

# National Diabetes Inpatient Audit England, 2019

England

13 November 2020

## Full report

# Foreword

NaDIA 2019 shows that, since the audit began in 2010, the very impressive improvements in many aspects of inpatient diabetes care have continued, including reductions in **medication errors**, severe **hypoglycaemia** and hospital-acquired diabetic **foot lesions**.

However, the occurrence of some important and life-threatening harms remain-unchanged:

- Severe hypoglycaemic episodes in inpatients with type 1 diabetes
- Hospital-acquired diabetic ketoacidosis (**DKA**)
- Hospital-acquired hyperosmolar hyperglycaemic state (**HHS**)

DKA and HHS are preventable and should not occur during a hospital admission. In this respect it is of interest that all medication errors have reduced with the exception of one, the failure to increase insulin when the capillary blood glucose<sup>1</sup> (CBG) is persistently above 11 mmol/L, suggesting that focusing on staff training in hyperglycaemic management and insulin dose adjustment may reduce these life threatening harms.

It is important to recognise the hard work of diabetes teams and the almost one hundred per cent participation in this annual audit, without which we may not have realised these improvements nor identified where we need to redouble our efforts. No other healthcare service in the world has such comprehensive national data to evidence and direct change in inpatient care; a unique achievement for which we should be proud.

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Supporting data is outlined on [slide 9](#)

[Deep-dive reports](#) are available for each of the numbered chapters, plus the following topics: **foot disease management**, **blood glucose monitoring**, **use of insulin infusions** and a separate report on **hypoglycaemic episodes**.

The deep-dive reports contain additional background, analysis and clinical commentary. See [slide 9](#) for further information.

# Executive summary:

## Improvements in diabetes inpatient care



188 out of 193 hospital sites known to be eligible for NaDIA took part in the 2019 audit (97 per cent)<sup>1</sup>. The **commitment** and **hard work** by hospital teams to collect data and their dedication to using the analysed results to alter their practice has delivered some very encouraging **improvements**. This has been achieved with the help of an appreciable increase in staffing levels since NaDIA 2017, treating a consistently high proportion of people in hospital who have diabetes - 18 per cent in NaDIA 2019.

### NaDIA team

#### In the face of this heavy workload teams have:

- ✓ **Delivered more personal care** to inpatients with diabetes – 75 per cent of those surveyed in 2019 were **seen by the diabetes team** where appropriate<sup>2</sup> compared to only 54 per cent in 2010.
- ✓ Reduced the proportion of inpatient drug charts found to contain **medication errors** by 15 percentage points since 2010 (from 45 to 30 per cent).
- ✓ Reduced **severe hypoglycaemic** episodes from 12 per cent of inpatients during the last 7 days of their hospital stay in 2010 to 7 per cent in 2019.
- ✓ Reduced the need for **injectable rescue treatment** for severe hypoglycaemia – from 2.4 per cent of inpatients during the last 7 days of their hospital stay in 2010 to 1.4 per cent in 2019.
- ✓ Reduced patients developing **foot ulcers** at any point during their hospital stay – from 2.2 per cent of inpatients audited in 2010 to 1.1 per cent in 2019.



# Executive summary:

## Areas where further improvement needed



Despite the significant and important improvements documented in [slide 4](#), NaDIA also demonstrates that there is still **considerable scope for further improvements**.

### On the day of the audit in 2019, NaDIA found high levels of:

- **Medication errors** – almost 1 in 3 of the inpatient drug charts surveyed had at least one medication error.
- **Insulin errors** – two fifths of inpatient drug charts for insulin-treated inpatients had one or more insulin error.
- Hospital-acquired **diabetic ketoacidosis (DKA)**: on the day of the audit, 3.6 per cent of inpatients with type 1 diabetes had developed in-hospital DKA at any point during their hospital stay.
- **Capillary blood glucose**<sup>1</sup> (CBG) levels not being recorded at all recommended stages of the perioperative pathway<sup>2</sup>.

All of these findings clearly demonstrate the benefit of NaDIA in identifying areas on which to focus service improvements, and in driving and tracking change.

**NaDIA team**

**Notes:** 1. The concentration of glucose in the blood.

2. At sign-in and sign-out stages of the surgical safety checklist, during surgery, in theatre recovery, on arrival on the ward.



# Executive summary:

## Areas where action is recommended



**Recommendation 1:** The MDiT<sup>1</sup> should meet regularly to discuss day-to-day errors and safety issues, and report to a quarterly trust-level diabetes safety board. All hospital-acquired life-threatening episodes of hypoglycaemia, DKA and HHS should be recorded as serious incidents, submitted to NaDIA-Harms and root cause analysis undertaken.

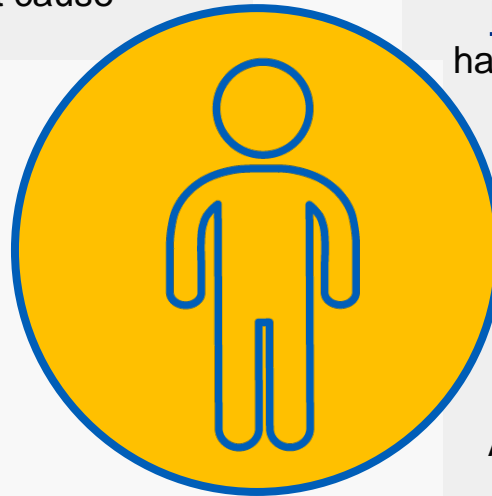
**Recommendation 6:** All trusts should have and promote a self-management policy, which supports patients who want to self-manage their diabetes to safely do so while in hospital, as clinically appropriate and in line with wider NHS England and NHS Improvement policies on inpatient self-management

**Recommendation 5:** All hospital trusts should have clear, audited perioperative pathways from pre-assessment through to discharge. These should be broadly in line with NCEPOD recommendations.

**Recommendation 2:** 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. Electronic records and prescribing should be implemented in support.

**Recommendation 3:** All trusts should 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.

**Recommendation 4:** 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.





**Notes:** 1. MDiT = Multi-disciplinary inpatient team.

# Introduction: Overview

- The National Diabetes Inpatient Audit (NaDIA) measures on one day the quality of diabetes care provided to all people with diabetes while they are admitted to hospital whatever the cause, and aims to support quality improvement.
- Data is collected and submitted by hospital staff in England. Wales did not participate in NaDIA 2019. Following a change in [legal basis](#)<sup>1</sup> in England to a Direction from NHS England for NHS Digital to process data, the Welsh Assembly government have been pursuing a request as a legal basis, but this was not completed in time for Welsh hospitals to participate.
- The NaDIA audit is part of the National Diabetes Audit (NDA) programme within the National Clinical Audit and Patient Outcomes Programme (NCAPOP), commissioned by the Healthcare Quality Improvement Partnership (HQIP).

This is the **full report**. **Deep-dive** reports are available for individual chapters, including four additional chapters. **Local reports** and **supporting data** are also published.

**Buttons** – *available on some slides*

	= Home (section/ contents)		= Further info (glossary)
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**Notes:** 1. EU General Data Protection Regulation. Article 6: Lawfulness of processing: <https://www.privacy-regulation.eu/en/article-6-lawfulness-of-processing-GDPR.htm>.

Prepared in collaboration with:



Supported by:



Public Health  
England



# Introduction: Audit questions

The audit sets out to measure the quality of diabetes care provided to people with diabetes while they are admitted to hospital, by answering the following questions:

- Did diabetes management minimise the risk of avoidable complications?
- Did harm result from the inpatient stay?
- Was patient experience of the inpatient stay favourable?
- Has the quality of care and patient feedback changed since NaDIA 2010, 2011, 2012, 2013, 2015, 2016 and 2017<sup>1</sup>?



The report will be of interest to the public, especially to people with diabetes. Health planners and policy makers, as well as acute NHS trusts, Clinical Commissioning Groups (CCGs), Local Health Boards (LHBs), Sustainability and Transformation Partnerships (STPs), Clinical Networks (CNs; formerly Strategic Clinical Networks or SCNs) and other providers and commissioners of specialist diabetes services will also make use of the information in this report.

## Notes:

1. Wales did not participate in NaDIA 2019 (see [slide 7](#)), so data from earlier years has been re-analysed to include English hospital sites only. To help ensure that tables and charts remain uncluttered as the audit duration increases, NaDIA 2011, 2012 and 2016 have been excluded from most tables and charts. There was no audit collection or report in 2014, so 2014 data is not available. Wales did not participate in NaDIA 2010.





# Introduction: Supporting data



NaDIA publishes a wealth of supporting data in addition to this report:

## Deep-dive reports

0	Key messages
1	Participation and prevalence
2	Inpatient harms
3	Medication errors
4	Care improvement initiatives
5	Staffing levels
6	Access to the diabetes team
7	Surgical care
8	Patient experience
9	<b>Foot disease management</b>
10	<b>Blood glucose monitoring</b>
11	<b>Use of insulin infusions</b>
12	<b>Hypoglycaemic episodes</b>

## Local reports

Hospital Level Analysis 2010-19	A wide range of NaDIA outputs at hospital site-level from 2010 to 2019
Hospital Characteristics Report 2019	All 2019 Hospital Characteristics results at hospital site-level, compared to national data
Hospital Characteristics Responses 2010-19	Time series of all comparable Hospital Characteristics results at hospital site-level from 2010 to 2019
Main Areas For Improvement Report 2015-19	Main areas for improvement at hospital site-level identified by inpatients with diabetes 2015 to 2019

## Supporting documents

One-page summary	Summary of the main report
Open data	Backing data in CSV format
Data quality statement	Details about the data collection
Methodology	Details about the methodology

**Bold** = Not covered in the [main report](#) (this document).



# Introduction: Terminology

## Main abbreviations

<b>DISN</b>	diabetes inpatient specialist nurse
<b>DKA</b>	diabetic ketoacidosis
<b>DSN/DISN</b>	diabetes (inpatient) specialist nurse
<b>HHS</b>	hyperosmolar hyperglycaemic state
<b>MDiT/MDFT</b>	multi-disciplinary (inpatient/foot care) team
<b>NICE</b>	National Institute for Health and Care Excellence
<b>OA-DA</b>	oral anti-diabetic agent

The above acronyms will not always be footnoted in the report. For an extended list of abbreviations, see [Glossary: Acronyms](#).

## Patient harms and medication errors

The audit looks at the proportion of inpatients that experience the following **patient harms** during their hospital stay:

- Severe hypoglycaemic episodes in the last 7 days
- Hypoglycaemic episodes requiring injectable rescue treatment in the last 7 days
- Hospital-acquired DKA and HHS
- Hospital-acquired diabetic foot lesions

**Medication errors** are broken down into two main sub-types:

- Prescription errors
- Glucose management errors

A further sub-category of **insulin errors** covers prescription and glucose management errors relating to insulin.

A single inpatient drug chart may contain multiple medication errors and a single inpatient may experience multiple patient harms.

For further information, see [Glossary: Patient harms](#) and [Medication errors: Definitions](#).

## Cohorts used in the report

Wales did not participate in NaDIA 2019, so NaDIA data from earlier years has been re-analysed to include **English hospitals only**.

Outputs are often split by **audit year** (see right) and/or **diabetes type**.

Inpatients with **type 1** diabetes are reported as a single group. Inpatients with **type 2** diabetes are grouped into three sub-categories based on their treatment type:

- **Type 2 (insulin)**
- **Type 2 (non insulin)**
- **Type 2 (diet only)**

Audit year	Notes <i>England and Wales unless stated</i>
2010	Full NaDIA, <i>England only</i>
2011	Full NaDIA, <i>first England and Wales</i>
2012 & 2013	Full NaDIA
2014	<i>No NaDIA</i>
2015 to 2017	Full NaDIA
2018	Hospital characteristics only
2019	Full NaDIA, <i>England only</i>

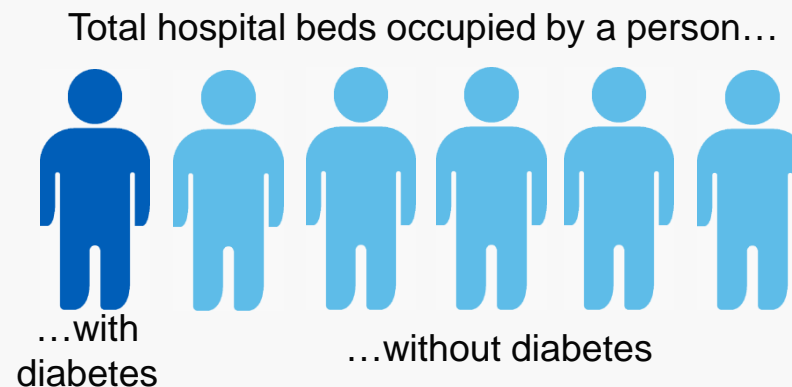
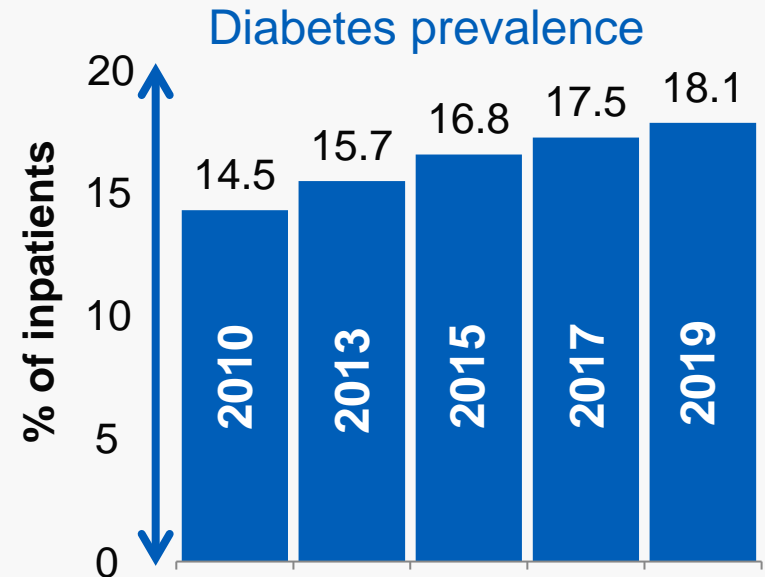
For further information, see [Glossary: Diabetes type](#) and [Diabetes treatments](#).



# 1. Key messages: Participation and prevalence

## Findings

- 188 out of 193 hospital sites known to be eligible for NaDIA took part in the 2019 audit (**97 per cent**)<sup>1</sup>.
- Bedside data on 15,479 inpatients in England was submitted, almost 600 more inpatients than NaDIA 2017<sup>2</sup>.
- Over half of inpatients returned a Patient Experience questionnaire (56 per cent).
- Around **1 in 6** hospital beds are occupied by a person with diabetes (18 per cent, an increase from 14 per cent in 2010). 1 in 15 of the total population have diabetes (7 per cent).
- In 11 hospital sites, over **one quarter** of inpatients have diabetes (25 to 31 per cent).



**Notes:** 1. Eligibility inferred from past NaDIA participation.

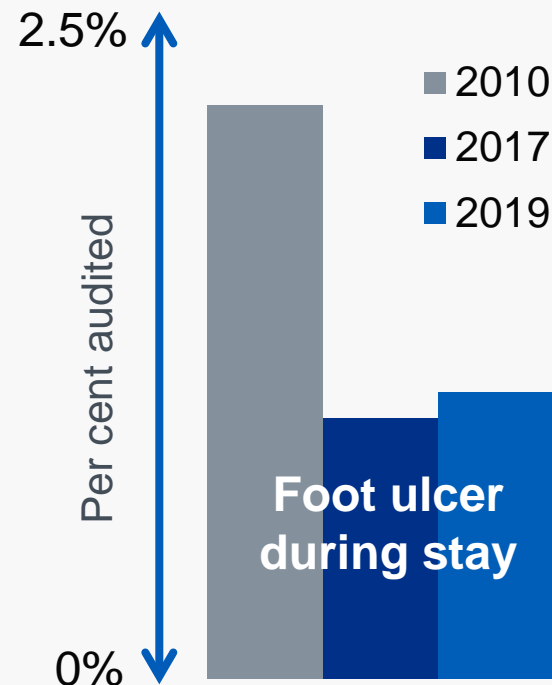
2. Wales did not participate in NaDIA 2019, so 2017 figures have been recalculated to cover England only.



## 2. Key messages: Inpatient harms

### Findings

- The proportion of audited inpatients that developed a diabetic foot ulcer or needed a hypoglycaemic rescue has **reduced** since 2010, though there has been **no reduction** since 2017.
- Although the proportion of inpatients experiencing severe hypoglycaemia has **dropped** overall, there has been **no reduction** amongst inpatients with type 1 diabetes since 2010.
- And there has been **no significant change** in inpatients acquiring diabetic ketoacidosis (DKA) or hyperosmolar hyperglycaemic state (HHS) since data collection began.



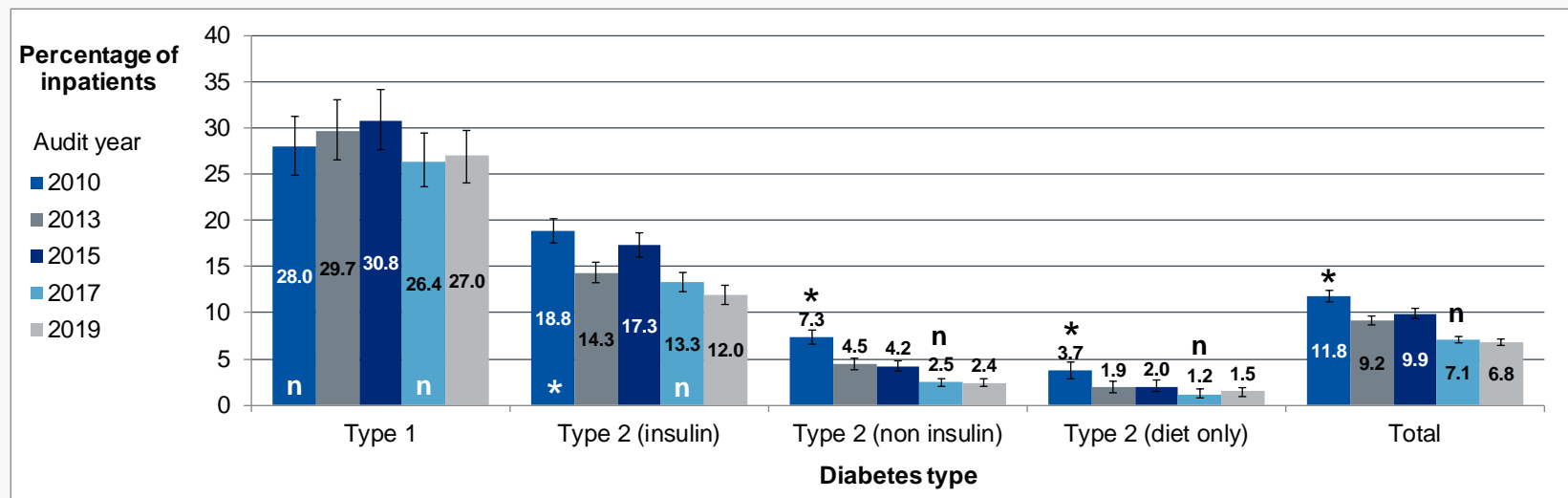
**Recommendation 1:** The MDiT should meet regularly to discuss day-to-day errors and safety issues, and report to a quarterly trust-level diabetes safety board. All hospital-acquired life-threatening episodes of hypoglycaemia, DKA and HHS should be recorded as [serious incidents](#), submitted to [NaDIA-Harms](#) and root cause analysis undertaken.



# Inpatient harms: Severe hypoglycaemia



**Chart 2.1: Inpatients having one or more severe hypoglycaemic episode<sup>1</sup> in the last 7 days of their hospital stay: by diabetes type, England, 2010-19**



Diabetes type	Significant difference ( $p < 0.05$ )			
	2010 to 2019		2017 to 2019	
Type 1	Static	–	Static	–
Type 2 (insulin)	Down	▼	Static	–
Type 2 (non insulin)	Down	▼	Static	–
Type 2 (diet only)	Down	▼	Static	–
Total	Down	▼	Static	–

## Findings

- Severe hypoglycaemic episodes have **decreased** for all type 2 groups since 2010, though proportions have remained static since 2017.
- On the audit day in 2019, more than **1 in 4** inpatients with type 1 diabetes had experienced at least one severe hypoglycaemic episode in the last 7 days of their hospital stay. There has been **no significant reduction** in severe hypoglycaemia episodes in patients with type 1 diabetes.

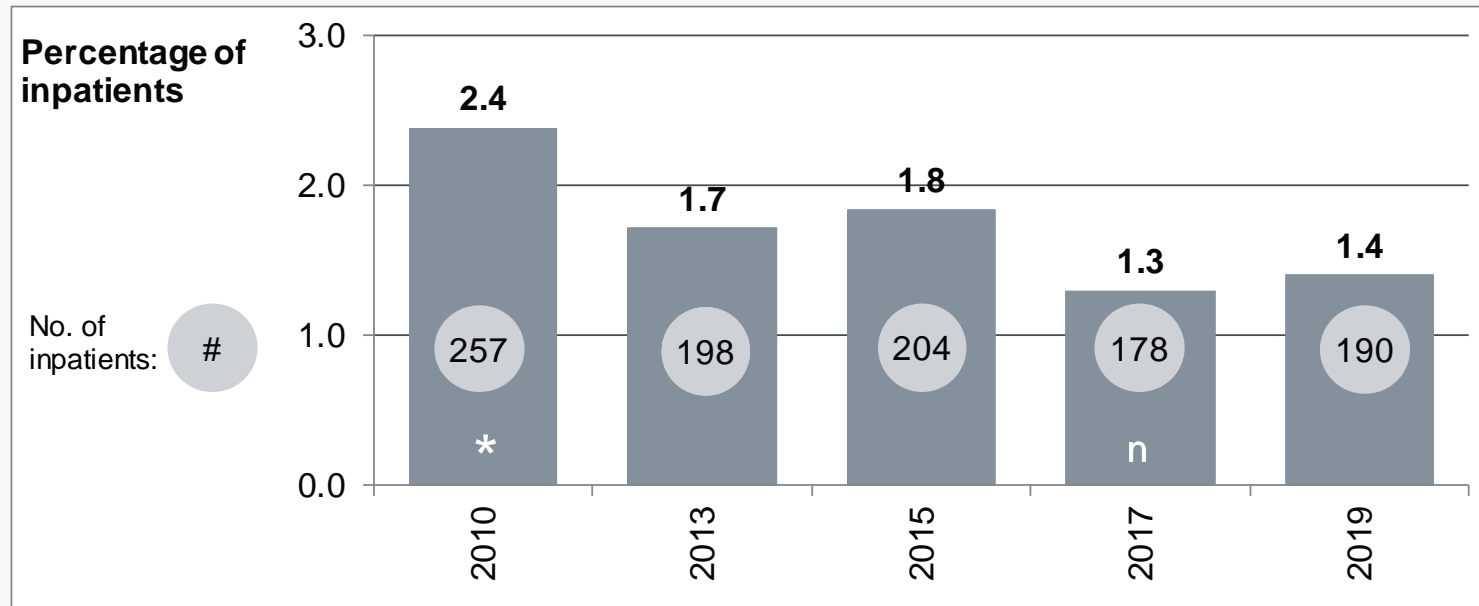
**Notes:** \* = statistically significant at the 0.05 level (vs. current audit year).  
n = not statistically significant (vs. current audit year).  
1. Severe hypoglycaemic episode =  $< 3.0 \text{ mmol/L}$ .



# Inpatient harms: Hypoglycaemic rescue



**Chart 2.2: Inpatients having one or more hypoglycaemic episodes that required injectable rescue treatment<sup>1</sup> in the last 7 days of their hospital stay, England, 2010-19**



Comparison	Significant difference ( $p < 0.05$ )
2010 to 2019	Down ▼
2017 to 2019	No change -

## Findings

- On the audit day in 2019, **1 in 70** inpatients had required hypoglycaemic rescue during the last 7 days of their hospital stay.
- Hypoglycaemic rescue has **decreased** since 2010, though not since 2017.

**Notes:**

\* = statistically significant at the 0.05 level (vs. current audit year).

n = not statistically significant (vs. current audit year).

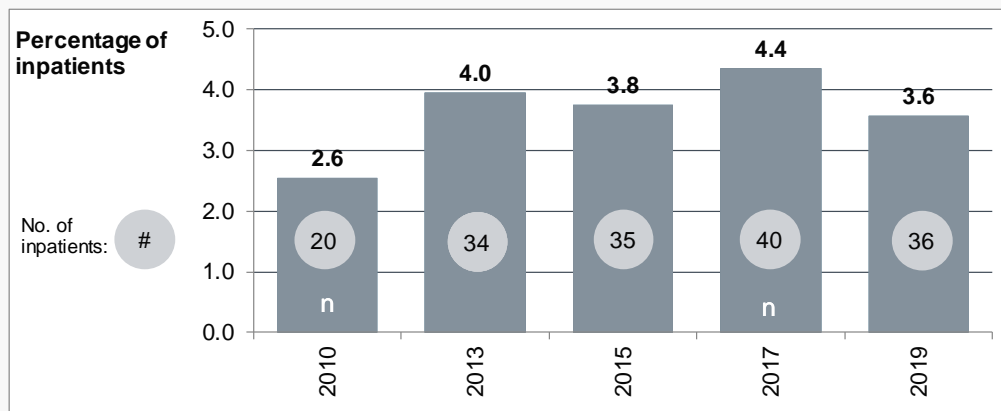
1. See [Glossary: Patient harms](#).



# Inpatient harms: DKA and HHS



**Chart 2.3: Proportion of inpatients with type 1 diabetes that develop diabetic ketoacidosis (DKA) at any point during their hospital stay, England, 2010-19**



## Findings

There has been **no significant change** in either DKA or HHS since data collection began.

On the audit day in 2019:

- **3.6 per cent** of inpatients with type 1 diabetes had developed DKA at any point during their hospital stay; and
- **0.2 per cent** of inpatients with type 2 diabetes had developed HHS at any point during their hospital stay.

**Chart 2.4: Proportion of inpatients with type 2 diabetes that develop hyperosmolar hyperglycaemic state (HHS) at any point during their hospital stay, England, 2015-19**



**diabetes that develop hyperosmolar hyperglycaemic state (HHS) at any point during their hospital stay, England, 2015-19**

Comparison	Significant difference ( $p < 0.05$ )	
	DKA	HHS
2010 to 2019	No change -	Not collected
2017 to 2019	No change -	No change -

**Notes:** \* = statistically significant at the 0.05 level (vs. current audit year). n = not statistically significant (vs. current audit year).

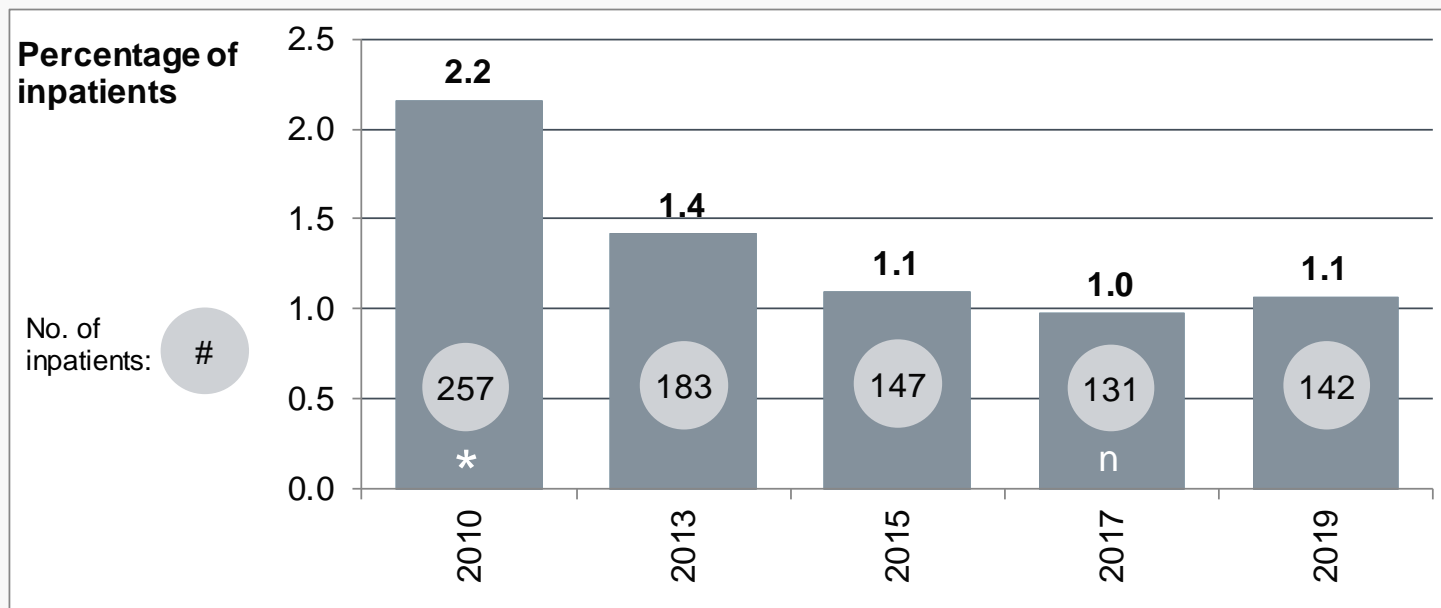
1. See [Glossary: Patient harms](#).



# Inpatient harms: Foot ulcers



**Chart 2.5: Percentage of inpatients who developed a foot ulcer at any point during their hospital stay, England, 2010-19**



Comparison	Significant difference ( $p < 0.05$ )
2010 to 2019	<b>Down</b> ▼
2017 to 2019	No change —

## Findings

- On the audit day in 2019, around **1 in 90** inpatients with diabetes had developed a foot ulcer at any point during their hospital stay.
- The proportion of inpatients that had developed diabetic foot ulcers during their admission has **reduced** since 2010 (from 2.2 per cent to 1.1 per cent), but has **not changed** since 2017.

**Notes:** \* = statistically significant at the 0.05 level (vs. current audit year). n = not statistically significant (vs. current audit year).

1. See [Glossary: Patient harms](#).

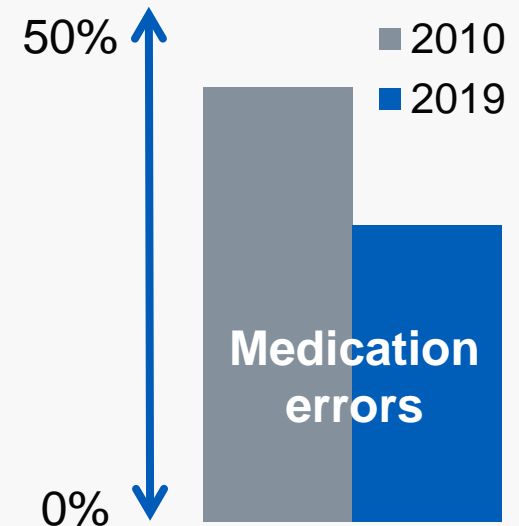




# 3. Key messages: Medication errors

## Findings

- Almost **one third** of inpatient drug charts audited in 2019 had at least one medication error (30 per cent). This has **reduced** from 45 per cent in 2010.
- **18 per cent** of inpatient drug charts had one or more insulin error during their hospital stay, which is an **improvement** from 26 per cent in 2010.
- The proportion of inpatient drug charts with at least one prescription error has **decreased** since 2017 (from 19 to 17 per cent), although the proportion of glucose management and insulin errors has remained **static** over this period.



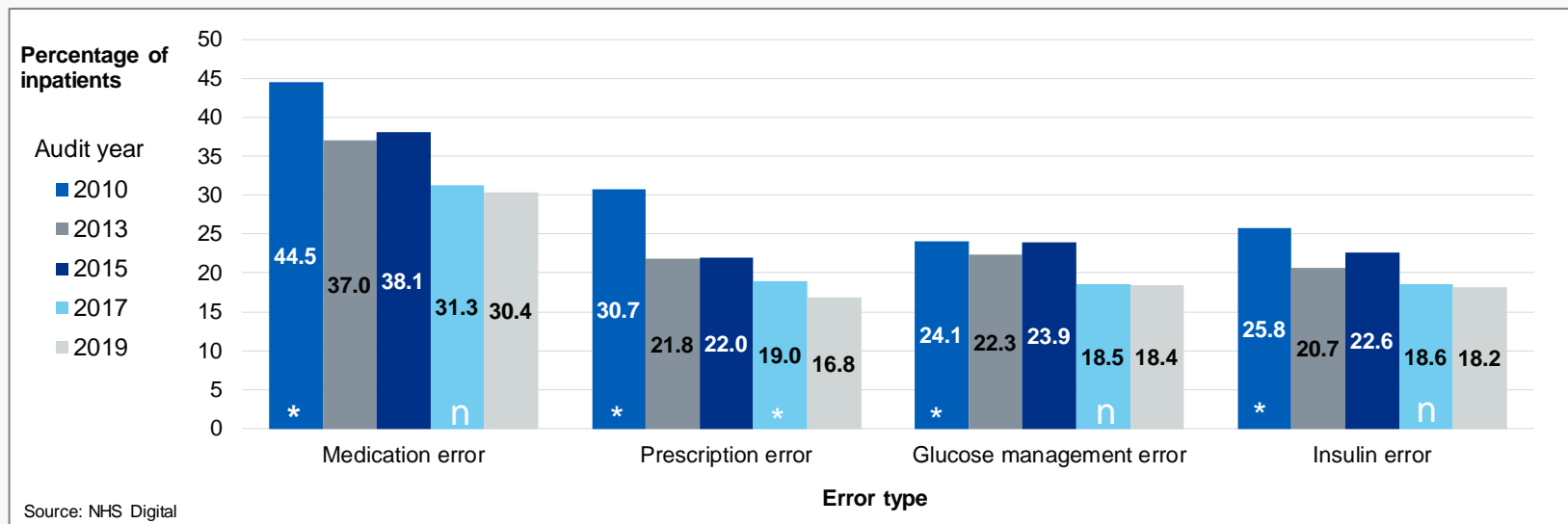
**Clinical comment:** Despite improvements in recent years, the proportion of inpatient drug charts with medication errors is still too high, even in hospital sites that have adopted health technologies (see slides [22](#) and [23](#)).



# Medication errors: Error type



Chart 3.1: Inpatient drug charts having one or more medication error<sup>1</sup> in the last 7 days of their hospital stay: by error type, England, 2010-19



Error type <sup>1</sup>	Significant difference ( $p < 0.05$ )			
	2010 to 2019		2017 to 2019	
Medication error	Down	▼	No change	—
Prescription error	Down	▼	Down	▼
Glucose management error	Down	▼	No change	—
Insulin error	Down	▼	No change	—

## Findings

- In the 2019 audit, **3 out of 10** inpatient drug charts had at least one medication error (30 per cent).
- The proportion of inpatient drug charts having medication errors has **decreased** by 14 percentage points since 2010.

Notes: \* = statistically significant at the 0.05 level (vs. current audit year).

<sup>n</sup> = not statistically significant (vs. current audit year).

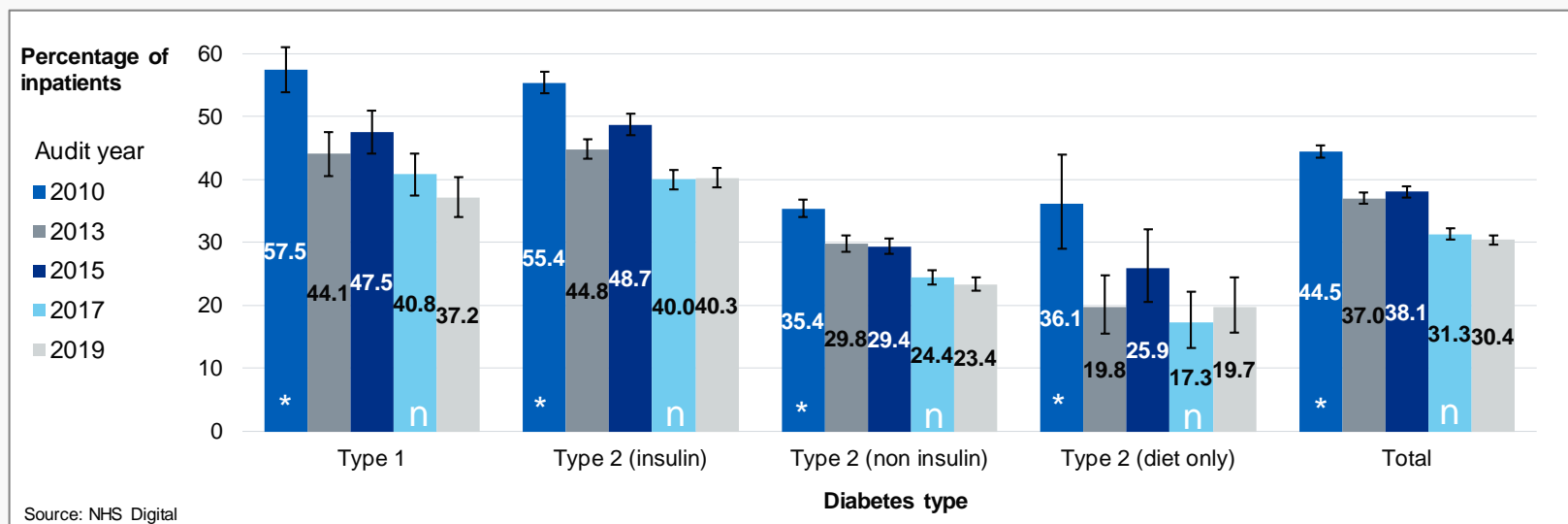
1. See [Medication errors: Definitions](#) for explanation of error types.



# Medication errors: by diabetes type



Chart 3.2: Inpatient drug charts having one or more medication error<sup>1</sup> in the last 7 days of their hospital stay: by diabetes type, England, 2010-19



Diabetes type	Significant difference ( $p < 0.05$ )	
	2010 to 2019	2017 to 2019
Type 1	Down ▼	No change –
Type 2 (insulin)	Down ▼	No change –
Type 2 (non insulin)	Down ▼	No change –
Type 2 (diet only)	Down ▼	No change –
Total	Down ▼	No change –

## Findings

- In the 2019 audit, **4 out of 10** drug charts for insulin-treated inpatients had at least one medication error (40 per cent).
- The proportion of inpatient drug charts with medication errors has **reduced** for all diabetes types since 2010, but has **not changed** since 2017.

Notes: \* = statistically significant at the 0.05 level (vs. current audit year). n = not statistically significant (vs. current audit year).

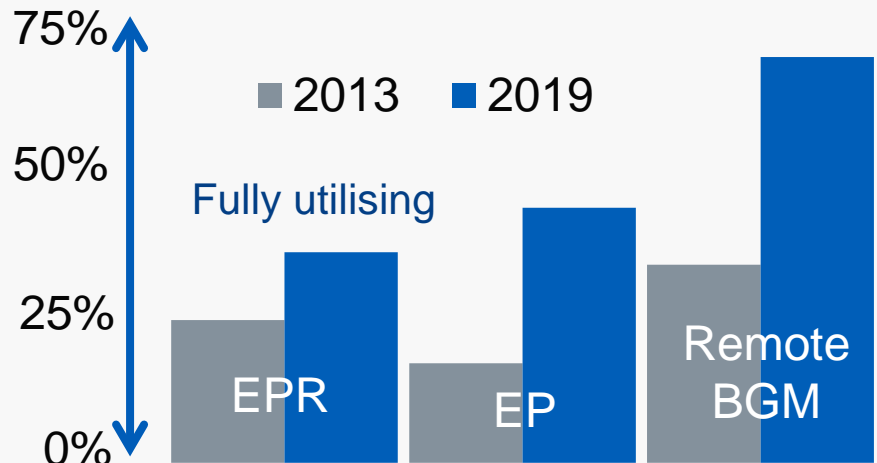
1. See [Medication errors: Definitions](#) for explanation of error types.



# 4. Key messages: Care improvement initiatives

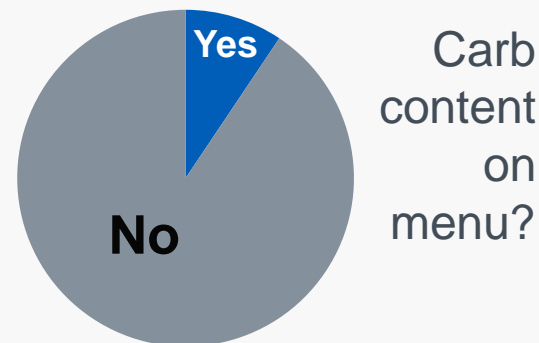
## Findings

- An **increasing** proportion of hospital sites are now fully-utilising electronic prescribing (EP) and electronic patient record (EPR) systems, and remote blood glucose monitoring (BGM).
- Inpatient drug charts are **less likely** to contain medication errors if EPR or EP are used.



**Recommendation 2:** 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. Electronic records and prescribing should be implemented in support.

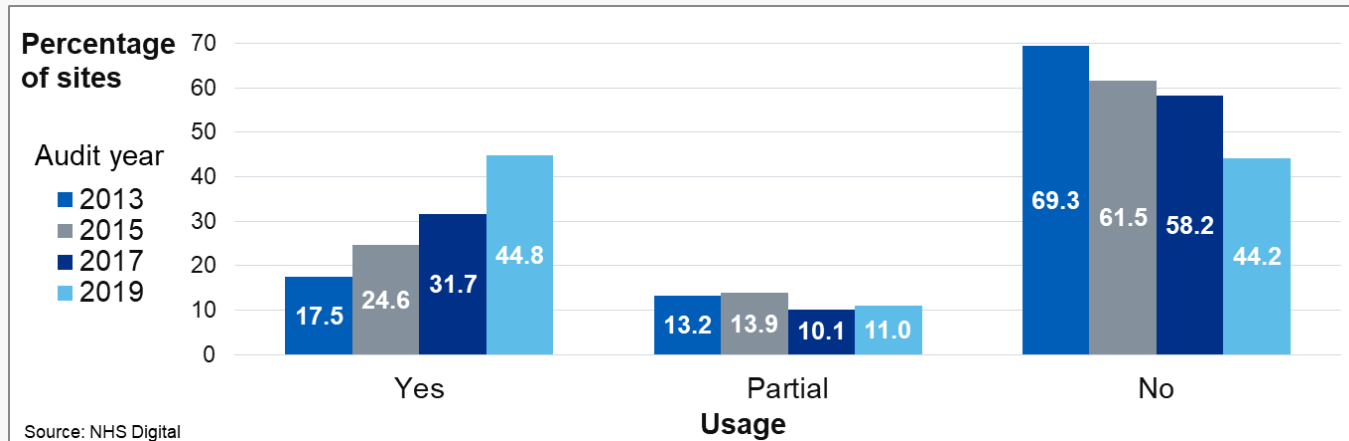
**Clinical comment:** NaDIA has found that 1 in 10 hospitals manage to print carbohydrate content on their hospital menus (9.4 per cent) which is very helpful to inpatients with diabetes.



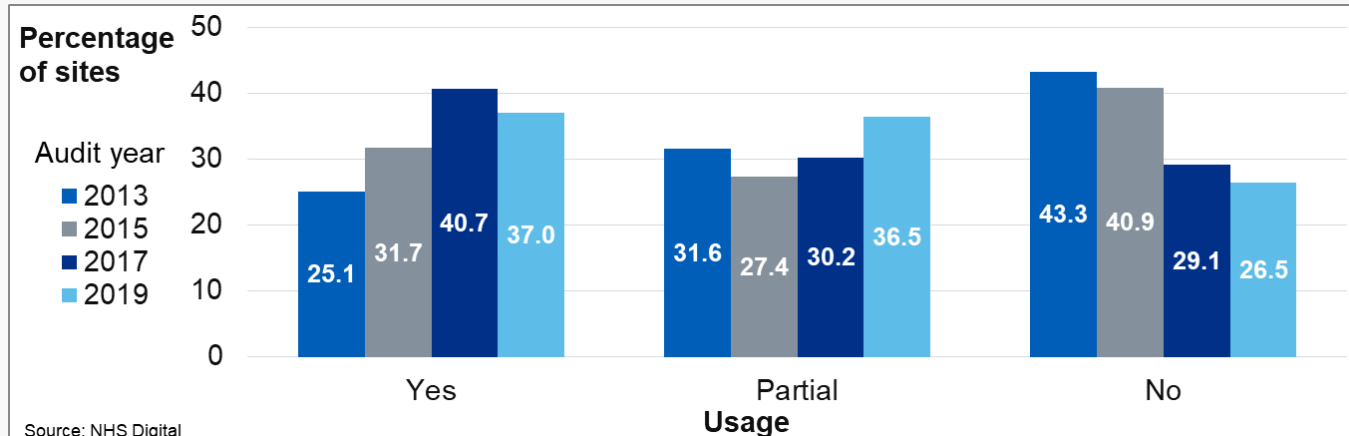
# Care improvement initiatives: EPR and EP



**Chart 4.1: Percentage of hospital sites using electronic prescribing (EP), England, 2013-19**



**Chart 4.2: Percentage of hospital sites using an electronic patient record (EPR), England, 2013-19**



## Findings

The proportion of hospital sites fully-utilising EP has **increased** since 2017, from 32 to 45 per cent.

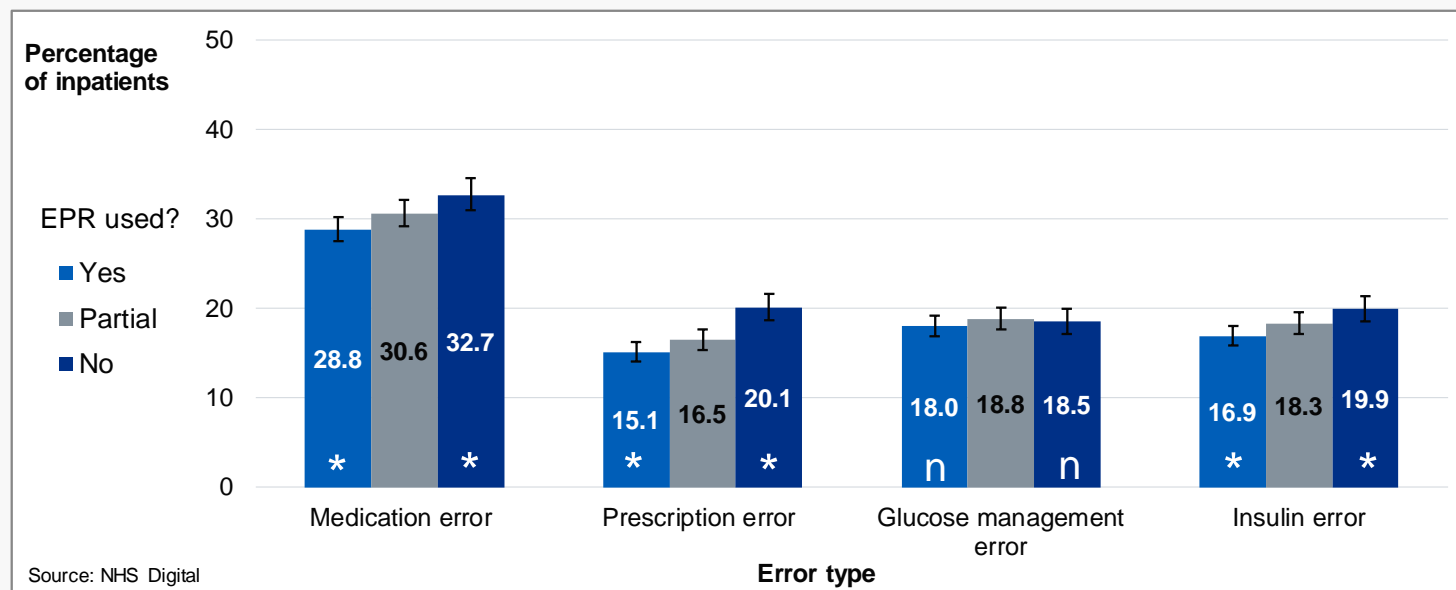
The proportion of hospital sites fully or partially utilising EPR has **increased** since 2017, from 71 to 82 per cent.



# Care improvement initiatives: EPR and medication errors



Chart 4.3: Inpatient drug charts having one or more medication error<sup>1</sup> in the last 7 days of their hospital stay: by electronic patient record (EPR) usage<sup>2</sup>, England, 2019



Error type <sup>1</sup>	Significant difference ( $p < 0.05$ )	
	EPR used	EPR not used
Medication error	Less likely	More likely
Prescription error	Less likely	More likely
Glucose management error	No difference	No difference
Insulin error	Less likely	More likely

## Finding

- Inpatient drug charts are **less likely** to contain medication, prescription and insulin errors if EPR is used.

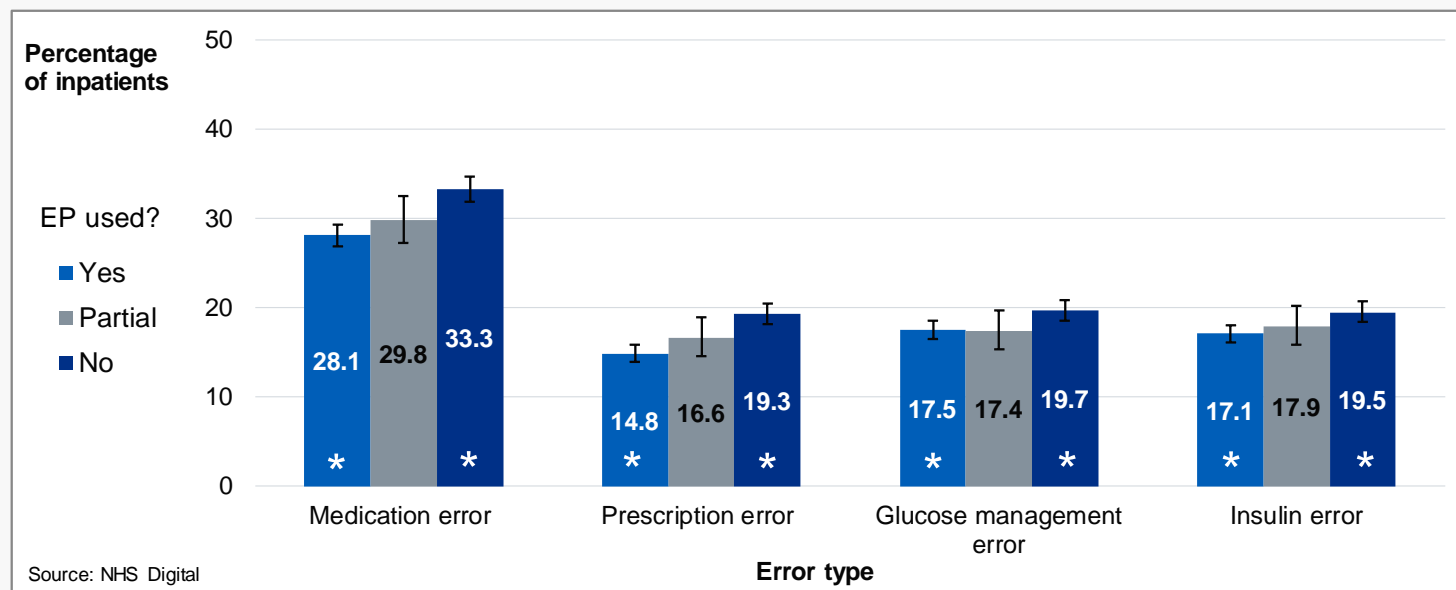
**Notes:** \* = statistically significant at the 0.05 level (EPR used vs. EPR not used in audit year). n = not statistically significant (EPR used vs. EPR not used in audit year). 1. Medication error = any prescription or glucose management error. See [Medication errors: Definitions](#) for explanation of error types. 2. See [Glossary: Healthcare technologies](#) for information on EPR.



# Care improvement initiatives: EP and medication errors



Chart 4.4: Inpatient drug charts having one or more medication error<sup>1</sup> in the last 7 days of their hospital stay: by electronic prescribing (EP) usage<sup>2</sup>, England, 2019



Error type <sup>1</sup>	Significant difference ( $p < 0.05$ )	
	EPR used	EPR not used
Medication error	Less likely	More likely
Prescription error	Less likely	More likely
Glucose management error	Less likely	More likely
Insulin error	Less likely	More likely

## Finding

- Inpatient drug charts are **less likely** to contain all types of medication error if EP is used.

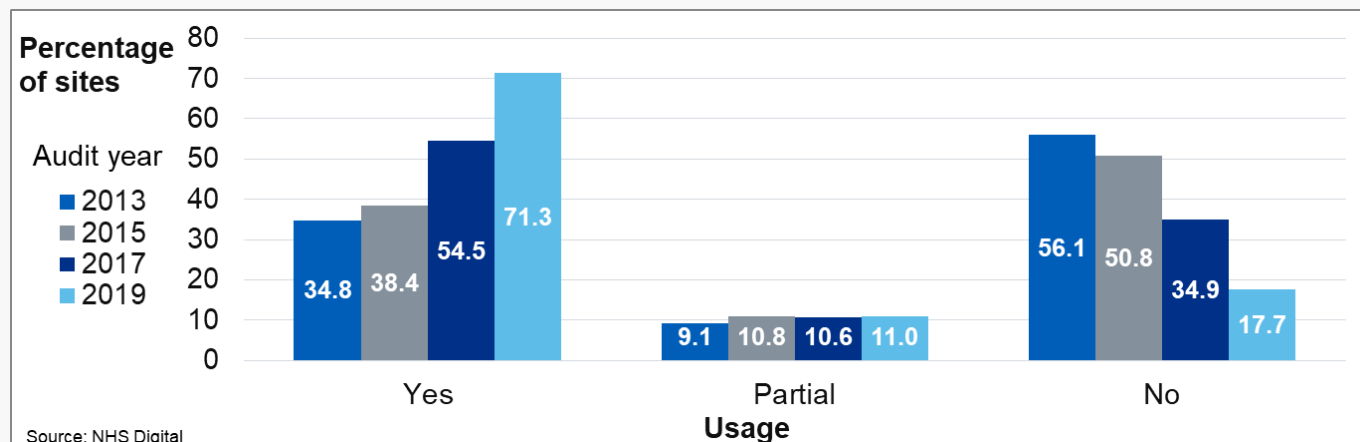
**Notes:** \* = statistically significant at the 0.05 level (EP used vs. EP not used in audit year). n = not statistically significant (EP used vs. EP not used in audit year). 1. Medication error = any prescription or glucose management error. See [Medication errors: Definitions](#) for explanation of error types. 2. See [Glossary: Healthcare technologies](#) for information on EP.



# Care improvement initiatives: Remote BGM



Chart 4.5: Percentage of hospital sites using remote blood glucose monitoring (BGM), England, 2013-19



Source: NHS Digital

## Findings

- The proportion of hospital sites fully-utilising remote BGM has **increased** by 17 percentage points since 2017 and has more than doubled since 2013 (from 35 to 71 per cent).
- However almost **1 in 5** hospital sites do not utilise remote BGM (18 per cent).

“Web-linked blood glucose (BG) and ketone meters should be actively used to alert the diabetes inpatient team to out of range glucose values and to monitor glucometrics across the trust and at ward level (**remote BGM**).”

*Making Hospitals Safe for People with Diabetes<sup>1</sup>, 2018*

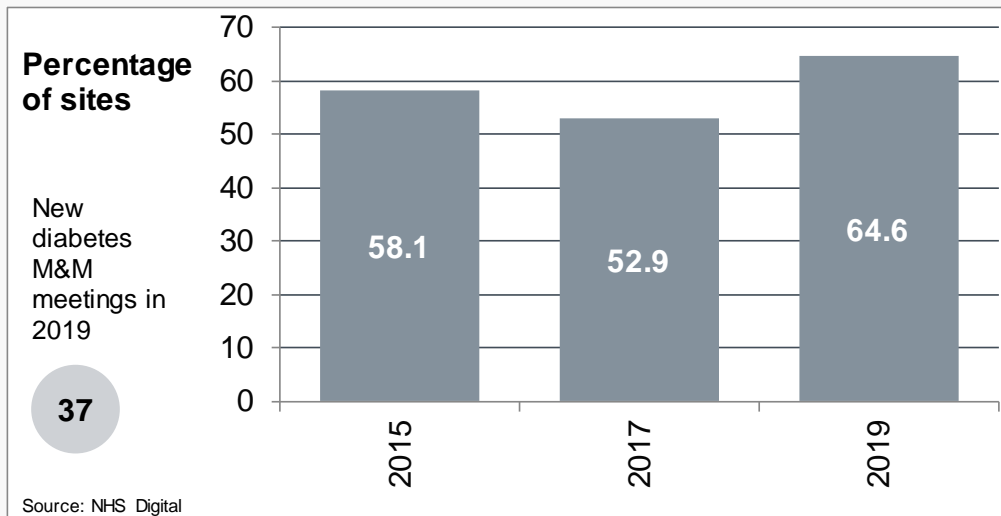




# Care improvement initiatives: M&M



**Chart 4.6: Percentage of hospital sites holding diabetes mortality and morbidity (M&M) meetings<sup>1</sup>, England, 2015-19**



## Findings

- The proportion of hospital sites having diabetes M&M meetings has **increased** since 2017.
- Almost **two-thirds** of hospital sites hold diabetes M&M meetings.
- **40 hospital sites** fully-utilise EPR, EP and remote BGM.

**Table 4.1: Number of hospital sites that fully utilise electronic patient record (EPR), electronic prescribing (EP) and remote blood glucose monitoring (BGM), England, 2013-19**

Audit year	Hospital sites having EPR, EP and remote BGM	
• 2013	5	–
• 2015	14	Increase
• 2017	24	Increase
• 2019	40	Increase

**Notes:** 1. If the hospital site does not hold a diabetes M&M meeting, they may hold a general M&M meeting where diabetes is discussed. This information has not been collected for 2019.

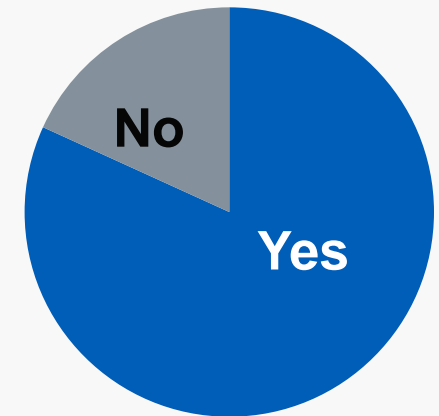


# 5. Key messages: Staffing levels

## Findings

- Staffing levels for almost all professions have **increased** for inpatients with diabetes since 2015 and 2017.
- However, improvements are sometimes from a **low starting point** (e.g. less than 1 minute per inpatient per day of podiatrist and dietitian time in 2015) and diabetes specialist pharmacist hours have actually **decreased**.
- Almost **one fifth** of hospital sites report no dedicated diabetes inpatient specialist nurses (DISNs) (18 per cent).
- Inpatient dietetic provision, although improved, is still too **low** (only 35 per cent of hospital sites).

DISN?



## Clinical comment

Despite recent positive increases in staffing levels, NaDIA has found that staffing deficiencies remain, with access to specialist diabetes dietitians and pharmacists a particular problem. This is especially important in the context of continually rising patient numbers.

**Recommendation 3:** All trusts should 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.



# Staffing levels: Results

**Table 5.1: Average staffing for care of inpatients with diabetes<sup>1</sup>, England, 2015-19**

Profession	Hours per week of inpatient care per inpatient with diabetes		
	2015	2017	2019
Diabetes inpatient specialist nurse (DISN)	0.51	0.63	0.79
Diabetes specialist nurse (DSN)	0.17	0.22	0.39
Any diabetes specialist nurse (DISN and DSN)	0.68	0.85	1.18
Diabetes consultant	0.19	0.29	0.38
Podiatrist	0.11	0.16	0.26
Specialist diabetes dietitian	0.03	0.04	0.07
Non-specialist dietitian	0.07	0.05	0.14
Any dietitian	0.10	0.09	0.22
Diabetes specialist pharmacist	0.03	0.07	0.05

## Findings

At national level, staffing levels for almost all professions have **increased** for inpatients with diabetes since 2015 and 2017:

- DISN hours per inpatient have **increased** from 0.63 in 2017 to 0.79 in 2019.
- Diabetes Consultant hours have **increased** from 0.29 in 2017 to 0.38.
- Podiatrist hours have **increased** from 0.16 in 2017 to 0.26.
- Dietitian hours have **increased** from 0.09 in 2017 to 0.22.

However, some of the increases are from a **low starting point** (e.g. less than 1 minute per inpatient per day of podiatrist and dietitian time in 2015).

And diabetes specialist pharmacist hours have **decreased** from 0.07 in 2017 to 0.05 in 2019.

### Notes:

1. The stated figures are derived from the total number of Bedside Audit forms divided by the total number of hours of inpatient care per week. The NaDIA team acknowledge the difficulty of estimating staff hours. Caution is therefore advised when interpreting staffing levels, particularly at hospital site level.



# Staffing levels: Delivery of diabetes care



**Table 5.2: Changes in staffing of hospital sites, England, 2010-19**

Percentage of hospital sites with:	2010	2013	2015	2017	2019
• no diabetes inpatient specialist nurse (DISNs) <sup>1</sup>	31.5	30.2	29.3	25.9	18.2
• no specialist inpatient dietetic provision for inpatients with diabetes	67.3	71.4	71.8	72.0	64.6
• no inpatient podiatry service for inpatients with diabetes	26.8	33.3	25.5	32.3	18.2
• no inpatient specialist pharmacy service for inpatients with diabetes	–	88.0	83.0	75.7	74.0

The need for DISNs in hospitals is emphasised in the **NHS Long term plan**<sup>2</sup>: “...for those who periodically need secondary care support we will ensure that all hospitals in future provide access to **multi-disciplinary foot care teams** (MDFTs) and **DISN** teams to improve recovery and to reduce lengths of stay and future readmission rates.”

## Findings

- The proportion of hospital sites with no DISNs has **dropped** by 8 percentage points since 2017.
- However, more than a **sixth** of hospital sites have no DISNs (18 per cent). **Two-thirds** of these hospital sites also had no DISNs in 2017<sup>2</sup>.

**Notes:**1. 33 hospital sites had no DISNs in 2019. 21 of the 33 also had no DISNs in the 2017 audit, along with a further 28 hospital sites.  
2. NHS England, [NHS Long Term Plan](#), 2019.

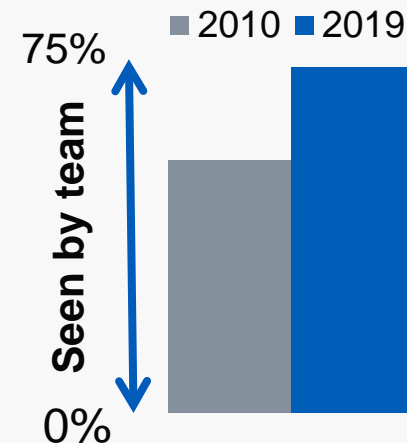


# 6. Key messages: Access to the diabetes team

## Findings

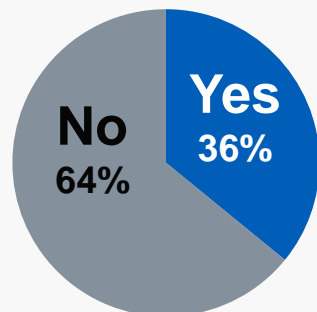
- The proportion of inpatients with diabetes seen by the diabetes team where appropriate<sup>1</sup> has **increased** since 2010 (from 54 to 75 per cent).
- A **higher** proportion are seen by the diabetes team<sup>1</sup> when 7 day diabetes inpatient specialist nurse (DISN) cover is provided (78 per cent compared to 72 per cent).

**Notes:** 1. Based on the '[Think Glucose Criteria](#)' criteria. See [Glossary: Referral to the diabetes team](#).



**Clinical comment:** [GIRFT](#) has found that in some hospitals, staff only become aware that a patient had diabetes when a problem occurs, which can result in serious and life-threatening [harms](#). However, NaDIA has found that only **36 per cent** of hospital sites have an electronic system to identify and notify the diabetes team of all people with diabetes on admission.

## Diabetes ID system?



**Recommendation 4:** 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.

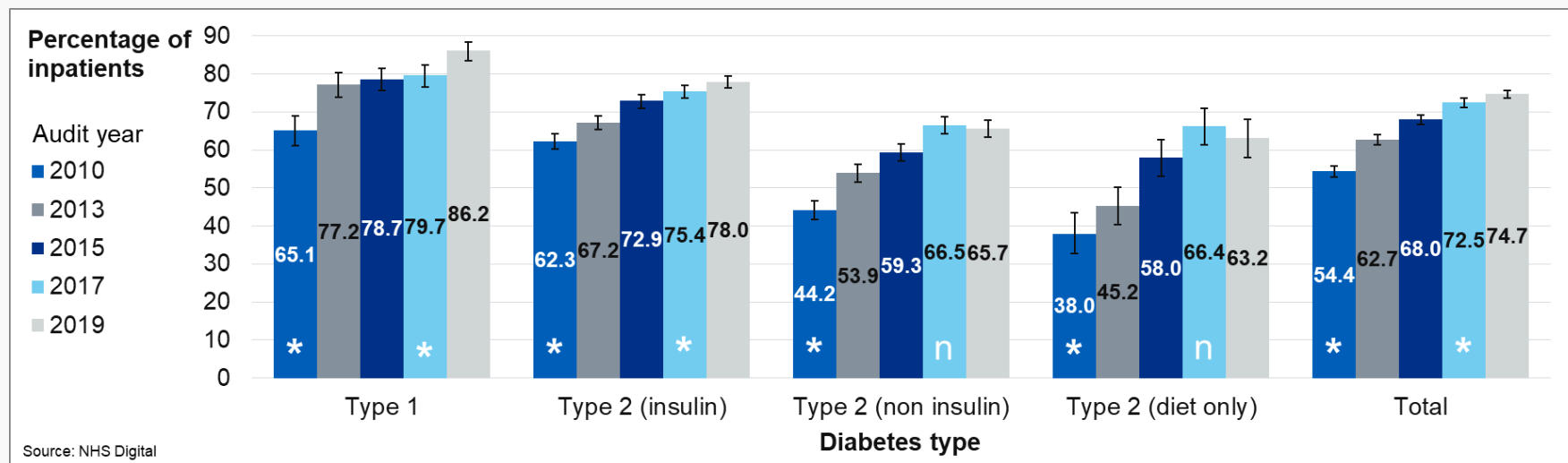


# Access to the diabetes team: Results



Based on the 'Think Glucose Criteria'<sup>1</sup>, on the audit day it was appropriate for 41 per cent of inpatients to have been referred to the diabetes team, six percentage points lower than in 2011.

**Chart 6.1: Percentage of inpatients seen by the diabetes team where it was deemed appropriate<sup>1</sup>: by diabetes type, England, 2010-19**



Comparison	Significant difference (p <0.05)							
	Type 1	Type 2 (insulin)	Type 2 (non insulin)	Type 2 (diet only)	Total			
2010 to 2019	Up ▲	Up ▲	Up ▲	Up ▲	Up ▲			
2017 to 2019	Up ▲	Up ▲	No change -	No change -	Up ▲			

## Findings

**More** inpatients are being seen by the diabetes team where appropriate<sup>1</sup>, reaching 86 per cent in those with type 1 diabetes.



**Notes:** \* = statistically significant at the 0.05 level (vs. current audit year).

n = not statistically significant (vs. current audit year).

1. Based on the 'Think Glucose Criteria'. See [Glossary: Referral to the diabetes team](#).

# Access to the diabetes team

## 7 day DISN provision

**Table 6.1: Percentage of hospital sites with 7 day provision, England, 2015-19**

Percentage of hospital sites with:	2015	2017	2019
• 7 day diabetes inpatient specialist nurse (DISN) provision	7.0	9.5	17.1
• 7 day Diabetes Physician access	–	25.9	23.8
• Both of the above	–	4.8	8.3

**Table 6.2: Percentage of inpatients seen by the diabetes team where it was deemed appropriate<sup>1</sup>: by 7 day DISN provision, England, 2019**

Percentage of patients:	7 day DISN provision?	
	Yes	No
• seen by the diabetes team where appropriate	78.2 *	72.5 *

↓

Significant difference ( $p < 0.05$ )	
7 day DISN	No 7 day DISN
Higher ▲	Lower ▼

### Findings

- Since 2015, 7 day DISN provision has more than **doubled**; an increase of 10 percentage points (from 7 to 17 per cent).
- However there has been a **decrease** in the proportion of hospital sites with 7 day Diabetes Physician access.
- A **higher** proportion of inpatients are seen by the diabetes team where appropriate when 7 day DISN cover is provided (78 per cent compared to 72 per cent).

### Comment

Important aspects of DISN care are not captured in this metric. For example, weekend DISN teams provide reviews of those admitted during the week and identified to be at high risk of metabolic decompensation



# Access to the diabetes team

## Diabetes team working and support systems



**Table 6.3: Percentage of diabetes inpatient teams with an office which facilitates team working<sup>1</sup>, England, 2019**

Percentage of diabetes inpatient teams with:	2019
• an office which facilitates team working	74.0

**Table 6.4: Percentage of hospital sites with diabetes inpatient management systems, England, 2019**

Percentage of hospital sites with:	2019
• an electronic system to identify and notify the inpatient diabetes team of all people with diabetes on admission	35.9
• a system to help non-specialist staff identify and prioritise those with diabetes that need reviewing by the inpatient diabetes team	63.0

## Findings

- Almost **three-quarters** of diabetes inpatient teams have an office which facilitates team working (74 per cent).
- Take-up of automated systems to identify and notify the diabetes team to new diabetes admissions is low (**35.9 per cent**), probably reflecting the fact that only about 50 per cent of hospital sites have electronic medical records.
- Only **63.0 per cent** of hospital sites have systems to triage those needing a diabetes review.



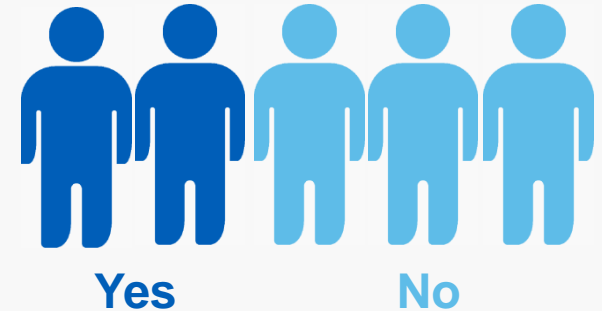


# 7. Key messages: Surgical care

## Findings

- On the audit day in 2019, **4 out of 5** elective surgery inpatients had been prioritised in the surgical list (80 per cent).
- Only **2 out of 5** of the surgical inpatients audited in 2019 had their capillary blood glucose<sup>1</sup> (CBG) levels recorded at all recommended stages of the perioperative pathway<sup>2</sup> (43 per cent): At sign-in and sign-out stages of the surgical safety checklist, during surgery, in theatre recovery, on arrival on the ward.
- Emergency surgery inpatients were **less likely** to have their CBG levels recorded than elective surgery inpatients (41 vs 47 per cent).

CBG levels recorded in all 4 areas?



**Recommendation 5:** All hospital trusts should have clear, audited perioperative pathways from pre-assessment through to discharge. These should be broadly in line with [NCEPOD](https://www.ncepod.org.uk/2018pd.html) recommendations.

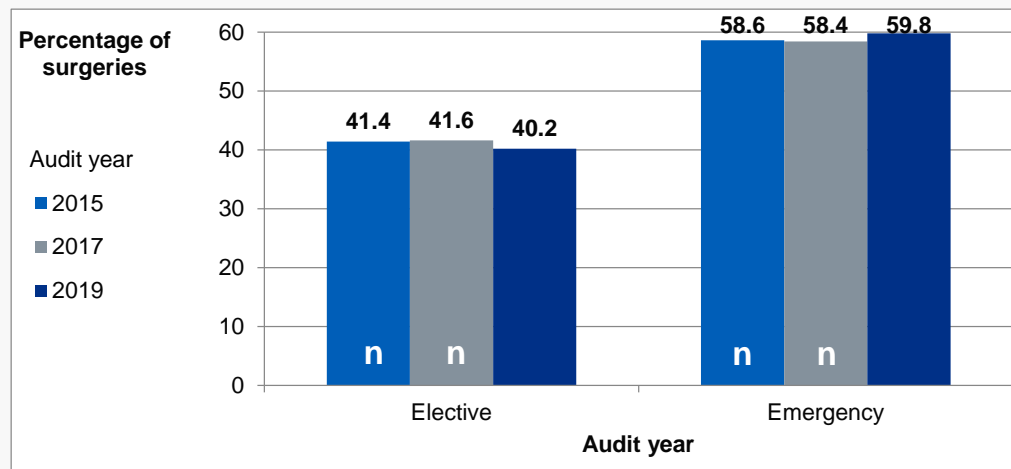


# Surgical care: Diabetes management

**Table 7.1: Proportion of hospital sites having perioperative diabetes care structures, England, 2019**

Care structure	Yes?
	Per cent
Is there a <b>team</b> responsible for organising <b>perioperative diabetes care</b> ?	30.9
Is there a standardised <b>process</b> for <b>pre-operative diabetes care</b> covering diabetes control, blood pressure and management of comorbidities?	61.3
Is there a <b>referral pathway</b> to ensure <b>elective patients</b> who need pre-admission optimisation of diabetes control are seen by an appropriate health care professional?	65.7

**Chart 7.1: Nature of surgery, England, 2015-19**



## Findings

- Only **3 out of 10** hospital sites have a team responsible for organising perioperative diabetes care (31 per cent).
- There were **18 per cent fewer** surgical inpatients in the 2019 audit compared to 2015 (2,035 vs 2,495), with drops in both elective (1,033 to 819) and emergency surgical inpatients (1,462 to 1,216).

**Notes:** \* = statistically significant at the 0.05 level (vs. current audit year).  
n = not statistically significant (vs. current audit year).



# Surgical care: CBG recording and surgical prioritisation

**Table 7.2: Proportion of surgical inpatients having their capillary blood glucose (CBG)<sup>1</sup> levels recorded, England, 2019**

Are the CBG levels <sup>1</sup> recorded in the following areas:	Elective		Emergency		Total
	Per cent		Per cent		Per cent
At sign-in and sign-out stages of the surgical safety checklist <sup>2</sup>	66.3	n	63.6	n	64.4
In anaesthetic charts – during surgery <sup>3</sup>	62.2	*	54.9	*	57.5
In theatre recovery	72.6	n	68.9	n	70.2
On arrival on the ward	85.8	n	85.6	n	85.5
All of the above	47.0	*	40.6	*	43.0

**Table 7.3: Proportion of elective surgical inpatients prioritised to avoid prolonged starvation, England, 2019**

Care process	Yes?
	Per cent
For elective cases, was the patient prioritised to avoid prolonged starvation <sup>4</sup> ?	80.2

## Findings

- Only **4 out of 10** of the surgical inpatients audited in 2019 (43 per cent) had met the NCEPOD recommendation<sup>5</sup> of having CBG levels recorded in all four clinical areas.
- Emergency surgery inpatients were **less likely** to have their CBG levels recorded.
- **4 out of 5** elective surgery inpatients had been prioritised in the surgical list (80 per cent).

**Notes:** \* = statistically significant at the 0.05 level (vs. other admission type). n = not statistically significant (vs. other admission type).

1. The concentration of glucose in the blood. 2. e.g. WHO safety checklist. 3. If operation >1hr. 4. usually to the first third of the list. 5.

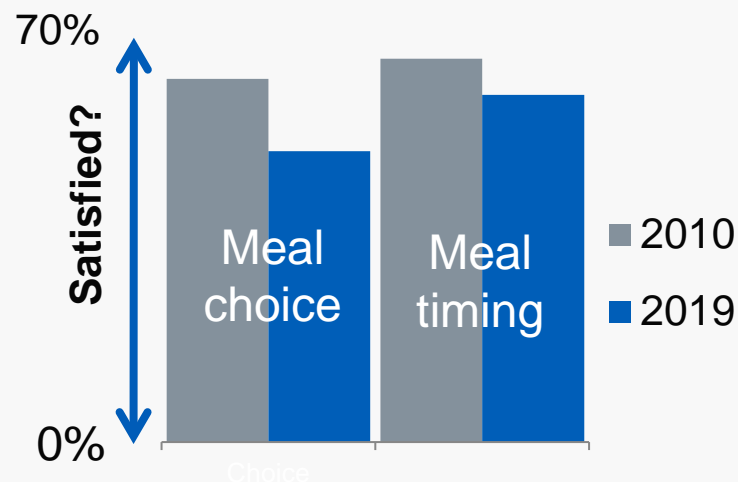
NCEPOD (2018) Perioperative Diabetes. Recommendation 4, p.12: <https://www.ncepod.org.uk/2018pd.html>



# 8. Key messages: Patient experience

## Findings

- Inpatient perception of meal choice and timing **dropped** in 2015 and has not recovered.
- Inpatient perception of staff knowledge and ability to answer questions on diabetes has **not changed** compared to 2010.
- The proportion of inpatients who were satisfied with staff awareness of their diabetes has **worsened** since 2010.
- There has been **no change** in measures relating to inpatient empowerment: self-management, self-administration and involvement in care planning



**Clinical comment:** Inpatients should be empowered to take control of their diabetes as much as possible, and patient expertise in their own diabetes care should be harnessed. However the NaDIA Patient Experience has found no increase in inpatient reported self-management, and the NaDIA Hospital Characteristics survey has found a large reduction in the percentage of hospital sites with a policy or guideline for self-management of diabetes.

**Recommendation 6:** 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 NHS England and NHS Improvement policies on inpatient self-management.



# Patient experience: Summary



**Table 8.1: Trends in inpatients' views of their hospital stay, England, 2010-19**

Inpatients...	2010	2013	2015	2017	2019	Significant difference ( $p < 0.05$ )				
						2010 to 2019	2017 to 2019			
• Aware of diabetes team <sup>1</sup>	-	-	-	-	51.8 n	53.5	N/A	No change	-	
<b>Inpatients satisfied with...</b>										
• Involvement in care planning <sup>1</sup>	-	-	-	-	62.6 n	60.4	N/A	No change	-	
• Extent that ward staff respected wishes around diabetes care <sup>1</sup>	-	-	-	-	91.1 n	91.5	N/A	No change	-	
• Control over blood sugar management <sup>1</sup>	-	-	-	-	70.1 n	70.0	N/A	No change	-	
• Ability to self-administer insulin	87.6	n	86.3	87.0	88.4 n	86.9	No change	-	No change	-
• Meal choice	64.0	*	63.7	54.3	53.8 n	51.3	<b>Down</b>	▼	No change	-
• Meal timing	67.6	*	70.2	62.2	62.6 n	61.2	<b>Down</b>	▼	No change	-
• Staff awareness of patient's diabetes	87.7	*	82.1	84.3	81.9 n	81.2	<b>Down</b>	▼	No change	-
• Staff knowledge of diabetes	64.7	n	67.5	65.5	64.6 n	63.7	No change	-	No change	-
• Staff ability to answer questions on diabetes	88.4	n	86.2	87.5	85.9 n	86.3	No change	-	No change	-
• Overall care for diabetes	83.7	n	86.1	84.3	83.4 n	82.1	No change	-	No change	-

## Findings

- Inpatient perception of meal choice and timing and staff awareness of their diabetes have **worsened** since 2010.
- There has been **no change** in measures relating to inpatient empowerment: self-management, self-administration and involvement in care planning.

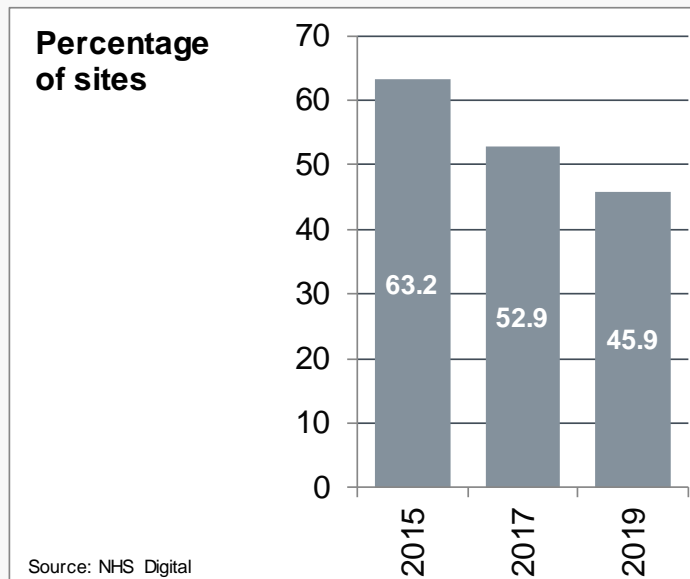
**Notes:** \* = statistically significant at the 0.05 level (vs. current audit year), deft = 2. n = not statistically significant (vs. current audit year), deft = 2. 1. Changes to the 2017 Patient Experience questionnaire means that historic results are not comparable.



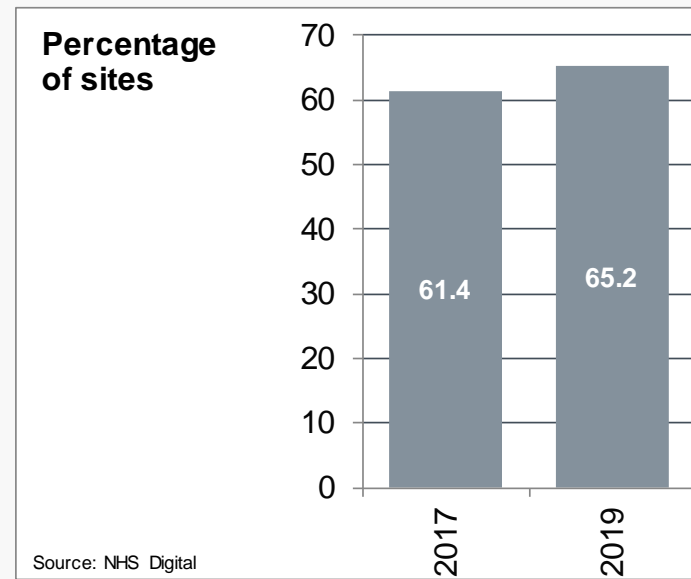
# Patient experience: Self-management and self-administration



**Chart 8.1: Percentage of hospital sites with a policy or guideline for self-management of diabetes, England, 2015-19**



**Chart 8.2: Percentage of hospital sites with a policy or guideline for self-administration of diabetes medication, England, 2017-19**



## Findings

- The proportion of hospital sites with a policy or guideline for self-management of diabetes has **fallen** (from 63 per cent in 2015 to 46 per cent in 2019).
- **35 per cent** of hospital sites still do not have a policy or guideline for self administration of diabetes medication.



# Glossary: NaDIA data collection

## Data collection

Each participating hospital identified all inpatients with diabetes and distributed questionnaires accordingly. Where the patient was able and willing a **Patient Experience** (PE) form was completed, as well as a **Bedside Audit** (BA) form which provided information on the patient's medical treatment taken from the patient's notes. The hospital team also completed a **Hospital Characteristics** (HC) questionnaire providing information on the hospital's resources and staffing structure.



**Which patients are included in the audit?** A patient was included in the inpatient audit (NaDIA) if they had been admitted to a hospital bed for 24 hours or more. Patients on an Obstetric or Paediatric ward were excluded from this audit. Mental Health wards were also excluded due to the high prevalence of long stay patients. Other exclusions included:

- Patients who were hyperglycaemic but not yet formally diagnosed with diabetes
- Accident and Emergency
- Day case ward
- Day surgery unit patients
- Observation ward (if patients had been admitted for less than 24 hours)
- Surgical short stay unit (if patients had been admitted for less than 24 hours)
- Palliative care centres
- Community hospitals



# Glossary: Diabetes type

**Diabetes** is a serious life-long health condition that causes a person's blood glucose (sugar) level to become too high. This occurs when there is not enough of the hormone insulin to manage blood glucose (BG) levels effectively. If untreated, diabetes leads to serious illness and death.

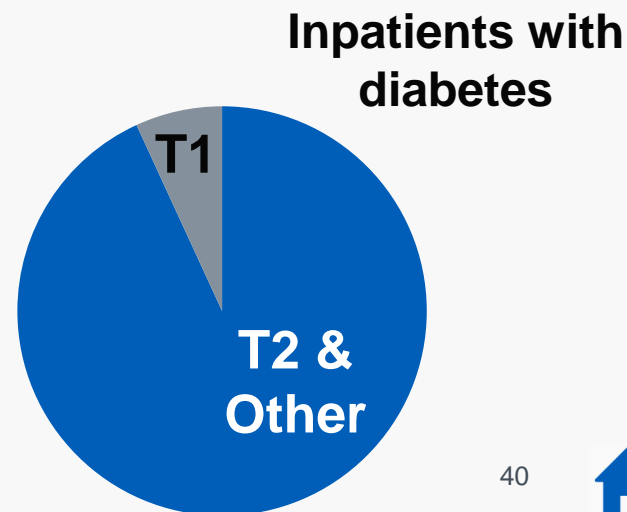
There are two main diabetes types:

- **Type 1 diabetes** develops when the insulin-producing cells in the body have been destroyed and the body is unable to produce any insulin.

Type 1 diabetes accounts for about 10 per cent of all adults with diabetes (7 per cent of inpatients with diabetes) and is treated by daily insulin doses. Type 1 diabetes can develop at any age but usually appears before the age of 40, and especially in childhood<sup>1</sup>.

- **Type 2 diabetes** develops when the insulin-producing cells in the body are unable to produce enough insulin, or when the insulin that is produced does not work properly (known as insulin resistance).

Type 2 diabetes usually appears in people over the age of 40, though it may appear at any age. Type 2 diabetes accounts for around 90 per cent of adults with diabetes (around 93 per cent of inpatients with diabetes)<sup>2</sup>.



Notes: 1. Diabetes UK: [What is type 1 diabetes?](#)

2. Diabetes UK: [What is type 2 diabetes?](#)





# Glossary: Diabetes treatments

There are a number of treatments available to help manage and control diabetes. All patients are different, so treatment will vary depending on individual needs<sup>1</sup>.

- **Insulin:** Everyone with type 1 diabetes, and some people with type 2 diabetes, need to take insulin to control blood glucose (BG) levels<sup>1</sup>.
- **Tablets:** Some people with type 2 diabetes (and a minority with type 1 diabetes) use tablets to help control their BG levels<sup>1</sup>. Common tablet treatments include Biguanide (Metformin) and Sulphonylureas.
- **Lifestyle:** Type 2 diabetes can sometimes be controlled through healthy eating and increased exercise. However type 2 diabetes is a progressive condition, and over time people with type 2 diabetes may need medication (insulin or tablets) to help manage their BG levels.



For NaDIA analysis, inpatients with type 2 diabetes are grouped into three sub-categories based on their treatment type:

- **Type 2 (insulin)**
- **Type 2 (non insulin)**
- **Type 2 (diet only)**

Inpatients with type 1 diabetes are reported as a single group.



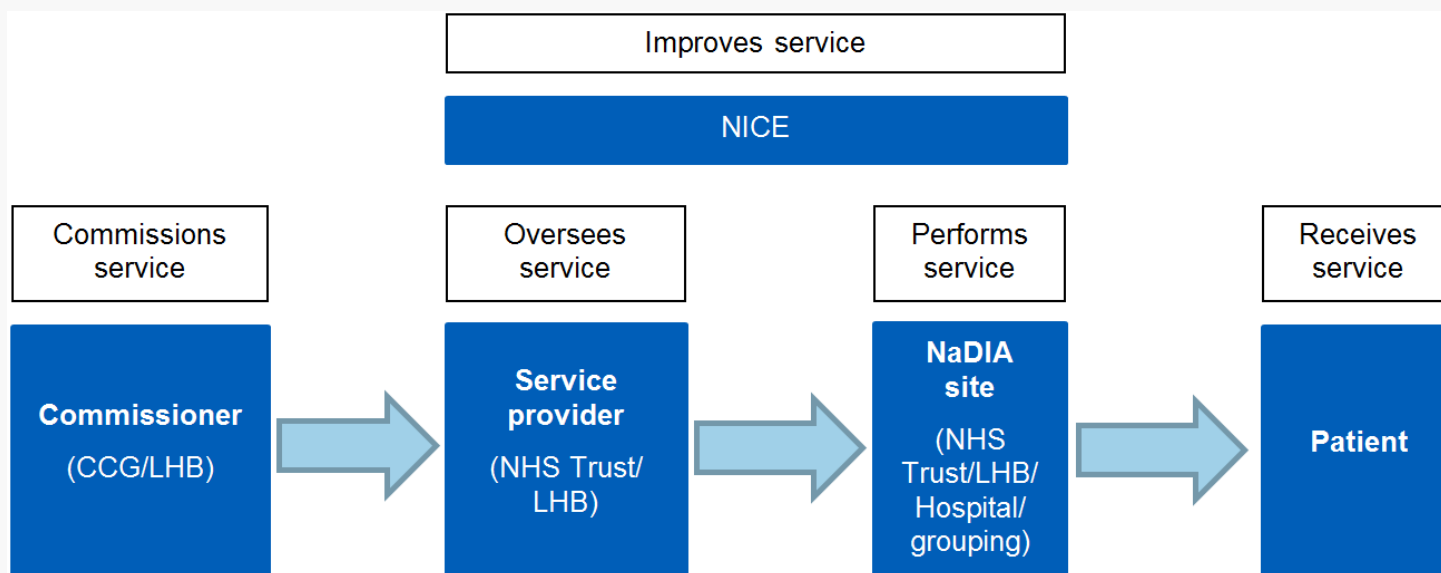
# Glossary: Healthcare providers

NaDIA data is collected and submitted by [healthcare professionals](#) that work on applicable hospital wards in England and Wales (Wales did not participate in 2019).

For NaDIA Hospital Level Analysis, data is aggregated by **NaDIA hospital site**, which may be an **NHS trust**, Welsh **Local Health Board** (LHB), an individual hospital or a grouping of hospitals that have chosen to have their results aggregated together.

**Commissioners** decide what health services are needed and ensure that they are provided. Clinical Commissioning Groups (CCGs) in England and LHBs in Wales are responsible for commissioning healthcare services.

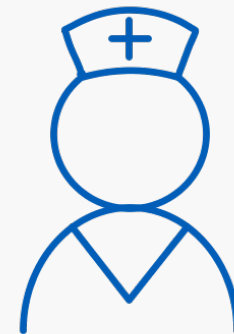
The National Institute for Health and Care Excellence (**NICE**) produces guidelines for the treatment of diabetes. All diabetes inpatient services should follow these guidelines, so that people with diabetes receive the best possible healthcare.



# Glossary: Healthcare professionals

A wide variety of healthcare professionals are involved in the care of inpatients with diabetes, including (but not restricted to) the following professions:

- **Diabetes consultants** are senior hospital physicians who diagnose and treat patients with diabetes. Diabetes consultants are specialists in diabetology and endocrinology (the specialism concerning the glands and hormones).
- **Diabetes specialist nurses** (DSN) work to meet the needs of people with diabetes and provide experience and expertise as part of dedicated diabetes teams. DSNs work wholly in diabetes care. A **diabetes specialist inpatient nurse** (DISN) provides hospital inpatient care<sup>1</sup>.
- A **dietitian** is a healthcare professional with expertise in diet and nutrition. A **specialist diabetes dietitian** advises people with diabetes on the most suitable diet to control and manage their diabetes.
- **Podiatrists** are healthcare professionals that specialise in conditions of the feet and lower limbs. This includes the prevention, management and treatment of foot complications commonly experienced by people with diabetes (e.g. diabetic foot disease).
- **Diabetes specialist pharmacists** are healthcare professionals that specialise in the safe and effective management of medication for controlling and treating diabetes.



# Glossary: Healthcare teams

“Specialists involved in the delivery of diabetes care must work in multi-disciplinary foot care teams (MDFTs) for care to be truly effective. They should have received extensive training accredited at a national level.”

Healthcare professionals form multi-disciplinary specialist teams in hospitals to co-ordinate diabetes care, including (but not restricted to):

- Inpatient specialist **diabetes teams** or **MDiTs** co-ordinate diabetes care in hospitals. Diabetes teams usually consist of diabetes consultants, diabetes specialist (inpatient) nurses (DSN/DISN), podiatrists and dietitians, who will also work with other specialists who might also form part of the team (e.g. pharmacists and clinical psychologists).
- Inpatient **MDFTs** co-ordinate diabetes foot care in hospitals. MDFTs meet weekly and consist of a diabetes consultant (diabetologist), a podiatrist with skills in managing the diabetic foot and a surgeon (general, orthopaedic or vascular surgeon). MDFTs will also work with other specialists who might be incorporated into the team (e.g. DSN/DISNs, podiatrists, interventional radiologists, microbiologists, tissue viability nurses). 82 per cent of hospital sites have MDFTs.
- 65 per cent of hospital sites host regular diabetes **mortality and morbidity (M&M) meetings** for healthcare professionals to discuss patient deaths and adverse incidents relating to diabetes. *At M&M meetings staff can discuss incidents in detail, report problems and share lessons to prevent the recurrence of adverse incidents.*

## Diabetes UK<sup>1</sup>



# Glossary: Referral to the diabetes team

When should the patient be referred to the diabetes team?

- Patient request
- Sepsis
- Vomiting
- Foot ulceration
- Unable to self-manage
- Impaired consciousness
- Newly diagnosed type 1 diabetes
- Newly diagnosed type 2 diabetes
- Parenteral or enteral nutrition
- Severe hypoglycaemia
- Recurrent hyperglycaemia
- Acute coronary syndrome
- Previous problems with diabetes as inpatient
- Intravenous insulin infusion for over 48 hours
- Intravenous insulin infusion with glucose outside limits
- Diabetic ketoacidosis (DKA)
- Hyperosmolar hyperglycaemic state (HHS)
- Admission for urgent or major elective surgical procedure
- End of life care



Derived from the 'Think Glucose Criteria' developed by the NHS Institute for Innovation Think Glucose<sup>1</sup>



# Glossary: Healthcare technologies

Hospitals may use some or all of the following healthcare technologies which support inpatient care:



- An **electronic patient record (EPR)** is a computer system designed to collect and store patients' clinical and health information in one place, replacing paper-based health records and multi-platform data collection. Hospital staff involved in patient care can access and update the EPR system at different points in the patient's care. A variety of EPR systems are used. More than one third of hospital sites fully-utilise an [EPR](#) system (37 per cent).
- Hospital **electronic prescribing (EP)** is a computer system designed to allow prescriptions to be sent to pharmacies through IT systems, rather than through paper prescriptions. More than 4 out of 10 hospital sites fully-utilise an [EP](#) system (45 per cent).
- **Remote blood glucose monitoring (BGM)** tools allow remote access to the measurement of patient blood glucose (BG) levels. Results can be transmitted to patients and caregivers in real time, providing an early warning if BG levels are outside the expected levels. More than 7 out of 10 hospital sites fully-utilise [remote BGM](#) (71 per cent).



# Glossary: Inpatient diabetic foot care

People with diabetes are at much greater risk of developing problems with their feet (**diabetic foot disease**), due to the damage raised blood sugars can cause to sensation (neuropathy) and circulation (ischaemia). If left untreated, these problems can cause foot lesions (ulcers) and infections and, at worst, may lead to amputations<sup>1</sup>.

About 9 per cent of inpatients with diabetes are admitted to hospital with active diabetic foot disease, around half of which are admitted for diabetic foot disease.

On admission to hospital, inpatients with diabetes may undergo a **specific diabetic foot risk examination** for ulceration, in addition to general pressure sore checks such as the Waterlow score.

Hospitals may follow foot care examination initiatives such as '**Putting Feet First**'<sup>2</sup> or **NICE inpatient foot guidance**<sup>3</sup> and may also have **tools or systems** in place to increase the number of inpatients with diabetes that have a specific diabetic foot risk examination.

Inpatients with active diabetic foot disease or at a high risk of developing foot problems should be assessed by the **multi-disciplinary foot care team** (MDFT – see [Glossary: Healthcare Teams](#)) as soon as possible following admission. 82 per cent of hospital sites have MDFTs.

If inpatient foot care is not effective, hospital-acquired diabetic **foot lesions** can arise. Foot lesions are associated with great patient distress, risk of amputation, increased mortality and high cost. *Whilst under a hospital's care, no patient should deteriorate enough so that they develop a new instance of a foot lesion.*



# Glossary: Medication errors

Hospital inpatients have **drug charts** to record their prescribed medication. Some entries contain **medication errors**, which have the potential to cause or contribute towards patient harms (see [Glossary: Patient harms](#)). Medication errors can be categorised by incident type (**prescription** or **glucose management**) and medication type (**insulin** or **OA-DA**<sup>1</sup>). A summary is shown in the table below:

Error description <sup>1</sup>	Error type			
Insulin not written up	Insulin prescription error	Insulin error	Prescription error	Medication error
Name of insulin incorrect				
Number (dose) unclear				
Unit abbreviated to 'u' or written unclearly				
Insulin or prescription chart not signed by prescriber				
Insulin not signed as given				
Insulin given/prescribed at the wrong time				
OA-DA not signed as given	OA-DA prescription error	OA-DA error	Prescription error	
OA-DA given/prescribed at the wrong time				
Wrong dose				
OA-DA not written up	Insulin management error	Insulin error	Glucose management error	
Insulin not increased when persistent BG >11 mmol/L and better glycaemic control appropriate for this patient				
Insulin not reduced if unexplained BG <4 mmol/L				
Inappropriate omission of insulin after episode of hypoglycaemia				
No action taken when persistent BG >11 mmol/L and better glycaemic control appropriate				
OA-DA not reduced if unexplained BG <4 mmol/L				
Inappropriate omission of OA-DA after episode of hypoglycaemia	OA-DA management error	OA-DA error		





# Glossary: Patient harms

There are a variety of patient harms that people with diabetes may develop in hospital. These potentially life-threatening events are entirely preventable and strenuous efforts must be taken to avoid them.

A **hypoglycaemic episode** (a hypo) is a potentially dangerous drop in a patient's blood glucose (BG) to below 4.0 mmol/L. 'Normal' BG (normoglycemia) is typically between 4.0 and 8.0 mmol/L.

- A 'mild' hypoglycaemic episode involves a BG level of between 3.0 and 3.9 mmol/L.
- A 'severe' hypoglycaemic episode involves a BG level of less than 3.0 mmol/L.

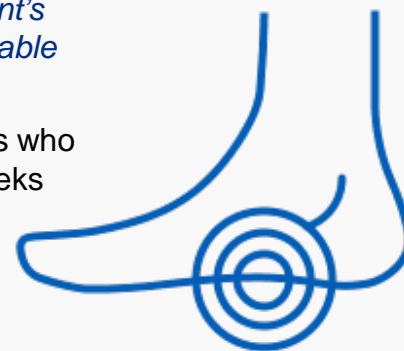
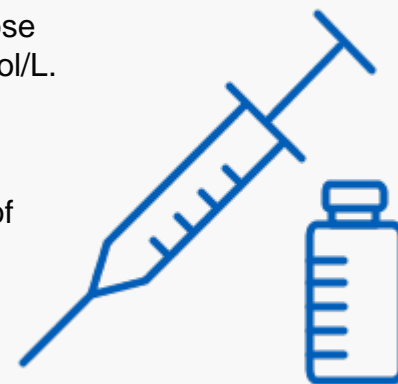
A **hypoglycaemic episode requiring injectable rescue treatment** occurs in severe cases of hypoglycaemia when the patient is unconscious and cannot take sugar by mouth. Rescue treatment is applied using an injection of glucose or Glucagon.

*A patient whose BG levels are properly managed should never experience a severe hypoglycaemic episode or require rescue treatment during their hospital stay.*

**Diabetic ketoacidosis** (DKA) mainly occurs in people with type 1 diabetes when a severe lack of insulin means the body cannot use glucose for energy and the body starts to break down other body tissue, releasing ketones as an alternative energy source. This can lead to ketoacidosis if the levels are too high. *The development of DKA after admission suggests that the inpatient's insulin treatment was omitted, or insufficient levels of insulin were provided, for an appreciable time. DKA is a potentially life-threatening emergency which should not develop in hospital.*

**Hyperosmolar hyperglycaemic state** (HHS) mainly occurs in people with type 2 diabetes who experience very high BG levels (often over 40mmol/L). It can develop over a course of weeks through a combination of illness (e.g. infection) and dehydration. *HHS is a potentially life-threatening emergency which should not develop in hospital.*

Patients with diabetes are at a higher risk of developing **foot lesions** (ulcers) because of associated blood flow (ischaemia) and nerve problems (neuropathy). *No patient should deteriorate enough while under a hospital's care that they develop a new foot lesion.*



# Glossary: NaDIA-Harms

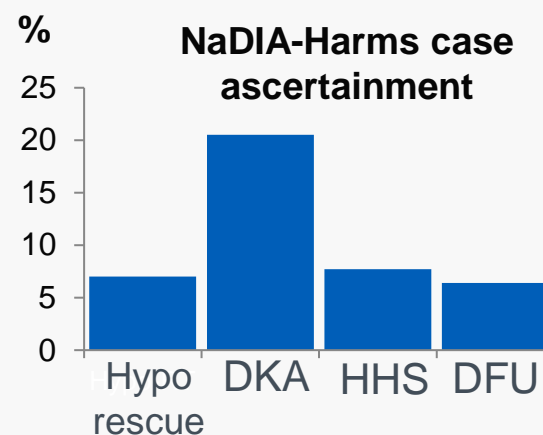


NaDIA-Harms is a continuous audit of inpatient harms that runs parallel to the annual NaDIA snapshot covered in this report.

**Why is NaDIA-Harms necessary?:** The snapshot nature of the annual NaDIA collection, coupled with the relatively low incidence of the four inpatient harms, means that continuous collection via NaDIA-Harms is needed to allow robust monitoring at **local level**, and contribute to the drive to lower the incidence of these serious inpatient harms.

In time, the NaDIA-Harms audit will enable NHS trusts to identify and analyse local occurrences of these key inpatient harms, supporting local **quality improvement** (QI) work. By collecting patient identifiers in NaDIA-Harms, the audit can harness the power of the core National Diabetes Audit (NDA) via **data linkage**, allowing case-mix adjusted **benchmarking** to be reported and **risk-adjusted** long term outcomes identified. Additionally, national characterisation of which patients are at **highest risk** will inform the development of better preventive care.

**Comparability:** In the latest NaDIA-Harms report, the NaDIA snapshot figures in slides 14, 15 and 16 have been used to produce an estimate of NaDIA-Harms case ascertainment, which ranges from 20 per cent (DKA) to just 6 to 8 per cent (others). Given these relatively low completeness levels, it is envisaged that the NaDIA snapshot will continue to collect data on inpatient harms over the next few years as participation in NaDIA-Harms improves.



The latest NaDIA-Harms report covering May 2018 to October 2019 is here: <http://digital.nhs.uk/pubs/nadia-harms2019>.



# Glossary: Patient experience

To find out whether the **patient experience** was favourable, the audit collects patient feedback on the following measures:

NaDIA Measure	Rationale
<ul style="list-style-type: none"> <li>• Involvement in care planning</li> </ul>	Inpatients should be empowered to become involved in their care planning as much as possible. Patient expertise in their diabetes care should be harnessed.
<ul style="list-style-type: none"> <li>• Extent that preferences for diabetes treatment taken into account</li> </ul>	Patient preferences for their diabetes treatment should be accommodated where possible.
<ul style="list-style-type: none"> <li>• Ability to take control of their diabetes</li> </ul>	Inpatients should be empowered to take control of their diabetes as much as possible. Patient expertise in their diabetes care should be harnessed.
<ul style="list-style-type: none"> <li>• Ability to self-administer insulin</li> </ul>	
<ul style="list-style-type: none"> <li>• Meal choice</li> <li>• Meal timing</li> </ul>	The timely provision of suitable food is integral to good diabetes management.
<ul style="list-style-type: none"> <li>• Staff awareness of diabetes</li> </ul>	Staff need to know which patients have diabetes to ensure the appropriate treatment is given.
<ul style="list-style-type: none"> <li>• Staff knowledge of diabetes</li> <li>• Staff ability to answer questions on diabetes</li> </ul>	Staff expertise in diabetes is essential to ensure the appropriate treatment is given and patient questions can be addressed.
<ul style="list-style-type: none"> <li>• Overall care for diabetes</li> </ul>	Patients overall perception of their diabetes care during their hospital stay is a useful measure of the patient experience as a whole.



# Glossary: Acronyms



**BA** form = NaDIA Bedside Audit form

**BG** = blood glucose

**CCG** = Clinical Commissioning Group

**DISN** = diabetes inpatient specialist nurse

**DKA** = diabetic ketoacidosis

**DSN** = diabetes specialist nurse

**EP** = electronic prescribing

**EPR** = electronic patient records

**HC** form = NaDIA Hospital Characteristics form

**HHS** = hyperosmolar hyperglycaemic state

**HQIP** = The Healthcare Quality Improvement Partnership

**IVII** = intravenous insulin infusion

**JBDS-IP** = Joint British Diabetes Societies for Inpatient Care group

**LHB** = Welsh Local Health Board

**M&M** meeting = mortality and morbidity meeting

**MDFT** = multi-disciplinary foot care team

**mmol/L** = millimole (one thousandth of a mole) per litre

**NaDIA** = National Diabetes Inpatient Audit

**NCAPOP** = National Clinical Audit Patient Outcomes Programme

**NCVIN** = National Cardiovascular Intelligence Network

**NDA** = National Diabetes Audit

**NICE** = National Institute for Health and Care Excellence

**OA-DA** = Oral anti-diabetic agent

**PE** form = NaDIA Patient Experience form

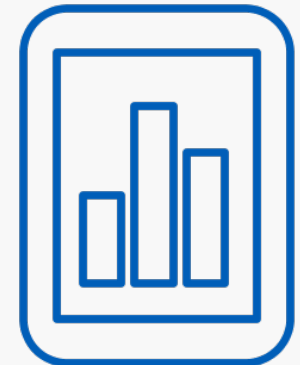
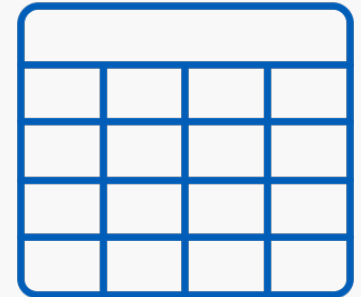
**QOF** = Quality and Outcomes Framework



# Additional information: Summary

The following documents are available from <http://digital.nhs.uk/pubs/nadia2019>

- A one page executive summary of this report.
- A PowerPoint version of this report.
- Deep-dive reports on individual chapters, including report chapters as standalone publications (pdf and PowerPoint).
- Hospital site level 2010-2019 charts and data
- Supporting data in Excel format
- Data Quality Statement
- Methodology



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- NICE: Diabetes in adults: <https://www.nice.org.uk/Guidance/QS6>
- NHS England: Diabetes transformation fund: <https://www.england.nhs.uk/diabetes/diabetes-prevention/diabetes-transformation-fund/>
- NHS England (2019): NHS Long Term Plan: <https://www.longtermplan.nhs.uk/>
- NHS England: Serious Incidents Framework: <https://www.england.nhs.uk/patientsafety/serious-incident/>



# Additional information: Acknowledgements

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# Prepared in collaboration with:



**The Healthcare Quality Improvement Partnership (HQIP).** The National Diabetes Inpatient Audit (NaDIA) audit is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing, and National Voices. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage, and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies [www.hqip.org.uk/national-programmes](http://www.hqip.org.uk/national-programmes).



**NHS Digital** is the new name for the Health and Social Care Information Centre. NHS Digital managed the publication of the 2020 annual report.



**Diabetes UK** is the largest organisation in the UK working for people with diabetes, funding research, campaigning and helping people live with the condition.

Supported by:



Public Health  
England

The **National Cardiovascular Intelligence Network (NCVIN)** is a partnership of leading national cardiovascular organisations which analyses information and data and turns it into meaningful timely health intelligence for commissioners, policy makers, clinicians and health professionals to improve services and outcomes.



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