

NDA

A summary report of the
National Diabetes Audit:
**Complications and
Mortality**

2017–18

**What are the long-term
outcomes for people
with diabetes?**



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Note: All results in this document are taken from the National Diabetes Audit 2017–18: Care Processes and Treatment Targets Report

Report at a glance

The National Diabetes Audit measures the quality of care provided to people with diabetes. The information in the audit is collected and submitted by GP practices and specialist diabetes services in England and Wales. This report includes information on nearly 3.6 million people with diabetes. It provides an overview of the long term outcomes of diabetes. This analysis helps to identify what additional health risks are faced by people with diabetes.

This report includes information on nearly



3.6M
PEOPLE WITH DIABETES

The results

COMPLICATIONS

CVD

People with diabetes are much more likely to develop cardiovascular disease (CVD) than people without diabetes. This includes heart attack, heart failure, angina and stroke.

Increased risk of developing CVD than people without diabetes:



CHRONIC KIDNEY DISEASE AND AMPUTATIONS

There are other complications that people with diabetes are more likely to develop. These include chronic kidney disease and amputations (surgical removal of part of the foot or leg).

Increased risk of developing CVD to be in end stage kidney disease than people without diabetes:



UP TO 75% of all admissions for amputations are for people with diabetes

PREVENTION

These are quite startling findings and you may be worried about your own risk. But there are steps you can take to help prevent these complications. Some of the steps you could take to manage your risk are:

-  Stopping smoking
-  Eating a healthy, balanced diet
-  Being more physically active
-  If you are overweight, trying to get down to a healthy weight. Any weight loss will be of benefit
-  Taking your medication as prescribed
-  Making sure you get your blood pressure, cholesterol and HbA1c checked at least once a year. And working with your healthcare team to keep to the targets you've agreed.

WE SAY

These findings are a stark reminder of the impact diabetes has on increased risk of complications and early death. But there is lots that can be done by people with diabetes and their healthcare teams to prevent these complications. The risk of early death is largely related to the health complications of diabetes.

Background

In December 2019, NHS Digital published the [National Diabetes Audit \(NDA\): Complications and Mortality report 2017–18](#). This report has been prepared by [Diabetes UK](#) and summarises the information in the report in a way that is more accessible for people with diabetes. This report is also for anyone interested in the outcomes for people with diabetes in England and Wales.

About this report

In this report we explain:

- The long term outcomes for people with diabetes compared to people without diabetes
- The associations between individual patient factors (ie age, Body Mass Index, smoking status) and outcomes
- The potential impact of making changes in lifestyle and treatment targets on complications and long term outcomes

Before writing this summary report, we talked to people with diabetes to find out what information they wanted to see and how to present the findings.

At the back of the report we explain what the audit is and why it is important to look at the care that is provided to people with diabetes. There is also a glossary and details of where to find more information.

In this report, 'type 2' refers to type 2 and other forms of diabetes such as MODY and LADA.

What outcomes are included?

The outcomes included in the audit come from 2017-18 hospital admission data. The type of outcomes we look at are split into:

Cardiovascular outcomes

- Heart failure
- Heart attack
- Angina
- Stroke

Diabetes specific outcomes

- Renal Replacement Therapy (kidney dialysis)
- Major and minor foot amputation
- Diabetic Ketoacidosis (DKA) and Hyperglycaemic Hyperosmolar State (HHS)

Mortality

- Causes of death compared to general population
- Rates of death related to age and type of diabetes

Background

What individual patient factors are included?

The individual patient factors we look at are split into:

Individual personal characteristics

- Age
- Type of diabetes
- Years since diagnosis of diabetes (duration)
- Sex
- Socio Economic Deprivation (measured using the Index of Multiple Deprivation (IMD) based on postcode of home address)
- Ethnicity

Diabetes treatment characteristics

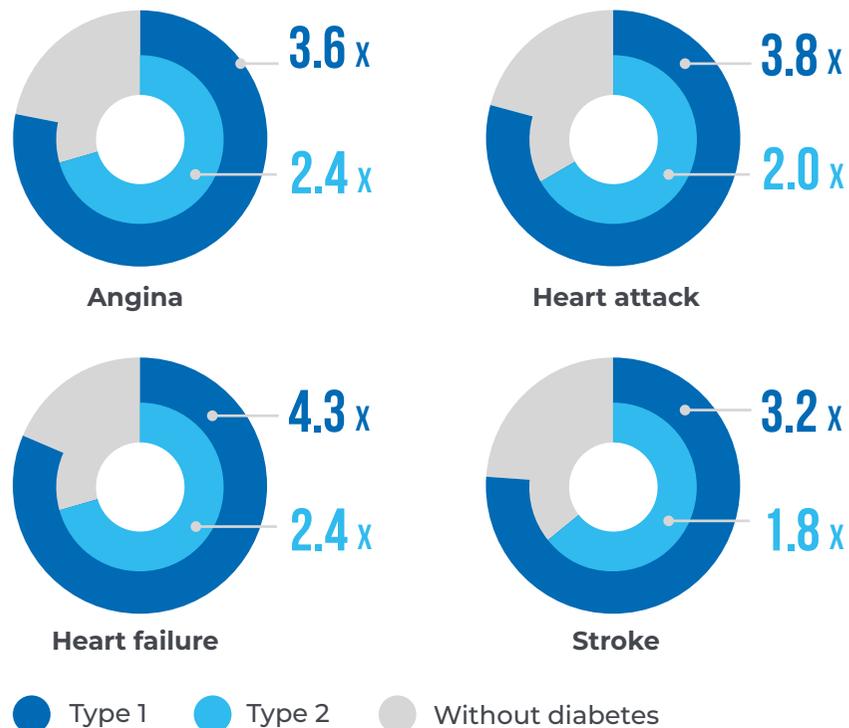
- Body Mass Index (BMI)
- Average HbA1c over the last five years
- Average systolic blood pressure over the last five years
- Smoking status (current smoker, ex-smoker, non-smoker, never smoked)

The results

Cardiovascular outcomes

Cardiovascular disease (CVD) includes heart disease, stroke and all other diseases of the heart and circulation. We looked at data relating to angina, heart attack, heart failure and stroke. We compared the data about CVD for people with diabetes to the data about CVD for people without diabetes. The results show that cardiovascular disease is much more common in people with diabetes.

This table illustrates the increased risk of having CVD for people with diabetes compared to people without diabetes.



About 5.5% of the adult population have diabetes but account for about 25–30% of all admissions to hospital for cardiovascular disease.

This table shows the most important individual patient factors associated with admissions to hospital with CVD for people with type 1 diabetes. Those highlighted are lifestyle and treatment target factors that are considered to be potentially amenable to healthcare/lifestyle changes.

| | Most important characteristic | Next most important characteristic(s) |
|---------------|-------------------------------|---|
| Angina | Age | HbA1c/Blood pressure/ Duration of diabetes |
| Heart attack | Age | HbA1c/ Blood pressure |
| Heart failure | Age | Duration of diabetes/ Blood pressure/ Smoking status |
| Stroke | Age | Blood pressure/ HbA1c/ Smoking status |

Age is the characteristic most closely associated with whether a person with type 1 diabetes has a cardiovascular admission. The secondary factors include many that are related to lifestyle and achievement of NICE treatment targets.

This table show the same information but for people with type 2 diabetes.

| | Most important characteristic | Next most important characteristic(s) |
|---------------|-------------------------------|--|
| Angina | Age | HbA1c/ Blood pressure/ BMI |
| Heart attack | Age | HbA1c/ Blood pressure/ Smoking status/ Duration of diabetes |
| Heart failure | Age | Social deprivation/ Duration of diabetes/ HbA1c/ Blood pressure |
| Stroke | Age | HbA1c/ Blood pressure |

Age is the factor that is most closely associated with whether a person with type 2 and other diabetes has a cardiovascular admission. The secondary factors include many that are related to lifestyle and achievement of NICE treatment targets.

The results

How can I manage my risk of developing cardiovascular disease?

These are quite startling findings and you may be worried about your own risk. But there are steps you can take to help prevent CVD. Blood vessels are damaged by high blood glucose levels, high blood pressure, smoking or high levels of cholesterol. Some of the steps you could take to manage your risk are:

-  Stopping smoking
-  Eating a healthy, balanced diet
-  Being more physically active
-  If you are overweight, trying to get down to a healthy weight. Any weight loss will be of benefit
-  Taking your medication as prescribed
-  Making sure you get your blood pressure, cholesterol and HbA1c checked at least once a year. And working with your healthcare team to keep to the targets you've agreed.

Diabetes specific outcomes

We looked at data relating to Renal Replacement Therapy (kidney dialysis), major and minor foot amputation.

Renal replacement therapy (RRT)

Renal replacement therapy means that a person needs kidney dialysis or a kidney transplant because their kidneys no longer work well enough. Whilst anyone can develop chronic kidney disease, it is much more common in people with diabetes.

A person with type 1 diabetes is **17 times** more likely to be in end stage kidney disease needing RRT than a person without diabetes.

A person with type 2 diabetes is **3.6 times** more likely to be in end stage kidney disease needing RRT than a person without diabetes.

About **5.5%** of the adult population have diabetes but account for more than **40%** of bed days for renal replacement therapy.

The results

Amputations

Amputation (surgical removal) of part of the foot or leg may be required when a foot ulcer cannot otherwise be successfully treated.

This may be a minor amputation (below the ankle) in which toes or part of the foot are removed in an attempt to save the leg. When this is not possible, major amputation (above the ankle) may be required.

Amputation is a life-changing event, with significant physical and psychological effects. Long hospital stays and periods of rehabilitation can result.

More than **4 out of 10** of all admissions for major amputations and almost **3 out of 4** of all emergency admissions for minor amputations are in people with diabetes.

This table shows the most important individual patient factors associated with admissions to hospital with diabetes specific complication for people with type 1 diabetes. Those highlighted are lifestyle and treatment target factors that are considered to be potentially amenable to healthcare/ lifestyle changes.

| | Most important characteristic | Next most important characteristic(s) |
|------------------|-------------------------------|---|
| RRT | Blood pressure | Duration of diabetes/ Social deprivation/ Ethnicity |
| Minor amputation | HbA1c | Age/ Smoking status / Duration of diabetes |
| Major amputation | Age | HbA1c |

HbA1c and blood pressure are the characteristics most closely associated with admissions for diabetes specific complications.

This table show the same information but for people with type 2 diabetes.

| | Most important characteristic | Next most important characteristic(s) |
|------------------|-------------------------------|--|
| RRT | Duration of diabetes | Blood pressure |
| Minor amputation | HbA1c | Sex/ Duration of diabetes |
| Major amputation | HbA1c | Duration of diabetes/ Smoking status |

HbA1c and blood pressure are closely associated with admissions for diabetes specific complications, as is duration of diabetes.

The results

Impact of making lifestyle changes and achieving treatment targets on complications

How can I manage my risk of developing diabetes specific complications?

There are strong links between having diabetes and developing chronic kidney disease or having a foot ulcer that requires amputation. But there are things you can do to reduce your risk of developing these complications:

- Making sure you get your blood pressure, cholesterol and HbA1c checked at least once a year. And working with your healthcare team to keep to the targets you've agreed
- Having the recommended test to measure kidney function at least once a year
- Having your feet checked at least once a year and talking to your healthcare team as soon as you have any concerns about your feet
- Stopping smoking
- Eating healthily and keeping physically active

What might be the impact of making changes in lifestyle and treatment targets?

In this audit, for the first time, we have been able to use statistical models to estimate what the impact of making changes to lifestyle or treatment targets could be on the risk of admissions for complications of diabetes. The complications we looked at are:

Cardiovascular complications

- Heart failure
- Heart attack
- Angina
- Stroke

Diabetes specific complications

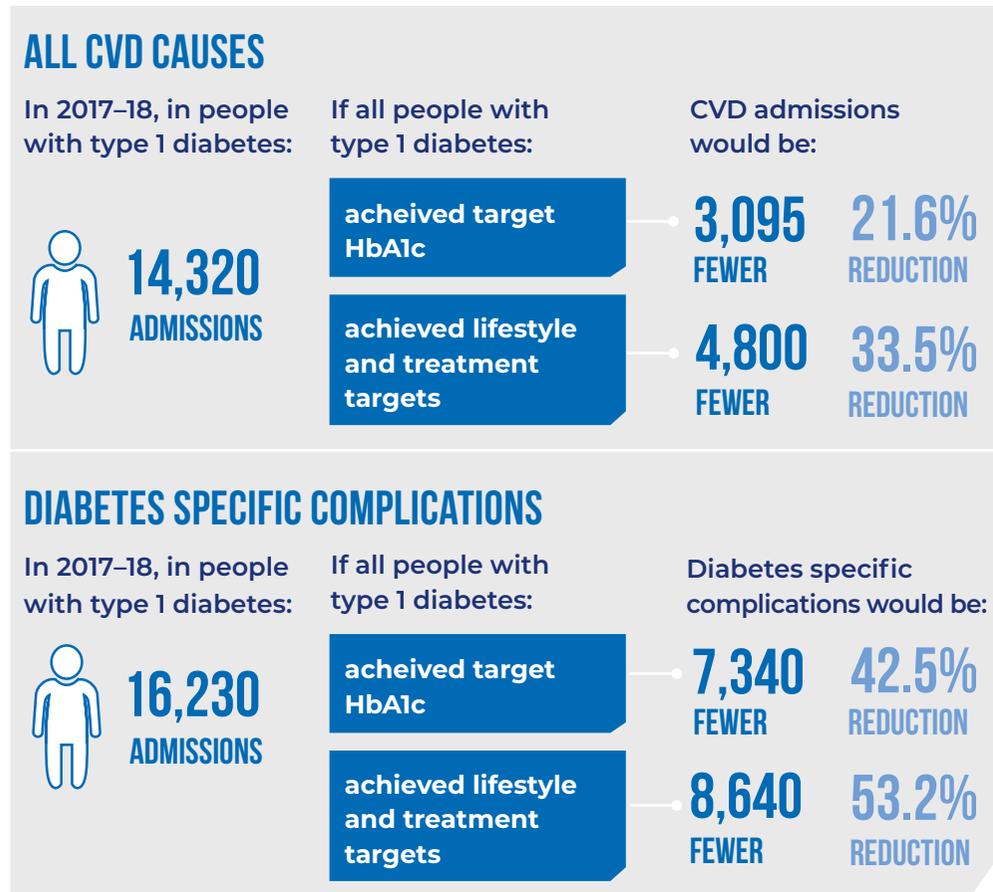
- Renal Replacement Therapy (kidney dialysis)
- Major and minor foot amputation
- Diabetic Ketoacidosis (DKA) and Hyperglycaemic Hyperosmolar State (HHS)

We assessed the potential impact of:

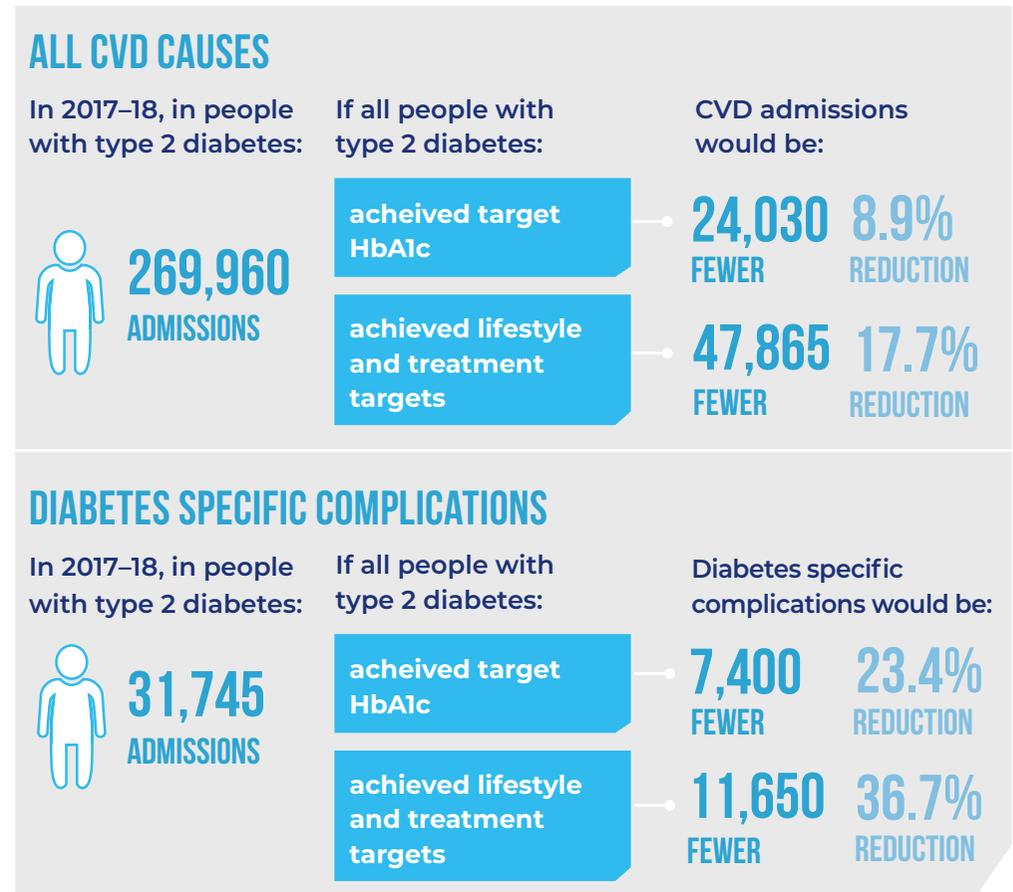
- Achieving HbA1c of 48-58mmol/mol
- Lifestyle changes (BMI reduced to 25-30, stopping smoking) **plus** achieving treatment targets of HbA1c of 48-58mmol/mol and systolic blood pressure 130-140

The results

Type 1



Type 2



WE SAY

If all people with diabetes were supported to meet the suggested lifestyle and treatment targets an estimated 72,955 admissions to hospital could be prevented each year. The impact of this, both in terms of distress to the person with diabetes and their families, and the financial costs to the NHS is huge.

Healthcare professionals should work in partnership with people with diabetes to agree a personalised care plan to help them achieve the recommended targets.

The results

Q What is the impact of diabetes on causes of death and risk of premature death?

We looked at causes of death for people with diabetes compared to people without diabetes. The number of people, with or without diabetes, who die from cardiovascular disease has been steadily declining. However, CVD remains the leading single cause of death in people with diabetes. Cardiovascular disease causes more deaths than cancer in people with diabetes.

| Cause of death (2017) | People with diabetes | People without diabetes |
|-----------------------|----------------------|-------------------------|
| All cancers | 25.2% | 28.3% |
| All CVD | 32.1% | 27.8% |
| All other causes | 41.3% | 41.5% |
| Unknown cause | 1.3% | 2.4% |

We also found that people with diabetes were 53% more likely to die prematurely than people without diabetes. For people with type 1 diabetes, the increased risk of premature death was 148%. For people with type 2 diabetes, the increased risk of premature death was 50%.

WE SAY

These findings are a stark reminder of the impact diabetes has on increased risk of early death. But, this risk is largely related to the health complications of diabetes. As shown above, there is lots that can be done by people with diabetes and their healthcare teams to prevent these complications.

The previous Complications and Mortality report (2017) showed that people who had received all three healthcare checks (HbA1c, cholesterol and blood pressure) for each of the previous 7 years had better outcomes than those who did not receive them all over the same period. These better outcomes included:

-  Decreased risk of early death
-  Reduced progression to heart failure
-  Reduced progressions to Renal Replacement Therapy

This demonstrates the importance of healthcare teams working with people with diabetes to ensure they are able to access these crucial checks.

Our recommendations



For people with diabetes

- ✓ Make sure you get all the annual healthcare checks you need
- ✓ Ask for the results of your healthcare checks so you have information about whether adjustments to your diabetes management are needed
- ✓ We have developed a 15 healthcare essentials checklist which gives details of the recommended annual healthcare checks, along with other important parts of diabetes care. Take this with you when you go to see your GP or nurse
- ✓ Work with your doctor or nurse to develop a personalised plan to help you to meet the blood glucose, blood pressure and cholesterol targets
- ✓ Make any lifestyle changes needed to help reduce your risk of developing complications. For example, stopping smoking, taking regular exercise and cutting down on salt and alcohol
- ✓ Speak to your doctor or nurse if you have any questions about your checks or if there are checks you are not getting



For diabetes services

- ✓ Support all people with diabetes to achieve lifestyle and treatment targets that will reduce adverse outcomes
- ✓ Address the additional risks associated with type 1 diabetes, longer duration of diabetes and social deprivation
- ✓ Track progress using NDA Report 1: Care Processes and Treatment Targets
- ✓ Recognise and manage the most prevalent adverse outcome – heart failure

Our recommendations



For commissioners

-  Recognise the substantial opportunities for improving outcomes for people with diabetes and reducing hospital admissions.
-  If your CCG/LHB has high rates of one or more adverse outcome, draw up and implement an action plan.
-  Ensure your primary care and specialist care diabetes providers are resourced and organised to deliver NICE standard care. Track progress using NDA Report 1: Care Processes and Treatment Targets.
-  Ensure you have systems to minimise future duration of type 2 diabetes (obesity prevention, diabetes prevention, diabetes remission).

Further information

What is the National Diabetes Audit?

The audit is a project that checks the quality of care provided to people with diabetes by GP practices and hospitals in England and Wales. The first audit took place in 2011 and has collected information annually since then about the quality of care for people with diabetes. Specifically, we look at:

- How many people with diabetes are registered at a GP practice or hospital diabetes clinic
- Whether people with diabetes receive their annual health checks
- Whether people with diabetes achieve treatment targets for blood glucose, blood pressure and cholesterol control
- Whether people have been offered a diabetes structured education course within 12 months of diagnosis and whether they have attended

Every few years the *Core Report 1 – Care Processes and Treatment Targets*, is supplemented with the *Core Report 2 – Complications and Mortality*. This report provides an overview of the long term outcomes of diabetes. This analysis helps to identify what additional health risks are faced by people with diabetes.

Why do we audit care for people with diabetes?

The [National Institute for Health and Care Excellence \(NICE\)](https://www.nice.org.uk) produces guidelines for diabetes care. All GP practices and specialist diabetes services should follow these guidelines to provide good quality diabetes care. In the audit we check whether people with diabetes get the care and treatment recommended in the NICE guidelines.

The NDA supports improvements in the quality of diabetes care by enabling NHS services to:

- Assess local practice against NICE guidelines
- Compare their care and outcomes with similar services
- Identify gaps or shortfalls that are priorities for improvement
- Identify and share good practice
- Provide a comprehensive national picture of diabetes care and outcomes in England and Wales

The audit findings are publically available, so you can see the results for your local GP practice or specialist service. You can find this on the [NHS Digital](https://www.nhs.uk) website.

Where to go for more information

The National Diabetes Audit

Information about the National Diabetes Audit and copies of the full reports are available on the NHS Digital website <https://digital.nhs.uk/data-and-information/publications/statistical/national-diabetes-audit/report-2--complications-and-mortality-2017-18>

Diabetes UK

For more information about diabetes, including living with diabetes, go to www.diabetes.org.uk/guide-to-diabetes or call Diabetes UK's Helpline on 0345 123 2399 for advice and support.

For information about getting involved in making a difference to diabetes treatment and care, go to www.diabetes.org.uk/get_involved/campaigning/diabetes-voices

To find out more about Diabetes UK's activities in your area, go to www.diabetes.org.uk/in_your_area

Further information

National Institute for Health and Care Excellence (NICE) guidelines

For information about how NICE develops guidelines, go to www.nice.org.uk.
Guidelines about diabetes care include:

www.nice.org.uk/guidance/ng17 for management of type 1 diabetes in adults

www.nice.org.uk/guidance/ng28 for management of type 2 diabetes in adults

Healthcare Quality Improvement Partnership (HQIP)

To find out more about clinical audits – and patient involvement in national clinical audits – you can visit the HQIP website at

www.hqip.org.uk/involving-patients

Patient Advice and Liaison Service (PALS)

If you have a question about local health services or an enquiry about health matters, you can contact PALS. Find more information or your local PALS at

www.nhs.uk

Community Health Councils (CHC) in Wales

If you need help and advice about NHS Services in Wales, you can contact CHC. Find out more at www.wales.nhs.uk

NHS Choices (England)

NHS Choices provides information about your health, including finding and using NHS Services in England. Find out more at

www.nhs.uk/pages/home.aspx

NHS Wales

NHS Wales provides information about your health, including finding and using NHS Services in Wales. Find out more at www.wales.nhs.uk

Explanation of words used in this booklet

Audit

A way of gathering information and measuring local NHS organisations' performance and quality of care against national guidelines, from which come recommendations for improvements.

Blood glucose

The main sugar the body makes from the food we eat. Glucose travels in the bloodstream, providing energy to all the body's living cells. However, the cells cannot use glucose without the help of insulin.

Cardiovascular Complications

Angina is chest pain that occurs when the blood supply to the muscles of the heart is restricted. It usually happens because the arteries supplying the heart become hardened and narrowed.

Myocardial Infarction (MI), commonly known as a heart attack, is a serious medical emergency in which the supply of blood to the heart is suddenly blocked, usually by a blood clot.

Heart failure means that the heart is unable to pump blood around the body properly. It usually occurs because the heart has become too weak or stiff.

A **stroke** is a serious life-threatening medical condition that occurs when the blood supply to part of the brain is cut off.

Diabetes

Diabetes is the shortened name for the health condition called diabetes mellitus. Diabetes happens when the body cannot use blood glucose as energy because of having too little insulin or being unable to use insulin. See also type 1 diabetes and type 2 diabetes.

Further information

Diabetes Specific Complications

Renal Replacement Therapy (RRT) is therapy (such as kidney dialysis) that replaces the normal blood-filtering function of the kidneys. It can also include kidney transplantation.

Amputation is the surgical removal of part of the body, such as an arm or leg.

Diabetic Ketoacidosis (DKA) is a serious problem that can occur in people with diabetes if their body starts to run out of insulin. This causes harmful substances called ketones to build up in the body, which can be life-threatening if not spotted and treated quickly.

Type 1 diabetes

Type 1 diabetes develops when the body permanently destroys its own insulin-producing cells. When this happens a person needs regular insulin, given either by injection or an insulin pump.

Type 2 diabetes

A condition in which the body either makes too little insulin, or cannot use the insulin it produces to turn blood glucose into energy. Diet and exercise is often enough to control type 2 diabetes, but some people also need diabetes medication or insulin.

[NDA publications](#)

[NDA: National Diabetes Audit](#)

[Care processes and treatment targets](#)

[Complications and mortality](#)

[Insulin pump](#)

[Transition](#)

[NPID: National Pregnancy in Diabetes Audit](#)

[N DFA: National Diabetes Foot Care Audit](#)

[NaDIA: National Diabetes Inpatient Audit](#)

[NDPP: National Diabetes Prevention Programme Audit](#)

We welcome your views on how we can improve this report

Please contact:

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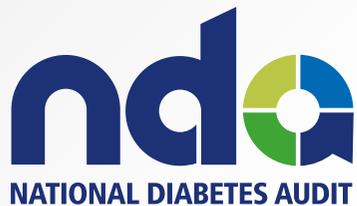
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The National Diabetes Audit (NDA) is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit (NCA) programme. The NDA is managed by NHS Digital, formerly known as the Health and Social Care Information Centre (HSCIC), in partnership with Diabetes UK and is supported by the National Cardiovascular Intelligence Network (NCVIN), Public Health England. The NDA receives invaluable support from people with diabetes, clinical staff and other health professionals across England and Wales.

