NHS

GIRFT
GETTING IT RIGHT FIRST TIME

Diabetes

GIRFT Programme National Specialty Report

by Professors Gerry Rayman and Partha Kar

November 2020

GIRFT is delivered in partnership with the Royal National Orthopaedic Hospital NHS Trust, NHS England and NHS Improvement

Contents

Foreword from Professor Tim Briggs GIRFT Programme Chair

I am delighted to recommend this Getting It Right First Time review of diabetes, led by Gerry Rayman and Partha Kar.

This report comes at a time when the NHS has undergone profound changes in response to the COVID-19 pandemic. The terrible and unprecedented events of 2020 – and the extraordinary response from everyone working in the NHS – add greater significance to GIRFT's recommendations, giving many of them a new sense of urgency.

Recommendations in this report, such as systems to support virtual clinics, can help the NHS as it faces the substantial challenge of recovering services while remaining ready for any future surges, by operating more effectively and safely than ever before.

Together, Partha and Gerry have applied the GIRFT approach to diabetes, one of the biggest health issues facing the UK. It is estimated that more than 4.7 million people are living with diabetes in the UK, and the number is growing, with diagnoses more than doubling in the last 20 years.

The findings and evidence-based recommendations in this report are based on GIRFT deep-dive visits to 108 acute trusts. They are focused on helping people with diabetes and their clinicians to better manage the condition and reduce avoidable harms. In particular, the recommendations will help to improve services for people with type 1 diabetes, and improve inpatient care and foot care for everyone living with diabetes.

In my own specialty, orthopaedics, I have seen some of the worst human costs of poorly managed diabetes, in the form of amputations due to diabetic foot disease. Other serious complications can include end stage kidney failure, sight loss, heart attacks and strokes. In addition to the human cost, there is a significant resource cost to the NHS and it is thought that 10% of the entire NHS budget is spent on diabetes and its complications.

We know that where there are high quality and accessible services, many of the human and financial costs of diabetes can be avoided. Partha and Gerry have found many examples of outstanding services during their visits, and many of these are highlighted as examples of best practice in this report. In tackling unwarranted variation in services, there is a huge opportunity for the NHS to improve quality of care and avert costly complications.

Like other GIRFT clinical leads, they have found a huge appetite within the NHS for change. This augurs well, as GIRFT can only succeed with the backing of clinicians, managers and all of us involved in delivering care.

My hope is that GIRFT will provide impetus to everyone involved to work together, shoulder to shoulder, towards a future where people who have diabetes live well with the condition and suffer fewer harms. With this ethos, GIRFT and the other Carter programmes are already demonstrating that transforming provider services and investing to save can bring huge gains in improving care for patients.

Professor Tim Briggs *CBE*

GIRFT Programme Chair and National Director of Clinical Improvement for the NHS.

Professor Tim Briggs is Consultant Orthopaedic Surgeon at the Royal National Orthopaedic Hospital NHS Trust, where he is also Director of Strategy and External Affairs. He led the first review of orthopaedic surgery that became the pilot for the GIRFT programme, which he now Chairs.

Professor Briggs is also National Director of Clinical Improvement for the NHS.

Introduction from Professors Partha Kar and Gerry Rayman

Over the last year or so, we've visited more than 100 hospitals providing diabetes services across England. As practitioners, it's been an enormous privilege for us to meet with so many of our colleagues doing the same work, to learn from their experience and share what we've learned from our analysis of the data.

We've been inspired by examples of good practice – which we've highlighted throughout this report – and encouraged by the openness of colleagues to engage with the process and listen to what the data tells us about variations and areas for improvement.

The strong response to our questionnaire also indicates there's a genuine desire to share experience and work together to develop practical solutions that can be applied across the system.

In looking at diabetes, we could have done a wide-ranging review including all areas of care. However, we felt that the greatest opportunity lay in areas where the evidence shows we still face major challenges in meeting the needs of patients.

In particular, we found that services for people living with type 1 diabetes are falling short of what we should expect in many areas of the country. Often, type 1 patients do not have the right support to help manage their condition throughout their lives, and especially during the transition from childhood to adulthood. This means some patients become disengaged with their diabetes, which in turn leads to many avoidable harms.

We also found wide variations in how services are organised and provided to people most at risk of footcare problems – leading to preventable ulceration and ultimately, needless amputation.

Another pressing issue is the care of people who come to hospital for reasons other than their diabetes. They often suffer because their diabetes is not identified, or not effectively monitored or managed through the stages of care. This is leading to mis-communication, insulin errors, hypoglycaemic events, diabetic ketoacidosis and unrecognised limb threatening foot complications.

Each of these issues has the potential to cause serious harm to patients, which can be avoided if we work in a more effective way to reduce unwarranted variations and close current gaps in provision.

Our recommendations do not prescribe how care should be delivered but are aimed at providing better systems and support to enable colleagues to do their best and level up to best practice.

We are delighted to have had the opportunity to lead this GIRFT diabetes review and we hope that it will help all of us to deliver improved outcomes for our patients.

Professor Partha Kar

Partha is the national specialty advisor for diabetes with NHS England and a full-time consultant in diabetes and endocrinology at Portsmouth Hospitals NHS Trust.

He served as Clinical Director of Diabetes in Portsmouth from 2009-2015 and was part of the team that developed the award-winning Super Six Diabetes model of care. He played a leading role in enabling access to freestyle libre glucose monitoring in the NHS, as well as ensuring continuous glucose monitoring (CGM) will be available for all Type 1 diabetes patients in pregnancy from 2020.

Partha led on developing the Language Matters guidance to encourage better communication with people living with diabetes, and the Type 1 diabetes information portal on NHS Choices. He is the co-creator of TAD talks (Talking About Diabetes).

Other work has included leading on the Diabetes Rightcare Pathway, working with multiple stakeholders to develop the Diabetes Technology pathway, developing a virtual reality programme to improve hospital safety, working on increased mental health access for diabetes patients across the NHS, helping to introduce of a Low Carbohydrate App into the NHS Apps Library and developing pilot projects for diabulimia treatment in the NHS.

He is an avid Twitter user (@parthaskar) and was recognised as a Social Media Pioneer by HSJ in 2014. He is also the co-creator of the Type 1 diabetes comic.

Professor Gerry Rayman *MBE*

Gerry is consultant physician at the Diabetes and Endocrine Centre and the Diabetes Research Unit atEast Suffolk and North Essex NHS Foundation Trust

He has been the national clinical lead for diabetes inpatient care and foot disease at NHS Diabetes and is the lead of the National Inpatient Diabetes Audit, which he developed. He is a past president of the Endocrine and Diabetes Section of the Royal Society of Medicine.

He was the clinical lead for Diabetes UK's Putting Feet First campaign, contributed to NICE guidelines on diabetic foot, CG10 and CG119, and chaired the writing group on diabetes wound care, published by the International Working Group on Diabetic Foot Disease.

Gerry was instrumental in developing the Ipswich and East Suffolk integrated diabetes service, nationally recognised as improving care. He also developed the Diabetes Inpatient Care and Education (DICE) and Improving the Perioperative Pathway of Patients with Diabetes (IP3D) programmes, both of which have improved inpatient care at Ipswich Hospital and won several awards.

He has served as Chief Medical Advisor to Diabetes UK and is currently the chair of its Clinical Study Group for Acute Diabetes Care, and the clinical lead of its inpatient programme. Gerry chaired Diabetes UK's consensus guideline writing group on flash glucose monitoring and co-authored the charity's report Making Hospitals Safe for People with Diabetes.

His work in diabetes care was recognised by the award of an MBE in 2020.

Statements of support

Diabetes UK

Diabetes UK welcomes this report; the recommendations it makes for vital improvements in key areas of diabetes care speak directly to the concerns of many people living with diabetes.

The COVID-19 pandemic has highlighted the importance of fully staffed multidisciplinary diabetes inpatient teams, foot protection services and access to diabetes specialist nurses. The benefits of diabetes technology have also been further demonstrated recently. We agree that access to diabetes technology should be available for all people with type 1 diabetes, and we urge local health systems to support the increased uptake of diabetes technologies across England.

We also welcome the focus on improving transition services, including psychological support, which we believe will address the often very poor health outcomes experienced by young people living with type 1 diabetes.

People with diabetes are still experiencing unacceptable harm due to medication errors while they're in hospital. The call for widespread uptake of electronic prescribing – among other initiatives – is vitally important, and will directly help in making hospitals safer for people with diabetes.

Despite huge advances – and investment – in foot care, one in six hospitals in England still does not have a multidisciplinary foot care team, so we are also pleased to see the Long Term Plan commitment to ensuring universal coverage in this area re-stated here.

There's a great deal of opportunity for improving care and services for people with diabetes arising from this report; we want to thank Gerry and Partha for their hard work in bringing it to publication, and we look forward to seeing its recommendations translated into practice.

Chris Askew
Chief Executive of Diabetes UK

Association of British Clinical Diabetologists

ABCD is fully supportive of the primary aims of the GIRFT workstream, namely to bring about higher-quality care in hospitals, at lower cost, by reducing unwanted variations in services and practices. For the first time, the report provides us with a comprehensive snapshot of provision of diabetes specialist care, focusing on three main aspects of care; type 1 diabetes care including transition from paediatric to adult care, in-patient diabetes services and diabetes foot care services. These aspects of care consume significant national resource and impact hugely on the quality of life for people who have diabetes.

The NHS needs to get better at sharing cost effective best practice in a timely way so that specialists can compare their own practice. This report represents a step forward in this aspiration. All specialist clinicians, including our members, can utilise the report to help make the case for investment in services. Patients may be able to use such a report to help make better informed choices with regards to their specialist care provider.

The unique aspect of GIRFT is a visit by specialists to specialists enabling valuable challenge, support and dialogue backed up by a common dataset. We appear to be on the cusp of a more advanced era for diabetes care – rapid pace of development of technologies, evolution of the NDA and potential extension of BPT for young people with type 1 diabetes.

The publication of GIRFT diabetes report is therefore welcomed and timely. ABCD wishes to thank the GIRFT leads in this area; Professors Gerry Rayman and Partha Kar for their leadership and dedication.

Dr Dinesh Nagi *MBBS, PhD (London) FRCP*
Consultant in Diabetes and Endocrinology
Ex-officio chairman ABCD (Association of British Clinical Diabetologists)

Dr Dipesh C Patel *PhD FRCP*
Consultant Physician in Diabetes & Endocrinology
Chairman ABCD (Association of British Clinical Diabetologists)

Executive summary

It's estimated that more than 4.7 million people now have diabetes in the UK and the number is growing[1]. Poorly controlled diabetes can lead to complications including diabetic ketoacidosis (DKA), foot ulceration and amputation, sight loss, stroke and heart disease[1]. Many of these outcomes are avoidable with better management of the condition and coordination of diabetes care services.

We heard on our GIRFT deep dives that some trusts' inpatient teams required further development, which is supported by 2017 NaDia data showing:

- One in six hospitals in England did not have a multidisciplinary foot care team;
- A quarter of hospitals did not have a single diabetes inpatient specialist nurse.

Transformation funding since 2017 will have improved these figures, and the NHS Long Term Plan commitment for universal coverage of multidisciplinary foot care teams and diabetes inpatient specialist nurses will improve this further. This is reflected in our GIRFT recommendation.

About this report

In scoping this report, we identified the areas of diabetes care that need most attention and which offer the most significant opportunities for improvement. We therefore decided to focus our recommendations on three key areas:

- type 1 diabetes
- inpatient care
- diabetic footcare

Other areas of interest will be addressed in other GIRFT reports.

Type 1 diabetes

Type 1 diabetes is a lifelong condition, often diagnosed in childhood. People who live with it need support to manage their diabetes and reduce the risk of serious complications.

But this is not happening everywhere. Data from the National Diabetes Audit shows that fewer than 30% of people with type 1 diabetes are meeting the recommended treatment target of HbA1c that will reduce their risk of complications.

We found many trusts and CCGs did not know how many people with type 1 received care from specialists in type 1 diabetes either within trusts or in the community, or they had many fewer patients than the estimated type 1 population for their area. In the vast majority of areas the CCGs were unable to provide information on the care being delivered to these 'missing' patients. This suggests a level of unmet need in some areas.

Transition services for young adults

Young people need support when transitioning from paediatric to young adult and adult services, at a time when they are going through big life changes such as leaving home and starting work or university.

We found that transition services are often unavailable or under-resourced. This may result in young people becoming disengaged and losing touch with their type 1 service, leading to avoidable harms. People with type 1 aged 19-25 have a higher rate of admission to hospital than other type 1 patients[2].

In particular, young people need more support for:

- using insulin pumps and other diabetes technology;
- psychological issues such as anxiety, depression and eating disorders;
- replacing the role of parents in managing their diabetes.

A dedicated transition service should be available for all young people with type 1. Implementing a new best practice tariff for the care of people with type 1 diabetes from ages 19 to 25 could improve the quality and availability of transition services.

[1] *Diabetes UK, 2018*
[2] *Hospital Episode Statistics 2017-18*

Technology, training and education

Technology, such as insulin pumps and blood glucose monitors, can help people regulate and monitor their diabetes, reducing the risk of hypoglycemic events, DKA and other long-term complications. We found wide variations in the provision of the technology, and the training for both staff and patients which is necessary to support it. Often, pump services are concentrated in larger teaching centres, with few resources at smaller local hospitals.

Diabetes technology should be made available to everyone who needs it as close as possible to where they live, supported by training which staff are given time to complete.

Downloadable technology

Technologies which allow people to download blood glucose data from their personal monitoring devices to their home computer – and share it with clinical staff via the web – can also be a great asset, enabling more informed treatment and self-management.

Downloadable technology should be available in all settings, including paediatric, transitional and adult services.

Structured education

Structured education has been shown to help people with type 1 learn to live well with diabetes – and can have a positive, lasting impact on how patients manage their condition throughout their lives. However, through the GIRFT process, we have found wide variations in the type and quality of patient education courses provided.

We recommend that quality controlled QISMET-accredited courses become the standard offered to all type 1 patients.

Inpatient care

Over 90 per cent of people with diabetes in hospital are admitted for non-diabetes related conditions such as pneumonia, fractures and elective surgical procedures[1]. They are treated by staff across various surgical and medical disciplines, who may not be experienced in diabetes care.

We found variation in the quality and availability of targeted diabetes inpatient services. For example, a quarter of hospitals do not have a single diabetes inpatient specialist nurse[3]. This may be associated with increased frequency of hospital-acquired harm. People with diabetes in hospital have higher infection rates, longer lengths of stay and higher mortality than people without diabetes[1].

Multi-disciplinary diabetes inpatient teams (MDiTs)

Trusts should have a dedicated multi-disciplinary diabetes inpatient team, including nurses, pharmacists, dietitians, psychologists and podiatrists, which can:

- target help for patients who are having problems on admission;
- implement an efficient referral system for cases needing specialist input;
- raise awareness of inpatient diabetes harms and how to prevent them;
- provide basic psychological support for patients experiencing stress.

Trusts should work towards providing a seven-day service with at least one MDiT team member, such as a specialist diabetes inpatient nurse, available for part of the day on Saturday and Sunday, so that urgent cases can be seen by a diabetes specialist within hours rather than days.

Identifying people with diabetes on admission

It's important to identify people with diabetes when they arrive in hospital, to establish their risk of hospital-acquired harms, and triage anyone having problems with their diabetes immediately to the inpatient diabetes team.

But fewer than half of the trusts who responded to our questionnaire said they had a system in place to do this. In some of the trusts we visited, staff only become aware that a patient has diabetes when a problem occurs.

We recommend that all trusts should have an electronic identification system, with screening and rapid referral for those most at risk of developing complications. The system should be integrated with web-linked meters in the wards, which allow the inpatient diabetes team to remotely view blood glucose and ketone data.

Reducing insulin errors

Almost 40% of patients treated with insulin experience an error during their stay in hospital[3]. This can lead to avoidable harms such as hypoglycaemic events and DKA. Yet we found that many trusts around the country have no structured programme to train staff on the safe use of insulin.

We recommend that training should be provided for every healthcare professional who dispenses, prescribes and/or administers insulin, including an assessment of competency.

Electronic insulin passports, electronic patient records which include information on insulin needs, and electronic prescribing, may also be effective in reducing insulin errors.

Perioperative diabetes care

People with diabetes who have surgery experience increased length of stay, higher readmission rates and higher morbidity compared with people without diabetes[4]. Poor diabetes control through the perioperative journey, which involves many hand-offs from pre-assessment through to discharge, can increase the risk of hypoglycaemia or hyperglycaemia, as well as post-operative surgical complications including delayed wound healing and infection.

Trusts should have clear, audited perioperative pathways for people with diabetes, broadly in line with the recommendations in the recent NCEPOD report Highs and Lows.

Self-management while in hospital

Most people who take insulin self-manage their medication daily and know how to control their blood glucose levels – and how to match it to the carbohydrate content in their food.

Yet, when they come to hospital, many find that their insulin and devices are taken off them and locked away. This can be stressful, and potentially dangerous if the healthcare professionals who take over control of the insulin don't understand how to use it safely.

All trusts should have and promote a self-management policy, which supports patients who want to self-manage their diabetes to safely do so while in hospital, as clinically appropriate.

Financial opportunity

Our recommendations have the potential to make considerable savings on the £2.5 billion[5] annual cost of caring for diabetes inpatients by cutting out errors, eliminating needless readmissions and reducing length of stay.

Diabetic footcare

The cost of care for diabetes-related ulceration and amputation is estimated at up to £1 billion – accounting for almost 1% of the total NHS budget in England[6]. Much of this could be avoided with better early prevention and coordination of services. Of the 140 leg, foot and toe amputations performed each week in the UK, 80% result from earlier ulceration, which is largely preventable[7].

Effective diabetic footcare services

Having a community-based footcare protection service (FPS) to screen people and help prevent diabetes-related problems in the community, along with rapid access to specialist hospital-based multi-disciplinary footcare services (MDFS), can reduce rates of ulceration and amputation.

We found wide variation in the quality and coordination of these services across the country. In many areas, hospitals still do not have a fully-established MDFS. And in some areas, there is no FPS. Often community-based staff are not trained to

[3] *National Diabetes Inpatient Audit (NaDIA) 2017*

[4] *Akiboye F, Rayman G Management of Hyperglycemia and Diabetes in Orthopedic Surgery. Curr Diab Rep. 2017 Feb;17(2):13. doi: 10.1007/s11892-017-0839-6*

[5] *https://www.diabetes.org.uk/resources-s3/2017-10/Inpatient%20Care%20for%20People%20with%20Diabetes%20%20The%20Economic%20Nov%202011_1.pdf*

[6] *Kerr, The cost of diabetic foot ulcers and amputations to the National Health Service in England, 2019 Diabetic Medicine*

[7] *Diabetes UK, Putting Feet First: six step guide to improving diabetes footcare https://diabetes-resources-production.s3-eu-west-1.amazonaws.com/diabetes-storage/2017-08/Putting%20feet%20first%206%20steps.pdf*

perform footcare screening examinations. As a result, opportunities to identify and address problems early may be lost.

We recommend that all trusts should have a dedicated MDFS, which should be well integrated with the FPS. Community-based staff should be trained to carry out foot screening examinations.

Vascular services

Vascular impairment is a key contributor to diabetic foot ulceration and amputation. It is therefore vital for at risk diabetes patients to have access to good vascular services.

Some smaller hospitals we visited, working within a hub and spoke model, mentioned difficulty in obtaining urgent vascular opinion. We recommend that everyone with a diabetic footcare emergency requiring admission should be assessed the same day by the MDFS, and if vascular impairment is identified, they should have same day access to a vascular opinion. If the MDFS is not available, they may need to be transferred to a vascular service.

Data and coding

Diabetes data being collected in hospitals is not always reliable due to differences in the way it is collected. For example, some trusts include rehabilitation in length of stay, which distorts the data.

We recommend that every acute trust should submit data to the National Diabetes Audit, the National Diabetes Inpatient Audit and the National Diabetes Footcare Audit including continuous reporting of harms and quarterly review of operational results, and be supported to do this by IT, analysts and coders. Trusts should benchmark their data against other trusts with a similar specification of service.

Inconsistent coding

We found inconsistency in coding related to diabetes. In many cases, the patient's diabetes is not coded for some stages and episodes of care, which can lead to underestimates of the diabetes need.

Diabetes teams should work closely with coders to ensure diabetes is coded consistently and accurately – and ensure all inpatients who have diabetes are identified on admission to hospital.

Procurement and medicines optimisation

There is considerable variation in the procurement of diabetes technology, such as insulin pumps, and medicines, including oral antidiabetic agents and blood glucose test strips. We believe there is potential for new procurement models to reduce these variations, generating savings which could help to fund the required increase in uptake of continuous glucose monitoring (CGM) and closed loop insulin delivery technology.

For example, if variations in procurement of blood glucose testing strips could be reduced by moving towards nationally coordinated procurement, coupled with action on unnecessary prescribing, we believe that as much £25m could potentially be saved.

Litigation

Because diabetes and related complications involve a wide range of surgical and medical specialties, NHS Resolution does not have a separate claims category specifically for diabetes.

To analyse claims, we sourced data on all medical negligence claims between April 2013 and April 2018 and performed a word search using diabetes-related search terms. Based on these results, we concluded that several of the most common causes of claims are patient safety issues that can be reduced through measures such as safer administration and management of insulin (see theme 7, page 37) and effective footcare to prevent ulceration (see theme 10, page 45).

List of recommendations

Type 1 diabetes

Transition from paediatric to young adult services

1. All trusts providing type 1 diabetes care should have a dedicated transition service with a clear pathway between paediatric and 16-18 services, a named lead clinician for 16-18 patients, and a service for 19-25 year olds. These services should provide support for those on insulin pumps and new technologies, as well as ongoing psychological support.

Training and technology

2. Access to diabetes technology should be available to all people with type 1 diabetes who need it in their local area in line with the NHS Long Term Plan and NICE guidelines. Relevant staff should be trained to support patients using these technologies and given the time they need to complete this training, which should form part of their annual appraisal process.

Structured education

3. All people with type 1 diabetes should be offered appropriate training to manage their condition through a QISMET-accredited, quality controlled structured education programme.

Systems to allow data download from blood glucose monitoring devices

4. All trusts providing type 1 diabetes services should have a system, such as Diasend, to enable blood glucose data to be downloaded and presented in a meaningful way in all diabetes clinical areas – including paediatric, transitional, 16-18 and adult services as well as diabetes pregnancy services. Each department should have provision to offer virtual clinics to patients with type 1 diabetes. This should be supported by trust IT departments.

Inpatient care

Dedicated multi-disciplinary inpatient diabetes teams (MDiTs)

5. All trusts must have a dedicated multi-disciplinary team of specialist diabetes inpatient practitioners as indicated in the NHS Long Term Plan. Trusts should work towards providing base level specialist diabetes cover at weekends where this does not exist.

6. The MDiT should meet regularly to discuss day-to-day errors and safety issues, and report to a quarterly trust-level diabetes safety board which reviews the overall quality of the inpatient service, with support from IT, based on incident reporting, local and national audits of patient harms, diabetes medication errors, length of stay and readmissions.

Identifying diabetes on admission and ensuring rapid referral

7. All trusts should have a robust system to identify all people with diabetes on admission to hospital, including emergencies and elective and non-elective surgery, and a triage system to identify those at risk and rapidly refer them to the diabetes team. This should be an electronic system, integrated with web-linked blood glucose meters which provide an alert system for staff when any out-of-range reading is recorded.

Reducing insulin errors

8. Training should be provided for every healthcare professional who dispenses, prescribes and/or administers insulin, appropriate to their level of responsibility, including an assessment of competency.

Improving care through perioperative pathways

9. All hospital trusts should have clear, audited perioperative pathways from pre-assessment through to discharge. These should be broadly in line with NCEPOD recommendations.

Supporting self-management in hospital

10. All trusts should have and promote a self-management policy, which supports patients who want to self-manage their diabetes to safely do so while in hospital, as clinically appropriate and in line with wider NHSE and NHSI policies on inpatient self-management.

Diabetic footcare

Effective diabetic footcare services

11. All trusts should have a dedicated multi-disciplinary footcare service (MDFS) as stated in the NHS Long Term Plan and NICE NG19. The service should be well integrated with the community footcare protection service (FPS), and with hospital renal wards and dialysis units given the increased risk of amputation for diabetic patients in these areas. CCGs and STPs should ensure that community foot protection teams are trained to carry out foot screening and that the community service is structured to deliver the standards recommended in NG19.

Vascular networks

12. Everyone with a diabetic footcare emergency requiring admission should be assessed the same day by the MDFS. If the MDFS identifies vascular impairment, they should have same day access to a vascular opinion, according to NICE NG19, whether the hospital is a vascular service hub or a spoke. If the MDFS is not present, the patient must still be assessed same day, which may require transfer to the vascular service.

Data and coding

13. Local commissioners should build in clear contractual requirements for trusts to collect and submit data to the National Diabetes Audit, including data on type 1 patients aged 19-25, the National Diabetes Inpatient Audit and the National Diabetes Footcare Audit. Trusts should work to improve the quality and consistency of clinical coding.

Procurement and medicines optimisation

14. GIRFT and partner organisations should work together to assess the financial and clinical case for novel approaches to the procurement of insulin pumps, blood glucose testing strips, oral anti-diabetic agents and diabetes footwear, which may reduce costs and support increased uptake of continuous glucose monitoring and closed loop technology. This should be done in a way that maintains reasonable choice for people living with diabetes.

Reducing the impact of litigation

15. Reduce litigation costs by applying the GIRFT Programme's five-point plan.

For complete details of the owners and indicative completion dates for each recommendation, please refer to the tables within the report.

Diabetes today

About diabetes

Diabetes results in too much glucose in the blood, either because the body cannot produce the insulin needed to regulate blood sugar (type 1), or because the body becomes resistant to insulin (type 2). It's estimated that more than 4.7 million people now have diabetes in the UK and the number of diagnoses has doubled over the last 20 years[1]. If not well-managed, diabetes can lead to complications including amputation, sight loss, kidney failure, stroke, heart disease and death. Every week there are 140-170 amputations, 680 strokes and 530 heart attacks as a result of diabetes[1]. Many of these are avoidable.

Type 1 and type 2 diabetes

Although they share many of the same symptoms, type 1 and type 2 diabetes have different causes and treatment needs. Type 1 is an auto-immune condition, which reduces the body's capacity to produce insulin. People can develop type 1 diabetes at any age, from childhood onwards. It is irreversible and all people with type 1 diabetes need to take insulin for life. Around 8% of people with diabetes have type 1[1].

People with type 2 diabetes may produce insulin, but their bodies may not be able to use it effectively. However, many people can manage the condition effectively without medication through good diet and exercise. Around 90% of people with diabetes have type 2[1]. Around 2% of people have other types of diabetes including type 3c diabetes, associated with pancreatic disease, monogenic diabetes, cystic fibrosis-related diabetes, and diabetes caused by rare syndromes[1].

Diabetes patients in hospital

There are people with diabetes in every acute hospital in the UK – accounting for a sixth of all beds. But only 8% of them come to hospital because of their diabetes[3]. The majority are admitted for other reasons such as pneumonia, fractures and elective surgery. As many as four in ten people who have diabetes experience an insulin error while in hospital[3], often because hospital staff have little experience of insulin management or do not engage with the patients to help them self-manage.

These errors can have serious consequences. In 2017, an estimated 9,600 people required rescue treatment having fallen into a coma after a hypoglycaemic attack in hospital[8], while 2,200 suffered from diabetic ketoacidosis (DKA) due to under-treatment with insulin[3]. People with diabetes stay an average 1-3 days longer in hospital than the rest of the population and have a 6% higher mortality rate[9]. There are too many preventable hospital-acquired foot ulcers, which if not treated effectively, can result in amputation.

Inpatient care

Dedicated multi-disciplinary diabetes teams are essential in hospitals to co-ordinate the inpatient care of people with diabetes – for example, by supporting patients in self-management, trouble-shooting patients who are having difficulty with diabetes control and coordinating with community services to ensure safe discharge. They can play an important role in supporting and upskilling other healthcare professionals who care for people with diabetes.

However, many trusts are still falling short of what's required – for example, 25% have no dedicated diabetes nurse and only 8% have a weekend service for diabetic patients[3].

Diabetic foot

People with diabetes are more at risk of footcare problems because high blood glucose levels over time lead to nerve and blood vessel damage. Even small cuts and burns can lead to chronic and non-healing ulcers, which can end in an amputation.

Ulceration and amputation cost the NHS up to £1 billion a year and have a devastating impact on patients. Someone with diabetes is 20 times more likely to experience an amputation than someone without diabetes[1]. Around half of all people who experience a major amputation will die within two years[1].

Many of these foot ulcers and amputations could be prevented, with large potential cost savings, if there were more dedicated multi-disciplinary footcare services (MDFS). While most MDFS will be hospital-based, it is essential they are integrated with community services, so that those at risk of ulceration and amputation are identified early and managed appropriately.

[8] *Making hospitals safe for people with diabetes UK 2018 https://www.diabetes.org.uk/resources-s3/2018-10/Making%20Hospitals%20safe%20for%20people%20with%20diabetes_FINAL.pdf*

[9] *Holman N, Hillson R, Young RJ. Excess mortality during hospital stays among patients with recorded diabetes compared with those without diabetes. Diabetic Medicine 2013;30:1393-1402 Doi: 10.1111/dme.12282*

How services are funded

Current funding arrangements for diabetes services are uneven. For example, there has been wide variation across CCGs in access to technologies such as glucose monitoring devices, which can help patients manage their condition and prevent complications. From April 2019, there has been a national commitment to commission flash glucose monitoring for patients with type 1 diabetes who fit the criteria for two years, in line with the commitment in the NHS Long Term Plan, and we expect provision in this area to improve over time.

There is also variation in staffing levels in the community, specialist diabetes clinics and inpatient diabetes services, as well as anomalies, for example between paediatric care, which is relatively well-funded, and services for young adults between 19-25, which are significantly less well-funded. This can lead to gaps in service, for example, when type 1 patients are transitioning from paediatric to young adult and on to adult services – which contributes to young people losing touch with the system.

Audits and data

Good data is essential to better understand levels of care, cost and patient outcomes and identify ways to improve. National diabetes audits are taken every year measuring the effectiveness of diabetes healthcare against NICE clinical guidelines and quality standards. However, some of data is incomplete because, in some areas, this is not a priority, or there is too much reliance on clinical staff who are already overcommitted and do have not the time to submit complete data. Another issue is that data collected in hospitals varies widely and is not always reliable because trusts have different ways of coding and recording data, which was historically collected for billing rather than clinical improvement purposes.

About this report

The analysis we carried out in developing this report is based on the Getting It Right First Time (GIRFT) programme model. First we gathered all of the relevant existing data related to NHS care for people with diabetes, including the Hospital Episode Statistics (HES) and other sources such as the National Diabetes Inpatient Audit (NaDIA). Then we carried out our own extensive questionnaire with over 100 hospital trusts across England. Drawing this data together, we benchmarked providers on key measures and identified variation in practice and outcomes, highlighting where trusts are falling below acceptable standards and also examples of good practice.

We developed a data pack specific to each trust and then visited them to present the data in depth with clinicians, senior management and all those involved in delivering and commissioning services that impact on people with diabetes. During these deep dive visits we discussed where the trust is doing well, where they are underperforming, how they stand in relation to their peers, and how they might be able to improve. These discussions have informed our findings and recommendations.

This report has been reviewed and considered by relevant stakeholders before publication, and secured strong support for both the overall direction of travel and specific recommendations.

While our visits have focused on individual acute trusts, the way in which services are planned and delivered in the NHS is in the process of changing. In 2016, NHS organisations and local councils joined forces in every part of England to develop proposals for improved health and care. They formed new partnerships – known as sustainability and transformation partnerships (STPs) – to run services in a more co-ordinated way, to agree system-wide priorities, and to plan collectively how to improve their population's health. Some areas have formed even closer partnerships known as Integrated Care Systems (ICS). The Long Term Plan (LTP) has set out an aim that every area of England will be covered by an ICS by 2021.

As such, for a number of the report recommendations we have identified STPs and ICSs as co-owners of these actions. As systems become more mature, improvement will be driven through the larger footprint of these new systems and not just at an individual trust level.

It is important to note that all of the deep dives visits we conducted for this review happened before the COVID-19 pandemic hit.

The scope of this report

Through the GIRFT process, we have developed a more complete understanding of the issues facing hospitals and healthcare practitioners, why variations are happening – and the impact these have on patient care and outcomes. As a result of looking at this whole picture, we identified the areas of care that need most attention and which offer the most significant opportunities for improvement. We have therefore decided to focus our recommendations in this report on three key areas:

- type 1 diabetes
- inpatient care
- diabetic footcare

Other areas of interest will be addressed in other GIRFT reports.

NICE guidance review

Our report and recommendations make reference to current NICE guidelines which are due for review.

You can find details of what will be updated here: *https://www.nice.org.uk/guidance/ng28/resources/2019-surveillance-of-diabetes-nice-guidelines-ng17-ng18-ng19-and-ng28-6837997933/chapter/Surveillance-decision?tab=evidence*

Type 1 diabetes

Type 1 diabetes can take a heavy toll on people, both physically and psychologically. Because it is irreversible, it requires constant monitoring and management of blood glucose for life.

That can be hard to deal with, especially when diagnosed in childhood or adolescence as is often the case. There are also increased risks – for example, people with type 1 are much more likely to develop diabetic ketoacidosis (DKA), or suffer heart failure or stroke, than people with type 2[1].

With the right support, many complications could be avoided. But data from the National Diabetes Audit shows that fewer than 30% of people with type 1 diabetes are meeting the recommended treatment target of HbA1c that will reduce their risk of complications – compared to nearly 70% for type 2.

This is reflected in poorer outcomes. A recent international comparison study found that people with type 1 diabetes in England, Scotland, Northern Ireland and Wales had the worst glycaemic outcomes as measured by HbA1c compared to 12 other European countries and the USA[10]. We need to turn this around and continue the recent work from NHS England and NHS Improvement of supporting people with type 1 diabetes throughout their lives.

What we found

There are wide variations between hospital trusts and clinical commissioning groups (CCGs) in areas such as the provision of technology which can help people with type 1 diabetes regulate and monitor their blood glucose – and the training and education programmes, and psychological support necessary to sustain them. Lack of psychological support may lead to recurrent admissions for DKA and/or hypoglycaemia because people experiencing depression or distress may be less able to manage their diabetes.

We identified problems for children transitioning from paediatric to young adult and adult services, where uneven funding arrangements and patchy service provision are causing some people to fall out of the service. This may be one reason why the number of people with type 1 diabetes in an area is often not known or may be underestimated by some CCGs and specialist diabetes services.

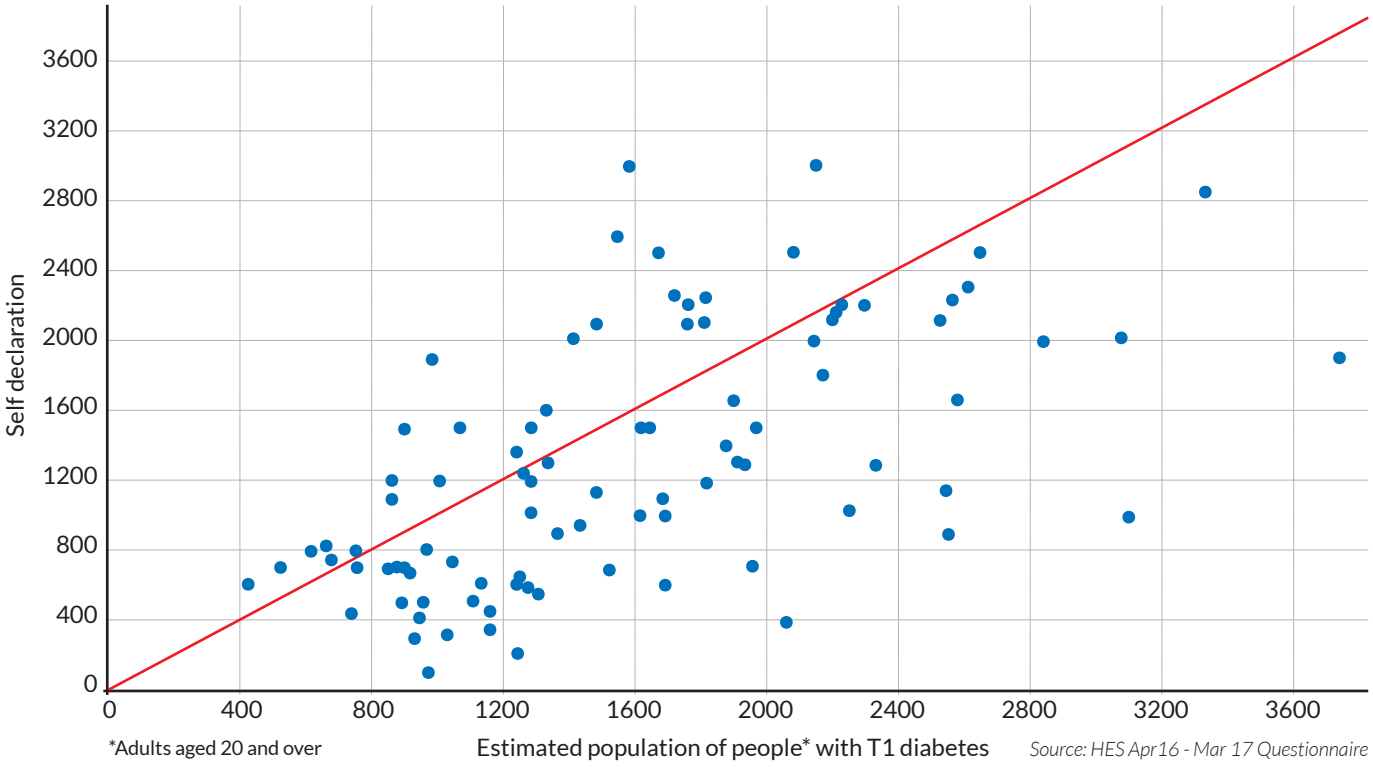
We found many trusts did not know how many people with type 1 they had within their specialist diabetes service. Where trusts did give a number, it was often far smaller than the number of people with type 1 estimated to be living in their catchment area – as figure 1 shows, in some cases there are over 1,000 'missing' patients. Even if some of them are accessing services through neighbouring trusts, this still points to a large amount of unmet need in many trusts – and means that in some cases, services are being under-provided.

Knowing how many type 1 patients a specialist service has in its catchment area is crucial in order to plan effective services, and build a case for investment and improvement.

Our recommendations are aimed at providing a more joined up service, helping people with type 1 diabetes manage their diabetes better at all ages, in collaboration with clinical staff, through targeted services, technology, training, education and access to psychological support for those who need it. Although they may require some investment in the short term, in the longer term we believe they will lead to a reduction in serious complications, resulting in fewer hospital admissions and operations, shorter stays and a lower level of readmissions.

[10] *J McKnight, Glycaemic control of Type 1 diabetes in clinical practice early in the 21st century: an international comparison. 2015 Diabetic Medicine*

Figure 1: Self-declaration of count of patients with T1 vs people with T1 diabetes in population.*



Theme 1: Transition between paediatric and adult services

The majority of children and young people who have diabetes have type 1 diabetes.

Services for these patients are generally well-funded under the best practice tariff (see panel on p18) and they receive a high standard of care while they are children. However, this funding falls away when they become adults. Often young people stay in paediatric care until 18 and may then face a cliff-edge when they move to adult services on the standard tariff without preparation or guidance.

The need for effective transition services

Young people with type 1 diabetes need effective transition services to help them move out of paediatric and into adult care as detailed in the NHSE/NHSI transition service specification[11].

Anecdotal evidence from Diabetes UK suggests that the most effective and well attended transition services are co-designed with young people around their needs and preferences, with staff who are skilled and experienced in working with young people.

However, time and again on our visits we found that transition services are either unavailable or are under-resourced. In some areas, there is no pathway at all, as there is no adult service close to where patients live. Where there is no transition to welcome young people into a new and unfamiliar service, they may become less engaged with their diabetes.

Ideally, the transition service should be co-located with the paediatric service, so young people can move seamlessly from one to the other. However, where transition services exist, they are often in a different part of the hospital, or a completely different place, which means having to travel long distances to access care in a new and unfamiliar environment.

These issues, combined with the complexities of adolescence and life changes, such as moving away from home for university or work, can result in many young adults losing touch with their type 1 service. This may partly explain the higher rate of admissions for 19-25 year-olds, as they receive less support to manage their diabetes, and they no longer know who to contact in an emergency.

[11] *Diabetes Transition Service Specification NHSE 2016 https://www.england.nhs.uk/wp-content/uploads/2016/01/diabetes-transition-service-specification.pdf*

Figure 2 (see p18) shows a worrying spike in people being admitted with a diagnosis of diabetic ketoacidosis (DKA) in this age group, at an estimated cost of more than £2,000 per episode[7].

Specialist support for young adults on pumps

A much higher percentage of children and young people use insulin pumps compared to adults – up to 40%.

As these patients move to adult services, their pump use is reviewed. If they still require insulin pumps, they will need specialist support to remain on them as they transition. However, many trusts do not support this effectively. This is often because of a lack of trained staff and/or capacity in the adult service, which may not have received the level of investment given to paediatric diabetes services. For those new to pumps under-resourced trusts often rely on other larger trusts or representatives from the pump manufacturers to initiate their patients on insulin pumps.

Psychological support needs

There is a strong correlation between psychosocial issues including anxiety and depression, and an increase in negative outcomes for young people with type 1 related to poor self-management and disengagement with their diabetes. These include increased HbA1c and longer gaps between appointments[12].

The Paediatric Diabetes Best Practice Tariff[13] stipulates that access to psychological support should be integral to the care of young people with diabetes. This can include emotional support, online or telephone counselling or referrals for specialist support if needed. However, on our deep dive visits, we found that many trusts do not offer even basic support at present. This is borne out by a 2015 survey by Diabetes UK, in which 76 per cent of people with diabetes had not been offered emotional or psychological support when they needed it.

It's important that support is available to all young people with type 1 diabetes and not merely those diagnosed with a psychological disorder as many common problems such as diabetes distress, or 'sub-threshold' depressive symptoms also have a negative impact on self-management, quality of life and health outcomes. Introducing a new best practice tariff beyond 18 could help fund improved access to psychological support - see introducing a best practice tariff for 19-25 year olds panel on p18.

The role of parents

Parents also play an important role in a child's diabetes care. As the child matures and the parental role reduces, it can leave a knowledge gap. This means we cannot always assume that the young person knows how to manage their diabetes, even if they have lived with it for several years. It is essential that we review their level of understanding and give them the information they need.

This can be done through transition plans such as the 'Ready, Steady, Go' initiative developed by University Hospital Southampton (UHS)[14] and the Youth Empowerment Skills (YES) transition programme in south London, which assess knowledge and prepare the young person for transition. For those diagnosed with type 1 diabetes in adolescence, support and understanding during this potentially difficult period are an essential for their diabetes care.

Transition service structure

We believe that trusts offering type 1 services should have a lead clinician for young adults aged 16-18. This should be a clinician from the adult type 1 service who can work closely with paediatric colleagues to make sure that these patients do not lose touch with their diabetes care. They should submit data to the National Diabetes Audit to increase our understanding of the issues faced by this age group and measure progress towards successful transition. The lead clinician should have dedicated time built into their contract to support this work.

We also believe that people up to age 25 would benefit from a service to cover the period when they experience significant changes in their lives, as described above. Paediatric, transition and adult services should work closely to ensure that type 1 patients receive joined-up care at all stages.

[12] *KK Dhatariya, C Skedgel, R Fordham The cost of treating diabetic ketoacidosis in the UK: a national survey of hospital resource use Diabetic Medicine 2017*

[13] *Paediatric Diabetes Best Practice Tariff, available at https://www.diabetes.org.uk/resources-s3/2017-09/Paediatric%20Diabetes%20Best%20Practice%20Tariff%20Criteria.pdf*

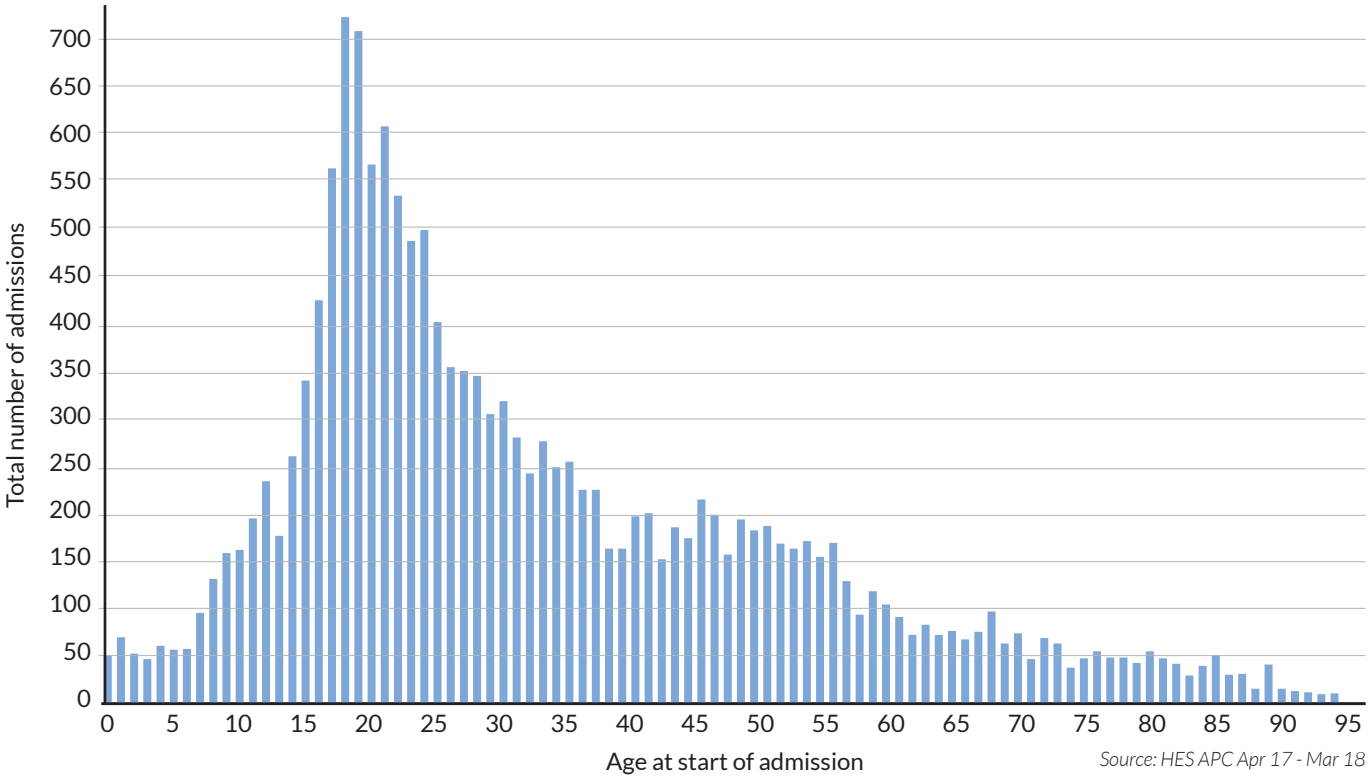
[14] *University Hospital Southampton, Ready Steady Go Transition to Adult Care https://www.uhs.nhs.uk/OurServices/Childhealth/TransitiontoadultcareReadySteadyGo/Transitiontoadultcare.aspx*

Introducing a best practice tariff for 19-25 year olds

A best practice tariff is an annual amount per patient paid to trusts in certain areas of care, provided they meet specified clinical and service standards. It's designed to incentivise best practice and reduce variation in quality. The BPT for paediatric care of type 1 diabetes patients has worked well to improve services and outcomes for children.

Introducing a new tariff for people between the ages of 19 and 25 could be a route to improve the quality and availability of transition services for young adults and ensure they remain engaged with their diabetes through a period of major change in their lives. We think NHSE and NHSI should explore this possibility and the potential long term savings which could result as young people become better able to manage their diabetes as adults.

Figure 2: Count of admissions with primary diagnosis of Diabetic Ketaocidosis in T1DM by start age



Source: HES APC Apr 17 - Mar 18

Recommendation	Actions	Owners	Timescale
1. All trusts providing type 1 diabetes care should have a dedicated transition service with a clear pathway between paediatric and 16-18 services, a named lead clinician for 16-18 patients, and a service for 19-25 year olds. These services should provide support for those on insulin pumps and new technologies, as well as ongoing psychological support.	**a** GIRFT will work with providers to carry out a type 1 diabetes audit including transition services.	GIRFT, NHSE/NHSI (pricing team, diabetes programme team), NHS Digital.	12 months from report publication.
	b GIRFT will work with NHSE/NHSI to consider the viability of a new best practice tariff for young adults (19-25).	GIRFT, NHSE/NHSI pricing team.	Ongoing.

IMPROVING OUTCOMES FOR YOUNG ADULTS THROUGH A TRANSITION SERVICE
Poole Hospital NHS Foundation Trust

Poole has achieved significant falls in HbA1c and admissions for DKA and hypoglycaemia among young adults since setting up its type 1 transition service.

Having seen a drop in compliance with diabetes care among young adults leaving the paediatric service, the trust's child and adult diabetes services worked together with patients to design the Poole Young People's Diabetes Service, based on three principles:

- Being flexible to young adults' needs and lifestyle
- Allowing young people to get to know the team
- Listening and offering tailored advice

Innovative service design

Led by a consultant diabetologist, the service's multi-disciplinary team also includes a consultant paediatrician, full-time diabetes nurse specialist, diabetes specialist dietician and clinical psychologist. New services introduced include:

- Weekly young adult clinics with a monthly evening clinic offering flexibility for those at college or work
- A weekly psychologist clinic and regular psycho-social meetings to discuss patients having difficulties
- A database to monitor outcomes and flag areas of concern
- Outreach for those not attending or disengaged from the service, including home or work visits
- Text and email appointment reminders, helplines, newsletters and Instagram account
- A questionnaire asking young adults how they would like to receive diabetes education
- A group education programme
- Quarterly handover meeting with the adult diabetes service

Results

The new service was delivered within the existing best practice tariff. To measure success, the trust carried out a data audit in late 2018, which found:

- Caseload increased by 31%, showing young adults are returning to the service
- The mean HbA1c among young adults fell by 8.3%
- Missed appointments reduced by 20%
- DKA and hyperglycaemia admissions reduced by 14%
- Diabetes-related inpatient admissions fell by 14%

Theme 2: Technology and staff training

People with type 1 diabetes need lifelong support to help them manage their condition. Technologies such as continuous subcutaneous insulin infusion (CSII) pumps, which infuse programmable amounts of insulin to keep blood glucose stable 24 hours a day, and glucose monitoring devices which give live readings of blood glucose levels, can help people live better lives, reducing the risk of hypoglycemic events, DKA and other long-term complications.

However, we found wide variations in the provision of these technologies – for example, figure 3 (see p21) shows that CSII pumps are provided to up to 40% of people with type 1 diabetes in some trusts, and less than 5% in others. Too many trusts are falling below the historic range of between 10-15% of type 1 patients on insulin pumps, with some offering no pump service at all – even in areas where we estimate there is a large population of people with type 1.

Providing staff time for technology training

Where fewer insulin pumps are provided, it is often not because of a lack of funding, but because there is not enough time available to complete the training that's needed or simply not enough staff to provide the service. Staff need to be trained, so that they can educate patients in how to use the technology – for example, how to interpret the glucose reading and adjust their pump settings accordingly, what to do when the glucose results are out of range, or if the pump malfunctions.

This takes time – first to train the staff and then the patients. Initiating a patient on a pump takes several hours, as well as follow-up supervision over several months. Initiating a patient on continuous glucose monitoring (CGM) or flash glucose monitoring (FlashGM), and training them to use the device, is also time intensive. These increasing demands on specialist time are relatively recent. Most diabetes teams are staffed and structured to deliver a historic level of diabetes care and are finding it very difficult to address these new needs, even where funding is available.

Many hospitals therefore rely on other larger trusts or representatives from the pump manufacturers to initiate their patients on pumps. A similar situation exists with sensor technologies (FlashGM and CGM) where manufacturers' representatives have stepped in to deliver patient education because of lack of staff expertise. These are not ideal solutions as manufacturers do not provide holistic patient care. External support should not replace diabetes staff who have years of training in patient education and are experts in engaging with people with diabetes but need upskilling in these new technologies.

Diabetes technologies

Insulin pumps

An insulin pump is an electronic device attached to the body that delivers small amounts of insulin continuously throughout the day and night, reducing the risk of hypoglycaemia and improving blood glucose levels.

Flash glucose monitors (FlashGM)

A flash glucose monitor is a small sensor worn just under the skin, which records blood glucose levels continuously throughout the day and night, without the need for regular finger-prick tests. Patients scan the sensor to get readings. The only flash monitor currently manufactured is called Freestyle Libre.

Continuous glucose monitors (CGM)

Continuous glucose monitors work in a similar way to flash glucose monitors, but continuously deliver glucose readings to a display device, so the patient does not have to manually scan the sensor for a reading. This allows patients to set alerts so that the system can warn them when their blood glucose gets too high or too low.

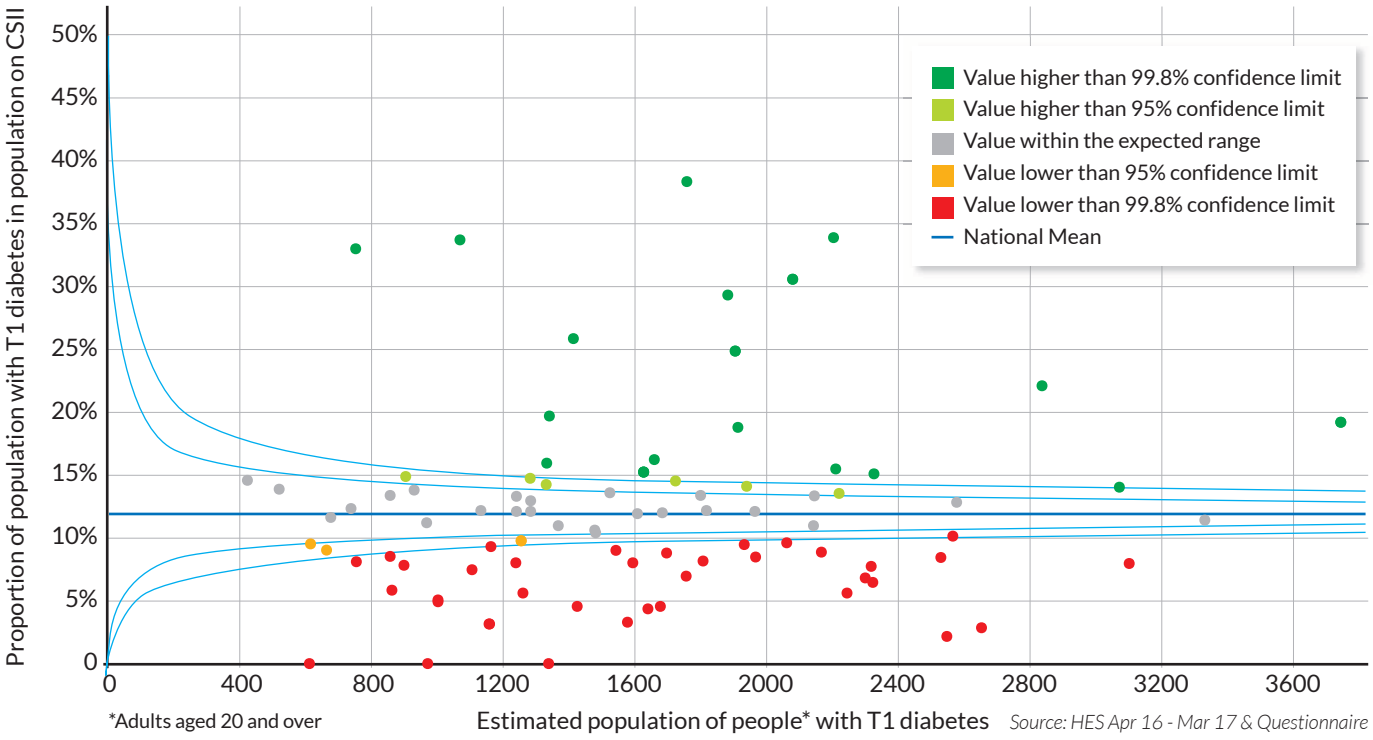
The need for local tech support

Another issue in some smaller trusts where pump services are not well developed, is the migration of patients to larger teaching centres. In the past, these larger centres have readily accepted patients from outside their area to help them establish their services.

Though this may appear appropriate, it may be not be the right approach. It's now clear that many of the larger centres can no longer cope with the numbers coming to them, while patients face having to travel long distances to access training and ongoing support. Of greater concern is that staff at the smaller hospitals who are cut out of the process will not develop skills in managing these technologies, and therefore won't be able to help these patients if they have a technical problem that needs a local solution. This lack of local technical support is unsustainable in the long term.

However, in some areas where the larger teaching centres and smaller referring hospitals are close to each other, a hub and spoke service could be an option. This would allow 'local' support at the spoke, while retaining expertise at the hub, without the need to travel long distances.

Figure 3: Proportion of people* with T1 diabetes in population on CSII, by trust



Recommendation	Actions	Owners	Timescale
2. Access to diabetes technology should be available to all people with type 1 diabetes who need it in their local area in line with the NHS Long Term Plan and NICE guidelines. Relevant staff should be trained to support patients using these technologies and given the time they need to complete this training, which should form part of their annual appraisal process.	**a** GIRFT will work with the Diabetes Technology Network and NHSE/NHSI on improving access to technology.	GIRFT, NHSE/NHSI (commercial medicines team, diabetes programme team), Diabetes Technology Network.	Ongoing.
	b GIRFT will consider whether any savings made from procurement efficiencies can be used to support a potential future roll out of CGM by NHSE.	GIRFT.	For consideration from report publication
	c GIRFT will work with NHSE/NHSI, the Diabetes Technology Network, trusts and local commissioners to identify training modules that ensure trusts are able to meet requirements for technology uptake. GIRFT will track the uptake of these modules and review improvements.	GIRFT, NHSE/NHSI, DTN, CCGs, STPs, ICSs.	Establish how this will be monitored a year after report publication.

Theme 3: Structured education for people with type 1 diabetes

Managing type 1 diabetes is complex. There are many things people need to learn and apply throughout their lives, such as how to inject insulin, how long the different types of insulin take to act, the importance of rotating the injection site, timing injections to match the carbohydrate content of meals, the effect of exercise, alcohol and stress on diabetes, what to do on sick days, ketone testing, the rules for driving and more.

Structured education has been shown to help people with type 1 learn how to live well with diabetes – and can have a positive, lasting impact on how patients manage their condition throughout their lives. However, through the GIRFT process, we have found wide variations in the type and quality of patient education courses provided.

Accredited education courses

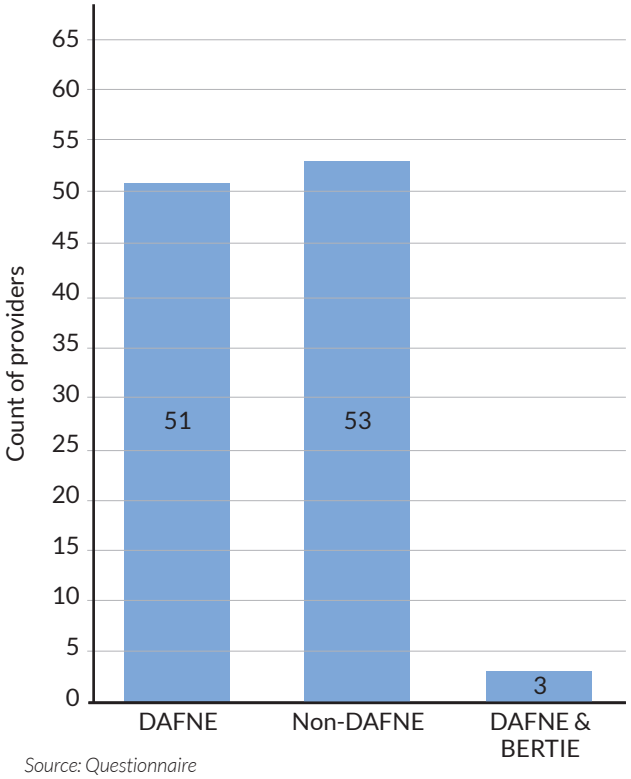
The charts in Figure 4 show that less than half of the trusts who answered our questionnaire offered the widely-recognised and accredited DAFNE course to their patients, while more than a third of trusts offered non-accredited courses or didn't know if their programme was accredited or not.

This is likely to indicate improvised or ad hoc education without proper quality control, which may therefore be inadequate. These non-accredited programmes may not be a good use of time for the educator or the patient.

Structured courses such as DAFNE, which are accredited by the Quality Institute for Self-Management Education and Training (QISMET), offer the best results and should be offered to all type 1 diabetes patients nationally, including long-standing type 1 patients as well as those newly-diagnosed. Ideally, the offer should be repeated annually to reach people who have previously declined.

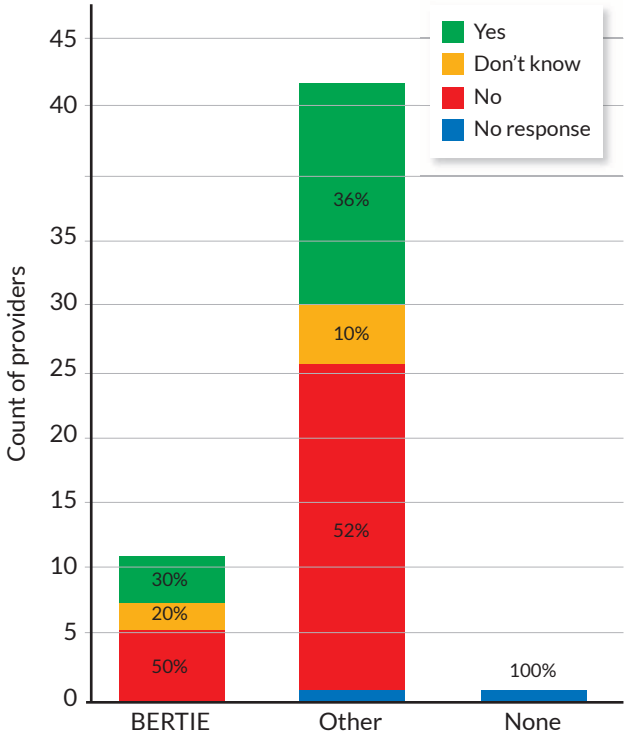
Courses that are not QISMET-accredited may also work well, provided they are supported by evidence of good uptake and outcomes. It's essential that each education centre collects and audits outcome data to enable benchmarking and provide evidence of their effectiveness. Not all DAFNE centres participate in benchmarking, so trusts should check with the provider to make sure.

Figure 4a: Count of providers offering structured courses for patients with T1 diabetes



Source: Questionnaire

Figure 4b: Count of providers offering non-DAFNE courses for people with T1 diabetes, by whether or not course is QISMET accredited



Source: Questionnaire

Note: 'No response' indicates providers who received the questionnaire but did not return an answer to this question

Recommendation	Actions	Owners	Timescale
3. All people with type 1 diabetes should be offered appropriate training to manage their condition through a QISMET-accredited, quality controlled structured education programme.	**a** GIRFT will work with trusts and local commissioners to ensure that an accredited structured education programme is available for all people with type 1 diabetes within their community.	GIRFT, CCGs, STPs, ICSs.	Six months from report publication.
	b GIRFT will monitor the effectiveness of education programmes by benchmarking trusts on admissions for hypoglycaemic events and DKA, and performance indicators used by the accredited programmes.	GIRFT.	Ongoing via GIRFT process.

IMPROVING DIABETES MANAGEMENT THROUGH STRUCTURED EDUCATION

Royal Surrey NHS Foundation Trust

People with type 1 have seen improvements in HbA1c and psychological wellbeing as a result of Royal Surrey's structured education programme, Cedric.

Engaging people in interactive sessions

The course, which has been accredited by QISMET, is based on interactive workshops and dialogue between presenters and participants. It is held over one day, rather than multiple sessions, to minimise disruption for working people, and includes a flash glucose monitoring initiation training module. Content evolves to keep up to date with changes in practice and research.

More than 500 people took the course between April 2018 and September 2019. To measure progress questionnaires are completed before the course, and afterwards at six-month review. These include HbA1c, Diabetes Attitudes, Wishes and Needs (DAWN) and Problem Areas in Diabetes (PAID).

Results

Everyone who has taken the course and completed a six-month review afterwards has shown improvements in HbA1c. Those with the highest HbA1c saw the biggest improvements. The DAWN and PAID questionnaires also showed improvements in the psychological impact of their diabetes. The feedback from participants on the content and convenience of the course has also been good.

STRUCTURED EDUCATION AS PART OF A PATHWAY FOR NEWLY-DIAGNOSED PATIENTS

Sheffield Teaching Hospitals NHS Foundation Trust

The proportion of patients achieving their HbA1c targets has doubled after Sheffield introduced a pathway for newly-diagnosed patients with structured education at its core.

An audit in 2014 found that Sheffield's type 1 patients were experiencing sub-standard and potentially damaging outcomes. Less than a quarter (23%) were achieving their HbA1c targets.

A team, including diabetes specialist nurses, dieticians and doctors reviewed the patient care pathway. They developed a new evidence-based protocol to follow for every patient newly-diagnosed with type 1, including insulin regimen, blood glucose monitoring, HbA1c checks, and roles and responsibilities for diabetes specialist nurse, doctors and dieticians.

Integrating education into patient care

DAFNE structured education is integrated in the pathway as a part of routine care. Doctors are trained in DAFNE and all team members encourage patients to take the course within 12 months of diagnosis. Diabetes specialist nurses assess patient readiness and help patients on to the course. The structure and timing of courses has been improved to be more convenient for service users.

Results

60% of newly-diagnosed patients now attend DAFNE courses within 12 months of diagnosis. Glycaemic control has improved significantly with 50% of patients now achieving their HbA1c targets compared to 23% before. Feedback from patients has been positive.

Theme 4: Systems to allow data download from glucose monitoring devices

We should do everything we can to help people with type 1 diabetes to manage their condition effectively in consultation with medical teams.

Technologies which allow people to download blood glucose data from their personal monitoring devices to their home computer – and share it with clinical staff via the web – can be a great asset, enabling more informed treatment and self-management.

Systems such as Diasend allow people to sync their monitoring devices to apps which present data in a user-friendly way. This enables patients and clinical staff to easily review key indicators and blood glucose trends over time – and identify any change of treatment if needed. These systems can link up with a wide variety of current monitoring devices and are available in most of the hospital trusts we visited.

A study with paediatric diabetes patients at Southport and Ormskirk Hospital Trust found that access to downloadable data, used together with an electronic management system and communication via social media, contributed to lower HbA1c levels, cut emergency admissions by 19% and reduced average length of stay from 2.7 days to 1.8 days[15].

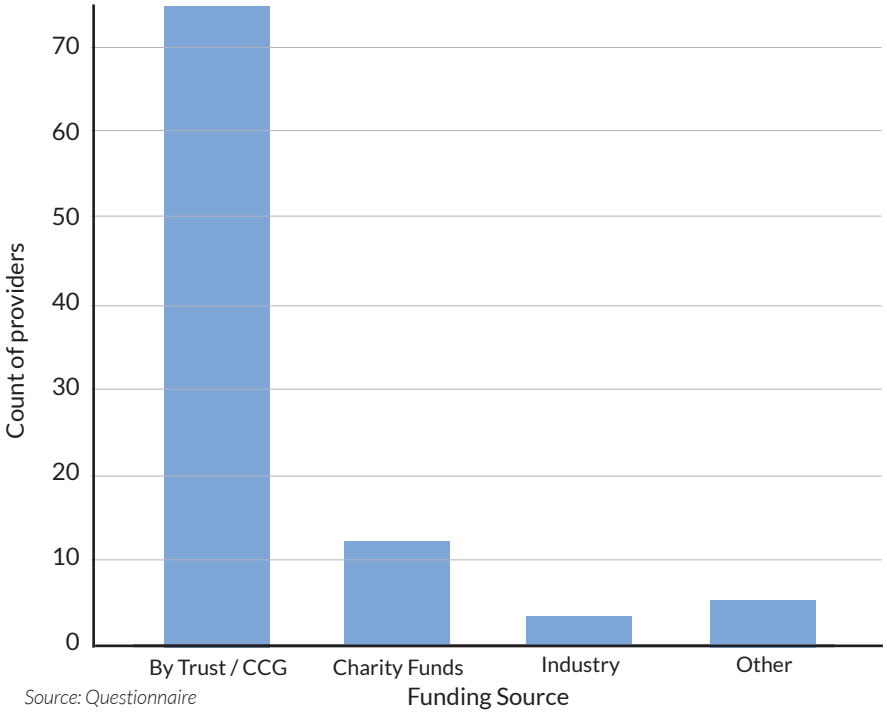
During the COVID-19 pandemic, we have been pleased to see virtual reviews of diabetes patients become much more widely used. We hope to continue to see these used as the crisis eases.

Need for trusts to commit to downloadable technology

Of more than 110 trusts who responded to our GIRFT questionnaire, less than 75 said that the technology is funded by the trust or the local CCG – as shown in figure 5. The rest are provided by charities or grants from pharma companies, and are therefore not well-embedded within hospitals and clinical teams. This means they are not being used to their full potential.

Often, the technology may be available in one part of the service (commonly the paediatric department where the best practice tariff and peer review has driven this), but not in others such as transitional, adult and pregnancy clinics. Trusts need to commit to funding these systems, and embedding the technology in all practice areas, so people with type 1 diabetes and their clinicians can access data in a meaningful way.

Figure 5: Count of providers by the source of funding for systems to enable glucose results to be downloaded from patients' meters



Source: Questionnaire

[15] *Sze May Ng Improving patient outcomes with technology and social media in paediatric Diabetes BMJ Quality Improvement Reports 2015*

Recommendation	Actions	Owners	Timescale
4. All trusts providing type 1 diabetes services should have a system, such as Diasend, to enable blood glucose data to be downloaded and presented in a meaningful way in all diabetes clinical areas – including paediatric, transitional, 16-18 and adult services as well as diabetes pregnancy services. Each department should have provision to offer virtual clinics to patients with type 1 diabetes. This should be supported by trust IT departments.	**a** GIRFT will explore the potential for trusts to conduct more virtual reviews which should reduce outpatient appointments.	GIRFT, individual trusts. NHSE/NHSI Elective Care Transformation programme	12 months from report publication.
	b GIRFT will work with providers on identifying potential aggregated cost savings if downloadable blood glucose systems were fully adopted. These savings would come from enabling patients to manage HBA1C levels more effectively, which should reduce hospital admissions.	GIRFT, STPs/ICSs, individual trusts	12 months from report publication.

Inpatient care

Over 90 per cent of people with diabetes in hospital are admitted for non-diabetes related conditions such as pneumonia, fractures and elective surgical procedures[1].

This makes it important that all healthcare professionals who interact with them are fully aware of their diabetes and the care required to keep them safe during their inpatient stay. Unfortunately, this is not always the case.

Despite progress achieved through the National Diabetes Inpatient Audit (NaDIA), which shows improvements in care every year since 2010, there is still a large degree of variation in the quality and availability of targeted inpatient services, and in the frequency of hospital-acquired harm resulting from poor diabetes care. People with diabetes in hospital have higher infection rates, longer lengths of stay – as clearly shown in figure 6 (see p28) – and higher mortality than people without diabetes[1].

At the height of the COVID-19 pandemic all diabetes staff in some areas were redeployed to hospital wards. This included staff from outpatient and community diabetes services. The increase in diabetes specialist presence was associated with an improvement in diabetes care despite the disruption associated with COVID-19. For example, in Manchester, the previously understaffed inpatient diabetes specialist service was bolstered by the redeployment and enabled seven-day working. A snapshot audit showed that compared with their previous NaDIA data there was a significant reduction in diabetes medication errors (81% to 20%), glucose management errors (66% to 12%), and improvements in foot examinations (5% to 73%) and blood glucose control.

A report from Diabetes UK *Inpatient Diabetes Care during the COVID-19 Pandemic* found that disruption to inpatient diabetes services created positive environments and opportunities for new ways of working, but also impacted on the quality of care clinicians felt they were able to deliver.

What we found

Through the GIRFT process, we found examples of hospitals investing in key services and putting measures in place to ensure better communication, monitoring and management of diabetes among inpatients. We've highlighted these in good practice case studies throughout this section of the report.

However, we also found widespread gaps in service. In some trusts there is no effective system to identify people with diabetes when they are admitted and some ward staff are not aware that their patients have diabetes. This can have serious consequences, particularly for people with type 1 diabetes who should never be without insulin. In many hospitals, ward staff have not been trained in the safe use of insulin, which can lead to insulin errors and avoidable harms such as hypoglycaemic events and Diabetic Ketoacidosis (DKA).

The DKA rate in hospital is estimated by Diabetes UK to be 1 in 25[16]. GIRFT has calculated that the risk of developing DKA in hospital is between 40-60 times higher than the background incidence rate of the type 1 population[17, 18]. Without dedicated teams and effective systems to identify, monitor and manage diabetes through all the stages of the inpatient journey, it is still too easy for diabetes care to fall through the gaps. This is of particular concern for those having surgery, where there are so many hand-offs from referral for surgery, to pre-assessment, admission, theatre, recovery, post-operative ward care and safe discharge.

Our recommendations are designed to improve services and develop more robust systems, so that inpatients do not suffer harm because of their diabetes. We believe they have the potential to make considerable savings on the £2.5 billion annual cost of caring for diabetes inpatients by cutting out errors, eliminating needless readmissions and reducing length of stay.

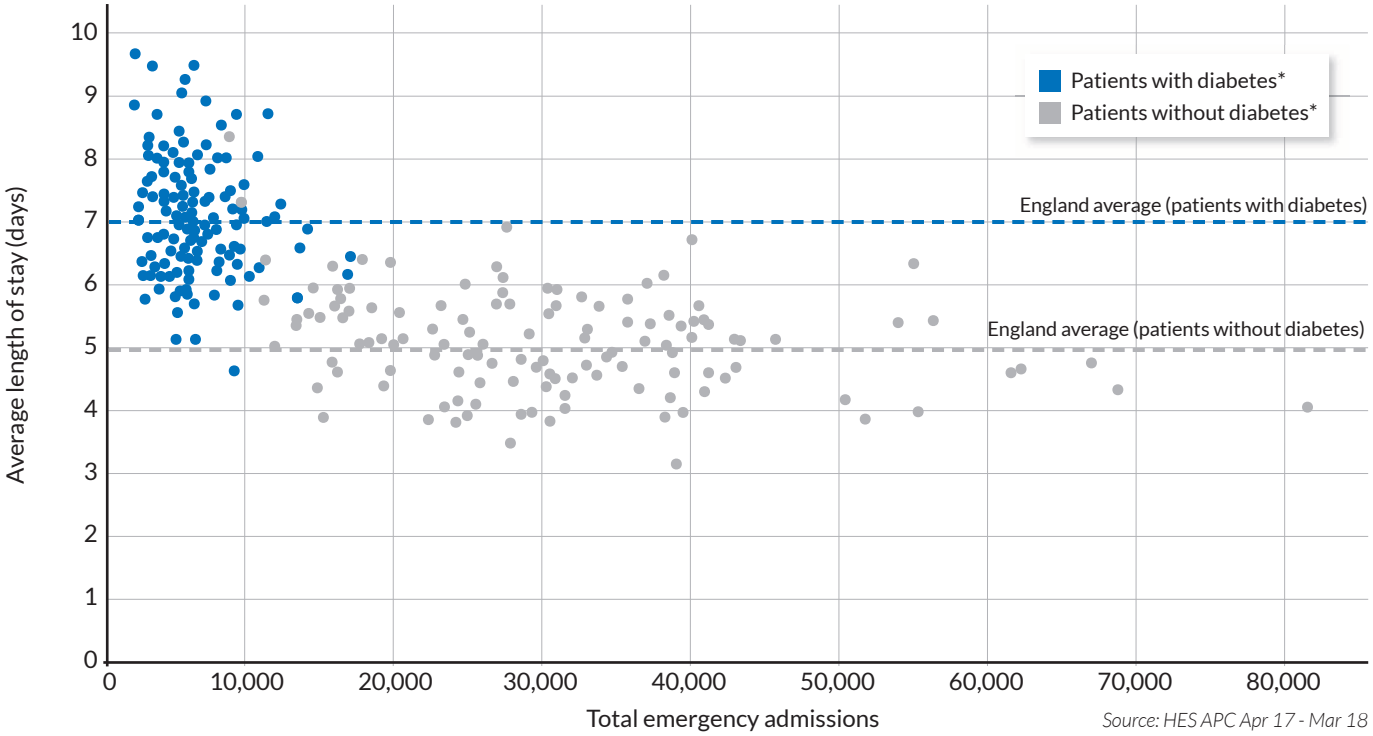
Our findings reinforce the Diabetes UK report 'Making Hospitals Safe for People with Diabetes'[6], which we reference across this section.

[16] *Diabetes UK, Making hospitals safer, 2018*

[17] *Comparison based on calculating the incidence of DKA as recorded in the NADiA (1 in 25) multiplied by mean length of stay to convert into per patient year as the numerator, over the underlying incidence of DKA in in T1 population as the denominator based on incidence in systematic review in as reference 13*

[18] *Farsani et al, Incidence and prevalence of diabetic ketoacidosis (DKA) among adults with type 1 diabetes mellitus (T1D): a systematic literature review (2016) https://bmjopen.bmj.com/content/7/7/e016587*

Figure 6: Difference in average length of stay between patients with and without diabetes* (type 1 and type 2) admitted as an emergency



Source: HES APC Apr 17 - Mar 18

*Excludes amputation and stroke admissions, includes admissions with LoS of 0 days

Theme 5: Dedicated multi-disciplinary diabetes inpatient teams (MDiTs)

Gaps in inpatient diabetes care

Only 8% of people with diabetes in hospital are there because of their diabetes[1]. This means they are being treated by staff, across various disciplines and areas of surgery and medicine, who may not be sufficiently experienced in diabetes care, or have the training needed to manage the condition well.

In many cases, patients who administer their own insulin are not allowed to self-manage in hospital and have their medication and devices taken off them – see theme 9. Patients also have little control over the quantity and quality of hospital meals, and the timing of insulin in relation to meals. Many suffer complications as a result of insulin errors or dietary issues.

The need for psychological support

Some patients also experience psychological harm. Feedback from the National Diabetes Inpatient Audit[19] shows people with diabetes find hospital a stressful place to be, associating it with a loss of control and a lack of understanding about their condition. This is especially the case if they are already suffering from depression as a result of their diabetes, highlighting the need for more inpatient support for mental wellbeing.

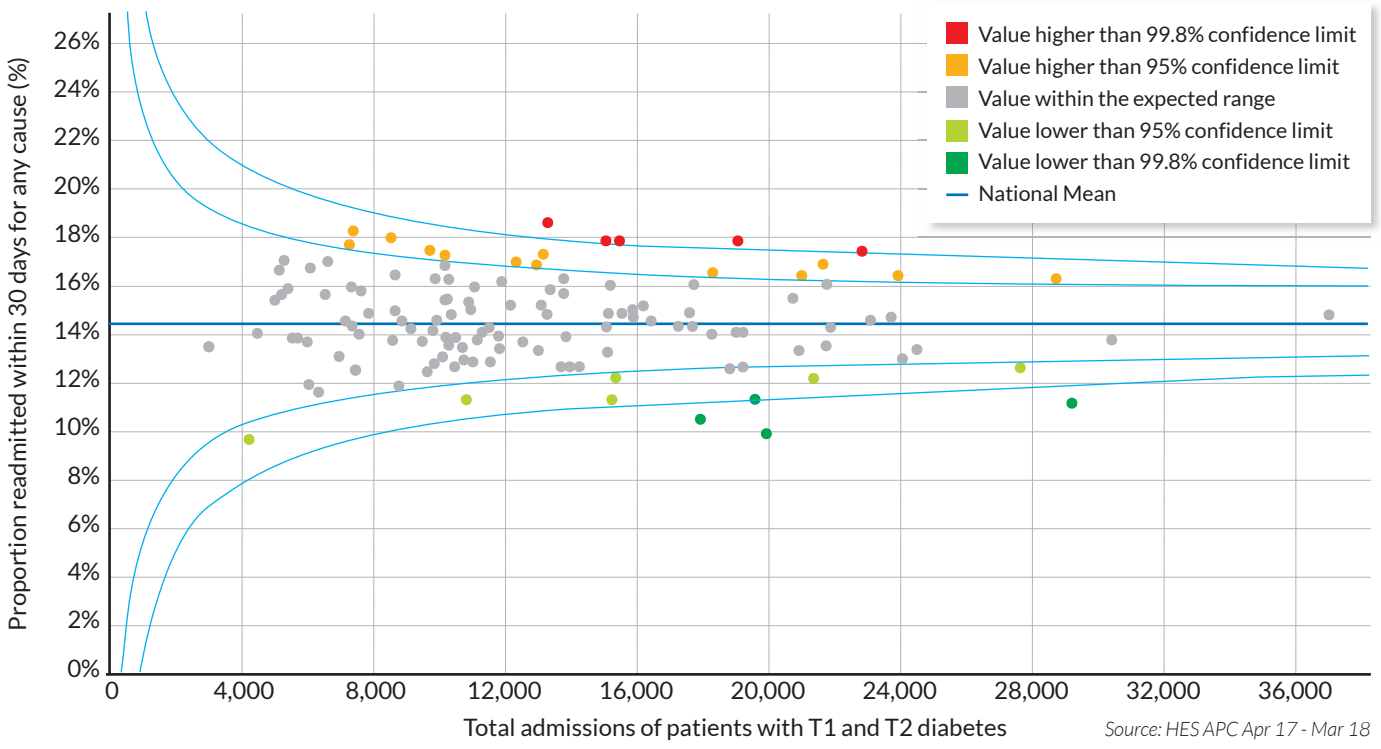
Diabetes UK's Future of Diabetes report[20] found that 64% of people sometimes or often feel down because of their diabetes. Many of these experience depression, anxiety or emotional distress, which is likely to be higher when they are in hospital.

These factors can contribute to poor management of diabetes in hospital, which can result in higher rates of complications, such as DKA, longer inpatient stays and higher re-admission rates. The national average for emergency readmissions within 30 days of leaving hospital is 16.2%, compared with 13.7% for people without diabetes (Hospital Episode Statistics 2017-18). Figure 7 shows the variation in readmission rates between hospitals, with some trusts seeing close to 20% of diabetes patients again within a month. Figure 8 and figure 9 show much higher rates of readmission and wider variations for patients who have complications when they are admitted.

[19] *Inpatient pilot study, NaDIA 2009*

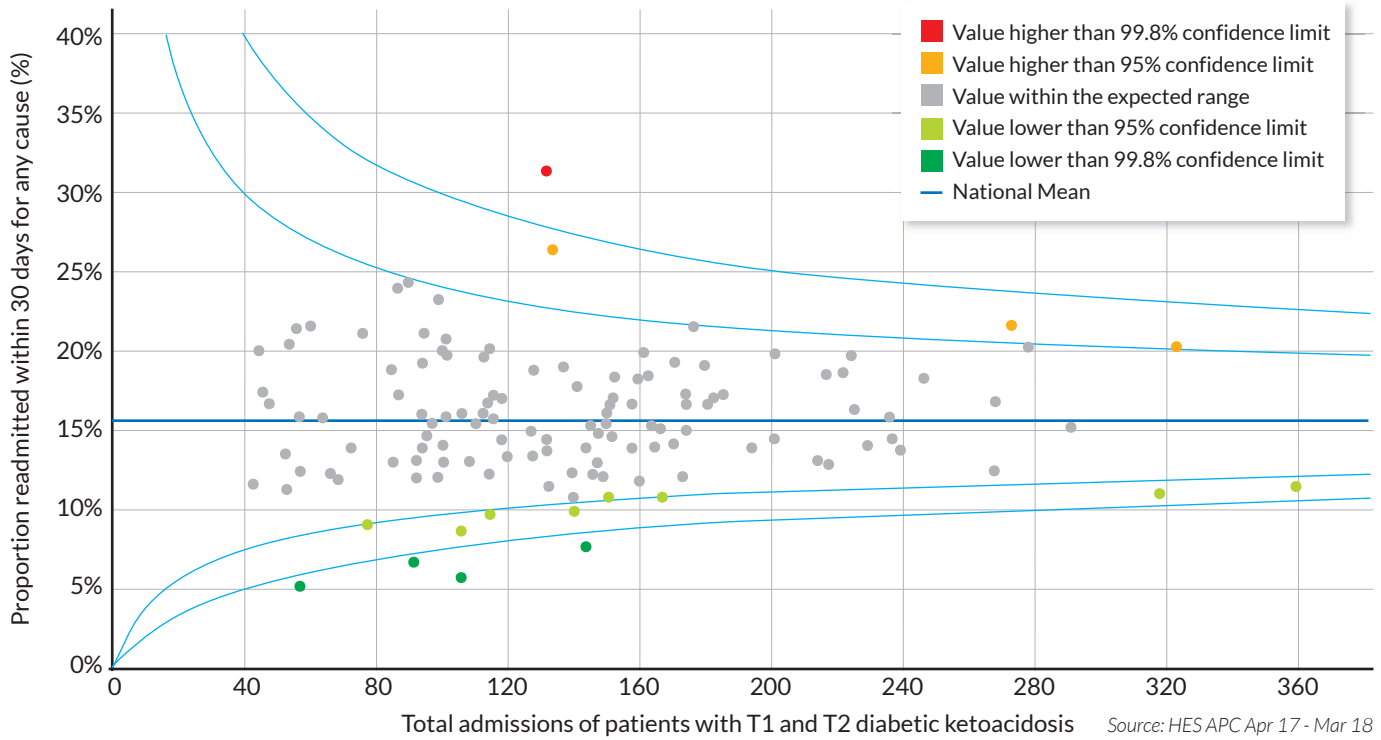
[20] *Diabetes UK (2017) Future of Diabetes report https://www.diabetes.org.uk/resources-s3/2017-11/1111B%20The%20future%20of%20diabetes%20report_FINAL_.pdf*

Figure 7: Proportion of adult patients with diabetes who are readmitted within 30 days of discharge (%)



Source: HES APC Apr 17 - Mar 18

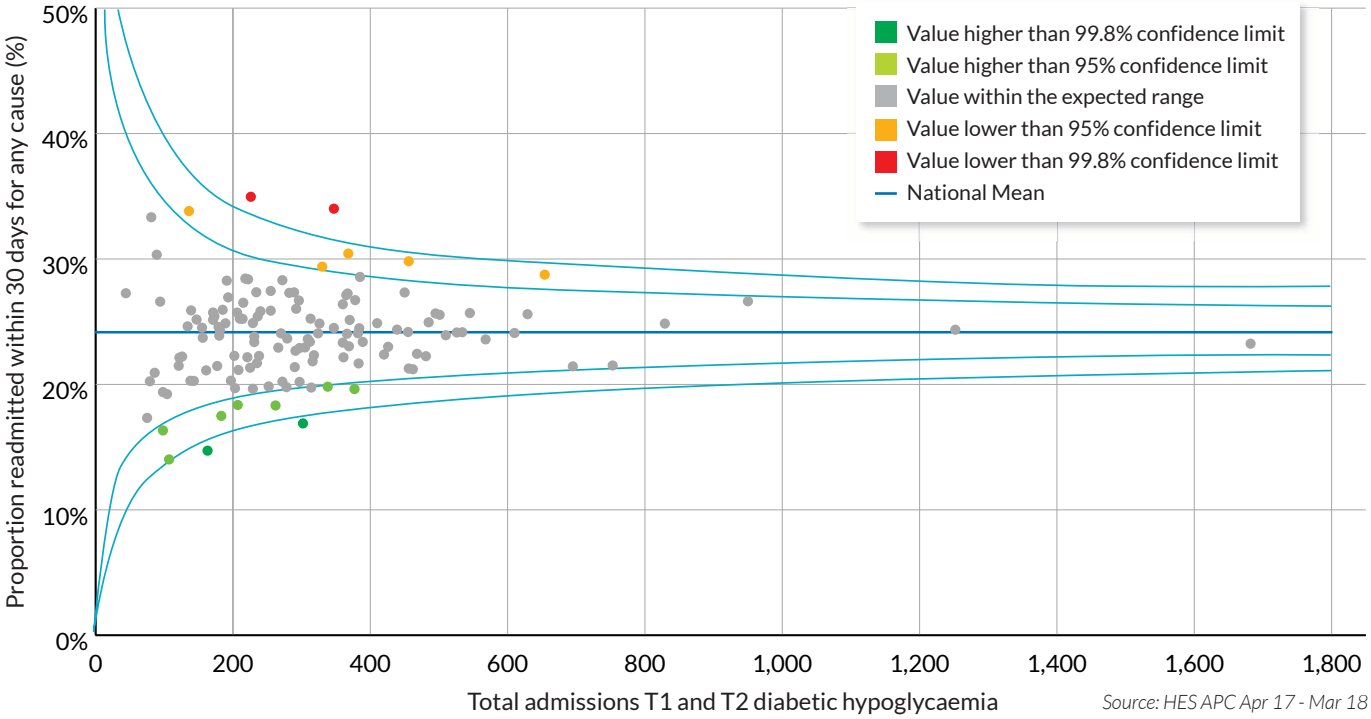
Figure 8: Proportion of patients with diabetes admitted with diabetic ketoacidosis who are readmitted within 30 days of discharge*



Source: HES APC Apr 17 - Mar 18

*Excludes admissions of patients who are admitted in DKA > 3 times in the year

Figure 9: Proportion of patients with diabetes admitted with hypoglycaemia who are readmitted within 30 days of discharge (%)



Source: HES APC Apr 17 - Mar 18

*Excludes trusts with less than 6 admission for T1 and T2 diabetic hypoglycaemia

How MDiTs improve the diabetes care of inpatients

For all the reasons outlined above, it is vitally important that hospitals have a dedicated multi-disciplinary diabetes inpatient team directly involved in the diabetes care of inpatients, which can:

- target help for patients who are having problems on admission
- implement an efficient referral system for cases needing specialist input, based on the 'Think Glucose' or similar referral criteria
- raise awareness of inpatient diabetes harms and how to prevent them
- provide basic psychological support for patients experiencing stress or direct them to specialist psychologists
- track outcomes by collecting and owning relevant data for audit purposes
- coordinate with community teams and outpatient care teams, working with them to help keep people safe after discharge and reduce the number of readmissions
- support and educate other healthcare professionals across all specialist areas to provide better care for patients with diabetes

It's important that these teams show strong leadership – driving change, championing diabetes inpatient care, and where it is difficult to recruit diabetes inpatient practitioners, seeking out and encouraging existing staff to develop the specialist skills required.

Current variations in provision

Many trusts already have fully-functioning MDiTs and there are many examples of good practice. However, a quarter of hospitals do not have even a single diabetes inpatient specialist nurse[2], the cornerstone of any MDiT, while 28% of people who needed to see a diabetes specialist during their hospital stay didn't because none was available[1].

On our visits, we found that some inpatient teams are ad hoc, and not solely dedicated to inpatient diabetes care – for example, some teams also cover outpatient services. As a result, leadership of key issues related to inpatient diabetes care is often lacking. This does not lend itself to good service development. It also means that diabetes issues and emergencies which arise on the ward are often not dealt with until after the outpatient-based diabetes specialist nurse or consultant finishes clinic.

Who should be in the MDiT?

The MDiT should include a range of specialists, including nurses, pharmacists, dietitians, psychologists and podiatrists working together as an integrated team led by senior experienced staff at consultant level (doctor, nurse or pharmacist) empowered to make important clinical decisions.

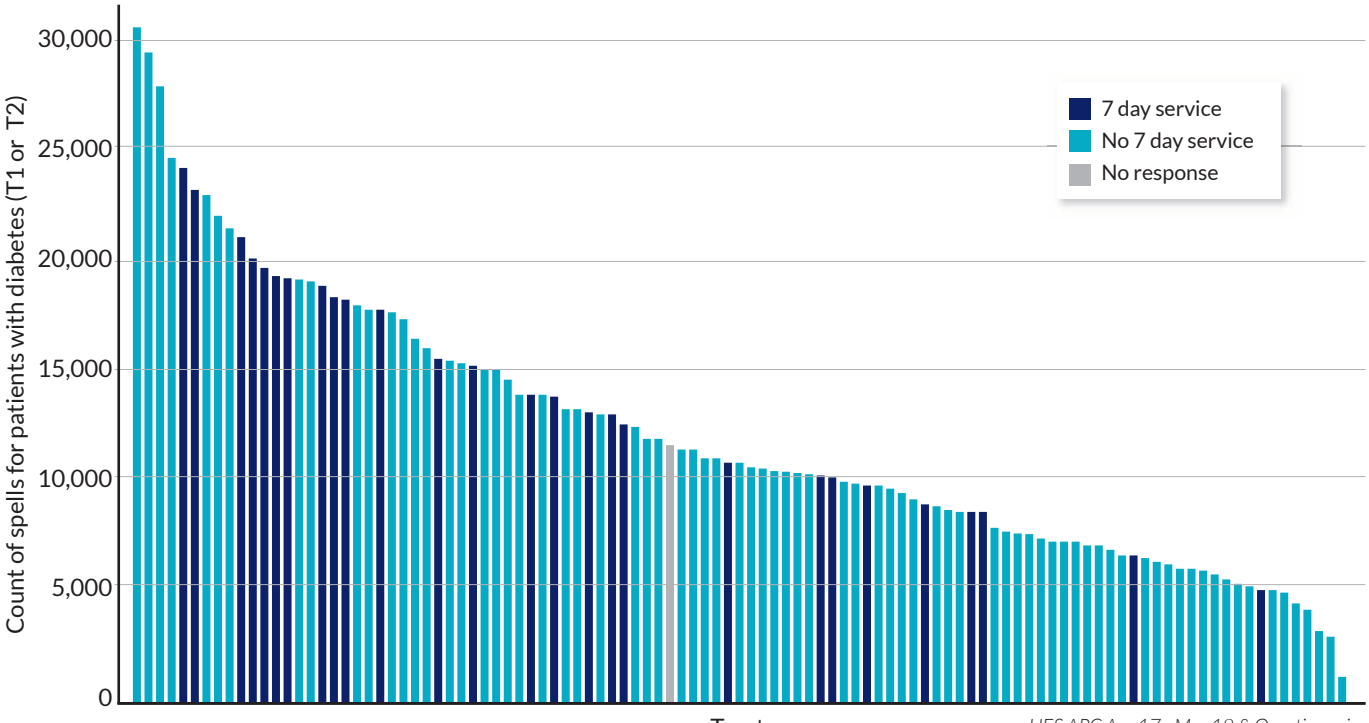
Where trusts do not have such an integrated team, often this is because of a lack of funding – for example, few of the trusts we talked to had funded psychological and dietetic support for inpatients with diabetes. As mentioned above, 25% of trusts did not have the very basic requirement of an inpatient diabetes specialist nurse. Recruiting trained staff can also be challenging as there is no pool of trained inpatient diabetes specialist nurses. Training a novice may take between 6-12 months.

A seven-day service

Some trusts, including some of those with the highest rates of admissions – as shown in figure 10 – fail to provide a seven-day diabetes service. That means anyone admitted at the weekend has to wait until Monday to be seen. This may contribute to increased length of stay and the potential for harm to happen at weekends.

Seven-day services can often be provided without large investment, or extra staff requirements, through better management of staff rotas. It does not require 24-hour full team cover – but at least one MDiT team member, such as a specialist diabetes inpatient nurse, to be available for part of the day on Saturday and Sunday, so that urgent cases can be seen by a diabetes specialist within hours rather than days and at risk patients identified during the week are reviewed.

Figure 10: Count of spells each trust admits, with colouration denoting whether they provide a seven-day service



Note: 'No response' indicates providers who received the questionnaire but did not return an answer to this question

HES APC Apr 17 - Mar 18 & Questionnaire

NHS Long Term Plan

"For those who periodically need secondary care support we will ensure that all hospitals in future provide access to multidisciplinary footcare teams and diabetes inpatient specialist nursing teams to improve recovery and to reduce lengths of stay and future readmission rates."

'Making hospitals safe for people with diabetes' – Diabetes UK

Recommendations

All hospitals should have a fully staffed diabetes inpatient team, made up of:

- diabetes consultant
- sufficient diabetes inpatient specialist nurses to run a daily and weekend service
- access to a diabetes specialist podiatrist, pharmacist and dietitian and access to psychological support
- a projects and implementation lead, admin, analytics and IT support

The team should meet regularly, have access to shared office space and administrative support.

All diabetes inpatient teams should host quarterly diabetes and insulin safety and strategy board meetings. Representation should include a member of the hospitals' safety committee, the executive board and IT and analytic teams.

All diabetes inpatient teams should meet weekly to discuss:

- incident reports and complaints
- monthly and other audits
- the service and innovations
- upcoming teaching.

IMPROVING CARE THROUGH A MULTI-DISCIPLINARY INPATIENT DIABETES TEAM

University Hospital Southampton NHS Foundation Trust

Since the launch of its enhanced MDiT, Southampton has achieved reductions in inpatient diabetes clinical errors and average length of stay.

Up to 18% of the inpatient population in Southampton has diabetes. A rise in numbers, as well as delays and errors in clinical care, led the trust to review the specialist support provided to this group.

Working proactively with other hospital teams

In a three-month pilot, an expanded multi-disciplinary diabetes inpatient team provided proactive weekday diabetes care for patients admitted for cardiac, vascular and orthopaedic treatment. Based on the success of this trial, they expanded the service to all clinical areas and developed innovations to help other healthcare professionals and patients, including:

- Advice on self-administration of insulin
- A smartphone diabetes microguide app
- A DKA care information leaflet for inpatients
- Diabetes education sessions for healthcare professionals in other teams

Results

During the initial pilot, the team achieved reductions in average length of stay and errors in clinical diabetes care, as well as a rise in patient satisfaction and significant associated cost savings. These have been sustained over time. Awareness has also increased, as other teams increasingly understand the need to take on core diabetes responsibility themselves, supported by the MDiT.

Recommendation	Actions	Owners	Timescale
5. All trusts must have a dedicated multi-disciplinary team of specialist diabetes inpatient practitioners as indicated in the NHS Long Term Plan. Trusts should work towards providing base level specialist diabetes cover at weekends where this does not exist.	**a** GIRFT will support NHSE/NHSI diabetes programme actions on MDiTS as stated in the NHS Long Term Plan.	GIRFT, NHSE/NHSI (diabetes programme team), individual trusts, STPs/ICSs.	Ongoing.
	b GIRFT will identify trusts that are outliers and work with them to improve MDiT provision. This should reduce the number of inpatient severe hypoglycaemic events and DKA incidence.	GIRFT, NHSE/NHSI, STPs/ICSs.	12 months from report publication.
6. The MDiT should meet regularly to discuss day-to-day errors and safety issues, and report to a quarterly trust-level diabetes safety board which reviews the overall quality of the inpatient service, with support from IT, based on incident reporting, local and national audits of patient harms, diabetes medication errors, length of stay and readmissions.	**a** GIRFT will work with NHS Digital to consider auditing patient safety issues and length of stay via the National Diabetes Inpatient Audit (NaDIA).	GIRFT, NHS Digital.	On commencement of trust revisits for diabetes workstream.

Theme 6: Identifying diabetes on admission and ensuring rapid referral

When people come into hospital, it is vital that their diabetes is identified immediately on admission, so that it can be monitored and controlled throughout their inpatient journey.

Once identified, effective screening of these patients can allow diabetes teams to categorise patients into those at higher and lower risk of hospital-acquired harms, such as hypoglycaemic events, and plan services to prevent these from happening from the beginning. Screening can also identify those having problems with their diabetes on admission, so they can be immediately triaged to the inpatient diabetes team.

Early identification, screening and triage

Such measures can have an enormous impact – for example, in Ipswich, a whole systems approach to inpatient diabetes care with an active triage system[21] reduced the average length of stay for patients with diabetes by almost one day[22]. However, fewer than half of the trusts who responded to our questionnaire said they had a system in place to identify all those known to have diabetes on admission – see figure 11. In some of the hospital trusts we visited, staff only become aware that a patient had diabetes when a problem occurred.

If all trusts had a system to identify those with diabetes on admission, along with screening of those identified and rapid referral to a dedicated diabetes inpatient team for those needing support, we believe this would reduce many avoidable harms resulting from poor diabetes care. It could even prevent deaths due to hospital acquired DKA and severe hypoglycaemia, as well as reducing length of stay and readmissions.

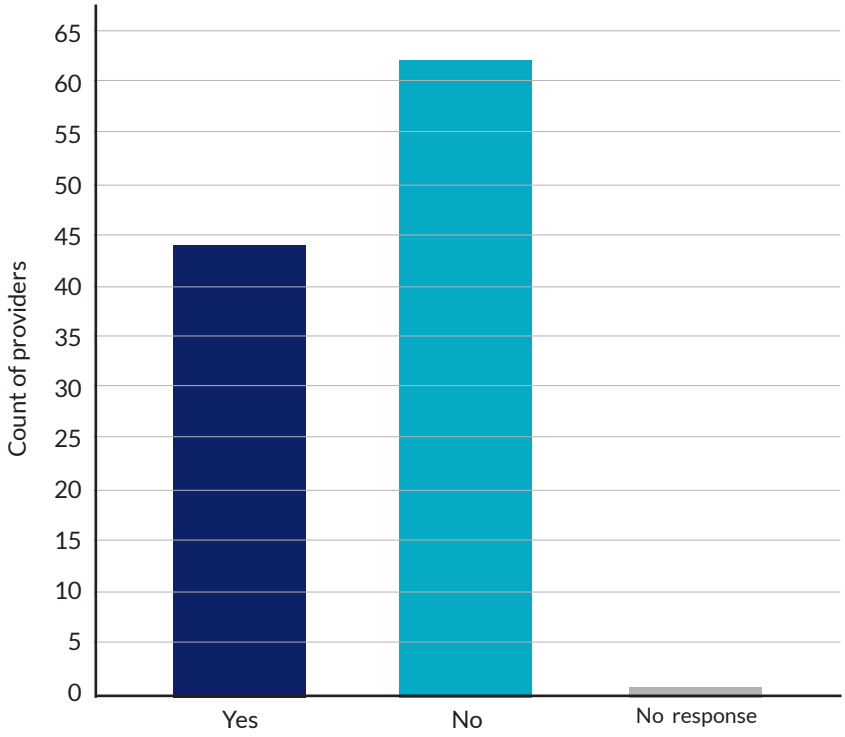
Interoperable systems

It's important that the identification is done systematically, using electronic interoperable technology where possible. Manual identification done by visiting clinical areas is very labour-intensive for already overstretched nurses.

Some trusts use a flagging system to identify diabetes admissions. This pools knowledge from previous admissions, people attending the diabetes outpatient service and patients on GP diabetes databases, where access is allowed. By triangulating the information from these sources, they can identify up to 95% of admissions.

Other trusts have successfully identified patients with diabetes on admission by matching them with the NHS numbers from their retinal screening data. This is potentially the ideal system which could be easily implemented across all trusts in England. However, there are some issues that need to be overcome – such as integrating privately-run retinal screening services with hospital IT systems and data governance issues with sharing of NHS numbers. Whatever system is adopted should identify at least 90% of patients.

Figure 11: Count of providers by whether or not they have a method that they use to identify patients with diabetes on their admission to the trust



Source: Questionnaire

Note: 'No response' indicates providers who received the questionnaire but did not return an answer to this question.

[21] *Rajendran R, Round RM, Kerry C, Barker S, Rayman G Diabetes patient at risk score - a novel system for triaging appropriate referrals of inpatients with diabetes to the diabetes team. Clin Med (Lond). 2015 Jun;15(3):229-33. doi: 10.7861/clinmedicine.15-3-229.*

[22] *Akiboye F, Adderley NJ, Martin J, Gokhale K, Rudge GM, Marshall TP, Rajendran R, Nirantharakumar K, Rayman G; DICE team Impact of the Diabetes Inpatient Care and Education (DICE) project on length of stay and mortality 2019*

Web-linked glucose monitoring for hospital staff

Web-linked blood glucose and ketone meters allow the inpatient diabetes team to remotely view blood glucose and ketone data from the ward-based bedside blood glucose systems.

This allows them to identify out of range results and quickly target care to these patients to prevent harms such as recurrent hypoglycaemia or DKA. Some bedside meters can also be programmed to provide alerts to the ward nursing staff, who are closest to the patient, if the result is out of range, so they can take immediate action to prevent harm.

Web-linked monitors with built-in alerts, used as part of a whole systems approach to inpatient diabetes care, have been shown to reduce severe hypoglycaemic events by more than 45%[23]. In our self-assessment questionnaire, more than 85 trusts reported that they used web-linked blood-glucose systems, as seen in figure 12 (see p36). However, less than 65 are using them to identify and act on out of range glucose results – figure 13 (see p36).

It's clear that there is great potential for web-linked meters to prevent avoidable harms. Where this is not happening, it's often because of a technical issue – trusts may be unable to identify out of range results because the system is simply not set up to provide the data. It needs more support from hospital IT staff and the device manufacturers, so that the downloads are easy to access and presented in a meaningful way.

Both automated screening systems and web-linked glucose monitoring systems work more efficiently where they are linked to an enterprise-wide electronic patient record (EPR) system. This enables specialists to carry out assessments remotely if needed, making best use of time and ensuring that ward visits are well-directed.

USING WEB-LINKED BLOOD GLUCOSE METERS TO PREVENT INPATIENT HARMS

Calderdale and Huddersfield NHS Trust

The trust achieved its target of zero preventable diabetes inpatient harms using ward-based web-linked meters to monitor and screen people with diabetes, supported by seven-day specialist nurse cover.

The meters enable staff to review blood glucose readings from anywhere in the trust, so they can remotely identify those at risk of harms such as DKA.

Reviewing data three times daily

Initially the team reviewed data from the system daily. However, the number of inpatient harms continued to be significant. During 2019, the team decided to review the data three times daily to identify hypoglycaemia and hyperglycaemia and target preventative efforts, along with a daily huddle meeting.

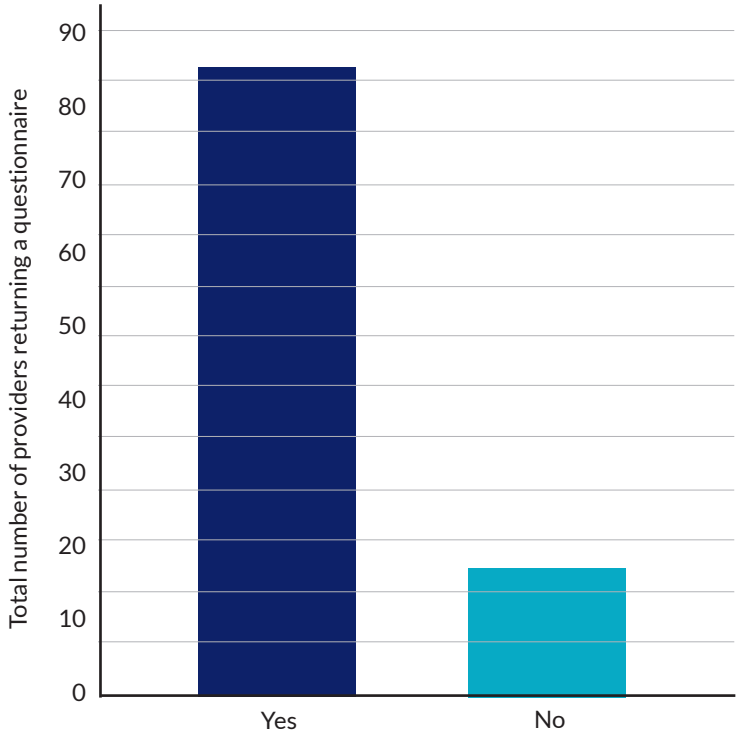
With support from the NHS England Transformation Fund, the trust has recruited extra diabetes nurses, which has enabled it to offer a seven-day diabetes inpatient specialist nurse service.

Results

From June 2018 to February 2019, the trust had at least one inpatient-acquired DKA per month. But from February to September 2019 there were no DKA events. With seven-day specialist support for A&E and wards, the number of safe weekend discharges has increased. Overall, there is evidence that inpatient care for people with diabetes is better and more timely.

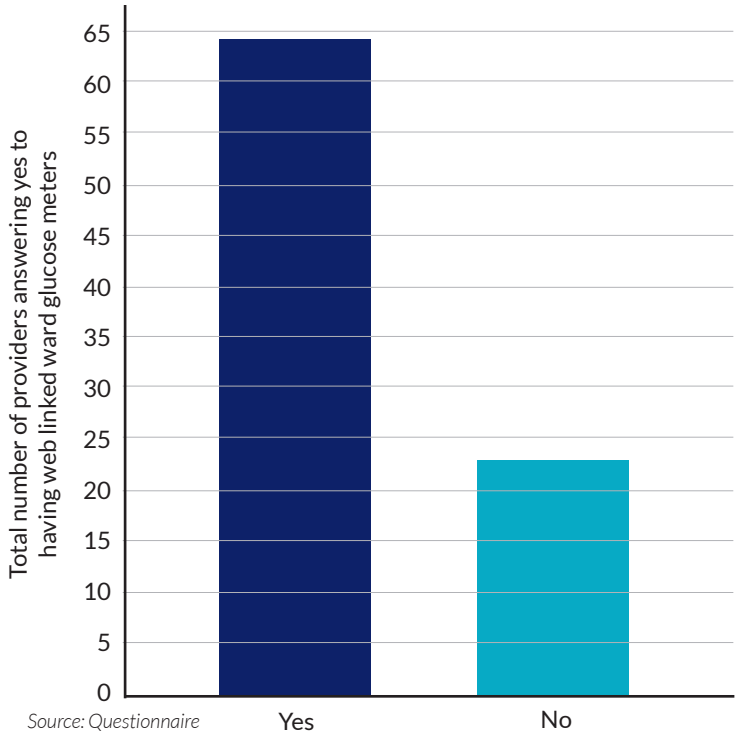
[23] *QiC Awards, Ipswich Hospital Diabetes Inpatient Care and Education (DICE) project 2015*

Figure 12: Count of providers by whether or not the provider is using web linked ward glucose meters



Source: Questionnaire

Figure 13: Count of providers by whether or not the provider is able to identify all out-of-range glucose results



Source: Questionnaire

Recommendation	Actions	Owners	Timescale
7. All trusts should have a robust system to identify all people with diabetes on admission to hospital, including emergencies and elective and non-elective surgery, and a triage system to identify those at risk and rapidly refer them to the diabetes team. This should be an electronic system, integrated with web-linked blood glucose meters which provide an alert system for staff when any out-of-range reading is recorded.	**a** GIRFT will work with NHSX and NHSE/NHSI and providers to roll out standard guidance on an interoperable system to identify diabetes patients on admission. This should realise savings by helping to reduce length of stay.	GIRFT, NHSE/NHSI (diabetes programme team), individual trusts, STPs, ICSs, NHSX.	For substantial progress within two years of report publication.
	b GIRFT will support trusts in highlighting appropriate specification and procurement of web-linked glucose meters for staff.	Individual trusts, STPs, ICSs.	12 months after report publication.
	c GIRFT will work with trusts to ensure that all trusts have web-linked meters that can pick up all out of range results.	GIRFT, individual trusts.	12 months after report publication.

Theme 7: Reducing insulin errors

Insulin error is the third most common cause of death or severe patient harm from medication error in the UK.

As shown in figure 14 (see p38), almost 40% of patients treated with insulin experience an error during their stay. Less than half of all insulin-treated patients and less than one-third of people with type1 diabetes had a 'good diabetes day' (a day on which there were no capillary blood glucose levels ≤ 4mmol/l and no more than one result above 11 mmol/l)[2].

Need for insulin safety training

These figures indicate unacceptable levels of errors in insulin management occur in most hospitals. Given that up to 20% of inpatients have diabetes, we believe that basic training in insulin safety should be a standard for all clinical staff, as recommended in NICE advice on safe insulin prescribing[24]. But there are large variations across the country. Many trusts have no structured programme to train staff on the safe use of insulin. This means many staff do not have sufficient competency in using insulin.

There are a number of good models already in use, which trusts can easily adopt. These include short video modules, such as 'Safe use of insulin in hospital' developed in Cambridge[25], as well as virtual reality training. Whatever model trusts use, it must be backed by a competency assessment on completion.

Using electronic patient records (EPR) to reduce errors

There is some evidence from the National Diabetes Inpatient Audit that electronic patient records, which include information on the patient's insulin needs, and electronic prescribing systems, may be effective in reducing insulin errors. During our deep dive visits we have seen examples of well-designed automated systems being used by trusts to deliver better outcomes.

Promoting good self-management

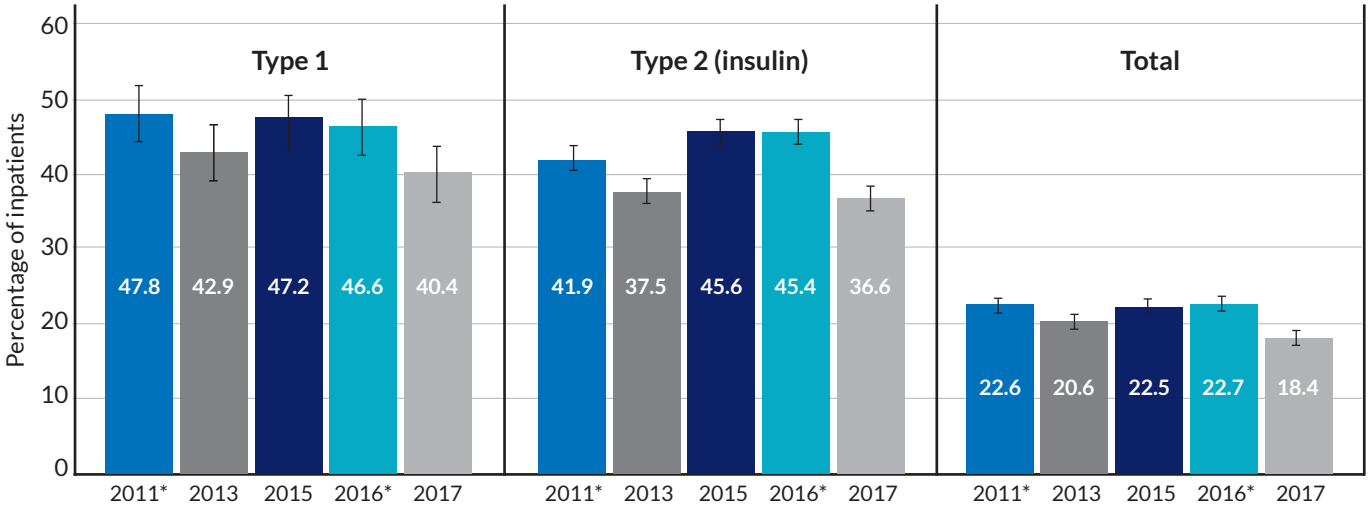
People with diabetes often have more knowledge of how to use insulin and their own specific requirements than the nursing staff who are caring for them. Many errors could be avoided if more patients were allowed to self-manage – but this this is often refused. Self-management should be promoted more widely, subject to checks by clinical staff –see theme 9.

Having an electronic insulin passport can also help. It's a health record held by the patient on a smart card device which when scanned tells staff which type of insulin they use, the administration method and their self-management equipment or technology.

[24] *NICE advice 2017 Safer Insulin Prescribing https://www.nice.org.uk/advice/ktt20*

[25] *Cambridge Diabetes Education Programme (CDEP) Safe Use of Insulin in Hospitals https://www.cdep.org.uk/safe-use-of-insulin-in-hospital.html*

Figure 14: Inpatients experiencing one or more insulin error during their hospital stay England and Wales 2011-2017



*Statistcally significant at the 0.05 (vs. current audit year)

Source: National Diabetes Inpatient Audit 2017

Recommendation	Actions	Owners	Timescale
8. Training should be provided for every healthcare professional who dispenses, prescribes and/or administers insulin, appropriate to their level of responsibility, including an assessment of competency.	**a** GIRFT and NHSE/NHSI will evaluate best practice in avoidable harm reduction looking at safety education modules such as ones developed by Leicester, Cambridge, St Helens and Knowsley.	GIRFT, NHSE/NHSI (diabetes programme team, medicines safety improvement programme), CQC.	18 months from report publication.
	b GIRFT will work with NHSE/NHSI to gather evidence on the roll out of patient safety initiatives such as electronic insulin passports and virtual reality training for healthcare professionals in the safe use of insulin.	GIRFT, NHSE/NHSI (diabetes programme team, medicines safety improvement programme), CQC.	To be completed within 12 months of report publication.

IMPROVING INSULIN COMPETENCY THROUGH AN E-LEARNING MODULE
Cambridge University Hospitals NHS Trust

Staff confidence in dispensing and administering insulin improved after taking an e-learning module developed at Cambridge.

The Cambridge Diabetes Education Programme (CDEP) is a competency-based e-learning platform that delivers bite-size modules to support diabetes learning for all clinical staff.

Boosting staff competence and confidence

The programme includes a nationally-recognised insulin safety module aimed at boosting staff insulin competence, confidence and familiarity with guidelines. The e-learning is centred on a five-minute video summarising the key aspects of safe use of insulin, developed with an external digital communication agency in consultation with experts. The module, which can be taken on any device, at a time that suits staff, includes an assessment of learning on completion.

Results

Clinical staff who signed up to the CDEP insulin module during Insulin Safety Week 2019 and completed the course scored 4.42 out of 5 for improvement of confidence, competency and guideline familiarity.

Theme 8: Improving care through perioperative pathways

Understanding and managing a patient's diabetes is especially critical when they are undergoing surgery.

Getting their diabetes treatment wrong could lead to hypoglycaemia and hyperglycaemia, both of which may cause serious harm. Poor diabetes control also increases the risk of post-operative surgical complications, including delayed wound healing and infection.

People with diabetes who have surgery experience increased length of stay, higher readmission rates and higher morbidity compared with people without diabetes[4]. By its nature, surgery is complex, with many different staff and specialisms involved. There may be up to seven pre-assessment stages before surgery, and the potential for error through all of these hand-offs is high.

NCEPOD Highs and Lows report – ensuring clinical continuity

The recent NCEPOD report 'Highs and Lows'[26] examined these issues and highlighted a lack of clinical continuity of diabetes management across the different specialties in the perioperative pathway, which can result in the diabetes management of the patient falling between gaps. Among issues it highlighted were poor adjustment of medication, prolonged fasting increasing the risk of complications and inconsistent monitoring of blood glucose.

To ensure patient safety during surgery and improve outcomes, the report recommended actions, including robust systems for pre-assessment and referral, close monitoring of the patient's diabetes while in hospital and more effective handovers through to recovery and discharge, as well as pharmacy input to ensure medicines safety. We endorse the NCEPOD recommendations (below) and believe they should be adopted by trusts.

Ideally, there should a perioperative diabetes team to implement and monitor the pathway.

Highs and Lows – NCEPOD report on people with diabetes undergoing surgery[26]

The National Confidential Enquiry into Patient Outcome and Death (NCEPOD) carried out a review of the quality of care provided to patients over the age of 16 who had diabetes and underwent a surgical procedure. The review looked at service structure at an organisational level and patient care at a clinical level at hospitals across the UK.

Recommendations

1 Write and implement a national joint standard and policy for the multidisciplinary management of patients with diabetes who require surgery. Information should include responsibilities for diabetes management across all specialties during routine care and in high risk patients.

2 Appoint a clinical lead for perioperative diabetes care in hospitals where surgical services are provided. This person will be responsible for developing policies and processes to:
   - **a.** Ensure diabetes management is optimised for surgery
   - **b.** Ensure patients with diabetes are prioritised on the operating list, including the co-ordination of emergency surgery
   - **c.** Identify when involvement of the diabetes multidisciplinary team, including diabetes specialist nurse, is required
   - **d.** Ensure high-risk patients are identified, such as those with type 1 diabetes
   - **e.** Identify patients with poor diabetes control who may need pre-operative optimisation or VRIII
   - **f.** Audit cases of prolonged starvation
   - **g.** Ensure high quality discharge planning

3 Use a standardised referral process for elective surgery to ensure appropriate assessment and optimisation of diabetes. This should include:
   - **a.** Satisfactory HbA1c levels within 3 months of referral
   - **b.** Control of co-morbidities
   - **c.** A list of all current medications

[26] *The National Confidential Enquiry into Patient Outcome and Death. Highs and Lows. 2018. London https://www.ncepod.org.uk/2018pd.html*

Recommendations (continued)

3 **d.** The patient's body mass index (BMI)
e. Estimated glomerular filtration rate (eGFR)
f. Perioperative risk rating

4 Ensure that patients with diabetes undergoing surgery are closely monitored and their glucose levels managed accordingly. Glucose monitoring should be included:
a. at sign-in and sign-out stages of the surgical safety checklist (e.g. WHO safety checklist)
b. in anaesthetic charts
c. in theatre recovery
d. in early warning scoring systems
System markers and alerts should be used to raise awareness of glucose levels, e.g. tagging of electronic medical records, use of a patient passport or unique stickers in paper based case notes.

5 Ensure a safe handover of patients with diabetes from theatre recovery to ward. This should be documented in the case notes and include:
a. Medications given in theatre
b. Glucose level on leaving the recovery area
c. Glucose level on arriving into the ward
d. Ongoing management of diabetes, especially VRIII
e. Criteria for contacting the diabetes team

6 Develop a pre-operative assessment clinic policy and standards for the management of patients with diabetes. These should be developed by the lead anaesthetist and the clinical lead for perioperative diabetes management, and include:
a. Identification of high-risk patients, such as those with poorly controlled or type 1 diabetes
b. Optimisation for surgery
c. Criteria for involvement of the diabetes multidisciplinary team
These policies should be audited locally and the results acted upon.

7 Ensure that patients with diabetes attending a preoperative assessment clinic prior to elective surgery have:
a. Access to the diabetes multidisciplinary team, including diabetes specialist nurse input
b. Written instructions regarding their diabetes management plan prior to surgery.

8 A clinical lead for day surgery should be in place in all hospitals providing day surgery services. This lead, along with the clinical lead for perioperative diabetes management should be responsible for ensuring that patients with diabetes are considered for day surgery, where appropriate. Policies should be developed to ensure patients with diabetes have equity of access to day surgery.

9 Cancellation of elective surgery in patients with diabetes should be avoided, particularly for known clinical reasons. Cancellation rates should be audited locally and the results acted upon.

10 Develop and implement referral criteria for surgical inpatients with diabetes to:
a. Diabetes specialist nurses
b. Dietitians
c. Pharmacists
d. Other diabetes multidisciplinary team members as required.

11 Record and monitor the time at which a patient begins fasting (for surgery or clinical reasons). If a patient misses more than one meal, their care should be escalated to the responsible medical team as this indicates prolonged starvation.

12 Prioritise patients with diabetes on the operating list to avoid prolonged starvation. Prioritisation of patients with diabetes on operating lists should be subject to local clinical audit and the results acted upon.

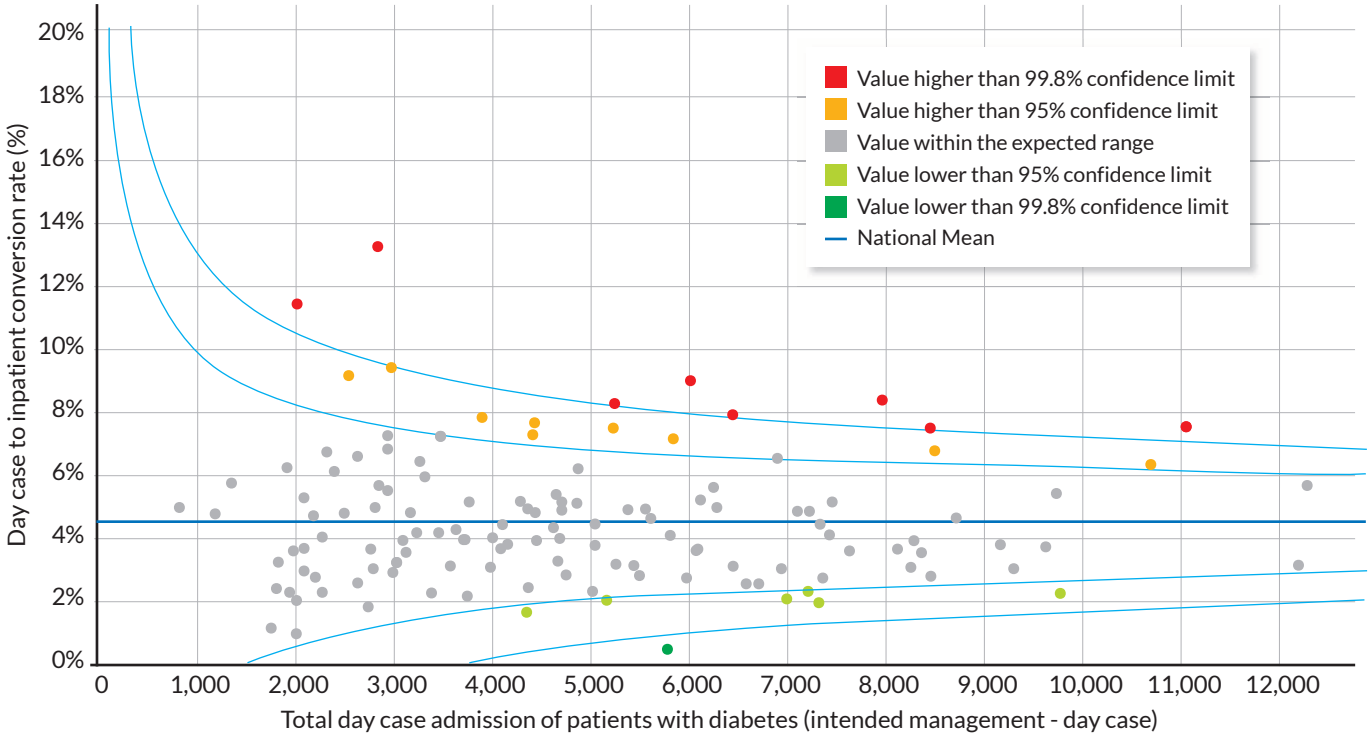
13 Provide patients with diabetes with education and information about their diabetes management at discharge from hospital as part of the discharge planning process.

Prioritising day case surgery

Many patients who would otherwise have their elective surgery as a day case are refused this option because of their diabetes. This is not only worse for them but also very costly. A health economics study of inpatient care found that lower day case rates for people with diabetes cost the NHS more than £9 million[27].

We found a wide variation among trusts in the proportion of people with diabetes seen as a day case. Where day case surgeries are planned, many of them are not completed on the day but convert to inpatient stays. Figure 15 shows the variation in conversion rates, with many trusts above the expected range and some having a conversion rate of more than 10%. Hospitals need to implement good perioperative planning, which identifies appropriate cases for day surgery and prioritises them on the operating list, so there is less potential for error on the day, to reduce the number of unnecessary inpatient stays.

Figure 15: Day case to inpatient conversion rate (%)



HES APC Apr 17 - Mar 18

[27] *Marion Kerr Inpatient Care for People with Diabetes: The Economic Case for Change, Insight Health Economics/NHS Diabetes 2011*

GIRFT IP3D project

GIRFT has started work on a new project to support trusts in implementing a care pathway which empowers the patient in both preparing for surgery and throughout their perioperative journey.

The IP3D project (Improving the Perioperative Pathway of Patients with Diabetes) is based on a model used at Ipswich Hospital, where it was shown to significantly reduce surgical length of stay and was well received by patients and staff.

The pathway features a number of innovations, including:

- a patient-held booklet containing important information relevant to the patient's surgical inpatient stay (the diabetes perioperative passport)
- the appointment of a perioperative diabetes specialist nurse
- the introduction of diabetes surgical study days

Over the next 18 months the IP3D project aims to demonstrate that the pathway is transferable to other trusts, resulting in improvements in many aspects of diabetes care. Wider national implementation may then follow.

Recommendation	Actions	Owners	Timescale
9. All hospital trusts should have clear, audited perioperative pathways from pre-assessment through to discharge. These should be broadly in line with NCEPOD recommendations.	**a** GIRFT will work with NCEPOD to help trusts develop and implement good perioperative pathways for diabetes in line with the NCEPOD recommendations.	GIRFT, NCEPOD, Royal College of Anaesthetists, Centre for Perioperative Care.	To be actioned when IP3D project has completed.
	b GIRFT will monitor and benchmark trust performance on day case to inpatient admissions via Model Hospital. GIRFT will revisit trusts with below average performance and agree an improvement plan.	GIRFT.	Ongoing once 9a is completed.
	c GIRFT will work with interested trusts on its IP3D project with a view to demonstrating an effective perioperative pathway for diabetes that has the potential to be implemented nationally, supported by the Royal College of Anaesthetists.	GIRFT, individual trusts.	Ongoing.

SUPPORTING SAFE PERIOPERATIVE DIABETES MANAGEMENT THROUGH REMOTE MONITORING

South Tyneside and Sunderland NHS Foundation Trust

Sunderland achieved reductions in length of stay and re-admission rates by introducing an electronic system to monitor people with diabetes undergoing surgery throughout the perioperative period.

Electronic monitoring from admission to discharge

The IT system is integrated with bedside blood glucose meters, electronic medical records (EMR) and electronic prescribing. It enables staff to monitor patients at all stages in the perioperative journey and alerts the inpatient diabetes team whenever a new patient with diabetes is admitted, triggering a timely clinical review.

The team also engage with surgical staff and patients, promoting the importance of safe diabetes care, good glycaemic control and the need to reduce diabetes-related errors. This is a key element in the system's success.

Results

The team achieved a reduction of 100 bed days a month, with a significant reduction in post-operative re-admissions for people with diabetes.

Theme 9: Supporting self-management in hospital

People with diabetes are often the greatest experts in their own care. Most patients who take insulin self-manage their medication daily and know how to control their blood glucose levels.

Yet, when they come to hospital, many find that their insulin and devices are taken off them and locked away. This can be stressful, and potentially dangerous if the healthcare professionals who take over control of the insulin don't understand how to use it safely. It can also have knock-on effects on patients' lives. We have heard of cases where people have lost their driving licenses after episodes of severe hypoglycaemia caused by inability to self-manage while in hospital.

Managing insulin with meals

Self-management is also important to help diabetes patients in hospital time their insulin to match their meals. The National Diabetes Inpatient Audit has found a large amount of dissatisfaction among people with diabetes about the timing, content, quantity and quality of the meals provided in hospitals. As set out in the Joint British Diabetes Societies for Inpatient Care Group's guidance on self-management[28], patients should be told about the carbohydrate content of meals and, within reason, be able to choose how much they want to eat and adjust their insulin to suit.

Safe storage of medications

A lockable compartment should be provided for patients to store their medication safely in a place where they can access it and the patient should be given a key to this facility under nurse supervision, which they return to a registered nurse if they leave the ward[28].

Unfortunately, this is not in place in many of the trusts we visited.

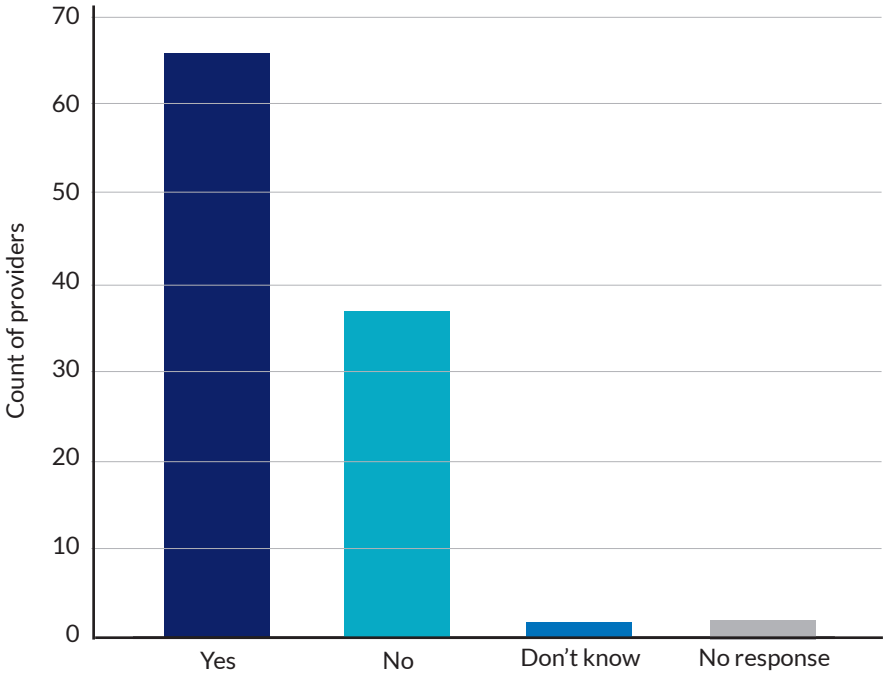
Hospital staff need to listen to patients with diabetes and not assume a 'we know best' attitude towards people with diabetes. Safeguards can be put in place, with checklists to ensure that the patient is competent to self-administer.

Self-management policies

Self-management of insulin can form part of a trust's wider self-administration policy covering all forms of administration of medicines. Where the policy is based on promoting patient independence among those willing and able to self-manage, and involving them in their own care and treatment in consultation with medical staff, it can be an important part of the strategy to improve safe use of insulin in hospital. However, in our questionnaire, we found that around one third of trusts have no diabetes self-management policy in place – as shown in figure 16 (see p44).

[28] *Self-management of diabetes in hospital: a guideline from the Joint British Diabetes Societies (JBDS) for Inpatient Care group. D. Flanagan. Dhatariya K, Kilvert A*

Figure 16: Count of providers by whether or not the provider has a self-management policy in place for patients with diabetes



Source: Questionnaire

Making hospitals safe for people with diabetes – Diabetes UK

Recommendations

- All patients with a diagnosis of diabetes should be supported to self-manage their diabetes where appropriate. Hospitals should have systems and training in place that supports this.
- All patients with a diagnosis of diabetes should benefit from a care plan – developed in collaboration between healthcare professionals and the patient – that is activated on admission to hospital.
- Diabetes inpatient teams should work with catering staff to make sure mealtimes and meal quantities are appropriate for people with a diagnosis of diabetes.
- All hospital menus should have carbohydrate content available.
- All patients with diabetes should have easy access to appropriate snacks and drinks throughout their inpatient stay.

Recommendation	Actions	Owners	Timescale
10. All trusts should have and promote a self-management policy, which supports patients who want to self-manage their diabetes to safely do so while in hospital, as clinically appropriate and in line with wider NHSE and NHSI policies on inpatient self-management.	**a** GIRFT will work with NHSE/NHSI to monitor the implementation of self-management policies.	GIRFT, NHSE/NHSI (diabetes programme team, hospital pharmacy team), CQC.	To be completed within two years of report publication.

Diabetic footcare

Diabetic footcare problems occur as a result of damage to nerve cells and blood vessels caused by high blood sugar over time. A fifth (20%) of all people living with diabetes are at a higher risk of developing this kind of damage[1].

If not treated properly, it can lead to foot ulceration and sometimes amputation. It's estimated that around 10% of people with diabetes will have a diabetic foot ulcer at some point in their lives[29], while someone with diabetes is 20 times more likely to experience an amputation than someone without diabetes[1].

This has a devastating impact. Up to 70% of people die within five years of an amputation and around 50% die within five years of a diabetic foot ulcer[28]. The cost of care for diabetes-related ulceration and amputation is estimated at up to £1 billion – accounting for almost 1% of the total NHS budget in England[5].

This represents a terrible waste of lives and resources, much of which could be avoided if better care was provided in the first place. Of the 140 leg, foot and toe amputations performed each week in the UK, 80% result from earlier ulceration, which is largely preventable[30].

What we found

Despite growing evidence that ulceration and amputation can be dramatically reduced by providing the right services for people with diabetes, many commissioners and trusts are not doing enough to improve.

This is reflected in a wide variation in foot-related complications from trust to trust and region to region across the country – and in the quality and coordination of footcare services. For example, it is clear from our visits that in many areas there is no training for staff performing footcare screening examinations and that the majority of patients are not made aware of their level of risk or what action to take if they develop a foot lesion. As a result, opportunities to identify and address problems early may be lost.

On our deep dive visits, we heard reports of problems with access to vascular services for patients with diabetic footcare problems in some smaller hospitals which are part of the hub and spoke vascular model – see theme 11.

Our recommendations are focused on closing these gaps in provision and improving coordination across services. If well implemented, they will help to:

- identify and educate those at risk;
- ensure they receive preventative care;
- reduce rates of ulceration;
- speed access to appropriate treatment to reduce time of ulcer healing, rates of recurrence and unnecessary amputations.

[29] *Diabetic foot problems: prevention and management, NICE Guideline 2015 www.nice.org.uk/guidance/ng19*

[30] *Diabetes UK, Putting Feet First: six step guide to improving diabetes footcare https://diabetes-resources-production.s3-eu-west-1.amazonaws.com/diabetes-storage/2017-08/Putting%20feet%20first%206%20steps.pdf*

Theme 10: Effective diabetic footcare services

The need for structured footcare services

Having staff who are trained in foot protection in the community, along with rapid access to specialist hospital-based multi-disciplinary footcare services (MDFS), can help to reduce ulceration and amputations

NICE (NG19) stipulates that within the community, everyone with diabetes should have an annual foot examination to detect their risk of foot ulceration. As part of this, they should be made aware of their risk and what to do if they develop a foot lesion. Anyone with an increased risk should be referred to a community footcare protection service (FPS). Anyone who is at high risk or has active ulceration should be referred to the MDFS. The FPS and the MDFS need to be well integrated.

However, in many areas, hospitals still do not have fully established MDFS to coordinate care of both inpatients and outpatients with footcare problems. And in some areas, there is no local FPS.

The NHS Long Term Plan commits to providing diabetes patients with access to specialist footcare services to improve recovery, reduce lengths of stay and future readmission rates – we need to act on this as a matter of urgency. This is a system-wide issue, which will require commissioners in primary care and providers in both primary and secondary care working together to provide training in footcare screening and to establish an integrated FPS and MDFS.

Monitoring patients on renal wards

Diabetes patients who are receiving dialysis treatment for renal disease have a significantly increased risk of developing foot ulceration[31]. It is therefore important that the hospital-based MDFS carries out regular checks on these patients, working closely with dialysis units and staff on renal wards to monitor their status and ensure they receive the preventative care they need.

South west partnership – reducing ulceration and amputations

A major project between CCGs in the south west of England examined the reasons for high amputation rates there up to 2010 and recommended actions to address them[32]. The 10 good practice actions they developed (see panel p47) have since been implemented and have led to a stabilisation of foot ulceration rates and a sustained reduction in amputation rates. For example, in the Northern Devon NHS trust, the total number of amputations in people with diabetes fell from 50 in 2015 to 10 in 2017, as shown in figure 17 (see p47).

As well as the overall improvement, the actions also led to a significant reduction in the number of major amputations – amputations above the ankle or knee – within a two-year period. Initial reviews showed that this reduction was directly related to the delivery of adequate diabetes foot care services.

We endorse the south west good practice actions and advise that all trusts and commissioning groups adopt them to reduce the number of preventable foot ulcers and amputations.

National footcare audit

Having accurate data is vital to find the root causes of footcare problems that lead to amputations and enable informed commissioning of services to prevent them happening. However, many parts of the National Diabetes Footcare Audit (NDFA) are incomplete. Currently, only 30% of trusts are submitting complete data to the NDFA. This may be because staff don't have time to submit data, or no one has been assigned to the task. More clerical support must be provided to enable this.

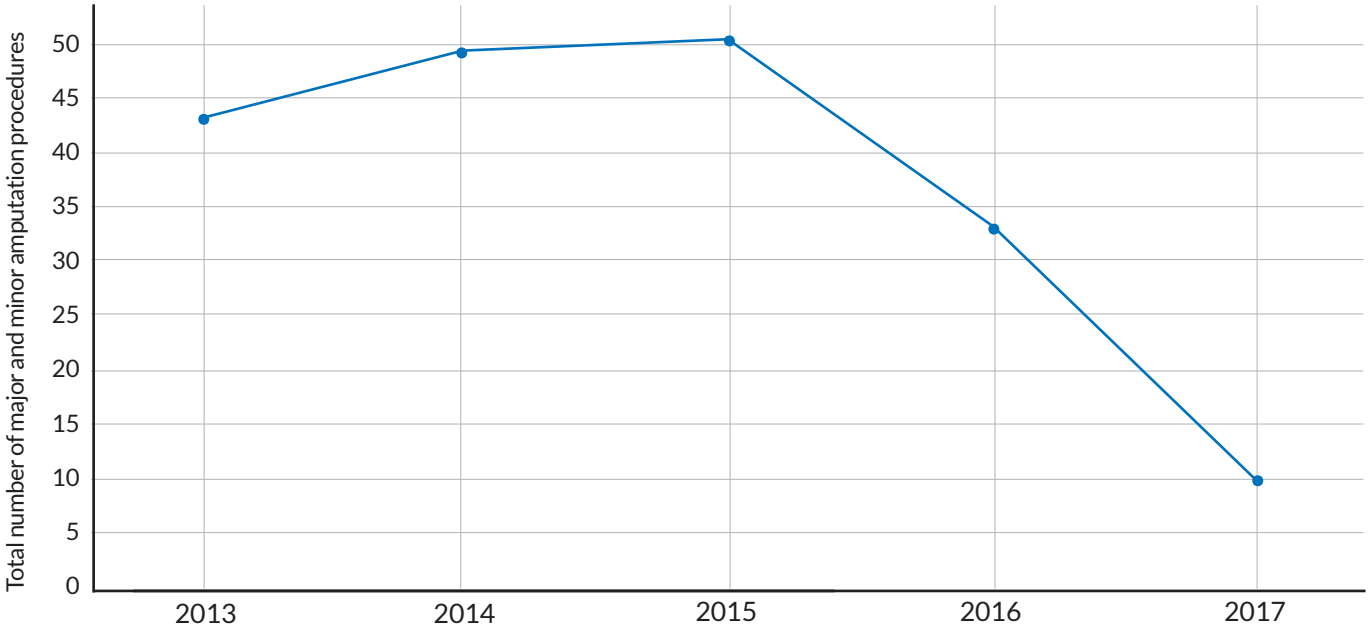
[31] *Agbor Ndip MD et al Dialysis Treatment Is an Independent Risk Factor for Foot Ulceration in Patients With Diabetes and Stage 4 or 5 Chronic Kidney Disease Diabetes Care 2010 Aug; 33(8): 1811-1816. https://doi.org/10.2337/dc10-0255*

[32] *Paisey RB, Abbott A, Levenson R et al. Diabetes-related major lower limb amputation incidence is strongly related to diabetic foot service provision and improves with enhancement of services: peer review of the South-West of England. Diabet Med. 2018 Jan;35(1):53-62*

South west: 10 steps to effective diabetic footcare services

1 Patient education at annual review
2 Regular community healthcare professional education
3 Adequate podiatry community staffing with rotation in to MDFT
4 Job planned MDFT weekly
5 Administrative support
6 Pathways and communication of plan of care to patient
7 Identification of diabetic inpatients and their foot checks
8 Orthotist an integral part of MDFT
9 Urgent vascular opinion available to foot clinic staff
10 Ulcer database and root cause analysis of all amputations

Figure 17: Count of amputations in diabetes, by year for Northern Devon Healthcare NHS Trust



Source: HES APC Apr 13 - Mar 18

Recommendation	Actions	Owners	Timescale
11. All trusts should have a dedicated multi-disciplinary footcare service (MDFS) as stated in the NHS Long Term Plan and NICE NG19. The service should be well integrated with the community footcare protection service (FPS), and with hospital renal wards and dialysis units given the increased risk of amputation for diabetic patients in these areas. CCGs and STPs should ensure that community foot protection teams are trained to carry out foot screening and that the community service is structured to deliver the standards recommended in NG19.	**a** Trusts and local commissioners should implement the ten key elements of an effective diabetic footcare service as developed in the south west to reduce preventable foot ulcers and amputations.	GIRFT, NICE, College of Podiatry , CCGs, STPs, ICSs.	To be completed within three years of report publication.
	b GIRFT will work with other stakeholders to create a toolkit for trusts to improve the quality of footcare service they provide.	GIRFT, NHSE/NHSI, College of Podiatry.	For progress within 12 months of publication.

WORKING WITH COMMUNITY SERVICES TO IMPROVE FOOTCARE AND REDUCE AMPUTATIONS

University Hospitals of Derby and Burton NHS Foundation Trust

The Derby multi-disciplinary footcare service (MDFS) has seen a reduction in major amputations as a result of integrated working with the community-based foot protection service.

The two services share records, expertise and technology to ensure joined-up care. This enables more patients to be monitored and treated in the community, relieving pressure on the hospital-based MDFS, which was at capacity, while enhancing the quality of MDT clinics.

Integrated weekly MDT clinics

Community-based specialist podiatrists rotate into the MDFS, with at least five podiatrists at each weekly MDT clinic, and also take part in twice-weekly diabetic footcare ward rounds. The acute trust in turn provides training, support and research opportunities for the podiatrists that would not be available in the community.

Orthopaedic and vascular surgeons also attend weekly MDT clinics, which enables a holistic approach to planned surgical interventions for more complex patients.

Monitoring patients with digital imaging

In 2016, the acute trust established a pilot to provide digital imaging for the community footcare team in Derby, so they can provide follow-up care for patients whose condition is stable. Digital imaging enables staff to accurately measure and monitor diabetic foot wounds, assess any changes and escalate to the MDFS if any concerns are identified. After a successful pilot, the trust received support from the NHS England Transformation Fund to extend it across south Derbyshire.

Results

Around 20% of appointments have moved from hospital to community settings, with accumulated savings on tariff for the CCG of £164,000. More patients are being treated closer to home and the changes have freed up capacity for the hospital-based footcare service to focus on more complex cases. Combined with job-planned joint MDT clinics, the changes have meant amputation rates, previously higher than national average, are now at national average and continue to decline.

Theme 11: Vascular networks

Vascular impairment is a key contributor to diabetic foot ulceration and amputation. It is therefore vital for diabetes patients who are at risk of developing footcare problems to have access to good vascular services to help prevent complications.

The GIRFT report on Vascular Surgery recommended reconfiguring vascular services along a hub and spoke models. These 'vascular networks' would ensure availability of services for everyone who needs them as close as possible to where they live. They should be integrated with diabetic footcare services to ensure continuous care.

During the deep dive process, some spoke hospitals reported difficulty in obtaining urgent vascular opinion. GIRFT tried to analyse HES data in conjunction with data from our bespoke questionnaire to see if there is a difference in access between hub and spoke hospitals, and whether such a difference might be reflected in the number of major amputations. Our analysis proved inconclusive. GIRFT will continue to monitor this issue.

Ensuring access to vascular services in spoke hospitals

In response to the apparent variation we found, we have identified a number of potential solutions which could overcome challenges in accessing a vascular opinion in spoke hospitals. These include:

- Holding multi-disciplinary diabetes footcare clinics ideally twice a week.
- Ensuring a vascular surgeon is on site whenever there is a multi-disciplinary footcare clinic.
- Developing closer relationships between diabetes and vascular services, with a key role for nurses to act as a liaison between teams.
- A member of the vascular team reviewing every patient admitted with an acute footcare problem within 24 hours of admission.
- A service level agreement or standard governing how hubs will provide cover to support spokes when needed.
- Governance over every hub and spoke link to ensure that the service is being delivered as specified, with auditing and national benchmarking of outcomes for people with diabetes managed in the vascular service.
- Closer working and outreach with primary care and community-based teams (including podiatrists), ensuring links to MDFTs.

Recommendation	Actions	Owners	Timescale
12. Everyone with a diabetic footcare emergency requiring admission should be assessed the same day by the MDFS. If the MDFS identifies vascular impairment, they should have same day access to a vascular opinion, according to NICE NG19, whether the hospital is a vascular service hub or a spoke. If the MDFS is not present, the patient must still be assessed same day, which may require transfer to the vascular service.	**a** GIRFT diabetes and vascular surgery workstreams will work together to monitor and identify an evidence base for vascular access.	GIRFT.	To be completed within a year of report publication.

REDUCING AMPUTATIONS THROUGH A FOOTCARE PATHWAY WITH IMPROVED VASCULAR ACCESS

Northern Devon Healthcare NHS Trust

Northern Devon has achieved a significant reduction in amputations by implementing a new footcare pathway integrated with community and vascular services.

The trust had the highest rate of amputations in its area. To turn this around it introduced a footcare pathway with triage managed by the multi-disciplinary footcare service (MDFS), which includes vascular surgery, podiatry, tissue viability and diabetes specialist nursing.

Fast review and triage

The MDFS links with community podiatrists weekly through a virtual diabetes foot clinic (VDFC). Enhanced communication and emailed ulcer images enable the team to review cases quickly to determine what further management or investigations are needed and, if necessary, vascular opinion or intervention.

Simple lesions can be managed locally with advice from the VDFC without the need for travel, while those at risk can be quickly triaged to the MDFS, or the vascular hub in Taunton. The pathway also tracks discharges from the hub to ensure patients are not lost to follow up.

Results

Amputations have reduced and fewer patients need MDFS appointments with many managed through advice and virtual review.

Data and coding

Theme 12: Data and coding

Data reliability

Good data is essential to better understand levels of care, cost and patient outcomes and identify ways to improve.

However, diabetes data being collected in hospitals is not always reliable due to differences in the way it is collected. For example, some trusts' length of stay rates are higher, not because of poor performance, but because they include the time the patient spends in rehabilitation after their operation or treatment. We need to start collecting and analysing the same data in the same way using the same methodology across all trusts, so that we know exactly how we are doing and can benchmark against good practice.

Owning and engaging with data

Diabetes teams should own their own data, working with IT and analysts to ensure it is collected and reviewed in ways that are helpful to the team. Teams should receive data every quarter at a minimum and track performance over time in order to improve outcome measures such as length of stay and readmission rates.

National audits

Regular, ongoing audits are the best way to track and maintain progress over time. Diabetes has several annual audits but complete data is lacking in many areas, such as the Diabetic Footcare Audit – see theme 10.

We believe that every acute trust should submit data to the National Diabetes Audit, the National Diabetes Inpatient Audit and the National Diabetes Footcare Audit including continuous reporting of harms and quarterly review of operational results, and be supported to do this by IT, analysts and coders. Trusts should benchmark their data against other trusts with a similar specification of service.

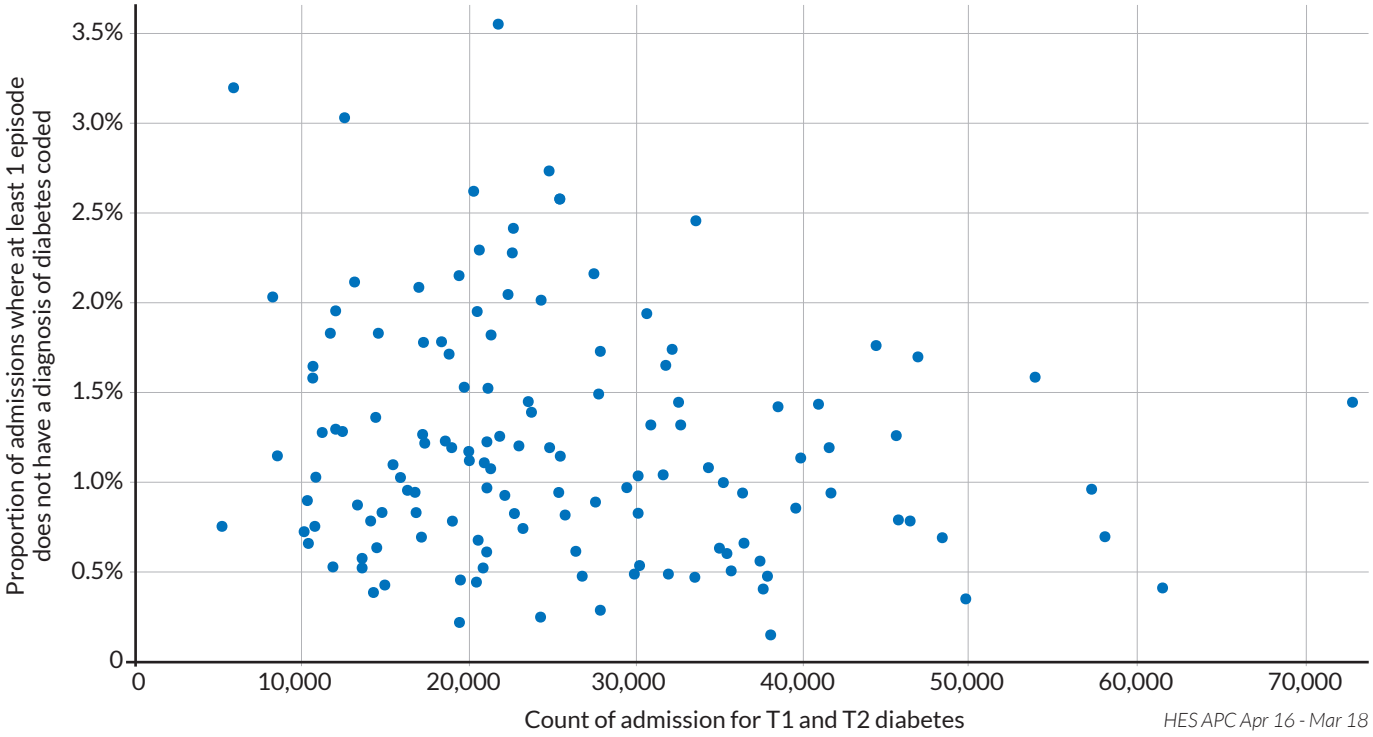
Coding

Coding is an internal management process in which each step of care is translated into a code, which is then used to apportion payment for NHS services. It also affects the quality of data collected and can skew and obscure our picture of what is happening in diabetes services if events are not recorded accurately.

There is a lot of inconsistency in coding related to diabetes. In many cases, the patient's diabetes is not coded for some stages and episodes of care, which can lead to under-estimates of the diabetes need – figure 18 (see p52) shows that patients' diabetes is not coded for each episode in up to 3% of cases. This should normally only happen if the patient has been newly-diagnosed with diabetes during their stay in hospital.

Diabetes should be coded consistently and accurately. To achieve this, it is important that diabetes teams work closely with coders and that diabetes is identified on every admission – see theme 6.

Figure 18: Proportion of admissions of patients with diabetes coded where the diagnosis is not coded on each episode



Recommendation	Actions	Owners	Timescale
13. Local commissioners should build in clear contractual requirements for trusts to collect and submit data to the National Diabetes Audit, including data on type 1 patients aged 19-25, and to the National Diabetes Inpatient Audit and National Diabetes Footcare Audit. Trusts should work to improve the quality and consistency of clinical coding.	**a** GIRFT will work with trusts, systems and NHS Digital to enable them to meet their contractual obligations to submit data to national audits.	GIRFT, individual trusts, NHS Digital, Diabetes UK, STPs/ICSs.	12 months from report publication.
	b GIRFT will highlight best practice in clinical coding for trusts to adopt.	GIRFT.	12 months from report publication.

Procurement and medicines optimisation

People with diabetes are reliant on medicines and technologies to help manage their blood glucose levels, reduce their risk of complications and improve their quality of life. However, we observed from our visits that there is variation both in access to these technologies and medicines, and also how they are procured. This in turn has led to high variation in what is purchased and the prices paid.

For this report we have focused on the areas that offer the greatest potential for savings and improvement, valuing quality of life for patients equally with safety and cost considerations:

- Insulin pumps
- Continuous glucose monitoring (CGM)
- Diabetic footwear
- Diabetes medicines, including oral antidiabetic agents and blood glucose test strip.

Insulin pumps

The NHS generally lags behind other European countries in its provision of insulin pumps[33]. Uptake varies with demand, budgets and the availability of healthcare professionals with relevant experience to support people using the technology. From a commercial perspective one supplier currently dominates the market, effectively setting the price the NHS pays for pumps. But availability of a choice of insulin pumps and suppliers is crucial to improve access and drive competition.

The NHS procurement category towers can play a significant role in addressing these issues, so we recommend they develop and implement a national framework for CCGs and trusts to secure better value from insulin pumps for the NHS and take advantage of new technologies, such as the closed loops being developed through linking of pumps and CGM devices. We also recommend the towers, working with GIRFT and NHSE/NHSI, explore a value/outcome approach to procurement where suppliers are paid, at least partly, on outcomes achieved rather than just supply. For example, suppliers could be paid through tiered payments based on 'time in range' glucose control. This would incentivise them to take an active part in the performance of the device, providing better support for people with diabetes and taking some of the pressure off NHS staff.

Continuous glucose monitoring (CGM)

Of the approximately 250,000 people with type 1 diabetes in England, only around 7,000 are using CGM. Some experts believe that up to 15-20% of a type 1 diabetes population could benefit from their use – a potential seven-fold increase – if the evidence can show that CGM improves blood glucose control, reduces episodes of hypoglycaemia, and is cost effective in meeting these aims. Even if the evidence could be strengthened, uptake would still be hampered by the general lack of staff and resource needed to initiate people on CGM. NHS England has expressed a desire to encourage greater self-management and use of technology, with plans to extend the benefits of CGM and closed loop technology to more patients where possible. We think that a new procurement model could help these efforts by generating savings which could be used to support a potential future roll out of CGM, as well as standardising specifications to drive down prices.

Diabetic footwear

As part of this review we were also keen to examine the costs and variation in the use of a diabetic footwear across the UK. However, we found it extremely difficult to obtain data to draw any conclusions, largely because footwear is often prescribed through orthotic departments for which there is no national dataset. That said, the category tower responsible for footwear is keen to gain a greater understanding of costs and variation so they can better help the NHS secure value for money. Their initial observations suggest there is significant variation in suppliers, brands and prices across the service, and so are planning to develop new framework arrangements for 2020. The GIRFT team recommend trusts work with the towers to ensure the NHS gets better value from this area.

Procurement strategy

We believe that savings from procurement of insulin pumps and footwear, combined with potential savings from optimisation of diabetes medicines (see Medicines optimisation), could help to fund the required increase in uptake of CGM and closed loop insulin delivery technology, which mimics the functions of the pancreas. GIRFT intends to work with NHSE, NHSI, commissioners and trusts, along with category towers and industry to work out a model for this to happen, including exploring bundled regional deals.

[33] *https://jdrf.org.uk/news/uk-still-trails-europe-usa-providing-insulin-pumps-type-1-diabetes/*

Medicines optimisation

Medicines used in diabetes management[34] in secondary care cost £41 million[35] in 2018/19, over a third of which was glucose testing strips provided by hospital pharmacies. In primary care, the cost was more than £1billion[36], including around £105m on strips.

Table 1: Primary and secondary care spend on medicines used in the management of type 1 and 2 diabetes based on BNF chapter 6.1 for FY 2018/19

Cost (£)	Primary care[1]	Secondary care[2]
Biguanides - 6.1.2.2	£84,899,248	£661,626
Sulfonylureas - 6.1.2.1	£21,942,135	£158,737
Other antidiabetic drugs - 6.1.2.3	£397,658,922	£7,980,483
Short-acting insulins - 6.1.1.1	£104,256,087	£5,366,414
Intermediate and long acting insulins - 6.1.1.2	£225,383,660	£7,432,840
Diagnostic and monitoring devices for diabetes mellitus - 6.1.6	£165,168,185	£16,719,222
Treatment of hypoglycaemia	£3,983,499	£2,560,110
Total	**£1,003,291,736**	**£40,879,432**

Table 1 shows the top-level analysis of the spend on the different classes of medicines used in diabetes. The total spend on biguanides, including metformin, and sulfonylureas is considerably lower, despite higher levels of prescribing, than the spend on 'other' oral antidiabetic agents across all healthcare settings. This is because these older drugs have lost patent and are available as generics. The cost of individual medicines is largely consistent in primary care, due to Drug Tariff pricing. But procurement frameworks are in place for secondary care, so medicine costs differ across organisational boundaries.

Oral antidiabetic agents

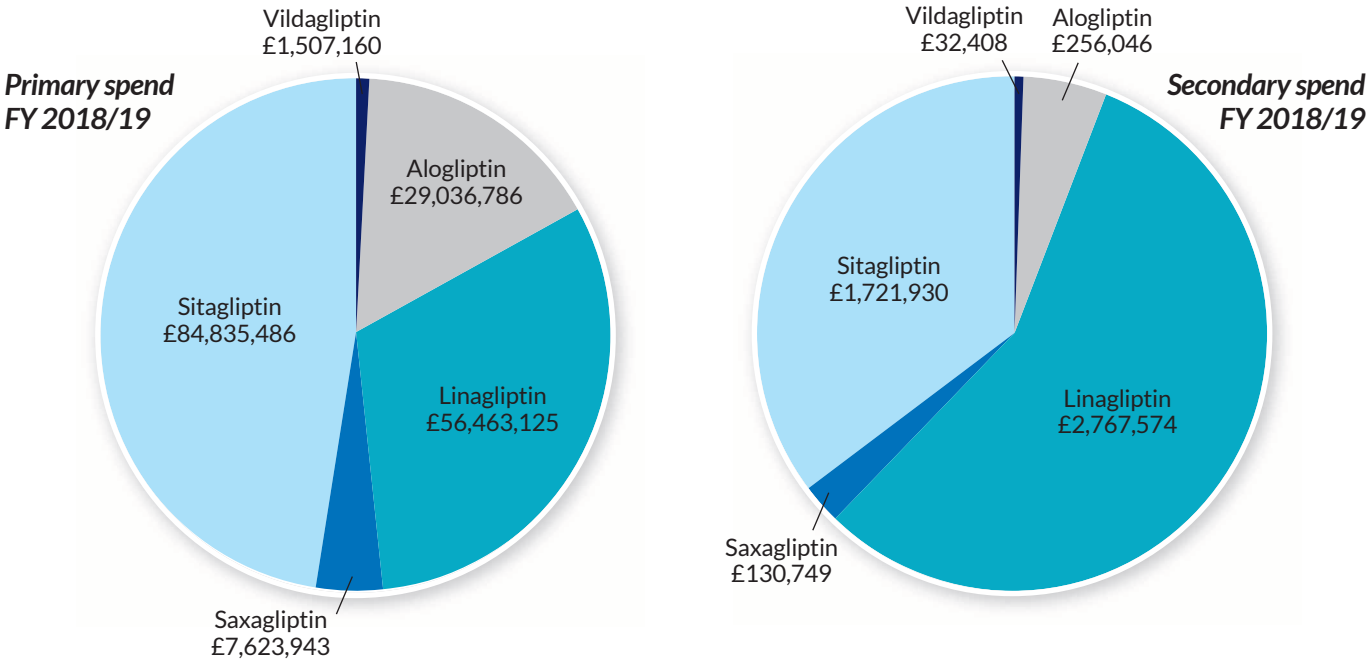
NICE guideline (NG28)[37] states that first line oral antidiabetic treatment for adults diagnosed with type 2 diabetes should include metformin. Where this is not clinically appropriate, or the patient's diabetes is not controlled by metformin, second line options include the use of sulfonylurea, pioglitazone, or dipeptidyl peptidase-4 (DPP-4) inhibitor or sodium–glucose co-transporter 2 (SGLT-2) inhibitors. The guidance does not state a preference for second line treatment of type 2 diabetes. Where two drugs in the same class are deemed clinically appropriate, it recommends choosing the option with the lowest acquisition cost.

DPP-4 inhibitors

An analysis of DPP-4 inhibitors, highlights significant opportunities to maximise efficiencies and optimise use of the lowest acquisition cost medicines for type 2 diabetes in adults.

[34] *Based on the British National Formulary BNF Chapter 6.1*
[35] *Rx-Info Define® data system*
[36] *ePACT-2 primary care data system*
[37] *National Institute of Clinical Excellence (2015). NICE guideline [NG28]. Type 2 diabetes in adults: management*

Figure 19: Total spend on DPP4-inhibitors in primary and secondary care for FY 2018/19



The DPP-4 total spend for 2018/19 was £179,466,502 in primary care and £4,908,707 in secondary care[35]. This is split across five licensed agents, alogliptin, linagliptin, saxagliptin, sitagliptin, and vildagliptin[37]. Systematic review and meta-analysis show that all of these drugs deliver similar outcomes for HbA1c reduction. The rate of adverse events associated with them, including hypoglycaemia, is also similar[38]. However, the costs of these products vary. Alogliptin is the cheapest product currently on the market in primary care, whereas prices vary in secondary care depending on local contracts and frameworks.

Figure 19 shows that sitagliptin is the most-prescribed DPP-4 inhibitor in primary care, with a spend of £84,835,486. In secondary care, linagliptin is the most prescribed, with a spend of £2,767,574. Detailed analysis of the data by local health economy shows unwarranted variation in the choice of product within the same area between secondary care and primary care. This suggests poor clinical co-ordination and, in some cases, non-compliance with NICE guidance on using lowest acquisition cost products.

Alogliptin is the cheapest DPP-4 inhibitor available in primary care, 16-20% cheaper than other existing DPP-4 inhibitors at current Drug Tariff prices. More than 50 of 127 clinical commissioning groups (CCGs) have made significant savings from their prescribing budgets using alogliptin in preference to more expensive DPP-4 inhibitors[39]. Based on current prices, this indicates that there is a potential opportunity to make savings for the NHS, by switching patients to a better value product across the system. The savings have been estimated between £12m if there was a 50% switch of current patients in primary care and just under £1m if a similar switch is done in secondary care. If new patients were also initiated on alogliptin, the total potential saving would be around £20m.

However, we recognise that market factors will likely result in further price reductions over time, which may mean that the lowest acquisition cost product changes. There also is the potential for additional benefits from other oral antidiabetic drug classes over time as market factors influence prices.

NICE guidance review

Our recommendations on medicines optimisation are based on current NICE guidelines which are due for review. You can find details of what will be updated here: https://www.nice.org.uk/guidance/ng28/resources/2019-surveillance-of-diabetes-nice-guidelines-ng17-ng18-ng19-and-ng28-6837997933/chapter/Surveillance-decision?tab=evidence

[38] *Kay S, Strickson A, Puelles J, Selby R, Benson E, Tolley K. Comparative effectiveness of adding alogliptin to metformin plus sulfonylurea with other DPP-4 inhibitors in type 2 diabetes: a systematic review and network meta-analysis. Diabetes Therapy. 2017 Apr 1;8(2):251-73*

[39] *Neal, John. March 14, 2019. Letter from Takeda to Professors Jonathan Valabhji and Partha Kar*

Blood glucose testing strips

The NHS spends an estimated £167.5m - £200m each year on testing strips, which people with diabetes use with monitoring devices to check their blood glucose. In 2018/19 the spend on diagnostic and monitoring devices for diabetes was around £165 million in primary care and £16.7 million in secondary care. In primary care the strips are routinely made available over-the-counter at pharmacies through the NHS Drug Tariff, so GPs and CCGs make the decisions about whether to prescribe them. In secondary care, the data shows that many trusts do not routinely supply the strips via the pharmacy department and the test strips are procured via the NHS supply chain.

Although many CCGs have already implemented cost-effective use of blood glucose testing strips, there is still variation around prescribing habits with uncertainty around quality of strips. As a result, the NHS England and NHS Improvement diabetes team are investigating and are expected to announce their findings later this year as part of NHS England's Low Priority Prescribing team recommendations. NHSE's guidance on items that should not be routinely prescribed is silent on the prescription of strips pending the outcome of this review.

The cost of strips available on the Drug Tariff also varies from 10p to 30p per strip, and there are nearly 80 different brands and types, reflecting the multitude of meters currently available on the market. Many CCGs have sought to help prescribers by providing guidance on the best value meters and strips, but this guidance also varies across the NHS.

The current CCG-led arrangements are not cost effective and lead to wide and unfair variation in provision. If these variations could be reduced by moving towards nationally coordinated procurement, coupled with action on unnecessary prescribing (approximately £15m is spent in areas of type 2 diabetes where the use of strips is not recommended by NICE), we believe there is a significant opportunity for savings which could be reinvested in other appropriate areas.

The test strip industry has already begun to recognise the need for the NHS to bring this expenditure under control and have already begun to lower their prices, fearing competition is imminent.

Recommendation	Actions	Owners	Timescale
14. GIRFT and partner organisations should work together to assess the financial and clinical case for novel approaches to the procurement of insulin pumps, blood glucose testing strips, oral anti-diabetic agents and diabetes footwear, which may reduce costs and support increased uptake of continuous glucose monitoring and closed loop technology. This should be done in a way that maintains reasonable choice for people living with diabetes.	**a. Insulin pumps:** NHS category towers to work with NHSE/NHSI and GIRFT to develop and implement a new national procurement framework for pumps to reduce costs and improve outcomes including exploring value-based procurement approaches to engage industry in device performance.	GIRFT, NHS Category Towers, NHSE/NHSI (commercial team, diabetes programme team).	Ongoing.
	b. Glucose testing strips: The NHSE/NHSI diabetes team to complete investigations on use of strips, and to assess quality to deliver a standard specification for the NHS. NHS category towers or other centralised procurement function to use this standard specification with the NHS having power to drive down prices and reduce variation across the NHS.		
	c. Oral antidiabetic agents: Commercial Medicines Directorate to work with NHS England diabetes team and regional pharmacists to develop a more strategic approach which aligns clinical and commercial priorities – making increased use of products with evidence of outcomes and using best value medications where clinical outcomes are similar.		
	d. CGM: NHSE/NHSI, GIRFT and commissioners to develop a model in which savings achieved from strips, insulin pumps and medications can support NHSE in extending access to CGM and closed loop technology to improve outcomes.		
	e. Diabetic footwear: NHS trusts to work with the category towers to reduce variation and identify potential savings from procurement of footwear.		

Reducing the impact of litigation

As well as looking at addressing variation in clinical practice, each of the GIRFT programme teams has been asked to examine the impact and causes of litigation in their field – with a view to reducing the number of incidents that lead to litigation.

Because diabetes and related complications are associated with long-term multiple organ failure, and involve a wide range of surgical and medical specialties, NHS Resolution does not have a separate claims category specifically for diabetes. This makes it difficult to learn from claims and improve care delivered to people with diabetes within the NHS at a national level.

About the data

We sourced data from NHS Resolution on all medical negligence claims (open or closed) notified between April 2013 and April 2018. We performed a word search of the incident details for all acute provider trust claims, using these search terms: "Diabetes", "diabetic", "insulin", "DKA", "Ketoacidosis", "Hyperglycaemia", "Hyperglycaemic", "Hypoglycaemia" and "Hypoglycaemic". Any claims related to children (defined as age 18 or under at the time of the incident), claims coded under 'Obstetrics' or 'HM Prison Medical/ Dental', Ian Paterson-related claims and all Dartford cases were excluded from the search. We identified 348 claims using the key words. Having reviewed each of these claims, we found 251 claims that directly related to diabetes.

Although we made every effort to produce the most accurate data, there are significant caveats when reviewing claims related to diabetes through this approach. The number of claims is likely to be under-represented due to the limitation of accurately identifying all diabetes-related claims through a word search. However, the data presented here provides national litigation data in diabetes for the first time.

Claims trends and causes

Table 2: Volume and cost of medical negligence claims related to diabetes (identified through word search as described in about the data) notified to NHS Resolution 2013/14 to 2017/18

Year	No. of Claims	% change in Claims No.	Total Cost (£m)	% change in Total Cost
2013/14	45		£10.7	
2014/15	50	11%	£7.4	-30%
2015/16	59	18%	£8.5	15%
2016/17	48	-19%	£11.9	40%
2017/18	49	2%	£18.0	51%
Total	**251**		**£56.5**	

Source data: NHS Resolution 2012/13 to 2017/18

Due to the multi-factorial nature of the claims, they often have more than one cause attributed to them. This means there are more causes identified than claims listed.

The most common causes for claims were 'Treatment' (192 claims, 63%), 'Diagnosis' (59 claims, 19%), 'Nursing/Assistance care' (32 claims, 11%), 'Discharge' (6 claims, 2%) and 'Infection/ Sepsis' (4 claims, 1%).

Under 'Treatment', 55 claims (19%) were related to medicine errors, of which 33 claims were related to insulin prescription or administration error. Overdose of insulin due to abbreviations or incorrect device is listed as one of the NHS never events[40]. These events represent system failure and are patient safety issues that can be eradicated by more diligent organisation and clear protocols designed to prevent these errors.

[40] *NHS Improvement. Never Events list 2018.*

The Rapid Response report on safer administration of insulin published by the National Safety Agency in 2010 identified two common preventable errors relating to dose – using abbreviations when prescribing insulin, and failing to use insulin syringes. The report outlined six action points to be completed by all service providers[41]. Another patient safety alert was issued in 2016 by NHS Improvement regarding the risk of severe harm and death due to withdrawing insulin from pen devices[42]. Both reports highlighted that staff training on prescription and administration of insulin plays a key role in patient safety. As well as training, the implementation of electronic prescribing systems has the potential to improve patient safety through reduction of medicine errors, especially in incidents where patients received ten-fold or greater overdoses of insulin because the words 'units' or 'international units' are abbreviated.

Failures in treatment, including inappropriate or delayed treatment, accounts for 126 claims (41%). The nature of these claims varies from a delay in initiating treatment for patients suffering from diabetic ketoacidosis to failure to recognise complications of diabetes, such as gangrenous toes, leading to amputation. A total of 55 claims were associated with amputations. Not only are amputations associated with huge financial cost to the NHS, but they have tremendous psychological and emotional impact on people with diabetes. Providers should review their inpatient diabetes pathway to ensure early recognition of diabetes-related complications, prevent deterioration of pre-existing foot ulcers, and avoid new injuries during their inpatient stay. There should be a clear protocol for the provision of care for these patients, whether it is through a diabetic footcare unit, or a vascular or orthopaedic surgeon, so that all patients receive the right care first time.

NHS Resolution review

NHS Resolution is currently reviewing its coding with a view to developing a common taxonomy for claims which align with the current work being undertaken via the Patient Safety Incident Management System (PSIMS) by the NHSE/NHSI national patient safety director's team. It is also exploring possible changes to coding as part of a commissioned programme of work reviewing its current claims management system.

Recommendation	Actions	Owners	Timescale
15. Reduce litigation costs by applying the GIRFT Programme's five-point plan (see Actions, **15A-E**).	**a** Clinicians and trust management to assess their benchmarked position compared to the national average when reviewing the estimated litigation cost per activity. Trusts received this information in the GIRFT 'Litigation data pack' published in June 2019. Although claims relating to diabetes have not been directly identified in the data pack as a separate specialty, trusts can learn from claims relating to diabetes by following the five-point plan for all medical and surgical claims listed, as a proportion of these relate to diabetic patients.	Individual trusts, NHS Resolution.	Ongoing.
	b Clinicians and trust management to discuss with the legal department or claims handler the claims submitted to NHS Resolution included in the data set to confirm correct coding to that department. Inform NHS Resolution of any claims which are not coded correctly to the appropriate specialty via CNST.Helpline@resolution.nhs.uk		
	c Once claims have been verified, clinicians and trust management to further review claims in detail including expert witness statements, panel firm reports and counsel advice, as well as medical records, to determine where patient care or documentation could be improved. If the legal department or claims handler needs additional assistance with this, each trust's panel firm should be able to provide support.		

[41] *Rapid Response Report NPSA/2010/RRR013: Safer administration of insulin. https://www.sps.nhs.uk/wp-content/uploads/2018/02/2010-NRLS-1243-Safer-administrmation-2010.06.16-v1.pdf*

[42] *Patient Safety Alert: Risk of severe harm and death due to withdrawing insulin from pen devices https://improvement.nhs.uk/documents/510/Patient_Safety_Alert_-_Withdrawing_insulin_from_pen_devices.pdf*

Recommendation	Actions	Owners	Timescale
15. Continued Reduce litigation costs by applying the GIRFT Programme's five-point plan (see Actions, **15A-E**).	**d** Claims should be triangulated with learning themes from complaints, inquests and serious untoward incidents (SUI)/serious incidents (SI)/patient safety incidents. Where a claim has not already been reviewed as SUI/SI/patient safety incident, we would recommend that this is carried out to ensure no opportunity for learning is missed. The findings from this learning should be shared with all frontline clinical staff in a structured format at departmental/ directorate meetings (including multidisciplinary team meetings, morbidity and mortality meetings where appropriate).	Individual trusts, NHS Resolution.	For continual action through GIRFT and NHS Resolution's collaborative work.
	e Where trusts are outside the top quartile of trusts for litigation costs per activity, national clinical leads and regional hubs will follow up and support trusts in taking steps to learn from claims. They will also be able to share examples of good practice where it would be of benefit the trust.		
	f NHS Resolution to develop its clinical coding to enable the identification of all claims that relate to diabetes either as a primary or secondary factor in a claim. Claims related to diabetes should be coded separately to help identify the true prevalence of diabetes in clinical negligence claims.		

Financial impact and opportunities

Our report sets out a number of ways which we can improve hospital diabetes services in England, and deliver better care for patients, based on existing resources.

When implemented the recommendations have the potential to improve the long-term management of diabetes and prevent associated complications, such as diabetic ketoacidosis (DKA), foot ulceration and amputation. This in turn will help to reduce length of stay, readmission rates and day case to inpatient conversion.

The opportunity is significant as it is estimated that up to 20% of all hospital inpatients have diabetes. Many of them are admitted for reasons other than their diabetes, therefore the notional financial opportunity is not limited to acute diabetes services but also extends to other specialities.

Notional financial opportunity

We have estimated the notional financial opportunity in diabetes at between £45.87m and £117.2m. We have made these calculations conservatively based on anticipated efficiencies ranging from the lower quartile to national average.

These figures are for illustration only, and are designed to highlight the opportunities that may be possible. They are in addition to potential savings that have been identified in the procurement of testing strips and meters – see Procurement, page 53.

Recommendation	Improvement	Lower quartile opportunity		National average opportunity	
		Target	Saving	Target	Saving
1	Clear pathway for transition from paediatric to adult diabetes service	15% reduction in DKA admissions among 18-25 year-olds	£1.39m	56% reduction in DKA admissions among 18-25 year-olds	£5.25m
2, 3, 4	Increase technology available to staff and patients, staff training and patient education	15% of total emergency admissions diabetes-related	£17.96m	13.4% of total emergency admissions diabetes-related	£41m
5, 7, 8, 10	Dedicated MDiTs. Identifying diabetes on admission and ensuring rapid referral, increased self-management whilst in hospital	7.67 days average emergency length of stay for people with diabetes	£18.4m	6.99 days average emergency length of stay for people with diabetes	£48.85m
		16% emergency readmissions for people with diabetes	£4m	14.5% emergency readmissions for people with diabetes	£12.4m
9	Clear, audited perioperative pathways from pre-assessment through to discharge	5.3% conversion rate day case to inpatient	£1.2m	4.5% conversion rate day case to inpatient	£2m
11, 12	Dedicated multi-disciplinary footcare service and patient access to vascular services	0.8% of diabetes patients have an amputation	£2.9m	0.57% of diabetes patients have an amputation	£7.6m
TOTAL			**£45.85m**		**£117.1m**

About the GIRFT programme

Getting It Right First Time (GIRFT) is a national programme designed to improve medical care within the NHS.

Funded by the Department of Health and Social Care and jointly overseen by the Royal National Orthopaedic Hospital NHS Trust and NHS England and NHS Improvement, it combines wide-ranging data analysis with the input and professional knowledge of senior clinicians to examine how things are currently being done and how they could be improved.

Working to the principle that a patient should expect to receive equally timely and effective investigations, treatment and outcomes wherever care is delivered, irrespective of who delivers that care, GIRFT aims to identify approaches from across the NHS that improve outcomes and patient experience, without the need for radical change or additional investment. While the gains for each patient or procedure may appear marginal they can, when multiplied across an entire trust – and even more so across the NHS as a whole – deliver substantial cumulative benefits.

The programme was first conceived and developed by Professor Tim Briggs to review elective orthopaedic surgery to address a range of observed and undesirable variations in orthopaedics. In the 12 months after the pilot programme, it delivered an estimated £30m-£50m savings in orthopaedic care – predominantly through changes that reduced average length of stay and improved procurement.

The same model is now being applied in 40+ different areas of clinical practice. It consists of four key strands:

- a broad data gathering and analysis exercise, performed by health data analysts, which generates a detailed picture of current national practice, outcomes and other related factors
- a series of discussions between clinical specialists and individual hospital trusts, which are based on the data – providing an unprecedented opportunity to examine individual trust behaviour and performance in the relevant area of practice, in the context of the national picture. This then enables the trust to understand where it is performing well and what it could do better – drawing on the input of senior clinicians
- a national report, that draws on both the data analysis and the discussions with the hospital trusts to identify opportunities for NHS-wide improvement
- an implementation phase where the GIRFT team supports providers to deliver the improvements recommended.

GIRFT and other improvement initiatives

GIRFT is part of an aligned set of workstreams within NHS Improvement. It is the delivery vehicle for one of several recommendations made by Lord Carter in his February 2016 review of operational efficiency in acute trusts across England.

As well as support from the Department of Health and Social Care and NHS England and NHS Improvement, it has the backing of the Royal Colleges and professional associations.

GIRFT has a significant and growing presence on the Model Hospital portal, with its data-rich approach providing the evidence for hospitals to benchmark against expected standards of service and efficiency. The programme also works with a number of wider NHS programmes and initiatives which are seeking to improve standards while delivering savings and efficiencies, such as NHS RightCare, acute care collaborations (ACCs), and sustainability and transformation partnerships (STPs).

Implementation

GIRFT has developed a comprehensive implementation programme designed to help trusts and their local partners to address the issues raised in trust data packs and the national specialty reports to improve quality. GIRFT regional hubs provide support at a local level with clinical and project delivery leads able to visit trusts and local stakeholders in each region on a regular basis. They advise on how to reflect the national recommendations into local practice and support efforts to deliver any trust specific recommendations emerging from the GIRFT visits. These teams also help to disseminate best practice across the country, matching up trusts who might benefit from collaborating in selected areas of clinical practice.

Through all its efforts, local or national, the GIRFT programme strives to embody the 'shoulder to shoulder' ethos that has become GIRFT's hallmark, supporting clinicians nationwide to deliver continuous quality improvement for the benefit of their patients.

Glossary

Co-morbidity

The simultaneous presence of two or more chronic (long-term) diseases or conditions in a patient.

Category towers

The procurement function of the NHS Supply Chain operating model. The 11 category towers undertake clinical evaluation of products and run procurement processes.

www.supplychain.nhs.uk/sccl

Closed loop pump system

A system connecting an insulin pump with a continuous glucose monitoring device (see below), also known as an artificial pancreas. The pump automatically delivers insulin infusions based on live blood glucose readings from the monitoring device, so patients don't need to programme the required amount.

Community foot protection service

A service, usually led by a podiatrist and based in a health centre or GP surgery, which specialises in providing foot care for people with diabetes, preventing diabetic foot problems and dealing with foot problems that don't need to be treated in hospital.

Continuous glucose monitoring (CGM)

A small sensor worn just under the skin, which records blood glucose levels continuously throughout the day and night, with software that automatically delivers data to a display device and allows patients to set alerts when their blood glucose gets too high or too low.

Continuous subcutaneous insulin infusion (CSII)

A pump that infuses programmable amounts of insulin from a small device attached to the body through a cannula to keep blood glucose stable 24 hours a day.

DAFNE

DAFNE (dose adjustment for normal eating) is an educational charity that runs courses for people with type 1 diabetes teaching them to manage their daily insulin intake and adjust it to their food.

Diabetic ketoacidosis (DKA)

A serious complication that occurs when the body is severely lacking insulin. It results in a build-up of ketone chemicals, which turn fat into acids that build up in the blood – see ketones. DKA, which mainly affects people with type 1 diabetes, can lead to diabetic coma and be life-threatening if not treated quickly.

Flash glucose monitoring (FlashGM)

A small sensor worn just under the skin, which records blood glucose levels continuously throughout the day and night, without the need for regular finger-prick tests.

Estimated Glomerular filtration rate (eGFR)

A measure of kidney health assessed through a blood test. A low eGFR number means the kidneys are not working well and may indicate kidney disease.

Glycaemic

The presence of glucose in the blood – too little glucose leads to hypoglycaemia, too much leads to hyperglycaemia. See hypoglycaemia and hyperglycaemia.

HbA1c

Glycated haemoglobin, created when the body can't use glucose and it sticks to the haemoglobin cells in the blood. The hbA1c test measures the build-up of glycated haemoglobin over time as a long-term measure of glucose in the blood.

Hospital episode statistics

Data on all admissions, out-patient appointments and A&E attendances at NHS hospitals in England. The aim is to collect a detailed record for each 'episode' of admitted patient care commissioned by the NHS and delivered in England, by either an NHS hospital or the independent sector. HES data is used in calculating what hospitals are paid for the care they deliver.

Hypoglycaemia / hypoglycemic event

Also known as a 'hypo', this is when blood sugar falls below safe levels, causing symptoms such as trembling, sweating, clumsiness and palpitations. Hypos can happen if someone hasn't had the right dose of insulin, or the balance of insulin and food is wrong. It can be serious if not treated quickly, but can usually be adjusted through eating.

Hyperglycaemia

When blood sugar is too high, associated with symptoms such as tiredness, thirst, frequent urination and blurred vision. Occasional episodes of hyperglycaemia are not serious, but can become so if they persist over a longer period.

Ketone/ketone meters

Ketones are chemicals in the body that build up when there is not enough insulin to turn glucose into energy. Ketones turn fat into energy instead, but are acidic and can be harmful at high levels in the blood – see Diabetic ketoacidosis (DKA). Ketone meters are devices, often used with test strips, that measure the level of ketones in the blood.

Multi-disciplinary foot service

A hospital-based footcare service specialising in problems such as foot ulcers and ischaemia. The team should include diabetologists (consultants who specialise in diabetes), podiatrists and diabetes nurse specialists, as well as other healthcare professionals with expertise in treating and managing diabetic foot problems.

National Institute for Health and Care Excellence (NICE)

Provides evidence-based guidance, advice, quality standards, performance metrics and information services for health, public health and social care.

www.nice.org.uk

NCEPOD

The National Confidential Enquiry into Patient Outcome and Death is a national charity that carries out studies into perioperative mortality and outcomes from surgery and the reasons behind them.

NHS Resolution (formerly the NHS Litigation Authority)

An arm's length body of the Department of Health that provides expertise to the NHS to resolve negligence concerns, share learning for improvement and preserve resources for patient care.

www.resolution.nhs.uk

Orthotic

Orthotic services provide aids such as prescription insoles, braces, splints, callipers and footwear, which help people recover from or avoid injury, or live with lifelong conditions.

Perioperative

Everything that happens before, during and after an operation, including admission to hospital, pre-surgery, anaesthesia, surgery, recovery and discharge.

QISMET

The Quality Institute for Self-Management Education and Training is an independent body that develops quality standards for self-management of medications and accredits self-management education courses.

Think Glucose

A national initiative to improve inpatient diabetes care, including the use of a 'traffic light' system to guide hospital staff on which patients should be referred to the multi-disciplinary inpatient team (MDiT).

VRIII

Variable rate intravenous insulin infusion is the infusion of insulin at a rate controlled by regular blood glucose measurements, sometimes used in hospitals to control a patient's blood glucose levels.

Acknowledgements

We'd like to thank everyone who contributed to the development of this report, starting with Professor Tim Briggs who initiated the GIRFT process and continues to guide its delivery and Rachel Yates for her leadership of the programme

We're grateful to the many colleagues in trusts across the country who took part in our deep dives visits for contributing their insights and experience. And to organisations such as Diabetes UK, JDRF and the Association of British Clinical Diabetologists (ABCD) for their ongoing support and advice, and for providing some of the evidence we've drawn on.

The GIRFT analytics team led by James Murphy played a crucial role, along with Methods Analytics, in preparing the data packs for each trust we visited, and analysing and visualising the hospital episodes statistics data that appear in the report.

We've had great support from the GIRFT diabetes team, including project manager Yvonne Frewin, who organised all of our hospital visits, Hassan Abu-Bakir, Marie Rogerson and Matthew Barker who guided the development of the narrative, and William Higgins who helped us to draft it.

Thanks also go to those who helped to develop the non-clinical elements of the report: John Machin and Cherrie Ho for the litigation section, John Warrington and Scott Pryde for procurement, Khola Khan and Andrew Davies for medicine optimisation and Julie Renfrew and Maddie Connelly for the financial impact statement.

Finally, as practising consultants, we'd like to thank our own trusts for being so understanding throughout the process – without that support we would not have been able to take on this important role.

Data and copyright acknowledgements

For more information about GIRFT,
visit our website: www.GettingItRightFirstTime.co.uk
or email us on info@GettingItRightFirstTime.co.uk

You can also follow us on Twitter @NHSGIRFT and
LinkedIn: www.linkedin.com/company/getting-it-right-first-time-girft

The full report and executive summary are also available to download as
PDFs from: www.GettingItRightFirstTime.co.uk