provision of services and workforce. In relation to young people with diabetes in hospital, it states that when commissioners and providers are assessing the care need of young people, amongst other criteria, they should address the local health burden: hospitalisations, length of stay, complication rates.

**Commissioning**

*Commissioning a Patient-Led NHS* (July 2005, DH), stated that the NHS should be moving from a provider driven service to a commissioning driven one. The document set out the importance of expert and imaginative commissioning in order to achieve the aim of a patient-led NHS.

*Health Reform in England: update and commissioning framework* (July 2006, DH), provides a detailed framework for commissioning. The framework includes policy and implementation guidance on commissioning and practice based commissioning (PBC) and expectations of how PCTs, GPs and health and social care commissioners will work together.

*The Diabetes Commissioning Toolkit* (November 2006, DH) was based on the principles outlined in these national documents and provides detailed advice on health needs assessment, and the generic and specific elements that should be in every good commissioning plan for diabetes. There is a specific inpatient section in this toolkit.

*World Class Commissioning* (December 2007, DH) sets out a new approach to commissioning for health and care services. The programme, based around 11 key competencies, sets out the knowledge, skills and behaviours to bring about a step change in commissioning, ultimately improving health and well-being outcomes. One of the 11 competencies requires commissioners ‘to lead continuous and meaningful engagement with clinicians to inform strategy, and drive quality, service design and resource utilisation.’ This document is a contribution to that engagement.

**Payment by results (PbR)**

*Health Reform in England: Update and Commissioning Framework, July 2006, DH,* described the different reforms that are being made to the healthcare system and explained how they are expected to interact. A key component is the Payment by Results (PbR) funding system, including the use of a national tariff for certain procedures and diagnoses. PbR aims to
ensure that different providers receive the same income for the same work and can thus compete on the basis of quality. Its introduction means that acute trusts are paid on the basis of the work that they do. Understanding how diabetes is handled by the PbR system can have important implications for both trusts and the specialist services they employ. It provides a financial incentive to reduce length of stay, can potentially incentivise the correct discharge coding and diagnosis of people with diabetes admitted to hospital, and can help diabetes teams demonstrate to their colleagues within the acute hospitals the critical role they play in providing support to other services and elective streams.

Public Service Agreements Targets

The Department of Health has a National Public Service Agreement (PSA) target specifically on reducing emergency bed days. The 2008 target to reduce emergency bed days by 5% has been met. However emergency bed days will continue to be monitored as part of the ‘vital signs’ which includes a set of national priorities and priorities for local determination, to be agreed in consultation with local partners as part of the LAA process. Emergency bed days will fall under priorities for local determination.

Since 60% of inpatients with diabetes have been admitted as emergencies, and account for 10% of all occupied beds, reducing the number admitted, and also their length of stay, would have a substantial impact in meeting and maintaining this target.

There is also a more generic PSA target to improve patient experience:

‘Secure sustained national improvements in NHS patient experience by 2008, ensuring that individuals are fully involved in decisions about their health care. The experiences of black and minority ethnic groups will be specifically monitored as part of these surveys’.

The Healthcare Commission will monitor progress against these PSA targets.

Taking Healthcare to the Patient: Transforming NHS Ambulance Services

This key document, published July 2005 by DH, provided a new vision for the ambulance service as part of a ‘mobile health resource’, by providing an increasing range of assessment, treatment and diagnostic services, and thus plays an important role in providing care closer to home.

It saw developing effective and enhanced partnerships and teamwork with other NHS organisations, social care providers and the independent sector as crucial to delivering radical improvements for patients. They are expected to work as part of the primary care team to help provide services and support patients with long-term conditions.

Interaction between Commissioning teams and clinical services

Important levers of service improvement are high-quality commissioning, clinical leadership and responsive and innovative teams. Commissioners can use the general principles associated with World Class Commissioning, and the specific points raised in the diabetes commissioning toolkit to assess the needs of their local diabetes population, describe the current service and identify gaps in service provision. Evidence of good practice, and how this can improve quality and reduce cost, is an important resource to help commissioners redesign and transform services. Diabetes networks provide an important forum where commissioners and clinicians can engage with people with diabetes in supporting World Class Commissioning. The National Diabetes Support Team has produced the Beyond Boundaries series of publications to support the creation and development of clinical networks. These are available at www.diabetes.nhs.uk
This report was written by a steering group of people with diabetes and clinicians from a variety of professional backgrounds, working with the Department of Health Diabetes Policy Team, Diabetes UK and the National Diabetes Support Team. This steering group worked in partnership with the NHS Institute of Innovation and Improvement. The work included a national ‘Challenges and Solutions Workshop’, which was attended by nearly 100 people representing inpatient diabetes and emergency services and Diabetes UK, as well as people with diabetes. They examined both the challenges and the possible solutions of improving care and contributed to the final recommendations, which were reviewed by professional groups involved in diabetes care.

This report is not intended as a guidelines document, or as a clinical resource for diabetes specialist teams, or as an exhaustive review of inpatient diabetes services.

This report is intended to provide quality information and standards for commissioners and providers, and to outline tools for service improvement in inpatient diabetes care. We hope to describe the scale of the problem, both clinically and financially, and identify models that lead to service improvement and financial savings. We hope this will also provide a framework within which the diabetes community as a whole can discuss these problems.

The working group decided to concentrate on three principal areas in which improvements are needed and where progress can be made relatively easily and measured:

- Preventing diabetes emergencies out of hospital, and emergency admissions, with an emphasis on ambulance services.
- Improving quality and value for money for people in hospital with diabetes.
- Preventing and treating acute foot problems in hospital: strategies for improvement.
Chapter 2
Preventing diabetes emergency admissions through education.

The problem
The most common diabetes-specific metabolic emergencies outside hospital are severe acute hypoglycaemia and diabetic ketoacidosis (DKA). These are both defined in the glossary at the end of this report. The risk of these complications can be reduced by enhanced self management skills and by optimising education, training and improved service delivery. This chapter focuses on preventing hospital admissions via these mechanisms. The other common and equally dangerous emergency admission – the diabetic foot – is dealt with in Chapter 3.

An estimated 5,000-6,000 people with diabetes are admitted to English acute trusts each year with DKA, and the incidence of DKA may be increasing (Figure 1). In addition, there is substantial variability between PCTs in DKA admission rates (Figure 2). The incidence of severe acute hypoglycaemia in a UK diabetes population \(^1\) was 11.5 (9.4 - 13.6) per 100 patient years for Type 1 diabetes. \(^1\)

Both of these conditions are more common during other illness, when there are difficulties with individual treatment regimens, a mismatch between food and physical activity when treatment regimens change, and at certain critical periods such as adolescence and young adulthood.

![Figure 1. Patients with diabetic ketoacidosis as a primary diagnosis, age and sex standardised, across English regions. Compendium of Clinical and Health indicators, 2002 (www.nchod.nhs.uk)](image-url)
Preventing emergency admissions – diabetes education and diabetes educators

Most diabetes emergencies can be prevented. This requires an integrated package of services commissioned across a whole community. The key components are

- Basic structured education in ‘sick day rules’ for everyone with diabetes
- Proactive intervention in high risk groups
- Access to emergency support for unexpected events
- Prompt and appropriate intervention by emergency services
- Close links to routine services to prevent recurrences.

Diabetes education and diabetes educators

The importance of patient education in reducing acute diabetes admissions has been understood for the last 30 years. Since then the central role of self management and diabetes education has becomes clear, and diabetes specialist nurses, unknown before the 1980s, have been appointed nation-wide to support this. Testing Times reported this was the development most appreciated by people with diabetes, although the recent Healthcare Commission survey reported that only 11% of respondents reported any form of educational course, quality assured or not. The Patient Experience survey carried out by the Healthcare Commission found that 39% of people said they would like more information on managing diabetes when they were ill and 30% want more information about what to do if their blood glucose drops too low.15

There is now recent evidence that contact with the specialist diabetes team, in structured educational approaches, reduces admissions for DKA and metabolic complications, particular for younger people with Type 1 diabetes.16

Personally relevant information, from time of diagnosis, is needed for people to understand both how to avoid hypoglycaemia and “sick day rules”; that is how to manage their condition when they are unwell. Local guidelines and protocols need to ensure that people get the right amount of information when diagnosed and are not overloaded with facts and figures. Individuals’ educational needs will change and need to be assessed regularly.

We had a person on DAFNE (a quality assured education programme for people with Type 1 diabetes) who said he had to have the paramedics out about 100 times a year and he knew all the ambulance men by name! His life was totally disrupted and he felt very unsafe. Post-DAFNE he is nowhere near as familiar with the paramedics’

A DAFNE educator

Proactive intervention for high-risk groups

Certain groups of people with diabetes use emergency services more than others. Commissioners will want to ensure that processes are in place to identify these high-risk groups and engage them in further education.

Residents of care homes, for example, are particularly vulnerable to admission due to metabolic decompensation. Mortality is high, probably due to multiple co-morbidities and delays in admission. It is important that local guidelines include routine proactive monitoring and preventative care.

In younger people, recurrent hypo or hyperglycaemia with or without admission could indicate problems with managing an insulin regimen in response to complex
psychosocial and behavioural factors. This can be helped by individual case management, provided by the diabetes team and supported by experienced psychologists.

**Preventing emergency admissions - out of hours contact**

The availability of out-of-hours services for people with diabetes varies across trusts. Estimates of the numbers of out-of-hours calls made which are diabetes-related are unknown as this data is not collected centrally. *Testing Times* found that some services provided people with diabetes with the number of a mobile phone carried by a member of staff on a rota basis, while many other centres have established a ‘duty’ system whereby diabetes specialist nurses provided cover for a dedicated telephone line. The Healthcare Commission Patient Survey recently found that 20% of people with diabetes did not know who to contact outside working hours and 78% of trusts visited did not have formal arrangements for people with diabetes to contact staff at weekends. Good availability of out of hours services has been associated with a reduced admission rate for DKA and hypoglycaemia.17

It is now clear that ambulance trusts in England are a very major provider of acute services for people with diabetes, particularly hypoglycaemia, and that they play a central role in treating these patients and making decisions about whether to transport people to Accident and Emergency departments or the local acute trust.

The UK ambulance services respond to approximately 100,000 emergency ‘999’ calls each year from people with diabetes experiencing a diabetes emergency, most of these calls are to those experiencing severe acute hypoglycaemia.18

Data from ambulance trusts confirms that a small number of people with diabetes initiate a much higher proportion of calls overall, sometimes calling the 999 ambulance services 6 – 10 times a year, indicating a group of very high intensity service users where concentration of support might improve quality and value.

Ambulance trusts use the UK Ambulance Services Clinical Practice Guidelines (JRCALC 2006). Emergency Medical Technicians are able to give glucagon injection but are not permitted to give any intravenous drugs. A paramedic is able to administer intravenous glucose 10%. If treatment does not quickly improve the patient’s condition they are rapidly transported to Accident and Emergency. Patients who fully recover with a blood glucose measure of > 5.0 mmol/L can be left on scene with a responsible adult and advice.

In the East of England, 64% of people with hypoglycaemia are treated at home but there is wide variation across the rest of England with the percentage taken to Accident and Emergency ranging from 26% to 58%.19 An indicator on hypoglycaemia has been included within the draft national ambulance services *Clinical Performance Indicator*, and will help commissioners interpret local performance against national comparators.
Preventing diabetes admissions: Follow up and liaison with the diabetes specialist team

The publication of *Taking Healthcare to the patient: Transforming NHS Ambulance Services* spelled out that ambulance services have a duty to work in a more integrated way with partner organisations. Working closely with local diabetes specialist teams can reduce some of the potential risk of leaving people at home when they have recovered and of preventing further episodes. ‘Treat and release’ protocols for people with acute hypoglycaemia by ambulance crew are now common.20

The East of England Ambulance Service NHS Trust has set up a new 24-hour Patient Call-Back System run by specially trained paramedics and nurses in response to a review of diabetes care in the trust. In appropriate cases ambulance staff will leave a person with diabetes who has experienced a hypoglycaemic episode after home treatment. A trained nurse or paramedic in Ambulance Control will telephone the patient two to four hours after the ambulance crew leave the scene to check on the patient’s condition. The telephone contact gives staff extra time to speak with the patient where they can offer advice and ensure that the patient’s diabetes team is informed by either the patient or the ambulance service with the patient’s permission. This is an important point as some patients chose not to have their GP informed because of the potential risk to their driving licence. This system, as well as assisting in risk management for the “left at home” patient may also help prevent recurrence of acute emergencies by reinforcing or facilitating engagement with routine diabetes care.

In West Yorkshire a referral pathway between the Ambulance Trust and the diabetes specialist nurse team led to 53% having their diabetes treatment adjusted, and 75% of people with diabetes in hospital feeling that this contact had increased their ability to manage hypoglycaemia.

Financial Issues

People with recurrent severe hypoglycaemia, making multiple 999 ambulance calls, are clearly at high risk and may benefit from extra support. There are models of care and pathways that can reduce the risk of severe acute hypoglycaemia, and the risk of being taken to hospital, and possibly admitted.21 These would improve quality of life for these people, but may also have financial advantages.

For instance, there would be substantial savings to be made by identifying the approximately 10% of callers who make 33% of 999 calls. By helping them to improve their self management it would reduce their use of ambulance services, Accident and Emergency and hospital admission and could have a significant cost benefit. With emergency ambulance attendance costing about £220, minor Accident and Emergency attendance tarrifed at £55 and significant additional admission costs there are obviously substantial incentives to improve.

Many ambulance trusts operate a ‘see and treat’ policy, but reducing the national variability in the percentage of these patients carried on to Accident and Emergency, minimum 26%; mean in England: 43%, could also significantly reduce Accident and Emergency and admission costs.
There are three interrelated outcomes of inpatient care where people with diabetes fare worse than comparable groups without diabetes, and where new ways of working and enhanced clinical leadership would improve them all. These are:

- **Inpatient experience**
- **Length of Stay**
- **Health outcomes**

### The inpatient experience

The Diabetes NSF recognises the issues faced by inpatients with diabetes, and the clinical staff that care for them. Standard 8 of the NSF states:

> ‘All children, young people and adults with diabetes admitted to hospital, for whatever reason, will receive effective care of their diabetes. Wherever possible, they will continue to be involved in decisions concerning the management of their diabetes.’

Following hospital admission many people with diabetes are not allowed to self-manage, are left feeling disempowered, report poor experiences particularly in relation to the inadequate knowledge of hospital staff, myths surrounding food, the timing of meals and medication, and report a lack of information provided during the inpatient stay. These frustrations are shared by many ward and specialist diabetes staff.

The recent *Healthcare Commission National Survey of People with Diabetes* obtained the views of almost 70,000 people with diabetes in 2007, and included questions on inpatient experiences. Some of the key findings are set out below, and they show there is still more to be done.

#### Healthcare Commission, National Survey of People with Diabetes:

- 30% of people with diabetes report staff are unaware of their condition
- 10% get no help with their diabetes in hospital
- 11% do not receive the right food
- 20% only sometimes or rarely could take their medication as they wished

The Steering Group asked Diabetes UK to gather the inpatient experiences of people with diabetes to identify the issues that currently need to be addressed. Some responses indicated that a hospital admission can be a positive experience and support recovery.

> ‘After the operation, I was checked hourly during the night, including my blood sugar levels, with the nurses adjusting the insulin drip accordingly. They seemed to know what they were doing which gave me confidence not to worry and to leave things’

*Person with Diabetes.*

However, in general, people experience poor inpatient care caused by:

- A lack of personalisation in the care received, leading to a perception by many people that they are not listened to. This can lead to stereotypes of diabetes being applied to everyone, regardless of their experience and individual need.
- Insufficient knowledge or training in general ward staff, leading to lack of confidence and sometimes inappropriate care.
The key themes and issues which emerged are set out below. Extracts from comments that were received can be found on the Diabetes UK website; www.diabetes.org.uk

**Disempowerment and ability to self-manage**

Loss of the ability to self manage while an inpatient is a common cause among many people with diabetes. Although self-management is not appropriate for some inpatients (very ill, newly diagnosed etc) this remains a principal cause of dissatisfaction. Most people with diabetes will be used to making their own decisions about managing their condition. A sudden exclusion from decisions is disempowering and distressing. In the case of children with diabetes, the parent or carer’s role in the management of their condition also needs to be considered.

‘On being admitted for an operation … my insulins and syringes were removed and taken into the “care” of the Sister. I was informed that I was not permitted to administer any “medication” and this would be performed by a member of Staff. No member of … staff had the required certification to deliver this’.

**Person with diabetes**

‘On several occasions I found food delivered…to eat when…blood sugar was high and no insulin had been given and the insulin dose was not given for up to another hour…had to let the food get cold and wait for the insulin…On other occasions insulin had been given when…blood sugar was at a moderate or low level and there was no food in sight…and I ended up taking control of my injections as the nurses either did not seem to know what to do, or would arrive long after my meal had been set down in front of me’.

**Person with Diabetes**

Control over food choices and timing

The Diabetes Treatment Satisfaction Questionnaire for Patients (DTSQ-IP) is the first psychometrically validated instrument for inpatients with diabetes and is related to the original DTSQ. In a pilot survey of inpatients with insulin treated diabetes, a significant minority said they would never have made similar meal choices at home.

‘On several occasions I found food delivered…to eat when…blood sugar was high and no insulin had been given and the insulin dose was not given for up to another hour…had to let the food get cold and wait for the insulin…On other occasions insulin had been given when…blood sugar was at a moderate or low level and there was no food in sight…and I ended up taking control of my injections as the nurses either did not seem to know what to do, or would arrive long after my meal had been set down in front of me’.

**Person with Diabetes**

Responsibility for the management of diabetes in hospital should be shared between the person with diabetes and the healthcare team. Wherever possible, people with diabetes should be allowed to make their own food choices, though guidance may be needed from the dietician to ensure that all food choices are appropriate to the circumstances of the illness.

Many people with diabetes treated with insulin, particularly those who have accessed structured education, will have good self-management skills. They will be able to choose any item regardless of recipe...
content or size and judge the appropriate dose of insulin, provided this information is displayed on the menu. Others need the security that items labelled as suitable have been appropriately modified and kitchen practices may need to be supervised to ensure this is the case. It is equally important that appropriate food is available to choose from, such as special menus for children. It is important that everyone looking after people with diabetes understands specific cultural and religious requirements such as the type, content and preparation of food, and etiquette around serving food. Labels designed to signpost the patient to or away from certain foods, and involvement of the family are helpful.

Frail older people may need enhanced nutrition and supervision at mealtimes. Nutritional impairment leads to increased mortality and greater lengths of stay. At the time of admission, signs of malnutrition are present in as many as 25% of elderly patients. All older adults require a nutritional assessment and suitable instruments are available.

**Access to information and support**

Having accurate information about what to expect, whether from ward staff or the specialist diabetes team, is important to people with diabetes when in hospital. Some will need extra emotional and psychological support. This is particularly likely in people newly diagnosed, in children and their families and in older people.

‘… because I have type 2 diabetes, I was informed that I would need to be admitted the night before so that my diabetes could be monitored by specialist staff. During my stay I saw no-one from the diabetes care team’.

**Person with diabetes**

**Staff expertise and medicines management**

People with diabetes in hospital need the right expertise at the right time from a trained ward team supported by the diabetes specialist team itself. The most common concern is lack of knowledge among ward staff about achieving steady and safe blood glucose levels. Staff may be unfamiliar with how to deal quickly with hypoglycaemic events, the different effects of different medication, or specific issues affecting children with diabetes.

The specialist diabetes team can provide assistance to ward staff, and ensure that protocols are up to date and training available. However, only 24% of people with diabetes report they had been visited by the diabetes team during their stay.

**Blood glucose control**

One contributory factor to erratic blood glucose control is staff mistiming of insulin in relation to meal times in those not self-managing their own insulin. Subcutaneous sliding scale insulin, associated with poorer blood glucose control than other approaches, has been heavily criticised, but is still used in about half of UK hospitals.

‘… my blood glucose was very high and erratic, so they insisted that I stayed ‘til they got it under control, whilst I wanted to get home to get it back under control myself… The DSN, who I knew very well… arrived within 20 minutes and after a few minutes conversation with me told the wards staff ‘He’s right … let him go.’

**Person**
‘I was put on ‘sliding scale’ and after the operation, I asked to return to my usual regime. The request was refused … I was told that as it is a bank holiday, if my levels were still high on Tuesday they would call somebody in. So, I made the decision to discharge myself on the Saturday. Within 24 hours of being at home my levels were back to where they were before the operation’

Person with diabetes

‘The next day I had a hypo, the nurse was called and did not know what to do … The charge nurse came and said [they] had nothing to give me, it was left for another patient on my ward to give me a sugary drink and biscuits, the nurses left, came back half an hour later, took my blood sugars, said the result was much better and with that they went, no food was offered … except by the patients on the ward.’

Person

Communication

Communication is particularly important to people with diabetes in hospital, whether communication between ward staff with the specialist team, or with the patient themselves. Staff will need the skills necessary to enable them to communicate effectively with all people with diabetes including children and those whose first language is not English. Information should be provided in an appropriate format and staff should check that the information has been understood. It is vital that all people with diabetes are kept informed and included in decisions about their care.

‘Everything that I read said that you did not experience hypos with Metformin. The nurse then revealed that I had not been receiving Metformin but another drug … This was the first time anybody had mentioned that my medication had been changed. This was my first experience of a hypo and I was already concerned about my health, this caused me a bit of additional concern that was unnecessary.’

Person with diabetes

Children with diabetes

Recently, the views of parents and carers of children with diabetes who had been in hospital identified many of the same issues reported by adults. Children and young people with diabetes may also have specific needs relating to their age and individual circumstances.

‘I still, however, had problems with the other hospital staff and ended up arguing with a registrar (who had not met me or my son before) who wanted to give my son a sizeable insulin dose before breakfast time, even though at that time my son had not eaten any proper food since the operation’

Person with diabetes

Newly diagnosed diabetes in the young is something that affects families and carers and it cannot be adequately supported on adult wards or where staff are not experienced and understand the implications for the young person, the family and their friends.

The DIPEX project of interviews with young people with type 1 diabetes consists of 18 different videos and audios of young people describing their experiences of hospital inpatient stays for their diabetes.

www.youthhealthtalk.org
We know that about 10% of hospital beds in England and Wales are occupied by people with diabetes, and this prevalence is higher in people in hospital who are elderly or have acute coronary syndromes (ACS).\(^{27}\)

The activity associated with inpatients with diabetes is increasing (see Figure 3).

This is an underestimate of the true inpatient activity, because diabetes as a discharge diagnosis is missed in as many as 20 – 25% of inpatients with the condition, particularly those with non-insulin treated diabetes.\(^{28}\)

The coding of diabetes on which bed occupancy is based is complex, and can be derived from Hospital Episode Statistics (HES) or Health Resource Groups (HRG). Using the International Classification of Diseases (ICD-10) codes E10 (insulin treated) and E11 (non-insulin treated) there were nearly one million discharges in the main medical and surgical specialities between 2000 -2004 in England. This accounted for 6.5 million beds days or 8.1% of all hospital discharges.\(^{29}\)

The largest single HRG diagnostic group is people with diabetes and coronary artery disease, accounting for 700,000 bed days in one year, 17% of the total (Table1).

### Table 1

<table>
<thead>
<tr>
<th></th>
<th>Admissions</th>
<th>% emergency</th>
<th>Bed days</th>
<th>% emergency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary cause</td>
<td>52,801</td>
<td>61%</td>
<td>373,105</td>
<td>84%</td>
</tr>
<tr>
<td>CHD diagnosis codes</td>
<td>78,563</td>
<td>67%</td>
<td>696,933</td>
<td>83%</td>
</tr>
<tr>
<td>HRGs – lower limb</td>
<td>2,490</td>
<td>75%</td>
<td>45,211</td>
<td>78%</td>
</tr>
<tr>
<td>HRGs – other diabetes</td>
<td>5,204</td>
<td>98%</td>
<td>35,721</td>
<td>95%</td>
</tr>
<tr>
<td>HRGs – amputations /PVD</td>
<td>3,832</td>
<td>65%</td>
<td>103,974</td>
<td>71%</td>
</tr>
<tr>
<td>Ophthalmology &lt; 70ys</td>
<td>11,775</td>
<td>7%</td>
<td>7009</td>
<td>40%</td>
</tr>
<tr>
<td>Nephrology</td>
<td>9,539</td>
<td>52%</td>
<td>86,677</td>
<td>75%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>164,204</strong></td>
<td><strong>61%</strong></td>
<td><strong>1,348,630</strong></td>
<td><strong>82%</strong></td>
</tr>
</tbody>
</table>

Data derived from HRG (2003/2004) for all diabetes related activity in key HRG showing total admissions and bed occupancy, and percentage admitted as emergencies.
Excess bed occupancy due to prolonged length of inpatient stay in diabetes populations

Inpatient populations with diabetes have an increased length of stay compared to age-matched inpatients without diabetes. This observation is consistent in all populations studied, and is apparent after age adjustment.

Estimates of excess bed occupancy due to prolonged length of stay in diabetes inpatients in England, with a main medical or surgical specialty discharge code, have been made at approximately 80,000 bed days every year and at 167.4 excess bed days per annum per 1000 people with diabetes in a local population.30

Around 60% of people with diabetes are admitted as emergencies but these admissions account for 82% of all diabetes related bed days. This is an important issue for commissioners in contributing to their ongoing target to reduce emergency bed days.

In England and Wales, this excess has been estimated from a mean of 1.2 bed days for younger surgical inpatients in England, to 1.8 days per inpatient with diabetes less than 60 years old, up to 4.0 days in other studies.31 Absolute bed occupancy is greatest in the elderly, but excess bed occupancy is more marked in younger age groups indicating that this is where the greatest improvement could be made within the hospital setting.32 It is important to age adjust or match length of stay data between diabetes and control groups.

Contributing issues to prolonged length of stay in diabetes inpatients

The reasons for prolonged length of stay in general diabetes inpatient populations are unclear, and include higher rates of co-morbidities in people with diabetes, but it must also include variability in clinical care, as it can be reduced by clinical interventions.

A recent audit by King’s College London found that 10% of people in hospital across all conditions had diabetes, and around 50% of these were on insulin (compared with 20% of the local diabetes population). Length of stay was increased by 2.7 days.

The direct contribution of hyperglycaemia to prolonged length of stay is unclear. Hyperglycaemia is associated with poorer outcomes and prolonged length of stay in people with diabetes and many other clinical conditions. The American Diabetes Association position statement makes a call to action to improve glycaemia in all inpatients with diabetes, on the premise that this may translate into improved outcomes and reduced length of stay.33 There is little substantial evidence now to suggest intensive efforts to improve glycaemic control will deliver this in general inpatients with diabetes.34

The impact of diabetes on health outcomes

People with diabetes in hospital may have worse clinical outcomes than those without diabetes.

As many as 40% of patients in Coronary Care Units (CCUs) have diabetes or impaired glucose tolerance. Failing to identify them and treat them according to best practice can lead to poor short and long-term outcomes. The Myocardial Infarction National Audit Project (MINAP) collects data from every hospital in England that treats people with acute coronary syndrome. In a recent study, only a third of newly diagnosed people with diabetes received relevant diabetes treatment in hospital, and only two thirds of these had an ongoing diabetes plan at discharge. The routine use of insulin in people with Acute Coronary Syndromes (ACS) based on the DIGAMI study protocols may have declined in recent years.35 MINAP report that the death rate was increased by 50% in those who did not receive insulin for raised blood glucose.
Diabetes is the commonest cause of non-traumatic limb amputation, and foot problems are amongst the most feared complications of diabetes.\textsuperscript{36} They have a significant impact on patients’ lives, including loss of occupation and status, disfigurement, reduced mobility, and depression. Furthermore, survival is bleak, with mortality rates after both amputation and foot ulceration of 50 per cent at two years and 75 per cent at six years.\textsuperscript{37}

Foot complications have a significant financial impact on the NHS through outpatient costs and increased bed occupancy and extended length of stay.

It has been estimated that of the £3bn of NHS expenditure on diabetes £600m could be attributed to diabetic foot complications.\textsuperscript{38} In the UK in 2003 foot complications including amputations cost £252 million.\textsuperscript{39}

In 2003/4 in England there were around 6,300 admissions associated with a diagnosis of diabetes combined with lower limb or amputation and peripheral vascular disease (Hospital Episodes Statistics, DH).\textsuperscript{40} These recorded admission episodes equated to almost 150,000 bed days and a cost, for bed days alone, of almost £30m. The total cost is significantly greater when the cost of amputation is also taken into account, furthermore the above bed days are based on hospital activity analysis which substantially underestimates true activity.

The National Institute of Health and Clinical Excellence (NICE) has published guidelines on the prevention and management of foot problems in people with Type 1 and Type 2 diabetes.\textsuperscript{41} This section will look at how inpatient care can be improved for those people who are admitted to hospital with foot complications, or at risk of foot complications, with considerable financial benefit.

### Preventing diabetes foot admissions – the evidence base

Foot complications of diabetes can be prevented. A substantial literature supports the roles of out-patient podiatry provision by a multi-disciplinary diabetic foot team and community podiatry services as part of a foot protection programme. Multi-disciplinary diabetic foot teams and foot protection programmes have previously been recommended by NICE Guidance (NICE, 2004).

NICE also recommends that high-risk patients should be fast tracked to an expert multidisciplinary foot care service, including specialist podiatry. This should enable access to modern wound management, microbiological and revascularisation techniques, pressure relief, and metabolic control.

Once ulceration, infection or critical ischaemia have occurred the use of a comprehensive protocol for the evaluation of the foot, and a critical pathway for its treatment, together with access to specialist expertise, increases the number of limbs saved and reduces waiting times and length of stay.\textsuperscript{42}

However only two thirds of hospitals in England have local guidelines for the management of the diabetic foot, and a number of NHS trusts in England have neither foot care guidelines, nor referral pathways to the diabetes specialist team.\textsuperscript{43}

### What has been shown to work?

Successful inpatient foot care models all have the same elements in common. These are routine and systematic inpatient care, provided by specialist multidisciplinary teams of doctors, nurses and podiatrists. Structured approaches to defining the competencies needed within the team have been developed.

There are several examples of good practice.\textsuperscript{45}
At King’s College Hospital, Vascular and Diabetic Foot Teams introduced an integrated care pathway for the management of the inpatient with a critically ischaemic diabetic foot. This pathway included the role of the Diabetic Foot Practitioner and the aim of closely supervising diabetic foot in-patients and co-ordinating all aspects of their foot care. This has resulted in a lower amputation rate and a reduction in mean length of stay by two weeks per patient.  

<table>
<thead>
<tr>
<th>Year</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2005/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroischaemic Admissions (number)</td>
<td>89</td>
<td>62</td>
<td>59</td>
</tr>
<tr>
<td>Mean length of stay</td>
<td>51±46.7</td>
<td>31±27</td>
<td>28±25.8</td>
</tr>
</tbody>
</table>

In Ipswich, a Specialist Diabetes Podiatrist and Diabetes Nurse Specialist (DNS) with an interest in foot care initiated twice-weekly ward visits to all wards to identify and co-ordinate the management of all inpatients with diabetes and foot problems and to educate medical and nursing staff. Major and total amputation rates fell consecutively for the next 5 years. When the team was withdrawn in 2000, total amputation rates started to increase again. Using the data they had collected the team was able to show that savings on bed days alone was 4-5 times greater than staff costs. The DNS post was reinstated and amputation rates fell again. 

The Ipswich experience: Amputation rates (1995 – 2005) per 100,000 general population. 

![Amputation rates graph]
When this specialist care in hospital is fully integrated with comprehensive outpatient services, the benefits are even greater. In **Southampton** a Diabetes Foot Protection Team (DFPT) was developed which included an advice line for staff and patients with a diabetic foot problem, a dedicated person providing rapid access to inpatient podiatry for all acute wards, as well as enhanced primary care podiatry clinics and discharge support. This led to a fall in mean length of stay for diabetic patients with complex foot disease from 50 days to 18.5 days.\(^{48}\)

In **Northamptonshire PCT** and Northampton General Hospital, integrated diabetes foot services provide an active Foot Protection programme and weekly ward round for diabetic foot inpatients by a Consultant and Podiatrist. Patients undergoing forefoot amputations and known to the Diabetic Foot Team prior to their admission spent 50% less bed days in hospital than those patients admitted to the ward with similar problems but who were not under the care of the multi-disciplinary foot team prior to admission.\(^{49}\) All inpatients are followed up by the multi-disciplinary foot team on discharge and when appropriate become long-term Foot Protection Programme patients in community podiatry clinics.

**The next steps**

The evidence provided in this chapter highlights the enormous improvements that could be made in managing diabetes inpatients with foot problems and the benefits in terms of real patient outcomes as well as value for money via reduced length of stay. The critical role of the specialist foot team is increasingly evidence based.

**Approaches to Improvement**

Improving care for people with diabetes in hospital requires a coordinated approach right across the organisation. This section sets out some of the ways in which acute trusts can approach this.

**Leadership and expertise**

The accumulating evidence is that it is the presence and leadership of the specialist diabetes team that is essential for improvement and service development for inpatients with diabetes. The exact interventions they bring, or whether one of the many care models being developed is superior to another, is not yet clear. To address issues of variation in quality of care and to drive up standards it is usually necessary to look at the system characteristics of the problem. For diabetes care, this is likely to require a combination of linked interventions right across the organisation, none of which by themselves will necessarily result in improvement. It is rare for specialist teams and managers to work together right across the organisation to plan care for people with diabetes - when this occurs, the outcomes can be impressive.

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**In Poole, the Consultant Diabetologist spends part of his time as an acute physician, helping to run the Emergency Admissions Unit with colleagues from other specialties. A local audit of laboratory glucose measurement showed that 22% of admissions had documented diabetes, newly diagnosed diabetes or impaired glucose tolerance. The presence of diabetes expertise from the moment of admission has helped to improve the management of people with diabetes in hospital, and direct involvement in policy making has resulted in improved care for other patients throughout the hospital.**
Bringing these messages to the heart of hospital clinical policy is important, and the specialist team are well placed to do this. There are powerful financial and clinical arguments to be made to commissioning teams and acute trusts on the benefits of enhanced inpatient diabetes services, and a whole system approach to inpatients diabetes care.

Protocols and guidelines
One way to ensure a systematic and consistent approach to care across an organisation where patients and staff may move from ward to ward is the development of guidelines and protocols. In 2000, the Audit Commission found that the presence of guidelines was variable. A recent survey reported little change, and overall only just over 20% of hospitals had all 10 key inpatient diabetes management guidelines although nearly 98% of UK hospitals have guidelines for DKA and the majority have for severe acute hypoglycaemia.

Improvement through enhanced inpatient services
Observational data from some large acute trusts have shown that 41% of inpatients with diabetes did not receive the care that the specialist team felt was required.

The integration of diabetes expertise across the whole organisation is important for the acute trust as a whole.

‘A large 750 bed surgical hospital in the USA (Greenville, North Carolina), developed a diabetes steering committee to address diabetes care across the entire hospital. They appointed 5 nurse case managers (NCM) to make direct contact with 85% of all inpatients with diabetes. They concentrated particularly on moving patients from sliding scale insulin regimens to the use of basal insulin and NCM led dose adjustments. They found that the use of NCM led to a 0.26 day length of stay reduction, about 1788 days saved per year, with an estimated $2.224 million revenue through enhanced elective activity. This was more than 4 times the original investment in the diabetes management programme.’

In the UK and elsewhere the employment of a diabetes inpatient specialist nurse (DISN), diabetes nurse educator (DNE) or diabetes specialist nurse (DSN) has resulted in impressive reductions in length of stay. Studies show a reduction in excess length of stay, of between 27–47% with an absolute reduction in mean or median length of stay of between 0.7 – 3.0 days, after the introduction of the service.

This is equivalent to 1,330 bed days saved by one DSN in one year in a 1,000-bed trust, or 1,788 bed days saved a year in a 750 bed surgical hospital, using 5 nurse case managers. These benefits are at least partly related to improved insulin management and education. Involving the diabetes specialist team, rather than a general medical team, in DKA management reduces length of stay.
An audit in the South West compared the management of diabetic ketoacidosis by specialist and non-specialist physicians. Those managed by non-specialists had considerably longer lengths of stay in hospital due to unnecessarily extended time on intravenous insulin, inappropriate insulin regimens and problems associated with converting back to subcutaneous insulin. By contrast, the specialist team was able to discharge the average uncomplicated patient within three days.

Using the specialist team to deliver regular training and education to improve the skills and confidence of all trust staff also seems to reduce excess length of stay for inpatients with diabetes as primary diagnosis.54

**Expertise and workforce**

The importance of the whole diabetes specialist team in providing the expertise, leadership, clinical care and staff training in inpatient diabetes care should be emphasised, and is supported by all trial and observational data on bed occupancy.

Skills for Health has produced a complete set of competencies for the care of people with diabetes, including competencies in the coordination of care.55 These enable job roles and job descriptions to be put together in ways that are most appropriate to each specialist team. These roles include medical, speciality nursing, dietetic and psychological elements.

The central role of the DISN in improving the inpatient experience of people with diabetes, reducing length of stay, reducing readmission rates, and delivering financial savings has been described. Only half of UK hospitals have a DISN service, although this number has increased rapidly since the publication of the Diabetes NSF. However, half of the 262 UK hospitals with a diabetes specialist team still have no inpatient specialist nurse input at all.56

![Figure 4](image-url)

**Figure 4**. Numbers of diabetes inpatient specialist nurses (total 149) appointed each year in the UK in 123 Hospitals between 1980 and 2005.
Consultant Diabetologists in some centres are working to a new model of the ‘Inpatient Diabetologist’ with a significant sessional commitment to inpatient diabetes care across an entire acute trust, in collaboration with a DISN. This model may also reinforce the value of specialist teams to acute trusts by associating them with financial savings and reduced pressure on elective activity.

The specialist dietitian is a key member of the inpatient team, with a lead educational and coordinating role over all these aspects. The dietitian will also have a specialist role in the supervision and monitoring of enteral and parenteral nutrition during times when the person with diabetes cannot take food by mouth. However, only half of UK hospitals have access to a dietician for routine inpatient diabetes care.57

There is a similar wide-ranging role, described previously, for the specialist podiatrist and foot team. They have a lead role not only in managing people in hospital with foot problems, but also in ensuring that appropriate prevention strategies are in place for all people with diabetes in hospital at risk of developing foot problems. However, only half of UK hospitals have access to a podiatrist for routine inpatient diabetes care.58

**Important financial issues for acute trusts and commissioners**

It is possible to make some estimates of costs associated with bed occupancy and excess length of stay. It must be stressed that these costs are estimates based on national HES data, which may underestimate activity and that the data is derived for English trusts and for the main medical and surgical specialties alone.59 Without HRG reference cost information it is also not possible to apportion precise costs to this data. Therefore, a unit cost of £286 per bed day was used from the Personal Social Services Research Unit’s ‘Unit Cost of Health and Social Care’.60 With these limitations, it suggests a total unit cost of at least £450m a year of which more than £20m, recognised as an underestimate, is due to excess length of stay and could be reduced.

<table>
<thead>
<tr>
<th>ICD10 Diagnosis Codes</th>
<th>Total bed days</th>
<th>Total Cost</th>
<th>Estimated Excess bed days</th>
<th>Cost of Excess Bed days</th>
</tr>
</thead>
<tbody>
<tr>
<td>E10 insulin dependent</td>
<td>1,422,728</td>
<td>£406,900,208</td>
<td>86,505</td>
<td>£24,740,430</td>
</tr>
<tr>
<td>E11 non insulin dependent</td>
<td>5,085,940</td>
<td>£1,454,578,840</td>
<td>201,831</td>
<td>£57,723,666</td>
</tr>
<tr>
<td>Combined</td>
<td>6,508,668</td>
<td>£1,861,479,048</td>
<td>288,396</td>
<td>£82,464,096</td>
</tr>
</tbody>
</table>

*Estimates based on 4 years HES data for England in main medical and surgical specialties.*61
Payment by results
Currently 20–25% of inpatients with diabetes are not correctly coded as having diabetes. However, the way hospitals are paid for diabetes should provide a powerful incentive to identify people with diabetes in hospital and ensure they get the best treatment.

People in hospital for elective procedures diagnosed with a 'co-morbidity or complication', such as diabetes, may attract a higher tariff with Payment by Results. The extra funding reflects the additional resource and expertise often required to treat inpatients with diabetes or other similar complications. This extra amount varies according to the primary HRG – many HRGs come in pairs, one where a procedure or diagnosis is defined as with complications and co-morbidities, and one without. The system is complex but will be described in a technical fact sheet to be published shortly. The additional amount per case for an Acute Trust if diabetes is a complicating factor of the treatment can be as much as £1,894 for a hip or lower limb fracture.

In Foundation Trusts where budgets are increasingly apportioned to each clinical service the identification of diabetes as a co-morbidity will affect the proportion of the tariff that can be allotted to the diabetes specialist service. Accurate recording of diabetes specialist team involvement in care thus has an important role in raising the profile and the importance of involving the specialist team. Coding in diabetes is complicated and there is evidence that Trusts and specialist teams are losing out because this is little understood. PbR as it applies to diabetes will shortly be described in the technical fact sheet mentioned above.

There is a further incentive provided under PbR to encourage the reduction of excessive length of stay. The tariff is paid per HRG, regardless of length of stay. So if you can treat a patient in four days rather than five, you will save money. For unusually complex cases excess bed days are paid past a defined “trim point” (a length of stay which varies for each HRG), but even here the level of the excess bed day payments is designed to ensure hospitals will not be making money from keeping patients in for longer. This should provide a powerful incentive to use specialist expertise to provide the best possible care to people with diabetes and reduce length of stay. It particularly provides an incentive to focus on foot care where the longest excess bed days occur. Reduction of length of stay allows the hospital to treat more patients and thus attract optimum payment for its services.
Whilst there has been some improvement in inpatient care following the publication of the Diabetes NSF, this has not been as rapid as in other areas of care. The Steering Group therefore worked in partnership with the NHS Institute of Innovation and Improvement to provide practical guidance based on examples of good practice in England. Their key findings are produced here so they can be incorporated into recommendations for commissioners. The details of their methodology and examples of good practice are described in detail in Delivering Quality and Value: Focus on: Inpatient care for people with diabetes. A collection of practical tools will be available for local teams to use early in the summer.

Following a literature review and baseline data collection, they selected a variety of hospitals to visit during which they worked closely with the local staff to tease out and understand the difficulties and examples of good practice. The Institute have developed a clinical pathway that is reproduced here, but more detail, recommendations and case studies are available in the full document.

This diagram shows a pathway used by some hospitals visited by the NIII. Although the pathway shows patients moving to a ward via an admissions unit, this should not be common practice. Not only can patients be discharged from an admissions unit, they can and should, be admitted directly to an inpatient ward directly from accident and emergency.

The suggested pathways for people with diabetes have a set of common components that are very similar whether the person is admitted in a planned or unplanned way. The important features are:

- Identification of everyone with diabetes in hospital
- Individual planning for care of diabetes during admission and prior to discharge
- Ensuring that everyone looking after someone with diabetes is appropriately skilled

The multidisciplinary specialist diabetes team working across the organisation to help plan pathways, write guidelines, train and support staff and provide individually tailored care is a key component.
Delivering quality and value
Inpatient care for people with diabetes

<table>
<thead>
<tr>
<th>Key Characteristics</th>
<th>Patient experience</th>
<th>Early identification</th>
<th>Assessment</th>
<th>Care pathway</th>
<th>Inpatient specialist team</th>
<th>Staff education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clear focus on patient experience to guide the organisation and delivery of care for people with diabetes.</td>
<td>Fail-safe system for early identification of people with existing diabetes and those with hypo/hyperglycaemia to enable appropriate response throughout the care</td>
<td>Early, comprehensive and standardised assessment of the patient’s relevant diabetes needs in planned and emergency care</td>
<td>Jointly agreed and effectively implemented care pathways to appropriately support individual patient need</td>
<td>Effective use of inpatient specialist diabetes team</td>
<td>Appropriate training using adult learning models</td>
</tr>
</tbody>
</table>
The admission and discharge plan for inpatients with diabetes.

The admission and discharge plan.
The Diabetes NSF describes routine care planning as a process in which the person with diabetes is actively involved in deciding, agreeing and owning how their diabetes is to be managed. It starts by sharing information with the professional, moves on to structured assessment of relevant issues, and ends with a jointly agreed plan based on individual goals, needs and priorities. This approach should be the foundation of the specific care plan on admission and discharge.

Everyone admitted to hospital should have an opportunity to be involved in such a process and have the details recorded. How and when this will be done will depend on the person’s health, and whether they are admitted in a planned or unplanned way. Each organisation will need to ensure these elements are effectively integrated into organisation wide protocols for diabetes care.

Planning on admission for inpatients with diabetes
1. Information exchange
   • Review of the person’s ongoing care plan, and discussion
   • of their preferences for self care of their diabetes while in hospital
   • Explanation of the reasons for admission, and what to expect in hospital
2. Systematic review of key areas from patient and professional viewpoint
   • Level of knowledge about diabetes and need for further information
   • Assessment of need for input from diabetes specialist team
   • Food choice, timings and access to food/snacks
   • Nutritional assessment, especially in older people
   • Risk status of feet in all people with diabetes, risk stratification, and management plan
   • Medicines management and control. Establish if self management is desired/appropriate. Ensure that self management includes administration of medication/insulin injections/insulin pump and access to their own capillary blood glucose monitoring and quality control equipment.
   • Need for emotional and psychological support (particularly older people, children, and those newly diagnosed).
   • Mobility (particularly in older people with diabetes).
   • Establish the cultural and religious needs of the individual including; subsequent dietary, treatment, and facilities requirements and matters surrounding physical contact
   • Establish ethnic identity
   • Establish preferred name
   • Other patient concerns
3. Developing and recording a plan
   • Key elements of the plan, and who is responsible for each of these, need to be recorded.
   • A named contact and other relevant information should be provided to each individual in written or other appropriate format. Relevant information should cover how diabetes related emergencies will be managed, how individuals can access hospital protocols and policies for the management of diabetes, and how to access the specialist team if necessary.
Planning on discharge for inpatients with diabetes

- Review of the admission and patient experiences
- Check on understanding of new or changed diabetes management
- Identification of ongoing needs
- A named contact in the community
- Written discharge summary to GP, diabetes team and relevant others e.g. social care.
- Information for the organisation on:
  - Accurate coding of all diagnoses including diabetes
  - Systematic recording of patient experience.
Preventing diabetes admissions:

Generally, commissioners may want to ensure that there are local community-wide models of care for preventing and managing diabetes emergencies. These should be integrated into the routine management of everyone with diabetes and include all the issues outlined below. A key component is to ensure membership of the diabetes network, or close local links, with the ambulance services and other members of urgent care networks.

Specifically, commissioners may also want to:

1. Ensure that all people with diabetes from diagnosis onwards, have access to structured educational programmes that meet national criteria and include managing emergencies (sick day rules)

   **Key outcomes:** Falling DKA and severe acute hypoglycaemia admission rates, falling ambulance call out rates

   **Evidence for improvement:** Improvement in access to quality assured structured educational programmes

   **Suggested audit and quality assurance measures:** Annex 3: D, G; Better metrics 14.09 (i, ii)

2. Ensure that ambulance trusts are represented on local diabetes networks, or that close links exist between ambulance services and specialist services for people with diabetes. This engagement should develop pathways between the specialist team and ambulance Trust for people with diabetes at highest risk, particularly multiple callers, for further education and support.

   **Key outcomes:** Reduction in number of frequent 999 callers and admissions

   **Evidence for improvement:** Demonstrable engagement with ambulance trust and new pathways

   **Suggested audit and quality assurance measures:** Annex 3: D, E; Better metrics 14.11

3. Ensure that there is specific service provision for groups at highest risk of a diabetes emergency – these include adolescents transferring to adult clinics, individuals with eating disorders, people with substantial psychosocial problems, residents in nursing and care homes, and prisoners.

   **Key outcomes:** Reduction in number of frequent 999 callers and admission rates

   **Evidence for improvement:** Demonstrable protocols, guidelines, and new pathways; monitoring of individual case management workloads in specialist diabetes team

   **Suggested audit and quality assurance measures:** Annex 3: C, D, E, F; Better metrics 4.11

Improving quality and value for people with diabetes in hospital: general recommendations

4. Commissioners may want to ensure that acute trusts have explicit arrangements to take a strategic overview and coordinate all aspects of inpatient diabetes services across the trust. This should be based on the quality makers identified in this document, led by a specialist...
multidisciplinary team, with management representation, integrated into trust clinical governance mechanisms.

**Key outcomes:** Improved coordination of inpatient services and recognisable whole system governance

**Evidence for improvement:** Trust wide guidelines and protocols. Evidence of audit, and related measured service improvement

**Suggested audit and quality assurance measures:** Annex 3:H, I, M; Better metrics 14.13

5. Commissioners may want to ensure that acute trusts have educational programmes for all staff who look after inpatients with diabetes, linked to staff induction and mandatory training. These programmes should include training on medicines management, nutritional issues, and insulin handling in acutely unwell people with diabetes.

**Key outcome:** Falling incident reporting for prescribing errors; reduction in complaints and improvement in patient experience measures

**Evidence for improvement:** Percentage of relevant staff who have had competency based training needs assessment and attended training annually

**Suggested audit and quality assurance measures:** Annex 3:A, B, J

6. Ensure that all people with diabetes in hospital have comprehensive and routine admission and discharge diabetes care plans according to the principles and including the components outlined in this document.

**Key outcomes:** Fall in complaints and incident reporting, improvement in patient experience tools

**Evidence for improvement:** Written evidence of appropriate formal diabetes care planning by trained individuals

**Suggested audit and quality assurance measures:** Annex 3: A, B, J

7. Ensure that inpatients with diabetes are surveyed regularly using local or other validated inpatient satisfaction assessments to identify areas of concern and poor process.

**Key outcomes:** Improvement in trust diabetes satisfaction scores

**Evidence for improvement:** Quantification of inpatients views

**Suggested audit and quality assurance measures:** Annex 3: B

8. Ensure that all clinical areas have access to the specialist medical, nursing, podiatric, dietetic and psychological competencies required by people with diabetes in hospital.

**Key outcomes:** Improved access

**Evidence for improvement:** Workforce assessment

**Suggested audit and quality assurance measures:** Annex 3:M
9. Review their portfolio of inpatient diabetes-management guidelines, in collaboration with the diabetes specialist team, to ensure a systematic approach to all aspects of diabetes care across a Hospital. These guidelines should indicate referral to and review by the specialist team of all people with DKA, severe acute hypoglycaemia, or diabetic foot ulceration on the day of admission.

**Key outcomes:** Increased guidelines establishment

**Evidence for improvement:** Availability of trust-approved diabetes inpatient management guidelines

**Suggested audit and quality assurance measures:** Annex 3: A, I, J.

10. Ensure regular and recurring data analysis to estimate:

- Admission rates with DKA and severe acute hypoglycaemia,
- Minor and major amputation rates in the diabetes population,
- Age adjusted excess bed occupancy due to prolonged length of stay.

**Key outcomes:** Falling admission rates; improved bed occupancy rate

**Evidence for improvement:** Admission rates and excess bed occupancy

**Suggested audit and quality assurance measures:** Annex 3: C, H, I

11. Ensure effective service models for people with known diabetes, with ‘new hyperglycaemia, or newly diagnosed Type 2 diabetes, following an acute coronary syndrome. The service model should include:

- Glycaemic management while in hospital
- Pathway towards confirmation of diagnosis post discharge
- Follow up arrangements for possible diabetes.

This service model should be developed with the diabetes specialist team.

**Key outcomes:** Recognition and treatment of hyperglycaemia/new T2DM on CCU’s

**Evidence for improvement:** Guidelines and protocols for managing glucose issues in CCU

**Suggested audit and quality assurance measures:** Annex 3: J, N
In the course of this work a number of areas were identified where further work or the development of consensus guidelines would be helpful. Some of these areas were highlighted in a large ‘Challenges and Solutions’ workshop in September 2007 for health care professionals and people with diabetes, or were identified by other professional groups. These areas include:

### Guidelines
The need for consensus guidelines:
- on the management of severe acute hypoglycaemia in the community or in acute hospitals.
- on parenteral and enteral nutrition in inpatients with diabetes.
- on the use, or misuse, of subcutaneous sliding scale insulin regimes in acutely unwell medical and surgical inpatients.

### Indicators
The need for a robust indicator of the quality and outcome of inpatient diabetes services to enable trusts to benchmark their services and commissioners to specify year on year improvement.62

### Research and Development
- The need for large scale research studies using a complex intervention methodology, to examine the reasons why specialist diabetes services are effective in reducing inpatient length of stay.
- The need to quantify the scale of under recording of diabetes as a discharge diagnosis.
- The need for detailed health economic analysis of national diabetes bed occupancy, excess diabetes bed occupancy, and for modelling the potential cost benefits of interventions to reduce diabetes bed occupancy.
- The need for a substantial UK randomised controlled trial (RCT) examining evidence of benefit of intensive glucose management of general medical and surgical inpatients with diabetes, with length of stay and clinical outcomes as primary endpoints.
- The need for research in the area of inpatient diabetes care, particularly on the feasibility and effectiveness of different service models.
Diabetes - There are two ‘types’ of diabetes - In type 1 diabetes (T1DM) the cause is an immune reaction against the insulin secreting pancreatic cells, usually in children and younger adults. Type 2 diabetes (T2DM), is commoner, occurs in older adults, and the cause is resistance to the actions of insulin and falling insulin secretion. People with Type 1 diabetes always need insulin injections, as do many people with Type 2 diabetes within a few years of diagnosis.

Diabetic Ketoacidosis (DKA) - A serious clinical condition, usually occurring in people with Type 1 diabetes, characterised by the appearance of ketones in the blood and urine, usually associated with high blood glucose levels, which can lead to coma and death. DKA requires a hospital admission.

Diabetic Complications - The complications which can arise from diabetes: these can be divided into acute (hypoglycaemia, dehydration and ketoacidosis) and long-term tissue complications. The tissue complications include damage to the retina, damage to the kidney, damage to the nerves, erectile dysfunction, circulatory, problems, and foot ulcers.

Diabetes Specialist Nurse (DSN) - Usually a senior specialist nurse, usually working in an acute trust, who has particular training and expertise in diabetes education and diabetes management.

Diabetes Inpatient specialist nurse (DISN) - Usually a senior specialist nurse, usually working in an acute trust, who has particular training and expertise in diabetes education and diabetes management, who is contracted to provide care for inpatients with diabetes across an entire trust.

Hyperglycaemia - Blood glucose level is too high, often associated with symptoms

Hypoglycaemia - Blood glucose is too low, often associated with symptoms of hunger, sweating and irritability. It can progress to confusion and loss of consciousness and require help from someone else – a relative or health care professional.

Insulin - The hormone which enables the body cells to use glucose to generate energy. All people with type 1 diabetes, and many with type 2 diabetes, need insulin injections.

Length of stay and excess length of stay - The duration (in days) of an inpatient stay. Excess length of stay is a subjective assessment describing a prolonged length of stay, beyond that normally expected.

NDST - National Diabetes Support Team, set up to support the implementation of the National Service Framework for Diabetes.

Neuropathy - Damage to the nerves, usually in the feet and lower limbs, where it can lead to risk of ulceration and amputation. Risk of ulceration can be reduced by early identification and preventative measures.

NICE - National Institute for Health and Clinical Excellence

NSF - National Service Framework for Diabetes, the ten-year plan begun in 2003 to improve the standards of care for people with diabetes.
Peripheral vascular disease - reduced circulation in the feet, which increases the risk of ulceration and amputation. Risk of ulceration can be reduced by early identification and preventative measures.

Payment by results (PbR) - a financial mechanism whereby a standard payment (called the national tariff) applies for the same inpatient (patients in the same HRG) and outpatient (patients of the same speciality) treatment.

Sick day rules - guidance for people with diabetes, usually written by the specialist team, on how to manage their blood glucose and insulin treatment on days when they are unwell.
Annex 2:
Inpatient experience collated by Diabetes UK

Diabetes UK and members of the Working Party would like to thank the people who shared their inpatient experiences. Approximately 50 experiences were collated and extracts of these are available on the Diabetes UK website: www.diabetes.org.uk
Acute and ambulance trusts may wish to audit various aspects of their service concentrating on areas of special interest and reporting through trust Clinical Governance structures.

Some suggested audits and audit areas are:

A: Review of the match between timing of insulin and food and number of prescribing errors.

B: Analysis of inpatient diabetes treatment satisfaction using local or available validated instruments, linked to review of local processes and procedures.

C: Benchmark incidence of DKA, severe acute hypoglycaemia, and diabetes admission rates against equivalent national and regional data for admissions using widely available local and national datasets (www.nchod.nhs.uk)

D: Analysis of local ambulance call-out rates for code 13 diabetes emergencies, transfer rates to Accident and Emergency, and admissions rates to hospital against national and regional data.

E: Review of the use and outcomes of local protocols for severe acute hypoglycaemia, and the pathways between this service and the specialist team.

F: Review of the number of people admitted to hospitals with emergencies from care homes.

G: Review local provision of NICE recommended and quality assured educational programmes for people with diabetes.

H: Analysis of their serial data for diabetes bed occupancy, either from their own Trust data source, related to age and speciality matched groups without diabetes, to allow estimated of total and excess bed occupancy. This can be done easily through returned HES data for their trust from DH/ Northgate Information Solutions (contact@northgate-is.com).

I: Availability of diabetes management guidelines based on national examples of good practice.

J: Analysis of under recording of diabetes as a discharge diagnosis, and improved performance, through staff training in clinical coding and linkage with existing diabetes databases (i.e. retinal screening) to trigger diagnosis alert on admission.

K: Training needs assessment and review of training programmes provided by the specialist team to all Health Care Professionals involved in inpatient diabetes care.

L: Analysis of diabetes foot ulceration and amputation rates, and related bed occupancy data, and benchmark this and their model against available national data.

M: Availability of hospital wide pathways agreed with diabetes speciality team and regular audit of key components.

N: Analysis of MINAP data and trust data to examine clinical outcomes for inpatients with hyperglycaemia and/or diabetes after an acute coronary syndrome.
Supporting tools:
To support audit, service improvement and provide key outcomes for commissioning a number of validated tools or instruments are now available. These include:

Better metrics
‘Better metrics’ is a collection of tested indicators agreed by the diabetes community in England as suitable for the assessment across the range of diabetes care. Collected in a standard way by trusts, they can be used for benchmarking. Where an appropriate better metric exists, it has been linked with the appropriate recommendation.

For example, Metric 14.13 refers to inpatient care

Age adjusted length of stay and length of stay ratio in people in hospital with diabetes for key indicator conditions compared to people in hospital without diabetes.

These metrics have been recommended for commissioners in the Diabetes Commissioning Toolkit and are available for all PCTs in England where data is available at:


DTSQ-IP. (copyright Professor Clare Bradley, Royal Holloway University London)

This 18 item questionnaire has been validated (2007) and provides a useful tool for the assessment of patient experience in hospital.

The views of hospital inpatients in England. (Healthcare Commission)
This national questionnaire, which is not specific to people with diabetes, was carried out in 2006 and provides questions on ambulance experience as well as all aspects of admission, hospital stay and discharge.


Specific tools
Malnutrition Universal Screening Tool (MUST) MUST is a five-step screening tool to identify adults who are malnourished, at risk of malnutrition (undernutrition), or obese. It also includes management guidelines that can be used to develop a care plan. It is for use in hospitals, community and other care settings and can be used by all care workers. (recommended by NICE and BAPEN)

http://www.bapen.org.uk/pdfs/must/must_full.pdf

There are a variety of techniques to use to assess patient experience including Discovery Interviews.

http://www.heart.nhs.uk/serviceimprovement/t/1338/4668/27794/Discovery%20Interviews%20final%20report%2025%20April.pdf
We would like to thank the following people for their membership on the emergency and in hospital care working group and for the contribution they have made to this report:

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