



# Diabetes in children and adolescents

MODULE

IV–I

## Overview

Annually, more than 200 000 children are diagnosed with Type 1 diabetes worldwide and its incidence continues to increase by 3–5% per year. Despite recent progress in our understanding of the genetics and immunology of the condition, the cause is unknown. Although Type 2 diabetes has been considered rare in the pediatric population, there has been an increased incidence reported throughout the world associated with the increase of childhood obesity and inactivity.

As they grow, children and adolescents with diabetes have special and changing needs. These needs must be recognized and addressed by the general public and health professionals alike. Although their total dependence on insulin and their need for good and appropriate nutrition is the same as adults with Type 1 diabetes, there are major physical, emotional, psychological, social and intellectual differences and needs.

These differences arise from the stages of growth and development through which young people pass. Infants, toddlers, school children and adolescents with their developing independence must each be considered differently.

All young people with diabetes have the right to competent medical management and diabetes education by a team or individuals with expertise in, and an understanding of, the medical and psychosocial needs of young people and their families.

A child cannot fight for these rights. It is therefore the responsibility of society to provide all necessary support to the child and family. This should include medical, social, public, government and industrial resources and efforts.

<p><b>Overview cont'd</b></p>	<p>Optimal management of diabetes in young people will include urine testing for glucose and ketones, monitoring blood glucose levels, food and exercise, along with taking 2–4 injections of insulin per day and/or other medications. It is essential that monitoring by the diabetes team occurs regularly.</p> <p>Individualized assessment of the child’s maturity level, developmental stage, family and social support, eating habits, and school and sports schedules is critical. The assessment should also be sensitive to cultural, socio-economic and environmental determinants in developing a realistic, comprehensive, individualized management plan.</p>
<p><b>Goal</b></p>	<p>To recognize and discuss the special and changing needs of young people with diabetes and their parent(s), families, carers and others.</p>
<p><b>Objectives</b></p>	<p>After completing this module, the participant will be able to:</p> <p><b>Management</b></p> <ul style="list-style-type: none"> <li>• Recognize that children have special and different needs and that these needs will change over time</li> <li>• Describe the key management components of diabetes care in children — refer to specific care topics, eg insulin, insulin adjustment, blood glucose monitoring, self-care, psychosocial</li> <li>• Recognize the constantly changing insulin requirements during growth and development</li> <li>• Recognize the practical skills and issues associated with insulin therapy in young people: <ul style="list-style-type: none"> <li>– describe how to dilute insulin for small doses</li> <li>– describe the need for rotation of injection sites in children and adolescents</li> <li>– describe the need for short, fine needles, if available</li> </ul> </li> <li>• Discuss how to interpret blood glucose results and adjust insulin accordingly</li> <li>• Discuss with parents strategies for recognizing hypoglycemia in the young child, school-age child and adolescent, and how to prevent it</li> <li>• Discuss the need for others involved in caring for the child (teachers, coaches, other family members) to be able to recognize and treat mild, moderate and severe hypoglycemia</li> </ul>

**Objectives cont'd**

- Discuss the need for regular monitoring of growth and height and strategies for children not following percentiles
- Provide education on the adjustment of insulin and carbohydrate according to specific sporting activities
- Discuss the importance of transition clinics and strategies to improve attendance of young adults at clinic

**Impact of age, growth, development and maturity on diabetes care**

- Describe the needs of children at each stage of growth and development and the impact of diabetes at each stage
- Understand how children accomplish diabetes tasks at different ages based on emotional maturity and parental and carer support, not on chronological age
- Recognize abnormalities of growth and development
- Explore strategies to promote positive growth and development

**Nutrition**

- Understand the need to organize food patterns around the child's food preferences
- Discuss the key role that food plays in the dynamics of the family
- Describe the reasons why nutrition goals are based on an individual's diabetes management goals
- Appreciate age-related problems, for example, toddler food refusal, peer pressure, omission of insulin by teenagers, religious and cultural influences, insulin abuse and hypoglycemia, and fast food (eg burgers), which will differ between countries
- Discuss the need to individualize insulin therapy and food in relation to the child's lifestyle
- Describe guidelines on the distribution of food to prevent hypoglycemia
- Describe the importance of healthy eating and reduction in energy to stabilize weight gain
- Design a suitable weight-reduction programme for a growing child (to include adequate nutrients and lifestyle changes)\*

**Objectives cont'd****Psychosocial influences**

- Discuss the need to encourage appropriate support from the extended family, carers and peers
- Discuss behavioural themes and strategies to promote acceptance and an agreement for sharing responsibilities for a management plan
- Discuss psychosocial themes and strategies to promote sound family functioning, health beliefs and quality of life
- Discuss the need to facilitate total integration of the young person with diabetes in all activities at school
- Discuss strategies for coping with insulin refusal or omission
- Understand the strategies for minimizing trauma in blood testing and coping with refusal
- Recognize the fear that parents and youths\* have with regard to hypoglycemia and the impact this has on tightening blood glucose control
- Understand that different environmental circumstances, such as school activities, camp, day trips, sleep-overs and sports days, can increase the likelihood of hypoglycemia
- Promote special diabetic camps and other group activities for different age groups
- Promote the need for all children to be involved in all sports at all levels
- Recognize the emotional trauma present when the diagnosis of diabetes is made, begin education when the family is ready, and pace education according to the family's wishes — refer to **Module I-4, Psychosocial and behavioural approaches**

**Adolescents**

- Discuss risk-taking behaviours in adolescents where culturally appropriate:
  - eating disorders
  - alcohol
  - drugs
  - smoking
  - unprotected sex

**Objectives cont'd**

- Discuss safety issues concerning adolescents driving
- Discuss strategies to educate teachers, church/religious community leaders, sports leaders, etc
- Assist parents in developing their own support groups
- Appreciate the problems encountered by teenagers — these problems will differ between countries
- Appreciate the importance of specific behavioural, psychological and social characteristics in children and adolescents that may influence compliance
- Recognize the importance of parental, carer and peer-group support
- Identify behaviour that might require special additional psychological help

**Complications**

- Recognize that obesity and being overweight are the family's problems, not just the child's
- Discuss, in a comprehensive but positive way, the risks of developing long-term complications, strategies for prevention or reducing their progression and the need for annual assessment

**Rarer forms of diabetes**

- Identify the increasing incidence of Type 2 diabetes in childhood
- Identify ethnic minority groups that have a high prevalence of Type 2 diabetes in childhood
- Identify the various genetic types of maturity onset diabetes of the young (MODY) and give appropriate healthy eating advice if not overweight

**Global aspects**

- Understand that children cannot advocate for themselves and so adults must fight for childrens' rights

**Teaching strategies** Short lectures, problem solving through case presentations, role play, presentation by parent/adolescent, attendance at camp

<b>Suggested time</b>	4 hours devoted to theory
<b>Who should teach this module</b>	Educator and/or pediatrician, behavioural scientist with expertise in diabetes
<b>Evaluation of learning</b>	Multiple-choice questionnaire. Present a case history that illustrates a problem and discuss possible alternatives to solve it from the therapeutic/psychosocial point of view
<b>References</b>	<p>Anderson BJ, Auslander WF, Jung KC, Miller JP, Santiago JV. Assessing family sharing of diabetes responsibilities. <i>J Pediatr Psychol</i> 1990;15(4):477-492.</p> <p>Australian Paediatric Endocrine Group (APEG). <i>APEG handbook on childhood and adolescent diabetes</i>, Silink M (ed.). Australia: Child Health Promotion Unit, Government Printing Service; 1996.</p> <p>Daneman D, Frank M, Perlman K. <i>When a child has diabetes</i>. Toronto, ON: Key Porter Books Ltd; 1999.</p> <p>International Society for Pediatric and Adolescent Diabetes (ISPAD). <i>Consensus Guidelines 2000</i>. Swift PGF (ed.). Zeist, The Netherlands: Medforum; 2000.</p> <p>Mellor L, Rifkin H, Silink M, McGill M. <i>Childhood diabetes: The International Diabetes Federation philosophy</i>; 1994.</p> <p>Silink M, Mellor L, McGill M, et al. <i>Diabetes Information</i>. IDF Consultative Section on Childhood and Adolescent Diabetes, 2001.</p> <p>Siminerio LM, Betschart J. <i>Raising a child with diabetes: A guide for parents</i>. Alexandria, VA: American Diabetes Association; 1995.</p>

\*Indicates objectives at an advanced level



# Gestational diabetes

## Overview

Gestational diabetes mellitus is a common manifestation in the later stages of pregnancy, usually diagnosed between 24 and 28 weeks' gestation. Gestational diabetes increases risks for both mother and baby and must be treated promptly, with stringent blood glucose levels to decrease these risks and improve the outcome. Gestational diabetes increases the risk of development of Type 2 diabetes for both mother and child later in life. It is more common in certain ethnic populations.

## Goal

To understand the importance of early diagnosis, and prompt and adequate treatment for women who develop gestational diabetes.

## Objectives

After completing this module, the participant will be able to:

- Define gestational diabetes and recognize diagnostic criteria
- Discuss the policy for universal screening for gestational diabetes
- Describe the pathophysiology of gestational diabetes and the effects on the gestational state, including symptoms of hyperglycemia and risk to mother and baby
- Describe the woman at risk of developing gestational diabetes
- Develop a management plan taking into account obstetric status, diabetes control and culture
- Recognize the need for intensive monitoring
- Discuss strategies for deciding when insulin is needed — refer to [Module III-3, Insulin therapy](#)
- Recognize that nutrition plays a role in both the management of blood glucose levels and nourishment for mother and baby — refer to [Module III-5, Nutrition therapy](#)

<b>Objectives cont'd</b>	<ul style="list-style-type: none"> <li>• Discuss the need for frequent contact with the diabetes healthcare team</li> <li>• Discuss the need for management of labour for women with gestational diabetes</li> <li>• Discuss post-partum follow up with the endocrinologist, obstetrician, diabetes educator and dietician</li> <li>• Discuss the potential for the mother to develop diabetes and the child to develop obesity and/or diabetes</li> <li>• Advise and educate on measures to prevent the development of diabetes, eg exercise, diet, weight loss and reduction of vascular risk factors such as smoking, hypertension and hyperlipidemia</li> <li>• Discuss the possibility of future pregnancies, arrange pre-pregnancy assessment, encourage good diet before or early in pregnancy (including carbohydrate management), repeat screening at 14–18 weeks' gestation</li> </ul>
<b>Teaching strategies</b>	Short lectures, case presentations, role play
<b>Suggested time</b>	2 hours
<b>Who should teach this module</b>	Diabetes educator and/or endocrinologist, obstetrician with expertise in this area
<b>Evaluation of learning</b>	Multiple-choice questionnaire Present a case history that illustrates a problem and discuss possible alternatives to solve it from the therapeutic/psychosocial point of view
<b>Reference</b>	Diabetes Education Consultative Section (DECS). <i>IDF position papers on diabetes education</i> . Brussels: IDF; 2001. p. 87-96.



# Pregnancy in pre-existing diabetes

MODULE

IV-3

## Overview

Women with pre-existing diabetes can have successful pregnancies; however, more intensive management, both pre-conception and throughout the pregnancy, is essential. An interdisciplinary approach that includes an obstetrician and the diabetes team is ideal. Where possible, the baby should be born in a facility that has the ability to provide specialized care for neonates.

## Goal

To provide the participant with an understanding of the special needs of women with diabetes who are pregnant.

## Objectives

At the completion of this module, the participant will be able to:

- Discuss the need to advise on pre-pregnancy planning including contraception and the importance of good blood glucose control before pregnancy
- Discuss the effects of diabetes on pregnancy and the effects of pregnancy on blood glucose control and diabetic complications
- Discuss the need for women to undergo a complication assessment, and to revise hypoglycemia management, glucagon and sick day management before conception
- Provide education about the risks of hypoglycemia and strategies to cope with morning sickness in early pregnancy
- Describe the team approach to management, including the educator, dietician, endocrinologist, obstetrician and ophthalmologist, and a renal physician in some cases
- Recognize that nutrition plays a role in both the management of blood glucose and nourishment for mother and child, and the need for altered dietary requirements — refer to **Module III-5, Nutrition therapy**

<b>Objectives cont'd</b>	<ul style="list-style-type: none"> <li>• Discuss the need for regular complication assessment at the beginning of the pregnancy and each trimester</li> <li>• Describe the need to change to insulin before pregnancy if Type 2 diabetes is treated with glucose-lowering agents</li> <li>• Discuss the need to cease treatment with an ACE inhibitor before pregnancy and change to another antihypertensive agent</li> <li>• Discuss the need for frequent contact with the diabetes healthcare team and the need to increase insulin dosages as pregnancy progresses</li> <li>• Describe the reason for planning and encouraging delivery in a major hospital with good neonatal care</li> <li>• Outline the importance of post-partum restabilization, the dramatic drop in insulin requirement and greater insulin sensitivity after birth</li> <li>• Recognize and educate women with regard to increased nutritional needs when breast-feeding and the increased risk of hypoglycemia — refer to <b>Module III-5, Nutrition therapy</b></li> </ul>
<b>Teaching strategy</b>	Problem-solving through case study. Involvement of a woman with diabetes who has had a successful pregnancy
<b>Suggested time</b>	2 hours
<b>Who should teach this module</b>	Educator and/or endocrinologist, obstetrician with relevant expertise
<b>Evaluation of learning</b>	Multiple-choice questionnaire Present a case history that illustrates a problem and discuss possible alternatives to solve it from the therapeutic/psychosocial point of view
<b>Reference</b>	Diabetes Education Consultative Section (DECS). IDF position papers on diabetes education. Brussels: IDF; 2001. p. 87-96.



# The older adult

## Overview

The prevalence of diabetes increases significantly with age in many countries. As people age, their ability to cope with living, learn new information and remain independent vary greatly. Older people are not an homogeneous group and, therefore, it is important to treat them as individuals and address their individual needs.

## Goal

To provide participants with the opportunity to consolidate their understanding of the special psychosocial, educational, nutritional and psychological requirements of older people with diabetes.

## Objectives

After completing this module, the participant will be able to:

- Define why special consideration is required in the management and education of older people with diabetes
- Describe the areas that need special consideration when managing diabetes in older people
- Define the issues to be considered when assessing the different treatment options and goals for older people
- Describe the factors that need to be considered when deciding on medication for older people with diabetes
- Recognize that older people are at increased risk of falling and consider the diabetes-specific factors that contribute to falls in the elderly
- Recognize the specific precautions that apply to the older person with diabetes undergoing surgical procedures or investigations that involve intravenous dyes, eg radiopaque contrast media
- Recognize that older people are an 'at-risk' group with regards to nutrition — refer to **Module III-5, Nutrition therapy**

<b>Objectives cont'd</b>	<ul style="list-style-type: none"> <li>• Define the factors that need to be considered when assessing the exercise requirements of this group</li> <li>• Describe the strategies required to assess the educational needs of older people</li> <li>• Extrapolate this information to assist in the selection of appropriate educational methods and resources</li> <li>• Outline this information to assist in the selection of appropriate educational methods and resources</li> <li>• Outline the community resources available for older people</li> <li>• Extrapolate this information to assist in the planning of safe and appropriate diabetes care for older people</li> <li>• Discuss the management of the older person in residential aged-care facilities</li> </ul>
<b>Teaching strategy</b>	Case study to highlight the special medical, social, nutritional and psychological requirements of an elderly person with diabetes
<b>Suggested time</b>	1 hour
<b>Who should teach this module</b>	Diabetes educator or dietician, geriatrician
<b>Evaluation of learning</b>	<p>Development of a management plan for an older person</p> <p>Assignment: Ask participants to describe the care available to older people with diabetes in their particular country</p>
<b>References</b>	<p>Diabetes Education Consultative Section (DECS). <i>IDF position papers on diabetes education</i>. Brussels: IDF; 2001. p. 87-96.</p> <p>Kirkland F. Improvements in diabetes care for elderly people in care homes. <i>J Diabetes Nurs</i> 2000;4(5):150-155.</p> <p>Mooradian AD, McLaughlin S, Boyer CC, Winter J. Diabetes care for older adults. <i>Diabetes Spectrum</i> 1999;12(2):70-77.</p> <p>Sinclair A, Finucane P (eds.). <i>Diabetes in old age</i>. 2nd edn. Chichester, UK: Wiley; 2000.</p> <p>Tattersall R, Page S. Managing diabetes in residential and nursing homes presents a complex set of problems with no one solution. <i>BMJ</i> 1998;316(7125):89.</p>



# Perioperative management

MODULE

IV–5

## Overview

From time-to-time, people with diabetes may have to undergo surgical or medical procedures that can disrupt their usual management regimen. Diabetes educators should be able to assist people with diabetes to alter their meals and medication, glucose-lowering agents or insulin, and to allow them to maintain target blood glucose levels.

## Goal

To be able to understand and anticipate the changing metabolic needs of the person with diabetes undergoing a surgical or medical procedure.

## Objectives

After completing this module, the participant will be able to:

- Describe the metabolic changes that occur during surgery
- Describe the relationship between glycemia and wound healing
- List the most common surgical and investigative procedures people with diabetes are likely to require
- Explain the stress hormone response and effects on glycemia
- Discuss the different principles of management for people with Type 1 and Type 2 diabetes undergoing fasting and surgery
- Describe the different regimens for management of people on glucose-lowering agents and/or insulin
- Discuss the different approaches for management of minor versus major procedures
- Explain the management of fasting hypoglycemia
- Explain the management of an insulin infusion
- Describe effective post-procedure strategies, including management of blood glucose, discharge planning, rehabilitation and follow-up appointments

<b>Teaching strategies</b>	Lecture, case studies
<b>Suggested time</b>	1 hour
<b>Who should teach this module</b>	Diabetes educator, endocrinologist
<b>Evaluation of learning</b>	Development of a perioperative management plan for different types of procedures
<b>Reference</b>	Kirschner R. Diabetes in paediatric ambulatory surgical patients. <i>J Post Anesth Nurs</i> 1993;8(5):322-326.