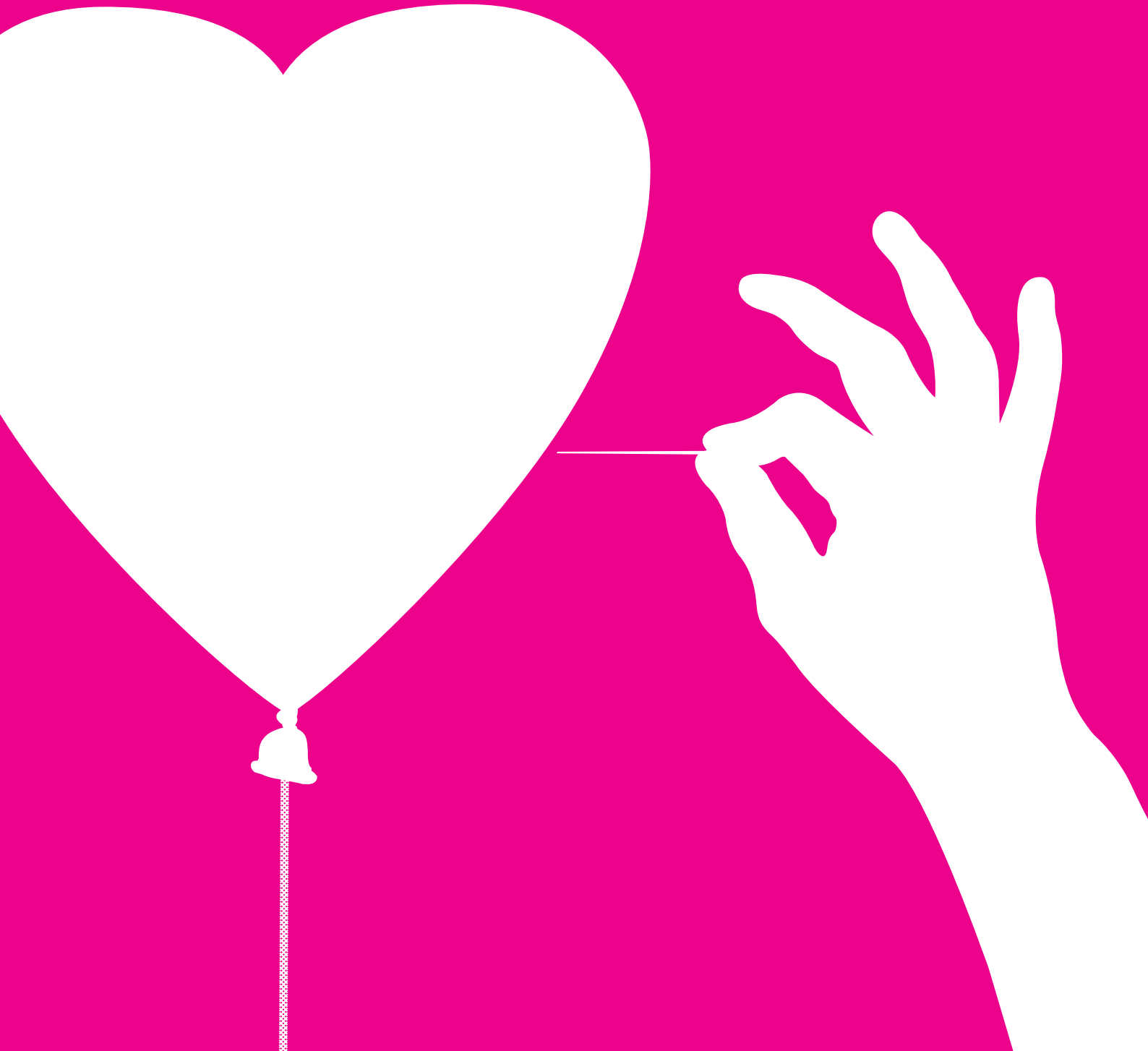


Diabetes heartache

The hard reality of cardiovascular
care for people with diabetes



At a glance...

- **2.2 million people** are currently **living with diabetes** in the UK.¹ Another **750,000** have the condition but are **not aware of it.**² Of these, **2.4 million are at risk of dying** from cardiovascular disease (CVD).³
- According to latest data, many people with diabetes are still **not receiving the recommended care** and treatment set out by official UK guidelines to reduce their CVD risk.
- This problem is likely to get **much worse** as the number of people with diabetes is set to almost **double over the next 20 years**, reaching epidemic proportions.³
- Diabetes UK considers this diabetes heartache a **national emergency** requiring immediate action.



This report has been kindly sponsored by Pfizer Ltd. Pfizer Ltd also provided gift-in-kind support for the production of the report. All final approvals stayed with Diabetes UK.

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“It is vital that we focus not only on the increasing burden of diabetes but also the cardiovascular risk that is associated with it. It is important that what we have learned from clinical trials is put into action, so that individual patients benefit and their CVD risk is decreased. Premature CVD is largely preventable by intensive attention to modifiable risk factors.”

Professor D. John Betteridge, Professor of Endocrinology and Metabolism, University College, London

Introduction

Diabetes UK is compelled to report that the lives of millions of people with diabetes are threatened by cardiovascular disease (CVD), despite the overwhelming evidence that awareness, lifestyle changes and early, aggressive treatment (when necessary) can significantly improve long-term health.

Many people with diabetes in the UK are failing to reach the recommended treatment targets for key CVD risk factors like blood pressure and cholesterol, despite the fact that official guidelines provide clear recommendations and treatment is proven to significantly reduce heart attacks and strokes. To make matters worse, the national cholesterol targets for people at high risk of a CV event (such as people with diabetes) are likely to remain at a target figure of Total cholesterol 5 mmol/l and LDL cholesterol of 3 mmol/l until December 2007 at the earliest.⁴ This goes against the recommendations of the UK's leading CVD and diabetes specialists, including Diabetes UK, who issued guidelines in 2005 recommending these people be treated to cholesterol targets of Total cholesterol less than 4 mmol/l and LDL cholesterol less than 2 mmol/l based on the latest clinical evidence.⁵

While leading a healthy lifestyle is key to reducing the risk of developing the various complications of diabetes, the provision of education courses on living a healthy lifestyle is patchy throughout the UK.¹ Many people with diabetes still smoke⁶ and access to dietitians is also limited.⁷

Awareness is also an issue as many people with diabetes remain unaware that CVD is a life threatening complication of diabetes.⁸

When it comes to treatment, in 2003 HPS (Heart Protection Study) and in 2004 CARDS (Collaborative Atorvastatin Diabetes Study), in which Diabetes UK took part, showed that most people with Type 2 diabetes would benefit from statin treatment.^{9,10} Nearly three years on, just 60 per cent of people with diabetes are recorded to be receiving statins.¹¹

This is all happening even though CVD needs to be treated as seriously in people with diabetes as those who have already had a heart attack or a stroke.⁵

This report collates the latest data on CV management in people with diabetes and shows the reality of the heartache it causes.

Diabetes:

A health crisis

2.2 million people in the UK have been diagnosed with diabetes – 4 per cent of the total population.¹ In addition, up to 750,000 people have the condition but are not aware of it.² This is 11 times the total number of people who were diagnosed with diabetes in 1940.³

Why is this happening?

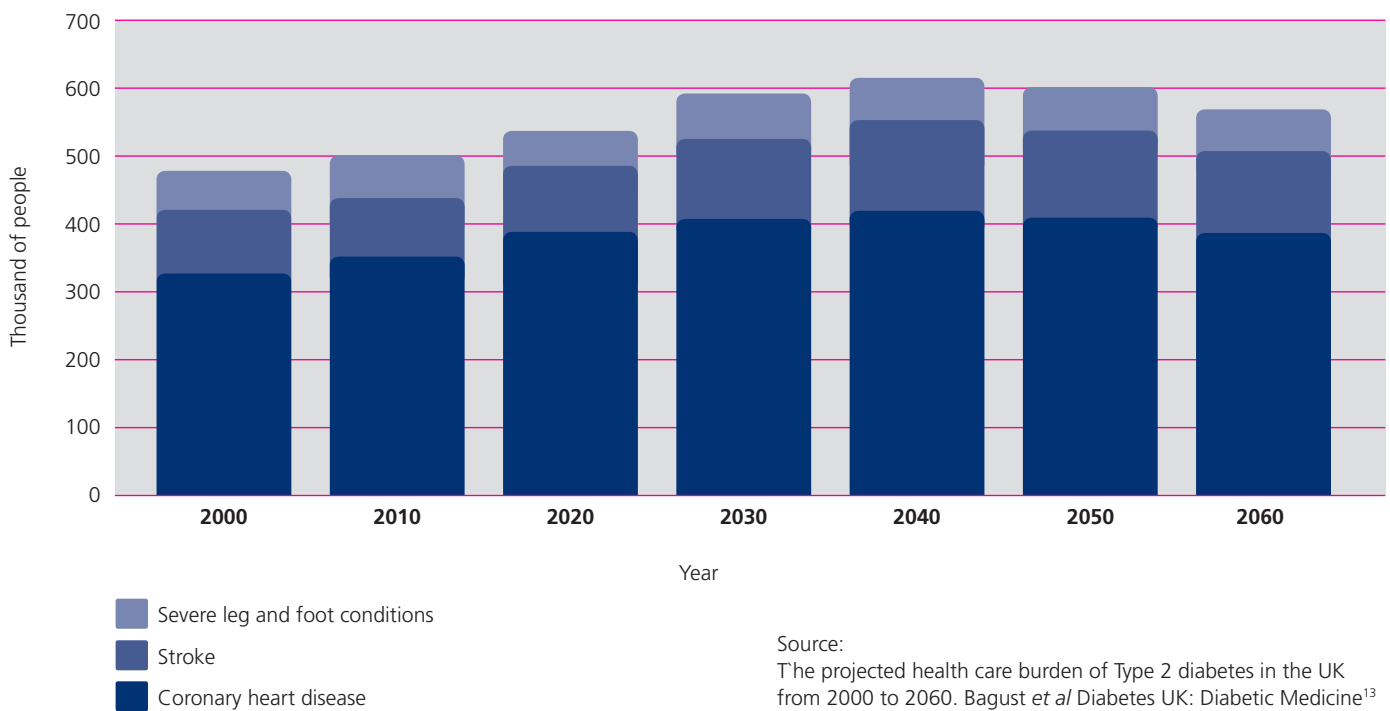
As in other countries, the increasing prevalence of diabetes in the UK is being fuelled by the rise in the number of people with Type 2 diabetes – which typically develops in those over 40 years of age.

This has largely been caused by an ageing population and increasing levels of obesity. There is also alarming evidence of an increasing incidence of Type 2 diabetes amongst children.¹²

Currently, more than 100,000 people are diagnosed with Type 2 diabetes every year in the UK. This is equivalent to:

- around 275 people every day
- almost 12 people every hour
- **one person every five minutes.**³

Figure 1.
Increase in diabetes complications between 2000 and 2060



Cardiovascular disease: At the heart of diabetes

It is vital to take action now to improve the care and treatment of people with diabetes, as the condition causes complications that affect the whole body, including the eyes, kidneys, and nerves. However, the complication which leads to the most premature deaths is CVD. In fact, diabetes is second only to smoking as the leading cause of CVD in the UK.¹⁴

A 2006 MORI survey for Diabetes UK showed a worrying lack of awareness amongst the general public of the dangers of CVD amongst people with diabetes. Only 28 per cent of people interviewed realised that diabetes can lead to heart disease and only 21 per cent were aware it can lead to strokes.⁸

CVD covers any disease of the heart and blood vessels including coronary heart disease (CHD), stroke and peripheral vascular disease and is still the number one cause of death in the UK.³

The risk factors leading to the disease such as high blood pressure and high cholesterol are more common in people with diabetes as they have a higher risk of developing high blood pressure and high cholesterol levels. People with diabetes who are overweight with abdominal obesity tend to have higher levels of low density lipids (LDL) or 'bad' cholesterol and lower levels of high density lipids (HDL) or 'good' cholesterol.

With the explosion in diabetes prevalence, substantial increases in the number of people with diabetes requiring treatment for CV complications are anticipated (figure 1).

The increased risk of CV complications for people with diabetes compared to those without

Complication	Increase in risk
CVD	8 fold (in women). ³ 5 fold (in middle aged men). ³
Stroke	3 fold. ³
Transient ischaemic attack ('mini stroke')	6 fold. ¹⁵
Admission to hospital	5 fold. ¹⁶

The implications of CVD for people with diabetes

- **80 per cent** of people with diabetes will die from CVD.³
- People with diabetes account for ten per cent of all hospital admissions and up to 20 per cent in some age groups. This includes about **30 per cent of coronary care admissions**.¹⁷
- Some people with diabetes need help from social services, and the presence of complications such as CVD **quadruples these costs**.¹⁶

CV care in diabetes:

The hope and the heartache

Clear evidence-based guidelines are in place to drive CV care for people with diabetes, but despite enormous publicity and significant steps forward, the latest data show that hundreds of thousands of patients with diabetes are still not getting the care that they need. Their lives are being put at risk.

Lifestyle advice

The hope...

All people with diabetes should receive education on careful 'self management' and maintaining 'good control', ie control of blood glucose levels, blood pressure, cholesterol and body weight through following a healthy diet, physical activity, moderating alcohol intake and stopping smoking. The value of patient education is evident from research demonstrating that people with diabetes who have never received diabetes education showed a striking four fold increased risk of a major complication.¹⁸

...and the heartache

- Over half of primary care trusts surveyed in England do not provide any structured education for children and young people.¹
- Only 6 per cent of Diabetes UK's adult members have participated in an education or training course in the last 12 months.¹
- Over 15 per cent of people with diabetes in England still smoke.⁶

Blood glucose management

The hope...

All people with diabetes should have access to the right treatment to manage their blood glucose effectively as good glycaemic control has been associated with a significantly reduced risk of complications, including those related to CVD.¹⁹

...and the heartache

- According to the latest Quality and Outcomes Framework (QOF) figures, 40 per cent of people with diabetes in England have an HbA1c of >7.4 per cent. Even fewer would achieve the JBS2 (Joint British Societies') guidelines optimal target of <6.5 per cent.²⁰

Blood pressure management

The hope...

All people with diabetes should have effective blood pressure management. In the UKPDS (United Kingdom Prospective Diabetes Study), intensive blood pressure lowering reduced the risk of stroke by 44 per cent and death from complications related to diabetes by 32 per cent.²¹

...and the heartache

- According to the latest QOF figures, around 25 per cent of people with diabetes in England have blood pressures of >145/85mmHg.²⁰ Even fewer would achieve the JBS2 guidelines optimal target of 130/80mmHg or less.⁵


Cholesterol management

The hope...

All people with diabetes should also have effective cholesterol management. Most people with diabetes should be able to be considered for statin treatment. CARDS (Collaborative Atorvastatin Diabetes Study) showed that statin treatment can reduce the risk of acute coronary events by 36 per cent and stroke by 48 per cent...in people with no previous history of CVD and moderate cholesterol levels.¹⁰

...and the heartache

- Only around 60 per cent of people with diabetes in England are currently recorded to be receiving statins.¹¹
- According to the latest QOF figures, around 20 per cent of people with diabetes in England have Total cholesterol (TC) of >5mmol/l. Even fewer would achieve the JBS2 optimal target of TC <4mmol/l.²⁰



"Before my heart attack I was completely unaware of the fact that diabetes could lead to cardiovascular disease. Also, when I was first diagnosed, lifestyle changes such as diet and exercise were mentioned in passing but not enough emphasis was put on how crucial they were to helping me manage my diabetes. I should have been told that following a healthy diet and being active was essential if I wanted to try to avoid developing the complications of diabetes.

All the possible complications of diabetes should also have been explained to me properly. Having the correct information and knowing as much as possible about diabetes can only help people manage their condition and be as healthy as possible.

I am now the chairman of a local diabetes support group and very involved in making sure that diabetes services meet patients' needs and expectations."

Jayantilal Solanki, who is 58 years of age and has Type 2 diabetes

Equal care for everyone

The hope...

All people with diabetes should receive treatment to reduce CV risk factors.

...and the heartache

- The provision of dietetic care varies greatly. Current dietary advice provision for people with diabetes is less than half the low recommended minimum standard despite the evidence for its effectiveness in reducing Type 2 diabetes and the associated CVD risks:²²
 - The national average is only 10.7 hours per 100,000 general population per week compared with the minimum standard of 22 hours per 100,000 general population per week.
 - This figure is even lower for provision of dietary support in primary care.
 - Less than half of dietitians are offering people with diabetes an annual review.⁷
- In England, of the 1.6 million people with diabetes, the proportion achieving the GP contract target for Total cholesterol (5mmol/l or less) and blood pressure (145/85mmHg) varies by as much as 20 per cent from PCT to PCT.²⁰
- Two in five adults and more than four in five children and young people have poor blood glucose management that puts them at risk of complications, yet access to blood glucose testing strips is still restricted in some areas.¹

Joint British Societies' guidelines for diabetes

What should optimal blood glucose be?	<ul style="list-style-type: none"> • Fasting blood glucose between 4.0mmol/l and 6.0mmol/l • HbA1c below 6.5 per cent (a measure of blood glucose over the last 2-3 months). (Audit standard <7.5 per cent)⁵
What should optimal blood pressure be?	<ul style="list-style-type: none"> • <130/80mmHg. (Audit standard <140/80mmHg)⁵
What should optimal cholesterol be?	<ul style="list-style-type: none"> • Total cholesterol below 4.0mmol/l or a 25 per cent reduction (whichever gives the lower value). • Low density lipoprotein (LDL) cholesterol below 2.0mmol/l or a 30 per cent reduction (whichever gives the lower value). (Audit standard TC <5mmol/l and LDL-C <3mmol/l)⁵

Joint British Societies' guidelines on prevention of cardiovascular disease in clinical practice. *Heart* (2005); 19 (supplement V): V1-V52.

Despite the JBS2 recommendations developed by clinicians from the country's leading professional CVD and health charities, including Diabetes UK, the Department of Health announced in November 2006 that the national cholesterol targets will remain at Total cholesterol 5.0mmol/l and LDL cholesterol 3.0mmol/l.²³

“People with diabetes deserve intensive management to stop cigarette smoking, control blood glucose, reduce blood pressure and reduce cholesterol. This is a major challenge for people with diabetes and the health care professional but should result in dramatic reductions in the toll of vascular disease.”

Professor D. John Betteridge, Professor of Endocrinology and Metabolism, University College, London

“It’s hard to believe that the health of people with diabetes could be at stake purely because doctors have to wait for NICE to confirm what is obvious from the evidence. The new targets are challenging but they are based on the most up to date trial data and they could save lives. We would urge the Department of Health to revise their statement as a matter of urgency.”

Simon O’Neill, Director of Care, Diabetes UK

The consequences of failing to act: Spiralling costs for patients as well as the NHS

The mismanagement of the UK diabetes epidemic results in high costs not just for people with diabetes, but for everyone in the UK.

- Poorly controlled diabetes may result in CVD, the world's number one killer, as well as other complications including blindness, kidney disease and nerve damage.
- People with diabetes face significant direct personal costs. Complications, such as CVD, can increase personal expenditure by as much as three times and double the likelihood that a person with diabetes will need a carer.¹⁶
- Five per cent of the NHS budget – a conservative estimate – is currently spent on treating diabetes and complications such as CVD.¹⁶
- This is equivalent to:
 - £3.5 billion a year.
 - £9.6 million a day.
 - **£400,000 an hour.**³

These costs to the NHS are expected to increase by more than 25 per cent in the next 20-30 years.¹³

- Diabetes accounts for 1.75 million bed days every year in the main medical and surgical specialties.¹⁷
- People with diabetes account for 10 per cent of all hospital admissions and up to 20 per cent in some age groups.¹⁷

Diabetes UK considers the situation to be a national emergency. Early, aggressive treatment is needed to shift the focus to preventing CVD.

We need to take action now: Four steps to end the heartache

Diabetes and the CVD it causes currently place a massive burden on the health of the nation and financial resources of the NHS. With thousands of people with diabetes dying prematurely from CVD every year, Diabetes UK considers the situation to be a national emergency. Early, aggressive treatment is needed to shift the focus to preventing CVD.

How should we care for the CV health of people with diabetes? Through appropriate education on the condition, lifestyle advice and ensuring they consistently receive the necessary medication that they require to prevent the onset and escalation of heart problems, strokes and peripheral vascular disease.

Diabetes UK calls for healthcare professionals, the government and people with diabetes to strive for:

1. Early identification of diabetes and regular monitoring for the early signs of CVD.
2. People with diabetes to be treated as having a similar risk of a CV event as someone who has already had a heart attack or stroke.
3. Better education for people with diabetes so that they understand the risks they may face...and how to reduce them.
4. Greater emphasis on aggressive treatment to achieve recommended targets for blood glucose, blood pressure and cholesterol, including:
 - access to structured education programmes on 'self management'
 - lifestyle advice (including healthy eating and physical activity)
 - advice and support on smoking cessation to all people with diabetes who smoke
 - access to the most suitable blood glucose lowering treatments
 - antihypertensive treatment considered for patients with raised blood pressure
 - statin therapy considered for people with Type 2 diabetes.



How can Diabetes UK help?

Diabetes UK provides a variety of resources that can help both people with diabetes and healthcare professionals. Information is available on a variety of topics, including:

- cardiovascular disease
- healthy eating
- weight management
- physical activity
- controlling cholesterol levels, blood pressure and blood glucose levels to achieve good diabetes management
- understanding of diabetes and diabetes care.

This and other information is available in a variety of formats including leaflets, magazines, newsletters, books, a DVD, audio tapes, CDs, posters and care recommendations. To obtain this information or to order a free catalogue with a full listing, please visit www.diabetes.org.uk/catalogue or call 0800 585 088.

Anyone wanting support and information on diabetes can ring the Diabetes UK Careline on 0845 120 2960 or visit the Diabetes UK website at www.diabetes.org.uk for further information.

Healthcare professionals and scientists wanting to become professional members of Diabetes UK should visit www.diabetes.org.uk/Professionals

Diabetes UK funds a variety of research projects and campaigns to ensure that people with diabetes receive the best possible care. The Diabetes UK mission is to improve the lives of people with diabetes and to work towards a future without diabetes.

“ We can now prevent at least 50 per cent of heart disease and strokes in patients with diabetes. It is therefore essential that we all work together to achieve good glycaemic control, blood pressure and cholesterol targets.”

Dr Vinod Patel, Consultant in Endocrinology and Diabetes at George Eliot Hospital NHS Trust, Nuneaton



"I think that my heart problems were a direct result of me having diabetes but no one realised this at the time. While I was being tested for my heart, they should also have explored other possibilities to explain my symptoms. If I had been diagnosed at the time I could have started treatment for my diabetes earlier and I might not have to take so much medication now."

Alan Cawthra, who is 72 years of age and has Type 2 diabetes

Background information

Understanding diabetes and cardiovascular disease

What is diabetes?

Diabetes (diabetes mellitus) occurs when the amount of glucose (sugar) in the blood is too high because the body is unable to process it adequately. Glucose comes from the digestion of starchy foods, sugar and other sweet foods and from the liver which also manufactures glucose. Insulin allows glucose to enter the cells of the body for energy.

Type of diabetes	Type 1	Type 2
Usually appears in	<ul style="list-style-type: none"> • People aged under 40 years, often during childhood, although can occur at any age. 	<ul style="list-style-type: none"> • People aged over 40 years (25 if S.Asian), though is being increasingly detected in younger people.
Happens when	<ul style="list-style-type: none"> • The body's insulin-producing cells have been destroyed and therefore no insulin is produced. 	<ul style="list-style-type: none"> • The body does not produce enough insulin or is not able to respond effectively to the insulin which is produced.
Symptoms	<ul style="list-style-type: none"> • Increased thirst and urinating with increased frequency. • Extreme tiredness and weight loss. • Genital itching / thrush. • Blurred vision and slow healing wounds. 	<ul style="list-style-type: none"> • Same as Type 1 but the symptoms are less dramatic at onset. Type 2 is therefore more likely to go undiagnosed for a long period of time.
Symptoms appear	<ul style="list-style-type: none"> • Usually over a few weeks, and are severe. 	<ul style="list-style-type: none"> • Slowly; some people may not realise they have diabetes until they undergo a routine medical check-up.
Linked to	<ul style="list-style-type: none"> • Genetic factors. • Possibly triggered by as yet unknown environmental factors. 	<ul style="list-style-type: none"> • Genetic factors. • More common in some ethnic groups. • Most commonly triggered by lifestyle factors.
Treated by	<ul style="list-style-type: none"> • Daily injections of insulin and lifestyle measures. 	<ul style="list-style-type: none"> • In about 25 per cent lifestyle measures are sufficient. 50 per cent of people require a combination of lifestyle measures and oral tablets. About 25 per cent require lifestyle measures and insulin injections.²⁴

Source: Diabetes UK factsheets www.diabetes.org.uk (last accessed May 2007)

What is cardiovascular disease?

In the majority of cases, CVD occurs when the walls of the arteries become narrowed due to the build up of fatty plaques which can be caused by LDL or 'bad' cholesterol (a process called atherosclerosis) or damaged by high blood pressure or high blood glucose levels. Over time, these changes lead to narrowing of the arteries or blood clots that can in turn result in a heart attack, a stroke or sudden death.

Most common types of CVD	Affects	Results in
Coronary heart disease (CHD)	<ul style="list-style-type: none">• Heart and surrounding blood vessels.	<ul style="list-style-type: none">• Angina• Heart attack• Heart failure• Sudden death
Cerebrovascular disease	<ul style="list-style-type: none">• Brain and surrounding blood vessels.	<ul style="list-style-type: none">• Stroke• Transient ischaemic attack (TIA) or 'mini-stroke'
Peripheral vascular disease (PVD)	<ul style="list-style-type: none">• Blood vessels of the legs and sometimes the arms. Also the penis in men.	<ul style="list-style-type: none">• Gangrene• Intermittent claudication• Amputation• Erectile dysfunction

How does diabetes lead to CVD?

Diabetes causes progressive damage to the heart and blood vessels through many complex processes, but the two main culprits are atherosclerosis and high blood pressure. People with poorly controlled diabetes are more likely to experience rapid development of atherosclerosis throughout their CV system. They are also more prone to higher blood pressure and higher LDL and triglyceride levels and lower levels of HDL than the general population.

People with poorly controlled diabetes are more likely to experience rapid development of atherosclerosis throughout their CV system.

What the guidelines say

It is well known that a healthy lifestyle and control of blood glucose, blood pressure and cholesterol are fundamental to reduce the CVD risk amongst people with diabetes. Below is a summary of key treatment guidelines for people with diabetes with regards to diet and lifestyle changes and managing their blood glucose, blood pressure and cholesterol levels.

Healthy diet and lifestyle

People with diabetes should receive the same advice about healthy lifestyle that is designed to reduce the risk of CVD in people without diabetes. They should also be involved in decisions about their treatment.

Healthy lifestyle advice designed to reduce the risk of CVD in people with diabetes

Don't smoke.

Maintain a healthy weight.

- BMI* 18.5-24.9 kg/m² for adults.

Keep waist circumference less than:

- 94 cm/37 ins for white and black men
- 90 cm/35 ins for Asian men
- 80 cm/31.5 ins for white and black women
- 80 cm/31.5 ins for Asian women.

Eat a healthy diet:

- eat at least 5 - 9 portions of fruit and vegetables each day
- limit salt intake
- eat oily fish at least twice a week
- reduce amount of fat in the diet
- replace saturated fat such as lard with monounsaturated fats such as olive oil.

Limit daily alcohol intake

Be physically active for at least 30 minutes a day on most days of the week.

*Body mass index (BMI) = weight in kilograms divided by height in metres squared
Source: Diabetes UK factsheets www.diabetes.org.uk (last accessed May 2007).²⁵

Self-management is central to controlling diabetes. Early awareness that diabetes can lead to CVD and the chance to discuss issues with their doctor such as lifestyle changes and treatment can help people with diabetes to take an active part in avoiding life-threatening complications related to CVD.

Blood glucose

Blood glucose control is important in people with diabetes because the higher the blood glucose, the higher the risk of CVD complications related to diabetes.

JBS2 (Joint British Societies') guidelines recommend that people with diabetes should have a fasting blood glucose of between 4.0mmol/l and 6.0mmol/l.⁵

Blood pressure

In people with diabetes intensive blood pressure lowering reduces the risk of stroke by 44 per cent and the risk of myocardial infarction by 21 per cent. Lowering blood pressure also helps to prevent kidney disease in people with diabetes.⁵

JBS2 guidelines recommend that people with diabetes should have a blood pressure level of 130/80mmHg or less.⁵

Cholesterol

JBS2 guidelines recommend that people with diabetes should aim for the following targets:

- Total cholesterol below 4.0mmol/l or a 25 per cent reduction (whichever gives the lower value).
- Low density lipoprotein (LDL) cholesterol below 2.0mmol/l or a 30 per cent reduction (whichever gives the lower value).⁵

As well as lifestyle measures to reduce cholesterol, everyone with diabetes aged over 40 should be considered for treatment with a statin even if they have no risk factors for, or history of CVD. People with diabetes under the age of 40 with at least one complication such as nephropathy, retinopathy or raised blood pressure should also be considered for statin therapy. Several clinical studies have shown that statins lower cholesterol and reduce the risk of heart attacks and strokes in people with diabetes.^{9,10,26} Other medications, such as fibrates or nicotinic acid, may also be considered.²⁷ It is important that people with diabetes discuss their treatment options with their doctor.

“ Making time to talk to patients is crucial. The patients then feel that their views are being taken into account. Healthcare professionals can help maintain motivation in the patient by praising any positive lifestyle change achieved. Of course, there are challenges when it comes to improving patient involvement including the fact that it is often difficult to allow extra time with a patient during consultation and the fact that sometimes the patient’s expectation cannot be met. ”

Professor Michael Kirby, Director of HertNet – the Hertfordshire Primary Care Research Network

The evidence behind the guidelines

By the time people find out that they have diabetes, more than half of those with Type 2 diabetes will already have signs of CVD complications.²⁷ There is overwhelming evidence however that earlier diagnosis and treatment, changes in lifestyle and effective medical therapies can reduce their risk of illness and death.

The current NHS strategy to care for people with Type 2 diabetes is based on the standards set out by:

- English and Welsh National Service Frameworks (NSF) for Diabetes (Department of Health 2001; NHS Wales 2002).
- NICE. Guidelines on the management of retinopathy (2002), renal disease (2002), blood glucose (2002), blood pressure and blood lipids (2002) and footcare (2004) in Type 2 diabetes.
- Scottish Diabetes Framework. Diabetes Action Plan 2006 (Scottish Executive).
- CREST. Diabetes Care in Northern Ireland. 1996.
- Quality and Outcomes Framework, part of the GMS contract which focuses on the measurement of targets.
- The Joint British Societies' Guidelines on prevention of Cardiovascular Disease in clinical practice (JBS2) published in *Heart*, December 2005.

By the time people find out that they have diabetes, more than half of those with Type 2 diabetes will already have signs of CVD complications.

The information below outlines the hard evidence behind the guidelines and why following expert recommendations and achieving treatment targets can significantly reduce the burden of diabetes and its complications – in particular CVD, the UK's biggest killer.

Blood glucose

- In the UKPDS (United Kingdom Prospective Diabetes Study) people with Type 2 diabetes with an average HbA1c of 7.0 per cent (intensive treatment group) had considerably fewer long term complications related to diabetes than those in the conventional treatment group who had an HbA1c of 7.9 per cent.¹⁹

Blood pressure

- In the UKPDS, intensive blood pressure reduction reduced the risk of stroke by 44 per cent and death from complications related to diabetes by 32 per cent.²¹
- The HOT (Hypertension Optimal Treatment) trial²⁸ investigated the optimum target blood pressure and the potential benefit of a low dose of acetylsalicylic acid (aspirin) in the treatment of hypertension in more than 18,000 people. Of these, 1,501 had been diagnosed with diabetes. The trial showed that lowering blood pressure in people with diabetes and hypertension can more than halve the risk of having a cardiovascular event.
 - The subgroup of patients with diabetes mellitus (1,501 people) was randomized to have their blood pressure reduced to a target of either ≤ 80 mmHg or ≤ 90 mmHg. Those reaching the lower target blood pressure (≤ 80 mmHg) saw their risk of having a CV event decrease by 51 per cent compared with those in the target group of ≤ 90 mmHg.

Cholesterol

- HPS (Heart Protection Study), which included 5,963 people with diabetes, found that statins reduced the risk of heart attack and stroke in people with diabetes with or without a prior history of heart disease or high cholesterol.
 - The incidence of major CV events among the nearly 3,000 people with diabetes who had no prior CVD was 33 per cent lower in those receiving statin treatment.⁹
- CARDS (Collaborative Atorvastatin Diabetes Study) investigated the benefit of statin treatment in people with Type 2 diabetes, no previous history of CVD and moderate levels of cholesterol.
 - In this study, treatment with a statin significantly reduced the risk of acute coronary events by 36 per cent and stroke by 48 per cent.

As a result of HPS and CARDS, the debate around whether people with Type 2 diabetes should receive statin treatment moved to focus on whether there were any people with diabetes at sufficiently low risk for treatment to be withheld.¹⁰

STENO-2 Study

The **STENO-2** study examined the effects of intensive therapy to treat all CV risk factors (including blood glucose, blood pressure, cholesterol and smoking) in reducing CV events in high risk patients with Type 2 diabetes and microalbuminuria. In this Danish study, intensive treatment of all CV risk factors reduced the rate of CV complications by about 50 per cent. 44 per cent of patients in the conventional group had a CV event compared to 24 per cent in the intensive group.²⁹

United Kingdom Prospective Diabetes Study (UKPDS)

A landmark study of around 4,000 UK people newly diagnosed with Type 2 diabetes. The study set out to investigate the effect of glucose control and blood pressure control on diabetes complications, including CVD.

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Registered charity no. 215199 © Diabetes UK 2007

Date of preparation: May 2007

LIP2626