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BMJ 2008;336;1306-1308
doi:10.1136/bmj.39560.442095.AD

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GUIDELINES

Management of type 2 diabetes: updated NICE guidance

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BMJ 2008;336:1306-8

doi:10.1136/bmj.39560.442095.AD

Why read this summary?

The prevalence of type 2 diabetes is rising rapidly.¹ More than 240 million people worldwide are estimated to have diabetes, and this number is likely to reach over 360 million by 2030.¹² The impact on health occurs primarily through cardiovascular disease, but younger age of onset and advances in the prevention of cardiovascular disease are increasingly exposing people to the risks of microvascular damage, such as kidney and eye disease.¹

The management of diabetes is complex and needs to address the prevention of cardiovascular disease and microvascular disease and the detection and management of early vascular complications.³ In recent years new evidence has accumulated on lifestyle intervention, self management through education, and self monitoring, and many new treatments have been introduced for various aspects of management. This article summarises the recommendations from an updated guideline by the National Institute for Health and Clinical Excellence (NICE) on the management of type 2 diabetes.⁴

Recommendations

NICE recommendations are based on systematic reviews of best available evidence. When minimal evidence is available, recommendations are based on the opinion of the Guideline Development Group (GDG) of what constitutes good practice. Evidence levels for the recommendations are in the full version of this article on bmj.com.

Patient centred care

- Offer structured education to every person and/or their carer at and around the time of diagnosis, with annual reinforcement and review, informing people and their carers that structured education is an integral part of diabetes care. A structured education programme implies an evidence based approach that is tailored to individual needs, is targeted at enhancing self management, has a formal curriculum, and is delivered by trained educators using defined education resources.
- Nutritional advice should be given. It should be targeted at cultural needs, delivered by a health-care professional with specific expertise in nutrition, and supported by appropriate education materials. The basis of dietary advice should be similar to the healthy eating advice offered to the general population.
- For a newly diagnosed person with type 2 diabetes, self monitoring of plasma glucose level is recommended only as an integral part of their

self management education, with help in understanding how the results should be interpreted. Every year agree its purpose and assess its utility with the person with diabetes.

- Involve the person with diabetes in setting targets for their individual HbA_{1c} levels, blood pressure, and lipid levels. The target HbA_{1c} level may be above or below that of <6.5% set for people with type 2 diabetes in general. HbA_{1c} should be checked every two to six months. Offer treatment to help in attaining targets.

Blood pressure lowering treatment

- Measure blood pressure at least annually (more often where it is known to have been above target level in the past). If the patient is already taking antihypertensive drugs at diagnosis of diabetes, review treatment and blood pressure control.
- Offer lifestyle advice if blood pressure is confirmed as being >140/80 mm Hg (or >130/80 mm Hg if kidney, eye, or cerebrovascular damage is present). Add medications—usually beginning with an angiotensin converting enzyme inhibitor (or an angiotensin II receptor blocker if angiotensin converting enzyme inhibitors are not tolerated)—unless the patient is of African-Caribbean descent or might be (or become) pregnant. Use a calcium channel blocker or thiazide diuretic as second line treatment if blood pressure is not controlled to the target level, and add other agents as required.

Glucose lowering treatment

- Offer metformin as first line treatment when HbA_{1c} is not controlled to target levels, unless clearly contraindicated by renal impairment or low cardiac output (or high risk of these). Use a sulphonylurea as second line treatment or if metformin cannot be used. Assess response to these treatments by measuring HbA_{1c}, and expect to increase doses and add further treatment as endogenous insulin production continues to decline. Offer education on hypoglycaemia to people using sulphonylureas and insulin, together with self monitoring to allow them to assess their glycaemic state.
- Offer rapid acting insulin secretagogues (meglitinides) only to people with erratic lifestyles who can benefit from them. Consider acarbose for those unable to use other oral glucose lowering treatments.
- When HbA_{1c} rises above 7.5%, consider human insulin, or thiazolidinediones where insulin is

This is one of a series of BMJ summaries of new guidelines, which are based on the best available evidence; they will highlight important recommendations for clinical practice, especially where uncertainty or controversy exists. The supporting evidence statements and further information about the guidance are in the full version on bmj.com.

inappropriate. Determine the choice of thiazolidinediones in line with current advice from the regulatory authorities, cost, and safety. Carefully assess for contraindications such as heart failure or higher risk of fracture.

- Offer exenatide (an incretin mimetic that increases insulin secretion, inhibits glucagon secretion, and reduces food intake) only when insulin would otherwise be started, obesity is a specific problem to the person with diabetes (body mass index (kg/m^2) >35.0), and the need for high dose insulin is likely. If improved blood glucose control is not obtained and body weight not lost, exenatide should not be continued beyond 12 months.
- Suggest starting insulin treatment with a pen injector once HbA_{1c} is confirmed as being above 7.5%. Start the treatment with human insulin; insulin glargine or pre-mixes including analogue pre-mixes are an alternative in certain circumstances (for example, use long acting insulin analogue if a once daily injection is beneficial, and pre-mixes where glucose control is poor before treatment). Use a structured programme when starting insulin treatment, using active insulin dose titration, structured education (including about hypoglycaemia), telephone support, and frequent self monitoring. Continue metformin treatment, and review the use of sulphonylureas. Pioglitazone is available for use with insulin when sensitivity to injected insulin needs to be enhanced.
- The Guideline Development Group considered including sitagliptin and insulin detemir in the guideline but were advised by NICE not to do so. NICE is undertaking a rapid update of recommendations in this guideline on second and third line drugs for managing blood glucose, which will cover these drugs. The updated guideline will be published early in 2009.

Blood lipid control and other cardiovascular risk management approaches

- Formal estimation of risk of cardiovascular disease is not generally recommended as most people with type 2 diabetes are at high premature risk of such disease. When unusually low risk is suspected, use the UKPDS (UK prospective diabetes study) risk engine (www.dtu.ox.ac.uk/riskengine).
- Offer aspirin (75 mg daily) to people aged >50 years and to younger people with other risk factors of importance for cardiovascular disease, including microalbuminuria. Use clopidogrel only in those with clear intolerance to aspirin.
- Assess cardiovascular risk annually, incorporating a full lipid profile (including high density lipoprotein cholesterol and triglyceride estimations) and requesting fasting serum specimens if triglyceride levels were previously abnormal.
- Start simvastatin (or statin of similar efficacy and cost) in most people aged ≥ 40 years with type 2

diabetes, and in people aged <40 years whose cardiovascular risk factor profile seems particularly poor (metabolic syndrome or conventional risk factors, microalbuminuria, at-risk ethnic group, strong premature family history of cardiovascular disease). Consider increasing cholesterol lowering treatment to simvastatin 80 mg if the patient's serum cholesterol level has not reached the target. If serum cholesterol is still below the target on further review and the patient has existing cardiovascular disease or microalbuminuria, consider using a more effective statin (or ezetimibe, in line with NICE guidance⁵). The target cholesterol is defined as a total cholesterol <4.0 mmol/l (and high density lipoprotein cholesterol ≤ 1.4 mmol/l) or low density lipoprotein cholesterol <2.0 mmol/l.

- If serum triglyceride levels are >4.5 mmol/l, prescribe fenofibrate after assessment of possible secondary causes of high serum triglyceride levels (poor glucose control, alcoholic liver disease, renal failure, hypothyroidism). For those with triglyceride levels of 2.3-4.5 mmol/l despite statin treatment, consider fibrates.
- Do not use nicotinic acid or fish oil preparations for primary prevention except with specialist expertise. Consider a trial of highly concentrated licensed omega 3 fish oils for refractory hypertriglyceridaemia if other measures have failed.

Kidney, eye, nerve, and foot problems

Foot care in people with diabetes is covered in a separate guideline.⁶

- Calculate the albumin:creatinine ratio on a first-pass morning urine specimen (or spot urine if not available) once a year. If this is found to be >2.5 mg/mmol for men or >3.5 mg/mmol for women, confirm microalbuminuria with further estimations. Measure estimated glomerular filtration rate at least annually. If either the albumin:creatinine ratio or the estimated glomerular filtration rate are abnormal, consider the possibility of non-diabetic renal disease.
- Discuss the significance of abnormal findings, and prescribe an angiotensin converting enzyme inhibitor (or an angiotensin II receptor antagonist if that is not tolerated) and target blood pressure control to below 130/80 mm Hg, adding other blood pressure lowering drugs as required.
- Arrange or perform eye screening at the time of diagnosis, and at least annually, with appropriate discussion about the reasons for this; use tropicamide mydriasis after assessing visual acuity and before digital retinal photography. Arrange early review or referral according to national criteria (summary of commoner indications: immediately if visual loss is acute; rapidly if new vessels are detected; routinely if maculopathy, unexplained deterioration in visual acuity, or pre-proliferative retinopathy is present).⁷

- Inquire annually about the development of neuropathic symptoms, and discuss management and prognosis if such symptoms are present. If standard analgesic measures do not work, try a tricyclic drug and assess the response. If this does not provide effective pain relief, offer a trial of duloxetine, gabapentin, or pregabalin, with choice determined by current drug prices. If this too is not successful, consider trying another such drug or other strong analgesia or seek help from the local chronic pain management service.
- Consider the diagnosis of gastroparesis if blood glucose control is erratic without explanation or if gastric symptoms such as bloating occur. Consider a trial of metoclopramide, domperidone, or erythromycin if gastroparesis is suspected and problematic.
- Review the issue of erectile dysfunction annually. Offer a phosphodiesterase type-5 inhibitor if erectile dysfunction is a problem. Discuss the possibility of other management options (such as intracavernosal injections or referral to an andrology service) if phosphodiesterase type-5 inhibitors have been unsuccessful.
- Consider the possibility of contributory damage to the sympathetic nervous system for a person who loses the warning signs of hypoglycaemia. When using tricyclic antidepressants and anti-hypertensive medications in people with diabetes who might have autonomic neuropathy, be aware of the risk of orthostatic hypotension. Consider the possibility of autonomic neuropathy causing unexplained diarrhoea or unexplained bladder emptying problems (such as poor voiding or recurrent infections).

Overcoming barriers

Effective implementation of these recommendations depends on the training of the staff providing diabetes care in both primary and secondary care. Local provision of education services will be necessary to ensure that structured education programmes are available to all with type 2 diabetes and that support

is available for insulin initiation, dose titration, and continued monitoring as endogenous insulin secretion worsens. Sufficient time must be available in each healthcare setting for the prevention and management of cardiovascular disease and microvascular disease by blood glucose control, blood pressure control, blood lipid management, and antithrombotic treatment; these all require both lifestyle management and medications. The need for annual review of complications is likely to be met only by structured care based on disease registers and recall. Self management requires time and resources to be devoted to explaining and agreeing the aims and methods of preventive management and developing and evolving individual care plans.

Contributors: All four authors worked on producing this summary version from the full guideline, and all four are guarantors of the paper.

Funding: The National Collaborating Centre for Chronic Conditions was commissioned and funded by the National Institute for Health and Clinical Excellence to write this summary.

Competing interests: All authors were members of the Guideline Development Group for the NICE guideline (PH the clinical lead, JM the chair, JD the lead systematic reviewer, and CT the project manager). Institutions associated with PH have received funding from nearly all pharmaceutical and diagnostics companies in connection with his research, educational, consultation, and development activities.

Provenance and peer review: Commissioned; not externally peer reviewed.

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Commentary: Controversies in NICE guidance on management of type 2 diabetes

Stephen Atkin,¹ Christopher Walton²

Publication of the original guidelines (in 2002) from the National Institute for Health and Clinical Excellence (NICE) for type 2 diabetes predated the wholesale change in the delivery of diabetes services in the England and Wales. As a consequence of the national service framework in 2001 and the new general practitioners' contract in 2003, primary care now delivers much more diabetes treatment, with fewer instances of insulin being started in secondary care. Consequently, the revised guidance¹ will now be

judged much more on its relevance to general practice diabetes care, including the drive to hit targets on blood glucose control.

Initial management

It is reassuring that a trial of lifestyle intervention with education is still encouraged before a patient is started on metformin, rather than the immediate prescription of metformin at diagnosis as suggested in the consensus document from the American Diabetes

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BMJ 2008;336:1308-9
doi:10.1136/bmj.39581.495069.AD