

Type 2 Diabetes Media Fact Sheet

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1. Facts & figures

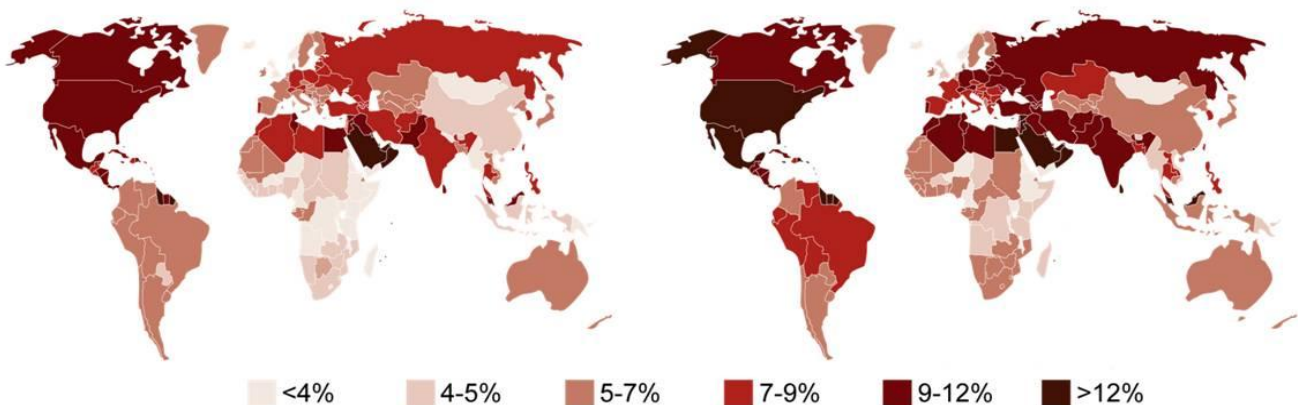
- Diabetes contributes to nearly four million deaths per year worldwide. It is the fourth or fifth leading cause of death in most developed countries and there is substantial evidence that it is epidemic in many developing and newly industrialised nations¹
- Every ten seconds two people develop diabetes¹
- Diabetes is a major risk factor for cardiovascular disease. Worldwide, approximately 50 percent of people with diabetes die of cardiovascular disease²

Type 2 diabetes is a pandemic of the modern era affecting approximately 285 million people worldwide. Over the next 20 years the number of type 2 diabetes patients is expected to increase by 50 percent to 438 million worldwide.¹

Proportion of population with diabetes¹

2010 (20-79 years)

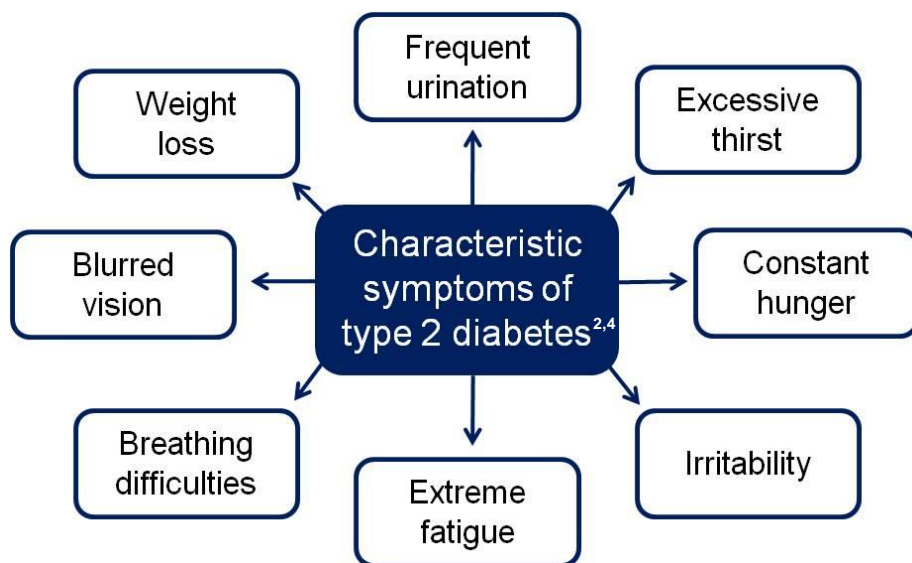
2030 (20-79 years)



Although figures can vary from country to country, statistics show that 50 to 80 percent of all people with diabetes are unaware of their condition prior to diagnosis.¹ In the early stages of type 2 diabetes, the symptoms can be so mild as to go unnoticed, often resulting in diagnostic delays of between four and seven years.³ At diagnosis, approximately 40 percent of type 2 diabetes patients already present with some form of tissue damage resulting from elevated blood glucose levels such as heart disease, stroke, renal impairment, nerve damage and others.^{1,3}

2. What is type 2 diabetes?

Type 2 diabetes is a chronic progressive disease and the most common form of diabetes, responsible for 90 to 95 percent of diabetes cases.¹



However, many people with type 2 diabetes show no symptoms at the early stages of the disease and may only be diagnosed when complications occur.^{1,2,4}

In most instances, type 2 diabetes is a dual-defect disease characterised by insulin resistance and impaired β -cell function. Glucose derived from dietary carbohydrate or hepatic glucose production is tightly regulated by the hormone insulin. Type 2 diabetes results from an imbalance between insulin sensitivity and insulin secretion. Glucose production fails to be regulated adequately by insulin, leading to hepatic glucose overproduction and diminished glucose uptake by muscle tissue.⁵

Over time, the impaired glucose metabolism leads to a loss of β -cells and the remaining β -cells eventually fail to maintain their high rate of insulin secretion, leading to glucose intolerance, insulin resistance, and overt type 2 diabetes. In addition, accelerated gastric emptying and excessive lipolysis in adipose tissue also contribute to the development of type 2 diabetes. High blood glucose levels can lead to disease-related long-term complications.⁵

3. The socio-economic impact of diabetes

Diabetes is considered one of the most challenging health problems of the 21st century, imposing a considerable socio-economic burden on patients, national healthcare systems and the economy through lost productivity due to reduced earnings as a result of lost work days, restricted activity days, lower productivity at work, mortality and permanent disability caused by diabetes.¹ Healthcare expenditures to treat and prevent diabetes and its complications are expected to account for approximately 12 percent of the total global healthcare expenditure in 2010. Global diabetes healthcare expenditures are predicted to total in excess of USD 376 billion in 2010, rising to USD 490 billion in 2030.¹

A European study has shown that diabetes-related complications have the greatest overall impact on the cost of type 2 diabetes management and pose significant challenges to both patients and physicians.⁶

4. Risk factors and complications of type 2 diabetes

Studies have revealed that first degree relatives of individuals with type 2 diabetes are about three times more likely to develop the disease than people without a family history of the disease.⁷ Obesity is a major risk factor for developing type 2 diabetes and is estimated to be responsible for 80 percent of all newly diagnosed cases.⁷ Obesity can cause increased insulin resistance that, in people with a certain genetic susceptibility, may develop into diabetes.¹ Insulin resistance accounts for more than 90 percent of all type 2 diabetes cases.⁵ Until recently, type 2 diabetes mainly occurred in adults, however, the increase in type 2 diabetes among children and adolescents has emerged in parallel with an alarming rise in the number of young people who are overweight or obese.⁸

Risk factors that contribute to type 2 diabetes include:¹

- Family history
- Obesity, diet and inactivity
- Ethnicity
- Insulin resistance
- Gestational diabetes

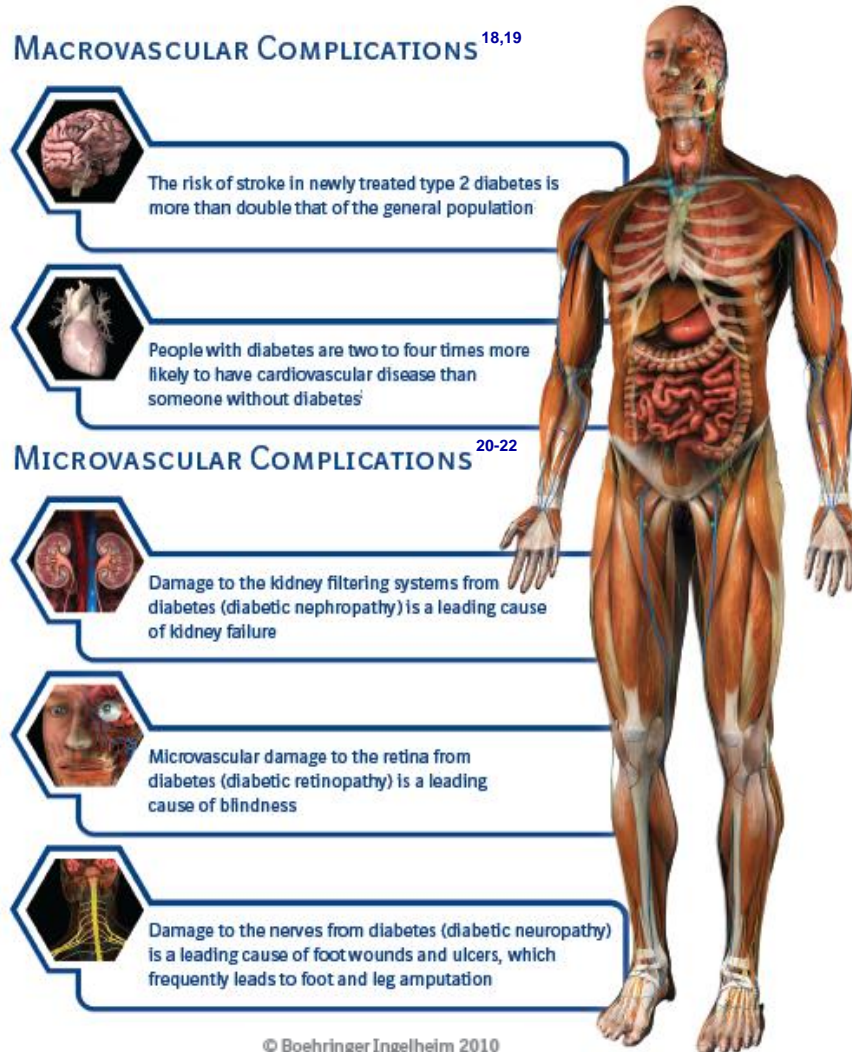
A key contributing factor to the alarming increase of type 2 diabetes is a global change in traditional lifestyles and dietary patterns.^{1,7} Up to 80 percent of type 2 diabetes cases could be prevented by adopting a healthy diet and increasing physical activity, yet every 10 seconds a person dies from diabetes-related causes.¹ If high blood glucose (hyperglycaemia) is left uncontrolled or is not controlled long-term, it can lead to serious medical complications in all parts of the body, especially where nerves and blood vessels play a vital role.^{1,2} On average, people with type 2 diabetes may die five to ten years earlier than people without diabetes, mostly due to cardiovascular disease.¹

People with type 2 diabetes are at risk of developing serious complications. A one percent decrease in blood glucose level, as measured by HbA_{1c}, may reduce the risk of death due to diabetic complications by 21 percent.⁹ Diabetes-related complications include:

- **Cardiovascular disease:** People with diabetes are up to four times more likely to have a heart attack or stroke as people who do not have diabetes.¹⁰ Indeed, people with diabetes are as likely to suffer a heart attack as people without diabetes who have already had a heart attack, whilst 45 percent of those hospitalised for a heart attack have known or previously diagnosed diabetes.^{1,10} Cardiovascular disease is responsible for approximately 50 percent of deaths in people with type 2 diabetes.² Diabetes is also an independent indicator of secondary adverse events including reinfarction, heart failure and death.¹⁰
- **Kidney disease:** Diabetic kidney disease is a result of damage caused to the kidney cells due to elevated blood glucose levels.¹¹ In some countries, deaths attributed to kidney failure are more than twice that seen with breast cancer.¹² Type 2 diabetes is the most frequent cause of kidney failure in countries of the Western world.¹ Approximately 65 percent of type 2 diabetes patients are at risk of, or have some degree of renal impairment.¹³⁻¹⁵
- **Renal failure and cardiovascular risk:** The risk of developing cardiovascular disease is up to three times greater in patients with impaired renal function.¹⁶
- **Eye complications:** People with diabetes often develop diabetic retinopathy (changes in the retina of the eye) and have a higher risk of blindness. It is estimated that more than 2.5 million people worldwide are affected by diabetic retinopathy, the leading cause of vision loss in adults of working age (20 to 65 years) in industrialised countries.¹

- **Foot complications:** People with diabetes can develop different forms of foot problems. Foot problems commonly occur when there is nerve damage or poor circulation in the feet. These problems are especially severe when nerve damage and poor circulation coincide.^{2,17}

The major diabetes complications



5. Management of type 2 diabetes

Good diabetes control means not only reducing but also keeping blood glucose levels as close to normal as possible.²³ Sometimes, this can be achieved through a combination of diet and exercise. However, more often than not, people with diabetes will require medication to achieve glucose control in the long term. Fifty percent of people who cannot control type 2 diabetes by diet alone will require more than one glucose-lowering drug three years after diagnosis. This rises to 75 percent by nine years after diagnosis.²⁴

Scientific understanding of type 2 diabetes has been revolutionised, but despite significant advances in treatment, its prevalence continues to rise across the globe¹ suggesting that new therapeutic options are still needed. Effective control of the disease can help delay the progression of serious complications associated with type 2 diabetes and reduce mortality.²⁵ However, many traditional treatments are not successful in helping patients with type 2 diabetes achieve and maintain blood glucose targets within recommended parameters²⁴ or may be associated with unacceptable trade-offs such as increased risk

of hypoglycaemia, weight gain, increased cardiovascular risk and gastrointestinal side effects such as nausea, vomiting and abdominal pain.^{25,26}

Traditional treatments may also be inappropriate for certain type 2 diabetes patients. Most currently available anti-diabetes treatments, for example, are mainly eliminated via the kidney and are not recommended in patients with renal impairment.²⁷ Others may require dose adjustment as kidney function declines or are contraindicated for patients with renal impairment.²⁸

In recent years, a newer generation of anti-diabetes treatment known as dipeptidyl peptidase (DPP)-4 inhibitors, has been shown to not only be efficacious, but also among those best tolerated and weight neutral. Importantly, DPP-4 inhibitors have a favourable safety profile, with a low risk of hypoglycaemia or drug-drug interactions.²⁶

Related links:

More information about type 2 diabetes, associated complications and DPP-4 inhibitors can also be found at www.diabeteshealthlounge.com and www.youtube.com/user/diabetismatters.

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REFERENCES

1. International Diabetes Federation. Available at: www.idf.org. Last accessed: August 2010.
2. World Health Organization. Available at: www.who.int. Last accessed: August 2010.
3. Votey S.R., Peters A.L. *Diabetes Mellitus, Type 2 – a review*. Available at: www.emedicine.medscape.com. Last accessed: August 2010.
4. Federation of European Nurses in Diabetes. *Diabetes. The policy puzzle: Is Europe making progress?* Available at: www.fend.org. Last accessed: August 2010.
5. Goldstein B. Understanding type 2 diabetes. *Medscape Diabetes & Endocrinology*, 2006. Last accessed: August 2010.
6. Jönsson B. Revealing the cost of type 2 diabetes in Europe. *Diabetologia*. 2002;45:S5-S12.
7. World Health Organisation. *Genetics and Diabetes*. Available at: <http://www.who.int/genomics/about/Diabetis-fin.pdf> Last accessed: August 2010
8. Copeland C. *et al.* Type 2 Diabetes in children and adolescents: risk factors, diagnosis, and treatment. *Clinical Diabetes* 2005;23:181-185.
9. Holman R.R., Paul S.K., Bethel M.A. *et al.* 10 Year follow-up of Intensive Glucose Control in Type 2 Diabetes. *N Engl J Med*. 2008;359:1577-89.
10. Kaul S. *et al.* Thiazolidinedione drugs and cardiovascular risks - a science advisory from the American Heart Association and American College of Cardiology Foundation. *Circulation*. 2010;121:1868-77.
11. Brownlee M. The pathobiology of diabetic complications; A unifying mechanism. *Diabetes*. 2005;54(6);1615-1625.
12. National Kidney Disease Education Program (NKDEP). Available at: www.nkdep.nih.gov/resources. Last accessed: August 2010.
13. Castro A.F., Coresh J. CKD surveillance using laboratory data from the population-based National Health and Nutrition Examination Survey (NHANES). *Am J Kidney Dis*. 2009;53(3,Suppl 3):S46-S55.
14. Coresh J., Castro B.C., Greene T. *et al.* Prevalence of Chronic Kidney Disease and Decreased Kidney Function in the Adult US Population: Third National Health and Nutrition Examination Survey. *American Journal of Kidney Diseases*. 2003;41(1):1-12.
15. Premaratne E., Macisaac R.J., Tsalamandris C. *et al.* Renal hyperfiltration in type 2 diabetes: effect of age-related decline in glomerular filtration rate. *Diabetologia*. 2005;48(12):2486-93.
16. International Diabetes Federation, International Society of Nephrology. *Diabetes and Kidney Disease: Time to Act*. 2003.
17. American Diabetes Association. Available at: www.diabetes.org. Last accessed: August 2010.
18. Jeerakathil T., Johnson J.A., Simpson S.H. *et al.* Short-term risk for stroke is doubled in persons with newly treated type 2 diabetes compared with persons without diabetes. *Stroke*. 2007;38:1739-43.
19. World Heart Foundation. Available at: www.worldheart.org. Last accessed: August 2010.
20. Hovind P., Rossing P., Tarnow L. *et al.* Progression of diabetic nephropathy. *Kidney Int*. 2001;59:702-9.
21. Fong D.S., Aiello L.P., Ferris F.L. *et al.* Diabetic retinopathy. *Diabetes Care*. 2004;27:2540-53.
22. Dang C.N., Boulton A.J. Changing perspectives in diabetic foot ulcer management. *Int J Low Extrem Wounds*. 2003;2:4-12.
23. Turner R.C., Cull C.A., Frighi V. *et al.* Glycaemic control with diet, sulfonylurea, metformin, or insulin in Patients with Type 2 Diabetes Mellitus: progressive requirement for multiple therapies. *JAMA*. 1999;281(21):2005-2012.
24. Brown J.B. *et al.* The Burden of Treatment Failure in Type 2 diabetes. *Diabetes Care*. 2004; 27: 7;1535-1540.
25. Hollander P.A., Kushner P. Type 2 diabetes comorbidities and treatment challenges: Rationale for DPP-4 inhibitors. *Postgraduate Medicine*. 2010;122(3):71-80.
26. Prately R., Salsali A. Inhibition of DPP-4: a new therapeutic approach for the treatment of type 2 diabetes. *Curr Med Res Opin*. 2007;23:919-931.
27. Inzucchi S.E. Oral antihyperglycemic therapy for type 2 diabetes: scientific review. *JAMA*. 2002;287:360-72.
28. Cavanaugh K.L. Diabetes management issues for patients with chronic kidney disease. *Clinical Diabetes*. 2007;25(3):90-97.