Management & prevention of type 2 diabetes

DIABETES CARE

ADA–EASD T2DM consensus algorithm

Readability	✓✓✓✓
Applicability to practice	✓✓
WOW! factor	✓✓✓

1 The ADA–EASD (American Diabetes Association–European Association for the Study of Diabetes) provide a consensus statement on the medical management of hyperglycaemia in type 2 diabetes, with a focus on the new classes of medications and their growing body of clinical data and experience.

2 The guidance and associate algorithm were derived from clinical trials addressing the effectiveness and safety of the therapies, and the authors' collective clinical knowledge and experience.

3 Anti-hyperglycaemic agents included in the algorithm were chosen on the basis of their effectiveness at lowering glucose, extraglycaemic effects that may reduce long-term complications, safety profiles, tolerability, ease of use, and expense. The goal of the algorithm is to maintain an HbA_{1c} of <7.0%, and to facilitate rapid medication change when this glycaemic target is not being met.

4 The algorithm is divided into two tiers. Tier 1 represents the best-established interventions that achieve glycaemic targets effectively and with economy. Tier 2 represents agents that are less well validated, and is for use in selected clinical settings where hypoglycaemia is of special concern.

5 Owing to limited clinical data, or lower levels of equivalent glucose-lowering effectiveness, the amylin agonists, alpha-glucosidase inhibitors, glinides and dipeptidyl peptidase-4 inhibitors are not included in the algorithm, but their role in the medical management of type 2 diabetes is discussed by the authors.

Nathan DM, Buse JB, Davidson MB et al (2009) Medical management of hyperglycaemia in type 2 diabetes: a consensus algorithm for the initiation and adjustment of therapy. *Diabetes Care* **32**: 193–203

New ADA–EASD consensus algorithm on managing hyperglycaemia in type 2 diabetes reaffirms the usability of the NICE guidance

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The ADA–EASD (American Diabetes Association–European Association for the Study of Diabetes) consensus statement on the medical management of hyperglycaemia in type 2 diabetes (summarised alongside) was published in January 2009. The authors state that this new guidance is derived from two sources: clinical trial evidence, and the clinical judgement of the seven named authors.

Recent trial evidence on the effect of glucose lowering on macrovascular disease is discussed and the authors conclude that an HbA_{1c} level ≥7.0% should serve as a call-to-action to initiate, change or intensify glucose-lowering therapies. This differs from the NICE guidance on the management of type 2 diabetes (National Collaborating Centre for Chronic Conditions [NCCCC], 2008), which recommends an HbA_{1c} level ≥6.5% as the point at which to initiate or up-titrate therapy for lifestyle interventions and mono or dual oral therapy, and an HbA_{1c} ≥7.5% for triple therapy.

Rather than providing the reader with a single algorithm, the authors divide the treatment options, providing two branches of guidance based on the level of validation for each. Tier 1 provides guidance on well validated core therapies: lifestyle interventions plus metformin at diagnosis, but failure to achieve or sustain glycaemic targets should prompt the addition of either a basal insulin or a sulphonylurea. Tier 2 provides guidance on less well validated therapies: lifestyle interventions plus metformin at diagnosis, but failure to achieve or sustain glycaemic targets should prompt the addition of either a pioglitazone or a glucagon-like peptide-1 receptor agonist. Unlike the NICE guideline (NCCCC, 2008), the ADA–EASD guidance does not suggest that the use of glucagon-like peptide-1 receptor agonists should be restricted to those individuals with a BMI >35 kg/m^2.

A brief section is included in this guidance on the use of dipeptidyl peptidase-4 inhibitors. However, the dipeptidyl peptidase-4 inhibitors, acarbose, nateglinide and repaglinide are not included in the algorithm itself. The authors cite "limited clinical data or relative expense" for this decision.

The ADA–EASD guidance differs in a number of respects from that provided by NICE in May 2008. Furthermore, the NICE update due for publication in late May 2009 is unlikely to look much like this ADA–EASD contribution. The NICE guidance and associated updates are clear, transparent and easy to use, and are more likely to influence glycaemic management in the UK than the algorithm and guidance presented by the ADA–EASD in this document.

National Collaborating Centre for Chronic Conditions (2008) *Type 2 Diabetes: National Clinical Guideline for Management in Primary and Secondary Care (Update)*. Royal College of Physicians, London

DIABETES

Past hypos impede counterregulatory responses to future hypoglycaemia

Readability	✓✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓✓

1 The authors aimed to determine whether lowering HbA_{1c} levels to <7.0% would blunt autonomic nervous system responses to hypoglycaemia.

2 Fifteen people with type 2 diabetes were intensively treated (6 months combination therapy: metformin, glipizide XL, acarbose) to achieve an HbA_{1c} level of 6.7%. Hypoglycaemic clamp studies were undertaken prior to and following this treatment regimen.

3 Adrenaline response was significantly blunted in post-intensive therapy clamp studies when compared with the prior studies ($P<0.05$), and the authors concluded that intensive glycaemic control in combination with repeated hypoglycaemia reduces physiological defences against future hypoglycaemic events.

Davis SN, Mann S, Briscoe VJ et al (2009) Effects of intensive therapy and antecedent hypoglycaemia on counterregulatory responses to hypoglycaemia in type 2 diabetes. *Diabetes* **58**: 701–9

THE JOURNAL OF CLINICAL ENDOCRINOLOGY AND METABOLISM

Improved glycaemic control with use of a GLP-1 receptor agonist

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓✓

1 Glucagon-like peptide-1 (GLP-1) increases insulin secretion and decrease glucagon secretion and reduces appetite.

2 In this single-blind, controlled study, the pharmacodynamics, pharmacokinetics, safety and tolerability of the GLP-1 receptor agonist albiglutide was investigated.

3 Participants ($n=54$) were randomised to receive either a placebo or albiglutide (9, 16, or 32 mg twice over 2 weeks). Concurrently, an injection site study randomised 46 people to receive a single does of albiglutide in the arm, leg or abdomen.

4 Twenty-four-hour profiles demonstrated reductions in fasting and postprandial plasma glucose levels in the albiglutide arm in a dose-dependent manor, independent of injection site, and adverse effects were mild (commonly headaches and nausea).

Matthews JE, Murray WS, De Boever EH et al (2008) Pharmacodynamics, pharmacokinetics, safety, and tolerability of albiglutide, a long-acting glucagon-like peptide-1 mimetic, in patients with type 2 diabetes. *J Clin Endocrinol Metab* **93**: 4810–17

DIABETES, OBESITY AND METABOLISM

Non-inferiority of vildagliptin versus glimepiride shown

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓

1 Dipeptidyl peptidase-4 (DPP-4) inhibitors can be used as add-ons when metformin alone fails to achieve glycaemic control.

2 To establish non-inferiority of the DPP-4 inhibitor vildagliptin versus glimepiride, 2789 participants failing to achieve glycaemic control on metformin alone were randomised to received vildagliptin or glimepiride in this study.

3 During the 52-week study period, participants were reviewed at 4, 8, 12, 16, 20, 24, 32, 40, 46 and 52 weeks.

4 By study end, non-inferiority of vildagliptin was established at the upper 97.5% confidence interval (0.02–0.16), with mean HbA_{1c} change from baseline in the vildagliptin arm –0.44% (0.02%), and –0.53% (0.02%) for the glimepiride arm.

5 The proportion of participants achieving the target HbA_{1c} (<7.0%) was similar in both the vildagliptin and glimepiride groups (54.1% and 55.5%, respectively); however, significantly more participants achieved the target without hypoglycaemia in the vildagliptin arm (50.9% and 44.3%, respectively; $P=0.006$).

Ferrannini E, Fonseca V, Zinman B et al (2009) Fifty-two-week efficacy and safety of vildagliptin vs. glimepiride in patients with type 2 diabetes mellitus inadequately controlled on metformin monotherapy. *Diabetes Obes Metab* **11**: 157–166.

"Those randomised to intensive lifestyle intervention lost significantly more weight … and showed a significant improvement in health-related quality of life in comparison to those receiving diabetes support and education."

DIABETIC MEDICINE

Peer-led diabetes education in an ethnic minority population

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓

1 People from ethnic minorities are less likely to know about the management of diabetes and its complications. Given that type 2 diabetes is four times more common among people of South Asian origin than the general population, the need for appropriately delivered, effective diabetes education for this group is evident.

2 The authors assessed use of a modified version of the X-PERT programme in a UK-based adult Bangladeshi population. Sessions were conducted in Sylheti by trained peer educators with type 2 diabetes.

3 Participants were recruited through posters placed in community settings, announcements at mosques, GP recommendation, discussion with the researcher, peer educators and other community members.

4 Programme registration was high (n=72), but attendance was only 58% (42/72). Time to attend the course appeared to be a barrier to attendance.

5 Participants completed a Summary of Diabetes Self-Care Activities questionnaire during the course and 1 month after. Questionnaire results suggested that the programme elicited a 0.3 day improvement in self-care activities in diet, and a 0.1 day improvement in exercise and foot care.

6 Attendee feedback was positive, and the authors suggest that the amended X-PERT programme could be one component of a package to improve outcomes for people with diabetes in the UK Bangladeshi community.

Choudhury SM et al (2009) Examining the effectiveness of a peer-led education programme for type 2 diabetes and cardiovascular disease in a Bangladeshi population. *Diabet Med* **26**: 40–4

BMC PUBLIC HEALTH

Measuring treatment adherence among people with T2DM

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓

1 Treatment adherence is associated with good glycaemic control and a decrease in the risk of complications. However, adherence – especially in the primary care setting – is difficult to measure as most validated methods are time- and resource-heavy.

2 The authors looked to determine the sensitivity, specificity, predictive values, likelihood ratios, and post-test probabilities for two questionnaires developed as proxy measures of adherence that could be deployed in the primary care setting.

3 The two questionnaires were developed by a panel of diabetologists, primary-care GPs and psychologists to identify: (i) a person's medical prescription knowledge, and (ii) their attitudes toward treatment adherence. Pill count was use as a gold standard indicator of adherence.

4 Participants (n=238) were recruited from GP clinics, and two healthcare professionals carried out three home visits over 3 months. During the first visit participants completed the two questionnaires. At every visit the number of pills that participants had received (cross-checked against medical records) was recorded. At the final visit the pill count was registered.

5 The questionnaire investigating medical prescription knowledge performed best, with a negative predictive value of 82.8% (i.e. approximately one in five people would be incorrectly classified as non-adherent) for identification of non-adherence among people with type 2 diabetes.

Prado-Aguilar CA, Martínez YV, Segovia-Bernal Y et al (2009) Performance of two questionnaires to measure treatment adherence in patients with type-2 diabetes. *BMC Public Health* **9**(38). Available from: http://tinyurl.com/ofmxfk

ARCHIVES OF INTERNAL MEDICINE

Improved QoL in T2DM following intensive lifestyle intervention

Readability	✓✓✓
Applicability to practice	✓✓
WOW! factor	✓✓✓

1 The Look AHEAD (Action for Health in Diabetes) Trial is a multicentre, randomised, controlled trial looking at the long-term effects of an intensive weight loss programme in overweight and obese people with type 2 diabetes. The authors report the impact of the trial on health-related quality of life (HRQoL).

2 Participants (n=5145; BMI 36.0; mean age 58.7 years) were randomised to an intensive lifestyle intervention (ILI) or to diabetes support and education (DSE).

3 HRQoL was measured using the 36-Item Short-Form Health Survey (SF-36) and the Beck Depression Inventory II (BDI-II). Measurements where taken at baseline (blinded) and 1 year later.

4 Those randomised to the ILI arm lost significantly more weight (–8.77 kg vs. –0.86 kg), significantly improved in physical fitness measures and experienced significantly reduced physical symptoms of diabetes (all P<0.001), than those receiving DSE.

5 The ILI arm showed a significant (P<0.001) improvement in HRQoL at 1 year in comparison to the DSE arm, using the SF-36 physical component summary (99% confidence interval [CI] –3.44 to –2.37) and the BDI-II (99% CI 0.24–0.86).

6 Beyond the improvements in body weight, fitness and physical symptoms, overweight and obese adults receiving ILI significantly improved their HRQoL.

Williamson DA, Rejeski J, Lang W et al (2009) Impact of a weight management program on health-related quality of life in overweight adults with type 2 diabetes. *Arch Intern Med* **169**: 163–71