Complete Summary

GUIDELINE TITLE

Type 1 diabetes: diagnosis and management of type 1 diabetes in children and young people.

BIBLIOGRAPHIC SOURCE(S)

National Collaborating Centre for Women's and Children's Health. Type 1 diabetes: diagnosis and management of type 1 diabetes in children and young people. London (UK): Royal College of Obstetricians and Gynecologists; 2004 Sep. 199 p. [685 references]

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY
DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

Type 1 diabetes mellitus and its complications and associated conditions, particularly hypoglycaemia; diabetic ketoacidosis; coeliac disease; thyroid disease; diabetic retinopathy; kidney, nerve, and vascular damage due to diabetes; and psychosocial disorders

GUIDELINE CATEGORY

Counseling
Diagnosis
Evaluation
Management

Prevention
Screening
Treatment

CLINICAL SPECIALTY

Cardiology
Endocrinology
Family Practice
Internal Medicine
Nephrology
Neurology
Nutrition
Ophthalmology
Pediatrics
Podiatry
Psychology

INTENDED USERS

Advanced Practice Nurses
Dietitians
Health Care Providers
Hospitals
Nurses
Patients
Pharmacists
Physician Assistants
Physicians
Podiatrists
Psychologists/Non-physician Behavioral Health Clinicians
Public Health Departments

GUIDELINE OBJECTIVE(S)

- To address the diagnosis and management of children and young people with type 1 diabetes
- To provide guidance on:
    - Initial management at diagnosis (including consideration of admission criteria and initial insulin regimens)
    - Continuing care of children and young people with type 1 diabetes
    - Ongoing monitoring of glycaemic control (including the role of home glucose monitoring and the frequency of haemoglobin A_{1c} [HbA_{1c}] measurement)
    - Management of hypoglycaemia (insufficient blood sugar) and hypoglycaemic coma
    - Prevention and management of diabetic ketoacidosis (including the management of intercurrent illness, that is, illness that occurs alongside type 1 diabetes; for example, influenza)
    - Peri-operative management of children and young people with type 1 diabetes
    - Surveillance for complications

- To address the special needs of young people (adolescents) and the interface between paediatric and adult services

TARGET POPULATION

Children (people younger than 11 years) and young people (those aged 11 years or older and younger than 18 years) with type 1 diabetes

The guideline does not address:

- The issue of contraception in young women with type 1 diabetes
- The management of young women with type 1 diabetes who wish to conceive or are pregnant
- The management of young women who develop type 1 diabetes during pregnancy
- The management of non-type 1 diabetes

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis/Evaluation

1. Glycated haemoglobin (haemoglobin A_{1c} [HbA_{1c}]) levels
2. Blood glucose concentration (including use of memory monitors)
3. Urine glucose monitoring (considered, but not recommended)
4. Blood lipid levels including triglycerides and low-density lipoprotein (LDL) and high-density lipoprotein (HDL) cholesterol
5. Assessment of growth, as measured by height, weight, and body mass index
6. Measurement of urine protein excretion
7. Screening for coeliac disease at diagnosis and at least every 3 years thereafter
8. Screening for thyroid disease at diagnosis and annually thereafter
9. Annual screening for retinopathy from the age of 12 years
10. Annual screening of microalbuminuria from the age of 12 years
11. Annual screening of blood pressure from the age of 12 years
12. Annual foot care reviews
13. Investigation of the state of injection sites at each visit
14. Screening for anxiety and depression and referral to child mental health professionals (when necessary)
15. Assessment of cognitive function

General Management Principles

1. Provision of a multidisciplinary paediatric diabetes care team that is accessible for advice 24 hours a day

Pharmacological Treatments

1. Rapid-acting insulin analogues
2. Short-acting insulins
3. Intermediate-acting insulins
4. Long-acting insulin analogues

5. Biphasic insulin (mixture of rapid-acting insulin analogue or short-acing insulin together with intermediate-acting insulin)
6. Acarbose (considered, but not recommended)
7. Sulphonylureas (glibenclamide, gliclazide, glipizide, tolazamide, glyburide) (considered, but not recommended)
8. Metformin (recommended for use only within research studies)
9. Annual influenza immunisation for children and young people with diabetes over the age of 6 months
10. Annual pneumococcal immunisation for children and young people with diabetes over the age of 2 months
11. Intramuscular or subcutaneous glucagon
12. Intravenous glucose
13. Concentrated oral glucose solution (Hypostop®)

Non-Pharmacological Treatments

1. Structured programme of education at diagnosis
2. Age-appropriate ongoing education to assist in decision making
3. Dietetic support
4. Exercise management
5. Counseling on use of alcohol, tobacco, and recreational drugs
6. Education on long-distance travel
7. Provision of structured behavioural intervention strategies and psychosocial support

MAJOR OUTCOMES CONSIDERED

- Glycaemic control (glycated haemoglobin, blood glucose concentration)
- Incidence of diabetic ketoacidosis
- Frequency and severity of hypoglycaemia
- Hypoglycaemic awareness
- Lipid regulation (triglycerides, low- and high-density lipoprotein cholesterol)
- Endocrine function (growth, height, weight, body mass index, sexual maturation)
- Cardiovascular function (blood pressure)
- Incidence of retinopathy and juvenile cataract
- Urine protein excretion
- Number of, duration of, and reason for hospital admission
- Incidence of emergency hospital admissions
- Participation in physical activity
- Incidence of eating disorders
- Diabetes knowledge
- Quality of life
- Patient satisfaction
- Psychological well-being, including self-esteem
- School participation/absence
- Clinic attendance
- Knowledge
- Cost measures including cost benefit, cost effectiveness, cost utility, cost consequence, and cost minimisation

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Literature Search Strategy

The aim of the literature review was to identify and synthesise relevant published evidence to answer specific clinical questions formulated and agreed by the Guideline Development Group (GDG). Searches were performed using generic and specially developed filters, relevant medical subject heading terms, and free-text terms. Details of all literature searches are available from the National Collaborating Centre for Women's and Children's Health (NCC-WCH).

Searches were carried out for each topic of interest. The Cochrane Library (up to Issue 4, 2003) was searched to identify systematic reviews (with or without meta-analyses) of randomised controlled trials (RCTs) as well as individual RCTs. The electronic databases MEDLINE (Ovid version for the period January 1966 to December 2003), EMBASE (Ovid version for the period January 1980 to December 2003), the Cumulative Index to Nursing and Allied Health Literature (Ovid version for the period January 1982 to December 2003), PsychInfo (Ovid version for the period January 1974 to December 2003), and the Database of Abstracts of Reviews of Effects were also searched.

There was no systematic attempt to search the 'grey literature' (conferences, abstracts, theses and unpublished trials).

The National Guidelines Clearinghouse database, the Turning Research into Practice database and the Organising Medical Networked Information service on the Internet were searched for guidelines produced by other development groups. The reference lists in these guidelines were checked against our searches to identify any missing evidence.

A preliminary scrutiny of titles and abstracts was undertaken and full copies of all publications that addressed the GDG's clinical questions were obtained. Following a critical appraisal of each publication, studies not relevant to a particular clinical question were excluded. Studies that did not report relevant outcomes were also excluded. Evidence submitted by stakeholder organisations that was relevant to the GDG's clinical questions and was of equivalent or better quality than evidence identified in the literature searches was also included.

It was thought that there would not be a large body of economic evidence and that specific searches could miss some relevant studies. A general search was therefore designed to find all economic studies relating to children and young people with type 1 diabetes. Additional search terms relating to economic studies were added to a search string for identifying the clinical effectiveness evidence on

children and young people with type 1 diabetes. A second search on topics relating to education and psychological interventions was also undertaken. The searches were undertaken using the same databases as the clinical effectiveness searches. Additional searches were undertaken of the Health Economic Evaluations Database and the National Health Service Economic Evaluations Database.

Abstracts and/or database reviews of papers that were identified by the economic searches were reviewed and excluded if they contained no economic data or if the focus of the paper explicitly excluded children and young people. Relevant references in the bibliographies of reviewed papers were also identified and reviewed.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Source of Evidence

Ia: Systematic review or meta-analysis of randomised controlled trials

Ib: At least one randomised controlled trial

IIa: At least one well-designed controlled study without randomisation

IIb: At least one well-designed quasi-experimental study, such as a cohort study

III: Well-designed non-experimental descriptive studies, such as comparative studies, correlation studies, case-control studies, and case series

IV: Expert committee reports, opinions, and/or clinical experience of respected authorities

METHODS USED TO ANALYZE THE EVIDENCE

Meta-Analysis
Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Synthesis of Clinical Effectiveness Evidence

Evidence relating to clinical effectiveness was reviewed using established guides and classified using the established hierarchical system described above in "Rating Scheme for the Strength of the Evidence." This system reflects the susceptibility to bias that is inherent in particular study designs.

The type of clinical question dictates the highest level of evidence that may be sought. For issues of therapy or treatment, the highest possible level of evidence is a systematic review or meta-analysis of randomised controlled trials (RCTs) (evidence level Ia) or an individual RCT (evidence level Ib). For issues of prognosis, the highest possible level of evidence is a cohort study (evidence level IIb). For each clinical question, the highest available level of evidence was selected. Where appropriate, for example, if a systematic review, meta-analysis or RCT existed in relation to a question, studies of a weaker design were ignored. Where systematic reviews, meta-analyses, and RCTs did not exist, other appropriate experimental or observational studies were sought. For diagnostic tests, test evaluation studies examining the performance of the test were used if the efficacy of the test was required, but where an evaluation of the effectiveness of the test in the clinical management of patients and the outcome of disease was required, evidence from RCTs or cohort studies was used.

Evidence was synthesised qualitatively by summarising the content of identified papers in evidence tables and agreeing brief statements that accurately reflected the evidence. Quantitative synthesis (meta-analysis) was performed where appropriate.

Summary results and data are presented in the guideline text. More detailed results and data are presented in the accompanying evidence tables. Where possible, dichotomous outcomes are presented as relative risks (RRs) with 95% confidence intervals (CIs), and continuous outcomes are presented as mean differences with 95% CIs or standard deviations (SDs) or standard errors (SEs) where CIs were not reported. Statistically significant relative risks are also presented as numbers needed to treat (NNTs) where appropriate. Meta-analyses based on dichotomous outcomes are presented as pooled relative risks with 95% CIs, and meta-analyses based on continuous outcomes are presented as weighted mean differences (WMDs) with 95% CIs. The results of meta-analyses that were performed specifically for this guideline are also presented as forest plots in Appendix B of the original guideline document.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus
Expert Consensus (Delphi)
Expert Consensus (Nominal Group Technique)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

This guideline was commissioned by the National Institute for Health and Clinical Excellence (NICE) and developed in accordance with the guideline development process outlined in *The Guideline Development Process - Information for National Collaborating Centres and Guideline Development Groups* (available at www.nice.org.uk).

Who Has Developed the Guideline?

The guideline was developed by a multi-professional and lay working group (the Guideline Development Group; GDG) convened by the National Collaborating Centre for Women's and Children's Health (NCC-WCH). Membership included:

- Two consumer representatives
- Two paediatric diabetes nurses
- Three paediatricians
- A paediatric dietician
- A general practitioner
- A clinical psychologist
- An adult physician with an interest in adolescence

Staff from the National Collaborating Centre for Women's and Children's Health provided methodological support for the guideline development process, undertook systematic searches, retrieval and appraisal of the evidence and health economic analysis, and wrote successive drafts of the guideline.

Young People's Consultation Day

A young people's consultation day was organised for this guideline in collaboration with the National Children's Bureau (NCB). The objective of the consultation day was to elicit the views of young people with type 1 diabetes and their carers in relation to topics considered in the guideline. A summary of the conclusions reached following the consultation day is presented in Appendix C of the original guideline document. Issues relating to specific topics are also discussed in relevant sections of the guideline.

Forming and Grading Recommendations

For each clinical question, recommendations were derived using, and explicitly linked to, the evidence that supported them. Where possible, the Guideline Development Group worked on an informal consensus basis. Where necessary, formal consensus methods (such as modified Delphi and nominal group techniques) were used to agree recommendations and audit criteria.

Each recommendation was graded according to the level of evidence upon which it was based using the established system described below in "Rating Scheme for the Strength of the Recommendations." For issues of therapy or treatment, the best possible level of evidence (a systematic review or meta-analysis or an individual randomised controlled trial [RCT]) would equate to a grade A recommendation. For issues of prognosis, the best possible level of evidence (a cohort study) would equate to a grade B recommendation. However, this should not be interpreted as an inferior grade of recommendation because it represents the highest level of relevant evidence.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Grading of Recommendations

A: Based directly on level I evidence

B: Based directly on level II evidence or extrapolated from level I evidence

C: Based directly on level III evidence or extrapolated from level I or level II evidence

D: Based directly on level IV evidence or extrapolated from level I, level II, or level III evidence

GPP: Good practice point based on the view of the Guideline Development Group (GDG)

NICE TA: Recommendation taken from a National Institute for Health and Clinical Excellence (NICE) Technology Appraisal

COST ANALYSIS

Health Economics

The purpose of the economic input to the guideline was to inform the Guideline Development Group (GDG) of potential economic issues that needed to be considered, to review the economic literature, and to carry out economic analyses agreed with the Guideline Development Group where appropriate data were available.

Since the overall body of literature was expected to be small, the economic review considered all types of economic studies (cost benefit, cost effectiveness, cost utility, cost consequence, and cost minimisation). The cost data were only considered if they were generalisable to England and Wales, or if resource use was described in sufficient detail to be able to apply UK cost data.

It was agreed that economic models using data from the clinical literature review should be considered where guideline recommendations had major resource implications, or represented a change in policy, or where clinical effectiveness data from well conducted studies were available.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guideline was validated through two consultations.

1. The first draft of the guideline (the full guideline, National Institute for Health and Clinical Excellence [NICE] guideline and Quick Reference Guide) were consulted with Stakeholders and comments were considered by the Guideline Development Group (GDG)

2. The final consultation draft of the Full guideline, the NICE guideline and the Information for the Public were submitted to stakeholders for final comments.

The final draft was submitted to the Guideline Review Panel for review prior to publication.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Evidence categories (Ia-IV) and recommendation grades (A-D) are defined at the end of the "Major Recommendations" field.

In addition to evidence-based recommendations, the guideline development group (GDG) identifies good practice points (GPP) as well as evidence from National Institute for Health and Clinical Excellence (NICE) Technology Appraisals (NICE TA).

Terminology Used in the Guideline

The internationally agreed term "type 1 diabetes" is used in this guideline, rather than "insulin-dependent diabetes mellitus." Similarly, "type 2 diabetes" is used in the guideline, rather than "non-insulin-dependent diabetes mellitus."

The guideline relates to the care of children (people under the age of 11 years) and young people (those aged 11 years or over, but under 18 years). Where appropriate, the following terms are used to refer to specific age groups:

- Neonates (0 weeks or older and younger than 4 weeks)
- Infants (4 weeks or older and younger than 52 weeks)
- Pre-school children (1 year or older and younger than 5 years)
- Primary school children (5 years or older and younger than 11 years)
- Young people (11 years or older and younger than 18 years)
- Adults (18 years or older).

Diagnosis and Initial Management

Diagnosis

D - The diagnosis of type 1 diabetes in children and young people should be based on the criteria specified in the 1999 World Health Organization report on the diagnosis and classification of diabetes mellitus.

GPP - Children and young people with suspected type 1 diabetes should be offered immediate (same day) referral to a multidisciplinary paediatric diabetes care team that has the competencies needed to confirm diagnosis and to provide immediate care.

GPP - Consideration should be given to the possibility of other types of diabetes (such as early-onset type 2 diabetes, other insulin resistance syndromes,

maturity-onset diabetes in the young, and molecular/enzymatic abnormalities) in children and young people with suspected type 1 diabetes who:

- Have a strong family history of diabetes
- Are obese at presentation
- Are of Black or Asian origin
- Have an insulin requirement of less than 0.5 units/kg body weight/day outside a partial remission phase
- Have no insulin requirement
- Rarely or never produce ketone bodies in the urine (ketonuria) during episodes of hyperglycaemia
- Show evidence of insulin resistance (for example, acanthosis nigricans)
- Have associated features, such as eye disease, deafness, or another systemic illness or syndrome

GPP - Children and young people with type 1 diabetes should be entered on a population-based, practice-based, and/or clinic-based diabetes register.

Management from Diagnosis

GPP - Children and young people with type 1 diabetes should be offered an ongoing integrated package of care by a multidisciplinary paediatric diabetes care team. To optimise the effectiveness of care and reduce the risk of complications, the diabetes care team should include members with appropriate training in clinical, educational, dietetic, lifestyle, mental health, and foot care aspects of diabetes for children and young people.

GPP - Children and young people with type 1 diabetes and their families should be offered 24-hour access to advice from the diabetes care team.

GPP - Children and young people with type 1 diabetes and their families should be involved in making decisions about the package of care provided by the diabetes care team.

A - At the time of diagnosis, children and young people with type 1 diabetes should be offered home-based or inpatient management according to clinical need, family circumstances and wishes, and residential proximity to inpatient services. Home-based care with support from the local paediatric diabetes care team (including 24-hour telephone access to advice) is safe and as effective as inpatient initial management.

GPP - Children and young people who present with diabetic ketoacidosis should have their diabetic ketoacidosis treated in hospital according to the guidance outlined in this document.

GPP - Children with type 1 diabetes who are younger than 2 years of age and children and young people who have social or emotional difficulties or who live a long way from hospital should be offered inpatient initial management.

GPP - Children and young people with type 1 diabetes and their families should be offered appropriate emotional support following diagnosis, which should be tailored to emotional, social, cultural, and age-dependent needs.

Natural History of Type 1 Diabetes

D - Children and young people with newly diagnosed type 1 diabetes should be informed that they may experience a partial remission phase (or "honeymoon period") during which a low dosage of insulin (0.5 units/kg body weight/day) may be sufficient to maintain a haemoglobin A_{1c} (HbA_{1c}) level of less than 7%.

A - Children and young people with type 1 diabetes should be informed that the use of multiple daily insulin injection regimens or continuous subcutaneous insulin infusion (or insulin pump therapy) will not prolong the partial remission phase, although these forms of therapy may be appropriate for optimising glycaemic control, especially in young people.

Essential Education at Diagnosis

D - Children and young people with newly diagnosed type 1 diabetes should be offered a structured programme of education covering the aims of insulin therapy, delivery of insulin, self-monitoring of blood glucose, the effects of diet, physical activity, and intercurrent illness on glycaemic control, and the detection and management of hypoglycaemia.

Ongoing Management

Education

GPP - Children and young people with type 1 diabetes and their families should be offered timely and ongoing opportunities to access information about the development, management, and effects of type 1 diabetes. The information provided should be accurate and consistent and it should support informed decision-making.

GPP - Children and young people with type 1 diabetes and their families should be offered opportunities to discuss particular issues and to ask questions at each clinic visit.

GPP - The method of delivering education and content will depend on the individual and should be appropriate for the child's or young person's age, maturity, culture, wishes, and existing knowledge within the family.

GPP - Particular care should be given to communication and the provision of information when children and young people with type 1 diabetes and/or their parents have special needs, such as those associated with physical and sensory disabilities, or difficulties in speaking or reading English.

Insulin Regimens

C - Pre-school and primary school children with type 1 diabetes should be offered the most appropriate individualised regimens to optimise their glycaemic control.

A - Young people with type 1 diabetes should be offered multiple daily injection regimens to help optimise their glycaemic control.

C - Multiple daily injection regimens should be offered only as part of a package of care that involves continuing education, dietary management, instruction on the use of insulin delivery systems and blood glucose monitoring, emotional and behavioural support, and medical, nursing, and dietetic expertise in paediatric diabetes, because this improves glycaemic control.

B - Children and young people using multiple daily injection regimens should be informed that they may experience an initial increase in the risk of hypoglycaemia and short-term weight gain.

C - Children and young people with type 1 diabetes and their families should be informed about strategies for the avoidance and management of hypoglycaemia.

GPP - Young people who do not achieve satisfactory glycaemic control with multiple daily injection regimens should be offered additional support and, if appropriate, alternative insulin therapy (once, twice, or three-times daily mixed insulin regimens or continuous subcutaneous insulin infusion using an insulin pump).

GPP - Young people with type 1 diabetes who have difficulty adhering to multiple daily injection regimens should be offered twice-daily injection regimens.

NICE TA - Continuous subcutaneous insulin infusion (or insulin pump therapy) is recommended as an option for people with type 1 diabetes provided that:

- multiple-dose insulin therapy (including, where appropriate, the use of insulin glargine) has failed;* and
- those receiving the treatment have the commitment and competence to use the therapy effectively

***NICE TA** - People for whom multiple-dose therapy has failed are considered to be those for whom it has been impossible to maintain an HBA_{1c} level no greater than 7.5% (or 6.5% in the presence of microalbuminuria or adverse features of the metabolic syndrome) without disabling hypoglycaemia occurring, despite a high level of self care of their diabetes. "Disabling hypoglycaemia," for the purpose of this guidance, means the repeated and unpredicted occurrence of hypoglycaemia requiring third-party assistance that results in continuing anxiety about recurrence and is associated with significant adverse effect on quality of life.

NICE TA - Continuous subcutaneous insulin infusion therapy should be initiated only by a trained specialist team, which should normally comprise a physician with a specialist interest in insulin pump therapy, a diabetes specialist nurse, and a dietitian.

NICE TA - All individuals beginning continuous subcutaneous insulin infusion therapy should be provided with specific training in its use. Ongoing support from a specialist team should be available, particularly in the period immediately following the initiation of continuous subcutaneous insulin infusion. It is recommended that specialist teams should agree a common core of advice appropriate for continuous subcutaneous insulin infusion users.

NICE TA - Established users of continuous subcutaneous insulin infusion therapy should have their insulin management reviewed by their specialist team so that a decision can be made about whether a trial or a switch to multiple-dose insulin incorporating insulin glargine would be appropriate.

Insulin Preparations

GPP - Children and young people with type 1 diabetes should be offered the most appropriate insulin preparations (rapid-acting insulin analogues, short-acting insulins, intermediate-acting insulins, long-acting insulin analogues or biphasic insulins) according to their individual needs and the instructions in the patient information leaflet supplied with the product, with the aim of obtaining an HbA_{1c} level of less than 7.5% without frequent disabling hypoglycaemia and maximising quality of life.

B - Children and young people with type 1 diabetes using multiple daily insulin regimens should be informed that injection of rapid-acting insulin analogues before eating (rather than after eating) reduces post-prandial blood glucose levels and thus helps to optimise blood glucose control.

GPP - For pre-school children with type 1 diabetes it may be appropriate to use rapid-acting insulin analogues shortly after eating (rather than before eating) because food intake can be unpredictable.

GPP - Children and young people with type 1 diabetes who use insulin preparations containing intermediate-acting insulin should be informed that these preparations should be mixed before use according to the instructions in the patient information leaflet supplied with the product.

Methods of Delivering Insulin

GPP - Children and young people with type 1 diabetes should be offered a choice of insulin delivery systems that takes account of their insulin requirements and personal preferences.

GPP - Children and young people with type 1 diabetes using insulin injection regimens should be offered needles that are of an appropriate length for their body fat (short needles are appropriate for children and young people with less body fat; longer needles are appropriate for children and young people with more body fat).

Non-Insulin Agents (Oral Antidiabetic Drugs)

A - Children and young people with type 1 diabetes should not be offered acarbose or sulphonylureas (glibenclamide, gliclazide, glipizide, tolazamide or glyburide) in combination with insulin because they may increase the risk of hypoglycaemia without improving glycaemic control.

A - Metformin in combination with insulin is suitable for use only within research studies because the effectiveness of this combined treatment in improving glycaemic control is uncertain.

Monitoring Glycaemic Control

A - Children and young people with type 1 diabetes and their families should be informed that the target for long-term glycaemic control is an HbA_{1c} level of less than 7.5% without frequent disabling hypoglycaemia and that their care package should be designed to attempt to achieve this.

D - Children and young people with type 1 diabetes should be offered testing of their HbA_{1c} levels two to four times per year (more frequent testing may be appropriate if there is concern about poor glycaemic control).

D - Current HbA_{1c} measurements should be made available in outpatient clinics because their availability can lead to immediate changes in insulin therapy and/or diet and so reduce the need for follow-up appointments.

A - Children and young people with type 1 diabetes and their families should be informed that aiming to achieve low levels of HbA_{1c} can lead to increased risks of hypoglycaemia and that high levels of HbA_{1c} can lead to increased risks of long-term microvascular complications.

B - Children and young people with HbA_{1c} levels consistently above 9.5% should be offered additional support by their diabetes care teams to help them improve their glycaemic control because they are at increased risk of developing diabetic ketoacidosis and long-term complications.

A - Children and young people with type 1 diabetes should be encouraged to use blood glucose measurements for short-term monitoring of glycaemic control because this is associated with reduced levels of glycated haemoglobin. Urine glucose monitoring is not recommended because it is less effective and is associated with lower patient satisfaction.

D - Children and young people with type 1 diabetes and their families should be informed that the optimal targets for short-term glycaemic control are a pre-prandial blood glucose level of 4 to 8 mmol/L and a post-prandial blood glucose level of less than 10 mmol/L.

C - Children and young people with type 1 diabetes and their families should be encouraged to perform frequent blood glucose monitoring as part of a continuing package of care that includes dietary management, continued education, and regular contact with their diabetes care teams.

GPP - Children and young people with type 1 diabetes and their families should be offered a choice of appropriate equipment for undertaking monitoring of capillary blood glucose to optimise their glycaemic control in response to adjustment of insulin, diet, and exercise.

D - Children and young people using multiple daily injection regimens should be encouraged to adjust their insulin dose if appropriate after each pre-prandial, bedtime, and occasional nighttime blood glucose measurement.

D - Children and young people using twice-daily injection regimens should be encouraged to adjust their insulin dose according to the general trend in pre-prandial, bedtime, and occasional nighttime blood glucose measurements.

GPP - Children and young people with type 1 diabetes who are trying to optimise their glycaemic control and/or have intercurrent illness should be encouraged to measure their blood glucose levels more than four times per day.

GPP - Children and young people with type 1 diabetes and their families should be informed that blood glucose levels should be interpreted in the context of the "whole child," which includes the social, emotional, and physical environment.

B - Children and young people with type 1 diabetes who have persistent problems with hypoglycaemia unawareness or repeated hypoglycaemia or hyperglycaemia should be offered continuous glucose monitoring systems.

B - Children and young people with type 1 diabetes should be offered blood glucose monitors with memories (as opposed to monitors without memories) because these are associated with improved patient satisfaction.

GPP - Children and young people with type 1 diabetes should be encouraged to use a diary in conjunction with a blood glucose monitor because recording food intake and events such as intercurrent illness can help to reduce the frequency of hypoglycaemic episodes.

See the section below titled "Cognitive Disorders" for recommendations about cognitive disorders related to frequent hypoglycaemia.

Diet

C - Children and young people with type 1 diabetes should be offered appropriate dietetic support to help optimise body weight and glycaemic control.

D - Children and young people with type 1 diabetes and their families should be informed that they have the same basic nutritional requirements as other children and young people. The food choices of children and young people should provide sufficient energy and nutrients for optimal growth and development, with total daily energy intake being distributed as follows:

- Carbohydrates - more than 50%
- Protein - 10-15%
- Fat - 30-35%

D - The consumption of five portions of fruit and vegetables per day is also recommended. Neonates, infants, and pre-school children require individualised dietary assessment to determine their energy needs.

GPP - Children and young people with type 1 diabetes should be encouraged to develop a good working knowledge of nutrition and how it affects their diabetes.

GPP - Children and young people with type 1 diabetes and their families should be informed of the importance of healthy eating in reducing the risk of cardiovascular disease (including foods with a low glycaemic index, fruit and vegetables, and types and amounts of fats), and means of making appropriate nutritional changes in the period after diagnosis and according to need and interest at intervals thereafter.

B - Children and young people with type 1 diabetes should be encouraged to consider eating a bedtime snack. The nutritional composition and timing of all snacks should be discussed with the diabetes care team.

C - Children and young people using multiple daily injection regimens should be offered education about insulin and dietary management as part of their diabetes care package, to enable them to adjust their insulin dose to reflect their carbohydrate intake.

GPP - Children and young people with type 1 diabetes should be offered education about the practical problems associated with fasting and feasting.

Exercise

B - All children and young people, including those with type 1 diabetes, should be encouraged to exercise on a regular basis because this reduces the risks of developing macrovascular disease in the long term.

GPP - Children and young people with type 1 diabetes and their families should be informed that they can participate in all forms of exercise, provided that appropriate attention is given to changes in insulin and dietary management.

GPP - Children and young people with type 1 diabetes wishing to participate in restricted sports (such as scuba diving) should be offered comprehensive advice by their diabetes care teams. Additional information may be available from local and/or national patient support groups and organisations.

C - Children and young people with type 1 diabetes and their families should be informed about the effects of exercise on blood glucose levels and about strategies for preventing exercise-induced hypoglycaemia during and/or after physical activity.

D - Children and young people with type 1 diabetes should be encouraged to monitor their blood glucose levels before and after exercise so that they can:

- Identify when changes in insulin or food intake are necessary
- Learn the glycaemic response to different exercise conditions

- Be aware of exercise-induced hypoglycaemia
- Be aware that hypoglycaemia may occur several hours after prolonged exercise

D - Children and young people with type 1 diabetes, their parents, and other carers should be informed that additional carbohydrate should be consumed as appropriate to avoid hypoglycaemia and that carbohydrate-based foods should be readily available during and after exercise.

GPP - Children and young people with type 1 diabetes, their parents, and other carers should be informed that additional carbohydrate should be consumed if blood glucose levels are less than 7 mmol/L before exercise is undertaken.

GPP - Children and young people with type 1 diabetes and their families should be informed that changes in their daily exercise patterns may require insulin dose and/or carbohydrate intake to be altered.

GPP - Children and young people with type 1 diabetes, their parents, and other carers should be informed that exercise should be undertaken with caution if blood glucose levels are greater than 17 mmol/L in the presence of ketosis.

Alcohol, Smoking, and Recreational Drugs

C - Young people with type 1 diabetes should be informed about the specific effects of alcohol consumption on glycaemic control, particularly the risk of (nocturnal) hypoglycaemia.

GPP - Young people with type 1 diabetes should be offered alcohol education programmes.

GPP - Young people with type 1 diabetes who drink alcohol should be informed that they should:

- Eat food containing carbohydrate before and after drinking
- Monitor their blood glucose levels regularly and aim to keep the levels within the recommended range by eating food containing carbohydrate

B - Children and young people with type 1 diabetes and their families should be informed about general health problems associated with smoking and in particular the risks of developing vascular complications.

GPP - Children and young people with type 1 diabetes should be encouraged not to start smoking.

GPP - Children and young people with type 1 diabetes who smoke should be offered smoking cessation programmes.

GPP - Children and young people with type 1 diabetes and their families should be informed about the general dangers of substance misuse and the possible effects on glycaemic control.

Long-Distance Travel

GPP - Children and young with type 1 diabetes and their families should be offered education about the practical issues related to long-distance travel, such as when best to eat and inject insulin when traveling across time zones.

Immunisation

D - Children and young people with type 1 diabetes and their families should be informed that the Department of Health recommends annual immunisation against influenza for children and young people with diabetes over the age of 6 months.

D - Children and young people with type 1 diabetes and their families should be informed that the Department of Health recommends immunisation against pneumococcal infection for children and young people with diabetes over the age of 2 months.

Complications and Associated Conditions

Hypoglycaemia

D - Children and young people with type 1 diabetes, their parents, and other carers should be informed that they should always have access to an immediate source of carbohydrate (glucose or sucrose) and blood glucose monitoring equipment for immediate confirmation and safe management of hypoglycaemia.

D - Children and young people, their parents, schoolteachers, and other carers should be offered education about the recognition and management of hypoglycaemia.

D - Children and young people with type 1 diabetes should be encouraged to wear or carry something that identifies them as having type 1 diabetes (for example, a bracelet).

GPP - Children and young people with mild to moderate hypoglycaemia should be treated as follows.

- Take immediate action.
- The first line of treatment should be the consumption of rapidly absorbed simple carbohydrate (for example, 10-20 g carbohydrate given by mouth).
- The simple carbohydrate should raise blood glucose levels within 5 to 15 minutes.
- Carbohydrate given in liquid form may be taken more easily.
- It may be appropriate to give small amounts of rapidly absorbed simple carbohydrate frequently because hypoglycaemia may cause vomiting.
- As symptoms improve or normoglycaemia is restored, additional complex long-acting carbohydrate should be given orally to maintain blood glucose levels unless a snack or meal is imminent.
- Additional complex long-acting carbohydrate is not required for children and young people using continuous subcutaneous insulin infusion.

- Blood glucose levels should be rechecked within 15 minutes.

GPP - Children and young people with severe hypoglycaemia should be treated as follows.

- In a hospital setting, 10% intravenous glucose should be used when rapid intravenous access is possible (up to 500 mg/kg body weight - 10% glucose is 100 mg/mL).
- Outside hospital, or where intravenous access is not practicable, intramuscular glucagon or concentrated oral glucose solution (e.g., Hypostop®) may be used.
- Children and young people over 8 years old (or body weight more than 25 kg) should be given 1 mg glucagon.
- Children under 8 years old (or body weight less than 25 kg) should be given 500 micrograms of glucagon.
- Blood glucose levels should respond within 10 minutes.
- As symptoms improve or normoglycaemia is restored, in children and young people who are sufficiently awake, additional complex long-acting carbohydrate should be given orally to maintain blood glucose levels.
- Some children and young people may continue to have reduced consciousness for several hours after a severe hypoglycaemic episode, and repeat blood glucose measurements will be required to determine whether further glucose is necessary.
- Medical assistance should be sought for children and young people whose blood glucose levels fail to respond and those in whom symptoms persist for more than 10 minutes.

D - Parents and, where appropriate, school nurses and other carers should have access to glucagon for subcutaneous or intramuscular use in an emergency, especially when there is a high risk of severe hypoglycaemia.

D - Parents and, where appropriate, school nurses and other carers should be offered education on the administration of glucagon.

GPP - Children and young people with type 1 diabetes and their families should be informed that when alcohol causes or contributes to the development of hypoglycaemia, glucagon may be ineffective in treating the hypoglycaemia and intravenous glucose will be required.

See the section below titled "Cognitive Disorders" for recommendations about cognitive disorders related to frequent hypoglycaemia.

Diabetic Ketoacidosis

D - Children and young people with diabetic ketoacidosis should be treated according to the guidelines published by the British Society for Paediatric Endocrinology and Diabetes.

D - Children and young people with diabetic ketoacidosis should be managed initially in a high-dependency unit or in a high-dependency bed on a children's ward.

D - Children and young people with deteriorating consciousness or suspected cerebral oedema and those who are not responding appropriately to treatment should be managed in a paediatric intensive care unit.

D - Children with diabetic ketoacidosis who are younger than 2 years of age should be managed in a paediatric intensive care unit.

D - Children and young people with a blood pH of less than 7.3 (hydrogen ion concentration of more than 50 nmol/L), but who are clinically well (with no tachycardia, vomiting, drowsiness, abdominal pain, or breathlessness) and less than 5% dehydrated, may respond appropriately to oral rehydration, frequent subcutaneous insulin injections, and monitoring of blood glucose.

Surgery

D - Children and young people with type 1 diabetes should be offered surgery only in centres that have dedicated paediatric facilities for the care of children and young people with diabetes.

D - Careful liaison between surgical, anaesthetic, and diabetes care teams should occur before children and young people with type 1 diabetes are admitted to hospital for elective surgery and as soon as possible after admission for emergency surgery.

D - All centres caring for children and young people with type 1 diabetes should have written protocols concerning the safe management of children and young people during surgery. The protocols should be agreed between surgical and anaesthetic staff and the diabetes care team.

Intercurrent Illness

D - Children and young people with type 1 diabetes and their families should be offered clear guidance and protocols ("sick-day rules") for the management of type 1 diabetes during intercurrent illness.

GPP - Children and young people with type 1 diabetes should have short-acting insulin or rapid-acting insulin analogues and blood and/or urine ketone testing strips available for use during intercurrent illness.

Screening for Complications and Associated Conditions

C - Children and young people with type 1 diabetes should be offered screening for:

- **C** - Coeliac disease at diagnosis
- **GPP** - and at least every 3 years thereafter until transfer to adult services
- **C** - Thyroid disease at diagnosis and annually thereafter until transfer to adult services
- **C** - Retinopathy annually from the age of 12 years
- **C** - Microalbuminuria annually from the age of 12 years
- **C** - Blood pressure annually from the age of 12 years

C - Routine screening for elevated blood lipid levels and/or neurological function is not recommended for children and young people with type 1 diabetes.

Children and young people with type 1 diabetes should be offered:

- **GPP** - Annual foot care reviews
- **C** - Investigation of the state of injection sites at each clinic visit

D - Children and young people with type 1 diabetes and their families should be informed that, as for other children, regular dental examinations and eye examinations (every 2 years) are recommended.

GPP - Children and young people with type 1 diabetes should have their height and weight measured and plotted on an appropriate growth chart and their body mass index calculated at each clinic visit. The purpose of measuring and plotting height and weight and calculating body mass index is to check for normal growth and/or significant changes in weight because these may reflect changing glycaemic control.

D - Children and young people with type 1 diabetes should have their height and weight measured in a private room.

GPP - The following complications, although rare, should be considered at clinic visits:

- Juvenile cataracts
- Necrobiosis lipoidica
- Addison's disease

Psychological and Social Issues

Emotional and Behavioural Problems

C - Diabetes care teams should be aware that children and young people with type 1 diabetes have a greater risk of emotional and behavioural problems than other children and young people.

Anxiety and Depression

B - Diabetes care teams should be aware that children and young people with type 1 diabetes may develop anxiety and/or depression, particularly when difficulties in self-management arise in young people and children who have had type 1 diabetes for a long time.

GPP - Children and young people with type 1 diabetes who have persistently poor glycaemic control should be offered screening for anxiety and depression.

GPP - Children and young people with type 1 diabetes and suspected anxiety and/or depression should be referred promptly to child mental health professionals.

Eating Disorders

C - Diabetes care teams should be aware that children and young people with type 1 diabetes, in particular young women, have an increased risk of eating disorders.

C - Diabetes care teams should be aware that children and young people with type 1 diabetes who have eating disorders may have associated problems of persistent hyperglycaemia, recurrent hypoglycaemia and/or symptoms associated with gastric paresis.

GPP - Children and young people with type 1 diabetes in whom eating disorders are identified by their diabetes care team should be offered joint management involving their diabetes care team and child mental health professionals.

Cognitive Disorders

C - Parents of pre-school children with type 1 diabetes should be informed that persistent hypoglycaemia, in particular in association with seizures, is associated with a small but definite risk of long-term neurocognitive dysfunction.

GPP - Diabetes care teams should consider referring children and young people with type 1 diabetes who have frequent hypoglycaemia and/or recurrent seizures for assessment of cognitive function, particularly if these occur at a young age.

Behavioural and Conduct Disorders

GPP - Children and young people with type 1 diabetes who have behavioural or conduct disorders, and their families, should be offered access to appropriate health professionals.

Non-Adherence

B - Non-adherence to therapy should be considered in children and young people with type 1 diabetes who have poor glycaemic control, especially in adolescence.

B - Non-adherence to therapy should be considered in children and young people with established type 1 diabetes who present with diabetic ketoacidosis, especially if the diabetic ketoacidosis is recurrent.

GPP - Young people with "brittle diabetes" (that is, those who present with frequent episodes of diabetic ketoacidosis over a relatively short time) should have their emotional and psychological well-being assessed.

GPP - The issue of non-adherence to therapy should be raised with children and young people and their families in a sensitive manner.

Psychosocial Support

C - Diabetes care teams should be aware that poor psychosocial support has a negative impact on a variety of outcomes of type 1 diabetes in children and young people, including glycaemic control and self-esteem.

A - Children and young people with type 1 diabetes, especially young people using multiple daily injection regimens, should be offered structured behavioural intervention strategies because these may improve psychological well-being and glycaemic control.

A - Young people with type 1 diabetes should be offered specific support strategies, such as mentoring and self-monitoring of blood glucose levels supported by problem solving, to improve their self-esteem and glycaemic control.

A - Families of children and young people with type 1 diabetes should be offered specific support strategies (such as behavioural family systems therapy) to reduce diabetes-related conflict between family members.

GPP - Children and young people with type 1 diabetes and their families should be offered timely and ongoing access to mental health professionals because they may experience psychological disturbances (such as anxiety, depression, behavioural and conduct disorders and family conflict) that can impact on the management of diabetes and well-being.

GPP - Diabetes care teams should have appropriate access to mental health professionals to support them in the assessment of psychological dysfunction and the delivery of psychosocial support.

Adolescence

B - Diabetes care teams should be aware that adolescence can be a period of worsening glycaemic control, which may in part be due to non-adherence to therapy.

Continuity of Care

Communication between Organisations

GPP - Children and young people with type 1 diabetes and their families should be offered information about the existence of and means of contacting local and/or national diabetes support groups and organisations, and the potential benefits of membership. This should be done in the time following diagnosis and periodically thereafter.

GPP - Diabetes care teams should liaise regularly with school staff involved in supervising children and young people with type 1 diabetes to offer appropriate diabetes education and practical information.

GPP - Teaching staff should be informed about the potential effects of type 1 diabetes on cognitive function and educational attainment.

GPP - Children and young people with type 1 diabetes and their families should be advised how to obtain information about benefits in relation to government disability support.

Transition from Paediatric to Adult Care

D - Young people with type 1 diabetes should be encouraged to attend clinics on a regular basis (three or four times per year) because regular attendance is associated with good glycaemic control.

GPP - Young people with type 1 diabetes should be allowed sufficient time to familiarise themselves with the practicalities of the transition from paediatric to adult services because this has been shown to improve clinic attendance.

GPP - Specific local protocols should be agreed for transferring young people with type 1 diabetes from paediatric to adult services.

GPP - The age of transfer to the adult service should depend on the individual's physical development and emotional maturity and local circumstances.

D - Transition from the paediatric service should occur at a time of relative stability in the individual's health and should be coordinated with other life transitions.

D - Paediatric diabetes care teams should organise age-banded clinics for young people and young adults jointly with their adult specialty colleagues.

GPP - Young people with type 1 diabetes who are preparing for transition to adult services should be informed that some aspects of diabetes care will change at transition. The main changes relate to targets for short-term glycaemic control and screening for complications.

Definitions:

Source of Evidence

Ia: Systematic review or meta-analysis of randomised controlled trials

Ib: At least one randomised controlled trial

IIa: At least one well-designed controlled study without randomisation

IIb: At least one well-designed quasi-experimental study, such as a cohort study

III: Well-designed non-experimental descriptive studies, such as comparative studies, correlation studies, case-control studies, and case series

IV: Expert committee reports, opinions and/or clinical experience of respected authorities

Grading of Recommendations

A: Based directly on level I evidence

B: Based directly on level II evidence or extrapolated from level I evidence

C: Based directly on level III evidence or extrapolated from level I or level II evidence

D: Based directly on level IV evidence or extrapolated from level I, level II or level III evidence

GPP: Good practice point based on the view of the Guideline Development Group (GDG)

NICE TA: Recommendation taken from a National Institute for Health and Clinical Excellence (NICE) Technology Appraisal

CLINICAL ALGORITHM(S)

An algorithm is provided in the original guideline document for the diagnosis and management of type 1 diabetes in children and young people.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Keeping blood glucose concentrations as close as possible to the normal range for people without diabetes is known to prevent or to delay the long-term vascular complications of diabetes.

POTENTIAL HARMS

Adverse events associated with insulin therapy, specifically hypoglycaemia and injections site reactions

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- This guidance represents the view of the Institute, which was arrived at after careful consideration of the evidence available. Health professionals are

expected to take it fully into account when exercising their clinical judgment. The guidance does not, however, override the individual responsibility of health professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Guideline Limitations

- This guideline is of relevance to those who work in or use the National Health Service (NHS) in England and Wales, in particular:
    - Primary and secondary healthcare professionals who have direct contact with and make decisions concerning the care of children and young people with type 1 diabetes (including dietitians, general practitioners, nurses, paediatricians, pharmacists, physicians, and podiatrists)
    - Those responsible for commissioning and planning healthcare services, including primary care trust commissioners, Health Commission Wales commissioners, and public health and trust managers
    - Children and young people with type 1 diabetes, their families, and other carers
- The guideline is also relevant to (but does not cover the practice of) those who work in:
    - Social services and the voluntary sector
    - Services supplied by secondary and tertiary specialties for the complications of type 1 diabetes (for example, cardiology, ophthalmology, renal and urology services) to which patients may be referred
    - The education and childcare sectors
- This guideline is intended to complement other existing and proposed work of relevance, including the Diabetes National Service Framework, the Children's National Service Framework and a guideline commissioned by the National Institute for Health and Clinical Excellence (NICE) that relates to the management of type 1 diabetes in adults.
- Some aspects of the adult guideline are relevant to the diagnosis and management of type 1 diabetes in children and young people. The developers of the children's and adults' guidelines worked in parallel and communication between the two development groups was maintained at project and advisory levels.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Implementation in the National Health Service

Local health communities should review their existing practice for type 1 diabetes against this guideline. The review should consider the resources required to implement the recommendations, the people and processes involved, and the timeline over which full implementation is envisaged. It is in the interests of people with type 1 diabetes that the implementation timeline is as rapid as possible.

Relevant local clinical guidelines, care pathways, and protocols should be reviewed in the light of this guidance and revised accordingly.

This guideline should be used in conjunction with the National Service Framework for Diabetes (available from http://www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/Diabetes/fs/en) and the Children's National Service Framework (available from http://www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/ChildrenServices/fs/en).

Key Priorities for Implementation

Management from Diagnosis

- Children and young people with type 1 diabetes should be offered an ongoing integrated package of care by a multidisciplinary paediatric diabetes care team. To optimize the effectiveness of care and reduce the risk of complications, the diabetes care team should include members with appropriate training in clinical, educational, dietetic, lifestyle, mental health, and foot care aspects of diabetes for children and young people.
- At the time of diagnosis, children and young people with type 1 diabetes should be offered home-based or inpatient management according to clinical need, family circumstances and wishes, and residential proximity to inpatient services. Home-based care with support from the local paediatric diabetes care team (including 24-hour telephone access to advice) is safe and as effective as inpatient initial management.

Education

- Children and young people with type 1 diabetes and their families should be offered timely and ongoing opportunities to access information about the development, management and effects of type 1 diabetes. The information provided should be accurate and consistent and it should support informed decision-making.

Monitoring Glycaemic Control

- Children and young people with type 1 diabetes and their families should be informed that the target for long-term glycaemic control is an haemoglobin A_{1c} (HbA_{1c}) level of less than 7.5% without frequent disabling hypoglycaemia and that their care package should be designed to attempt to achieve this.

Diabetic Ketoacidosis

- Children and young people with diabetic ketoacidosis should be treated according to the guidelines published by the British Society for Paediatric Endocrinology and Diabetes (see Appendix F of the original guideline document).

Screening for Complications and Associated Conditions

- Children and young people with type 1 diabetes should be offered screening for:
    - Coeliac disease at diagnosis and at least every 3 years thereafter until transfer to adult services
    - Thyroid disease at diagnosis and annually thereafter until transfer to adult services
    - Retinopathy annually from the age of 12 years
    - Microalbuminuria annually from the age of 12 years
    - Blood pressure annually from the age of 12 years

Psychosocial Support

- Children and young people with type 1 diabetes and their families should be offered timely and ongoing access to mental health professionals because they may experience psychological disturbances (such as anxiety, depression, behavioural and conduct disorders and family conflict) that can impact on the management of diabetes and well-being.

IMPLEMENTATION TOOLS

Audit Criteria/Indicators
Clinical Algorithm
Patient Resources
Quick Reference Guides/Physician Guides

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

National Collaborating Centre for Women's and Children's Health. Type 1 diabetes: diagnosis and management of type 1 diabetes in children and young people. London (UK): Royal College of Obstetricians and Gynecologists; 2004 Sep. 199 p. [685 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2004 Sep

GUIDELINE DEVELOPER(S)

National Collaborating Centre for Women's and Children's Health - National Government Agency [Non-U.S.]

SOURCE(S) OF FUNDING

National Institute for Health and Clinical Excellence (NICE)

GUIDELINE COMMITTEE

Guideline Development Group

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Committee Members: Stephen Greene, Paediatrician and Group Leader; Jeremy Allgrove, Paediatrician; Timothy Barrett, Paediatrician; Vincent Connolly, Physician; James Cripps, Consumer Representative; Jo Dalton, Specialist Nurse Practitioner, Paediatric Diabetes; Alan English, Clinical Psychologist; Jane Houghton, Nurse Consultant; Mustafa Kapasi, General Practitioner; Gill Regan, Paediatric Dietitian; Carol Williams, Consumer Representative; Jane Thomas, Director, National Collaborating Centre for Women's and Children's Health (NCCWCH); Moira Mugglestone Deputy Director, NCC-WCH; Anna Burt, Research Fellow, NCC-WCH; Gregory Eliovson, Informatics Specialist, NCC-WCH; Alex McNeil, Research Assistant, NCC-WCH; Anna Bancsi, Work Programme Coordinator, NCC-WCH; Hannah-Rose Douglas, Health Economist, London School of Hygiene and Tropical Medicine (LSHTM); Dimitra Lambrelli Health Economist, LSHTM

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

All Guideline Development Group (GDG) members' interests were recorded on a standard declaration form that covered consultancies, fee-paid work, shareholdings, fellowships and support from the healthcare industry in accordance with guidance from the National Institute for Health and Clinical Excellence (NICE).

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) format from the National Institute for Health and Clinical Excellence (NICE) Web site.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- National Collaborating Centre for Women's and Children's Health and the National Collaborating Centre for Chronic Conditions. Type 1 diabetes: diagnosis and management of type 1 diabetes in children, young people and adults. London (UK): National Institute for Clinical Excellence (NICE); 2004 Jul. 112 p. (Clinical guideline; no. 15). Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site.
- Type 1 diabetes: diagnosis and management of type 1 diabetes in children and young people. Quick reference guide. National Collaborating Centre for Women's and Children's Health, 2004 Jul. 6 p. Available from the National Institute for Health and Clinical Excellence (NICE) Web site.

Print copies: Available from the National Health Service (NHS) Response Line 0870 1555 455, ref: N0622. 11 Strand, London, WC2N 5HR.

Additionally, Audit Criteria can be found in Section 8 of the original guideline document.

PATIENT RESOURCES

The following is available:

- Type 1 diabetes in children and young people. Understanding NICE guidance - information for the families and carers of children with type 1 diabetes, young people with type 1 diabetes, and the public. National Institute for Clinical Excellence (NICE), 2004 Jul. 60 p. Available from the National Institute for Health and Clinical Excellence (NICE) Web site.

Print copies: Available from the National Health Service (NHS) Response Line 0870 1555 455, ref N0623. 11 Strand, London, WC2N 5HR.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This NGC summary was completed by ECRI on March 7, 2005. The information was verified by the guideline developer on February 20, 2006.

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