

Overweight and Obesity in Children

Instructions to Candidates

- There is a separate booklet for Texts and another booklet for Questions and Answers.
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Part A - Overweight and Obesity in Children

Text Booklet

Text A

Growth Monitoring

The monitoring of children's growth (and weight in particular) is an important role of all health professionals. At every consultation (or at least yearly), health professionals need to have a conversation with families and carers around children achieving a healthy weight.

"Ask and Assess - use percentile charts to monitor growth" Growth status in children and adolescents (age 0-18 years old) needs to be assessed using age- and sex-specific reference values, as the appropriate ratio of weight to height varies during development.

Reference values for assessing and monitoring weight, length/height and BMI have been developed by the World Health Organisation (WHO) and Centres for Disease Control and Prevention (CDC) in the form of the childhood growth charts. The choice of chart depends on the age and gender of the child. For children aged less than two years the WHO growth charts should be used. For children between 2 and 18 years, either the WHO or the CDC growth charts can be used. However, it is important to ensure that the same chart is used over time.

Text B

Steps for discussing weight with families or carers:

1. Make the family feel welcome and at ease.
2. Ask permission to discuss growth and development with the family.
3. Normalise the discussion of growth and development. Reassure the child and family that it is standard practice in primary care.
4. Explain what is measured and why? (Weight, Height, BMI).
5. Encourage involvement of parents/carers when measuring weight and height.
6. Explain how the child's growth tracks against the growth of all children. Engage the family in plotting and interpreting the growth chart, using the growth charts as a tool.
7. Advise parents or carers of a child's growth status. Be sensitive and non-judgmental but don't sugar-coat it. For example: "Tom's BMI is... which places him above the healthy weight range.
8. Use positive terminology to reinforce key concepts and advice: Use "healthy eating" "eating" or "eating plan rather than "diet" or dieting Do not use 'good' or 'bad' to describe food or drinks. These terms reinforce a dieting mentality and create blame and guilt. Let the family do most of the talking rather than you. Be realistic. Make sure everyone in the room understands that long term changes have to be made if the child is above the healthy weight range, and that it will take time. Avoid inappropriate words, such as "Tom is obese"
9. For adolescents, if appropriate, consider speaking to them without a parent or carer present.
10. Agree on and develop an action plan.

Text C

More than 25% of children and adolescents are overweight or obese. For obese children,

complications are more likely to develop because they are obese longer. Risk factors for obesity in infants are low birth weight and maternal obesity, diabetes, and smoking. After puberty, food intake increases; in boys, the extra calories are used to increase protein deposition, but in girls, fat storage is increased.

For obese children, psychological complications (eg, poor self-esteem, social difficulties, depression) and musculoskeletal complications can develop early. Some musculoskeletal complications, such as slipped capital femoral epiphysis, occur only in children. Other early complications may include obstructive sleep apnoea, insulin resistance, hyperlipidaemia, and non-alcoholic steatohepatitis.

Risk of cardiovascular, respiratory, metabolic, hepatic, and other obesity related complications increases when these children become adults.

Text D

The possibility of obesity persisting into adulthood depends partly on when obesity first develops:

- During infancy: Low possibility.
- Between 6 months and 5 yrs.: 25%.
- After 6 years.: >50%.
- During adolescence if a parent is obese: > 80%

In children, preventing further weight gain, rather than losing weight is a reasonable goal. Diet should be modified, and physical activity increased. Increasing general activities and play is more likely to be effective than a structured exercise program. Participating in physical activities during childhood may promote a lifelong physically active lifestyle. Limiting sedentary activities (eg, watching TV, using the computer or handheld devices) can also help. Drugs and surgery are avoided but, if complications of obesity are life threatening, may be warranted.

Part A – Answer Booklet

Questions 1- 6

For each of the questions, 1-6, decide which text (A, B, C or D) the information comes from. You may use any letter more than once.

In which text do you see information about:

1. How to approach giving advice about overweight children?
Ans: _____.
2. How often to discuss a child's weight?
Ans: _____.
3. Possible causes for obesity in infants and adolescent females?
Ans: _____.
4. The standards used to measure the development of children?
Ans: _____.
5. Other conditions which are associated with obesity in children?
Ans: _____.
6. Strategies to help stop children's weight increasing?
Ans: _____.

Questions 7-13

Answer each of the questions, 7-13, with a word or short phrase from one of the texts.

Each answer may include words, numbers, or both. Your answers should be correctly spelled.

7. If a mother has _____, smokes, or is herself obese it increases the risk of obesity in her child.
8. You should discuss healthy weight in children with parents _____.
9. Make sure to clarify the types of areas that are _____ and the reasons why.
10. The family should be encouraged to participate in the use of the _____.
11. Convey information about the _____ of children in an understanding way.

12. If a child is obese for a long period of time, then they are more likely to experience _____.
13. The family needs to appreciate that _____ changes must occur in children whose weight exceeds what is healthy.

Questions 14-20

Complete each of the sentences, 14- 20, with a word or short phrase from one of the texts. Each answer may include words, numbers or both. Your answers should be correctly spelled.

14. What influences the type of chart used to calculate a child's growth status?
Ans: _____.
15. What does the WHO and CDC assess and monitor when forming childhood growth charts?
Ans: _____.
16. What increases in children once they reach pubescence?
Ans: _____.
17. If it is already in the family, what is the likelihood that a teenager will remain obese?
Ans: _____.
18. What needs to be agreed upon and developed with the family of an obese child?
Ans: _____.
19. What psychological symptoms are known to appear early in obese children?
Ans: _____.
20. If the situation is serious enough, what might be required in some children?
Ans: _____.

Insulin Resistance and prediabetes

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Part A – Text Booklet

Text A

Insulin resistance is when cells in your muscles, fat, and liver don't respond well to insulin and can't easily take up glucose from your blood. As a result, your pancreas makes more insulin to help glucose enter your cells. As long as your pancreas can make enough insulin to overcome your cells' weak response to insulin, your blood glucose levels will stay in the healthy range. Not much different, prediabetes means your blood glucose levels are higher than normal but not high enough to be diagnosed as diabetes. Prediabetes usually occurs in people who already have some insulin resistance or whose beta cells (β cells) in the pancreas aren't making enough insulin to keep blood glucose in the normal range. Without enough insulin, extra glucose stays in your bloodstream rather than entering your cells. Over time, you could develop type 2 diabetes. More than 84 million people ages 18 and older have prediabetes in the United States. That's about 1 out of every 3 adults. People who have genetic or lifestyle risk factors are more likely to develop insulin resistance or prediabetes.

Insulin is synthesised as proinsulin and processed to proinsulin. Proinsulin is then converted to insulin and C-peptide and stored in secretory granules awaiting release on demand

Text B

Risk factors include:

- Overweight or obesity.
- Age 45 or older.
- A parent, brother, or sister with diabetes.
- African American, Alaska Native, American Indian, Asian American, Hispanic/Latino, Native Hawaiian, or Pacific Islander American ethnicity.
- Physical inactivity.
- Health conditions such as high blood pressure and abnormal cholesterol levels.
- A history of gestational diabetes.
- A history of heart disease or stroke.
- Polycystic ovary syndrome, also called PCOS.
- People who have metabolic syndrome — a combination of high blood pressure, abnormal cholesterol levels, and large waist size—are more likely to have prediabetes.

Along with these risk factors, other things that may contribute to insulin resistance include:

- Certain medicines, such as glucocorticoids, some antipsychotics, and some medicines for HIV.
- Hormonal disorders, such as Cushing's syndrome and acromegaly.
- Sleep problems, especially sleep apnea.

Although you can't change risk factors such as family history, age, or ethnicity, you can change lifestyle risk factors around eating, physical activity, and weight. These lifestyle changes can lower your chances of developing insulin resistance or prediabetes.

Text C

Researchers don't fully understand what causes insulin resistance and prediabetes, but they think excess weight and lack of physical activity are major factors. Experts believe obesity, especially too much fat in the abdomen and around the organs, called visceral fat, is a main cause of insulin resistance. A waist

measurement of 40 inches or more for men and 35 inches or more for women is linked to insulin resistance. This is true even if your body mass index (BMI) falls within the normal range. However, research has shown that Asian Americans may have an increased risk for insulin resistance even without a high BMI. Researchers used to think that fat tissue was only for energy storage. However, studies have shown that belly fat makes hormones and other substances that can contribute to chronic, or long-lasting, inflammation in the body. Inflammation may play a role in insulin resistance, type 2 diabetes, and cardiovascular disease. Excess weight may lead to insulin resistance, which in turn may play a part in the development of fatty liver disease.

Not getting enough physical activity is linked to insulin resistance and prediabetes. Regular physical activity causes changes in your body that make it better able to keep your blood glucose levels in balance.

Text D

Insulin resistance and prediabetes usually have no symptoms. Some people with prediabetes may have darkened skin in the armpit or on the back and sides of the neck, a condition called acanthosis nigricans. Many small skin growths called skin tags often appear in these same areas. Even though blood glucose levels are not high enough to cause symptoms for most people, a few research studies have shown that some people with prediabetes may already have early changes in their eyes that can lead to retinopathy. This problem more often occurs in people with diabetes. Doctors use blood tests to find out if someone has prediabetes, but they don't usually test for insulin resistance. The most accurate test for insulin resistance is complicated and used mostly for research. Doctors most often use the fasting plasma glucose (FPG) test or the A1C test to diagnose prediabetes. Less often, doctors use the oral glucose tolerance test (OGTT), which is more expensive and not as easy to give.

The following test results show Prediabetes:

- A1C—5.7 to 6.4 percent.
- FPG—100 to 125 mg/dL (milligrams per deciliter).
- OGTT—140 to 199 mg/dL

You should be tested for prediabetes if you are overweight or obese, and should have one or more other risk factors for diabetes, or if your parents, siblings, or children have type 2 diabetes. Even if you don't have risk factors, you should start getting tested once you reach age 45.

Questions 1 - 7

For each question, 1-7, decide which text (A, B, C or D) the information comes from. You may use any letter more than once.

In which text can you find information about?

1. Demographic data of the prevalence of prediabetes in a country.
Ans: _____.
2. A prediabetes-susceptible group that has Spanish ethnicity.
Ans: _____.
3. A particular body shape that is associated with prediabetes.
Ans: _____.
4. How insulin resistance impairs vision.
Ans: _____.
5. A type of diabetes that only women are said to have.
Ans: _____.
6. Some less likely adverse effects of chronic inflammation.
Ans: _____.
7. An old misconception about fat tissue.
Ans: _____.

Questions 8 - 14

Answer each of the questions, 8-14, with a word or short phrase from one of the texts. Each answer may include words, numbers or both.

8. What is a rare symptom of prediabetes?
Ans: _____.

9. Where in the pancreas is insulin produced?
Ans: _____.
10. Based on one's oral glucose tolerance test result, what indicates prediabetes?
Ans: _____.
11. From what age is everyone required to get tested for prediabetes?
Ans: _____.
12. What is the only changeable risk factor to thwart insulin resistance?
Ans: _____.
13. What is one of the ill effects of belly fat?
Ans: _____.
14. Based on one's oral glucose tolerance test result, what indicates prediabetes?
Ans: _____.

Questions 15 - 20

Complete each of the sentences, 15-20, with a word or short phrase from one of the texts. Each answer may include words, numbers or both.

15. A person with diabetes can have a _____ or _____ who could get prediabetes.
16. Skin tags are small _____.
17. Both _____ are characterised by higher than normal blood glucose levels.
18. Insulin helps blood glucose to enter the _____.
19. The absence of _____ can lead to prediabetes.
20. _____ is not a necessary cause for insulin resistance.

Obstetric Ultrasound

Part A

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Obstetric Ultrasound: Texts

Text A

An ultrasound scan, also referred to as sonography, uses high frequency sound waves to create an image of some part of the inside of the body, such as the stomach or muscles, by bouncing sound energy off tissue and translating the returning sound information into a visual representation. The word "ultrasound", in physics, refers to all sound with a frequency humans cannot hear; in diagnostic ultrasound this is usually between 2 and 10 MHz.

Higher frequencies provide better quality images, but are more readily absorbed by the skin and other tissue, so they cannot penetrate as deeply as lower frequencies. Lower frequencies can penetrate deeper, but the image quality is inferior. Obstetric ultrasound is performed routinely in most U.S. medical communities at about 20 weeks of gestation. Benefits include accurate dating, placental location, the diagnosis of multiple gestation or congenital abnormalities and the possible detection of maternal health risks.

Text B

Abstract: Implementing a obstetric ultrasound training program in rural Africa:

Objective: To evaluate the feasibility and sustainability of basic obstetric ultrasound training in rural Africa.

Methods: An 8-week training course, led by UK-based sonographers, was supported by training videos and followed by 10 months of remotely supported scanning in Mandimba, Mozambique. Data were collected using an Android tablet and the EpiCollect web application.

Results: The study group included 1744 pregnant women: 804 scanned by trainees under direct supervision and 940 scanned by trainees alone. Ultrasound identified 36 (2.1%) twin pregnancies, 230 (13.2%) breech presentations, 83 (4.8%) transverse presentations, and 22 (1.3%) cases of placenta previa. The detection rates for the above features were similar in the 2 groups. A subgroup of 230 (13.2%) women had a follow-up scan and 62 (3.6%) were referred to a doctor; 21 of these women required caesarean delivery.

Conclusion: Ultrasound training in a rural setting supported remotely is feasible and sustainable. It can help local healthcare workers to screen their prenatal populations for obstetric and neonatal risks, and therefore has the potential to improve outcomes at delivery and provide site specific epidemiologic data that can be used to develop new healthcare provision strategies.

Text C

The Role of Obstetric Ultrasound in Low Resource Settings

Poor maternal and child health (MCH) outcomes are a global, yet highly preventable problem. Evidence informs that the developing world accounts for the majority of the maternal mortality burden. Half a million women died of complications related to pregnancy in 2005, half of these in Africa and another third in South East Asia. Infant mortality is closely related and the trend is similar. About 3.1 million babies died before 28 days of age with 99% of these deaths occurring in middle and low-income countries. Maternal mortality is the health indicator that shows the widest gap between rich and poor, both between and within countries. In Africa the maternal mortality ratio is 620 per 100,000 live births compared to 14 per 100,000 live births in developed countries. Within countries there are also disparities between urban and rural populations, with rural areas suffering worse outcomes. The potential to reduce maternal and neonatal deaths through the use of ultrasound is significant and addresses two of the millennium development goals (MDGs) including (i) MDG 4 which aims to reduce child mortality and (ii) MDG 5 which aims to improve maternal health. Improving the level of obstetric care is critical to address MCH outcomes and to accelerate progress toward achieving MDG 4 and 5 targets.

Text D

"Entertainment" Ultrasound Examinations

It has been proposed that natural-appearing 3-D ultrasound images of the fetus could improve parent fetal bonding. Given the recognized importance of maternal-child bonding immediately postpartum, it seems reasonable that extending this bonding experience into the fetal period could be beneficial. However, a psychological benefit of viewing fetal photos has not been proven, and obtaining such images largely remains in the realm of "entertainment". In some countries, parents are able to enter a photography studio with ultrasound facilities and leave with pictures suitable for framing; no physician involvement is needed for this event. The use of ultrasound for non-diagnostic purposes has been condemned by the American Institute of Ultrasound in Medicine and the American College of Obstetricians and Gynecologists. Concerns that were raised in their policy statements include possible adverse bio-effects of ultrasound energy, the possibility that an examination could give false reassurance to women, and the fact that abnormalities may be detected in settings where personnel are not prepared to discuss and provide follow-up for concerning findings.

Obstetric Ultrasound: Questions

Questions 1-7

For each question, 1-7, decide which text (A, B, C or D) the information comes from. You may use any letter more than once.

In which text can you find information about:

1. Alternative name for professionals who do an ultrasound scan.
Ans: _____.
2. Benefits of obstetric ultrasound scan?
Ans: _____.

3. Benefits of three-dimensional ultrasound images?
Ans: _____.
4. Places which recorded high maternal mortality?
Ans: _____.
5. Who condemned non-diagnostic uses of ultrasound?
Ans: _____.
6. Who conducted the study in rural Africa?
Ans: _____.
7. Differences among countries regarding maternal mortality?
Ans: _____.

Questions 8-15

Answer each of the questions, 8-15, with a word or short phrase from one of the texts. Each answer may include words, numbers or both.

8. What is the maximum frequency limit of diagnostic ultrasound?
Ans: _____.
9. What does 'MDC' stand for based on the information given in the texts?
Ans: _____.
10. How many participants were there in the study conducted in rural Africa?
Ans: Ans: _____.
11. What type of frequencies travel more into the human body?
Ans: Ans: _____.
12. Which millennium development goal aims to reduce maternal mortality?
Ans: _____.
13. What is the alternate term for ultrasound scan?
Ans: _____.
14. What is the maternal mortality ratio in comparison with live births in developed nations?
Ans: _____.
15. How many transverse presentations were identified in the study conducted in rural Africa?
Ans: Ans: _____.

Questions 16-20

Complete each of the sentences, 16-20, with a word or short phrase from one of the texts. Each answer may include words, numbers or both.

16. _____ in a hinterland backdrop, which is assisted remotely is very practical.
17. The adverse bio-effects of ultrasound energy is a major _____ brought up by the American Institute of Ultrasound in Medicine.
18. Advancements in _____ is vital to eliminate the adverse outcomes of MCH globally.
19. _____ can penetrate through skin and provide superior image quality.
20. The significance of _____ is identified as essential, soon after the fetal period.

Diseases of Affluence

Part A - Diseases of Affluence – Text Booklet

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Text A

Tobacco

Tobacco smoking is also an important risk factor for cardiovascular diseases. Currently, an estimated 967 million smokers of the world's 7.6 billion population live in the developing world. Tobacco smoking increased among men, followed by women, in industrialized nations in the last century, and has subsequently declined in some nations such as Canada, the United States, and the United Kingdom. Descriptive models based on historical patterns in the industrialized world predict a reduction in the number of male smokers and an increase in the number of female smokers in the developing world over the coming decades. However, there have been major recent transformations in global tobacco trade, marketing, and regulatory control. As a result, tobacco consumption among men and women in most nations is primarily determined by opposing industry efforts and tobacco control measures, and by the sociocultural context, rather than national income.

Text B

BMI

The observed rapid BMI increase with national income indicates that preventing obesity, which may be more effective than reacting after it has occurred, should be a priority during economic growth and urbanization of a nation. Overweight and obesity are also important because they cause a number of non- cardiovascular outcomes including cancers, diabetes, and osteoarthritis which cannot be addressed by reducing risk factors such as blood pressure and cholesterol. Current intervention options for obesity in principle include those that reduce calorie intake and increasing energy expenditure of a population through urban design which incorporates space for outdoor activities.

Text C

Current Research (WHO, 2018)

Background

Cardiovascular diseases and their nutritional risk factors—including overweight and obesity, elevated blood pressure, and cholesterol—are among the leading causes of global mortality and morbidity, and have been predicted to rise with economic development in countries and societies throughout the world.

Methods and Findings

We examined age-standardized mean population levels of body mass index (BMI), systolic blood pressure, and total cholesterol in relation to national income, food share of household expenditure, and urbanization in a cross-country analysis. Data were from a total of over 100 countries and were obtained from systematic reviews of published literature, and from national and international health agencies. BMI and cholesterol increased rapidly in relation to national income, then flattened, and eventually declined. BMI increased most rapidly until an income of about I\$ 5,000 (international dollars) and peaked at about I\$ 12,500 for females and I\$ 17,000 for males. Cholesterol's point of inflection and peak were at higher income levels than those of BMI (about I\$ 8,000 and I\$ 18,000, respectively). There was an inverse relationship between BMI/cholesterol and the food share of household expenditure, and a positive

relationship with the proportion of population in urban areas. Mean population blood pressure was not significantly affected by the economic factors considered.

Conclusions

When considered together with evidence on shifts in income—risk relationships within developed countries, the results indicate that cardiovascular disease risks are expected to systematically shift to low and middle-income countries and, together with the persistent burden of infectious diseases, further increase global health inequalities. Preventing obesity should be a priority from early stages of economic development, accompanied by measures to promote awareness of the causes of high blood pressure and cholesterol.

Text D

Health Repercussions of Western Lifestyle

Factors associated with the increase of these illnesses appear to be, paradoxically, things which many people would regard as lifestyle improvements. They include:

- Less strenuous physical exercise, often through increased use of a car.
- Easy accessibility in society to large amounts of low-cost food.
- More food generally, with much less physical exertion expended to obtain a moderate amount of food.
- More high fat and high sugar foods in the diet are common in the affluent developed economies.
- Higher consumption of meat and dairy products -Higher consumption of grains and white bread.
- More foods which are processed, cooked, and commercially provided (rather than seasonal, fresh foods prepared locally at time of eating)

Answer Booklet

TIME: 15 minutes

- Look at the four texts, A-D, in the separate Text Booklet.
- For each question, 1-20, look through the texts, A-D, to find the relevant information.
- Write your answers on the spaces provided in this Question Paper.
- Answer all the questions within the 15-minute time limit.
- Your answers should be correctly spelt.

Questions 1-7

For each question, 1-7, decide which text (A, B, C or D) the information comes from. You may use any letter more than once.

In which text can you find information about:

1. The source of the research data.
Ans: _____.
2. One important risk factor for cardiovascular diseases?
Ans: _____.
3. What does the observed rapid BMI increase with national income indicate?
4. Types of foods are common in the affluent developed economies.
Ans: _____.
5. Cause of a number of non-cardiovascular outcomes.
Ans: _____.
6. The influence of economic factors on the mean population blood pressure.
Ans: _____.
7. The number of smokers in the developing world?
Ans: _____.

Questions 8-13

Answer each of the questions, 8-13, with a word or short phrase from one of the texts. Each answer may include words, numbers or both.

8. Who conducted the current research on diseases of affluence?
Ans: _____.
9. How many countries contributed the data for the research?
Ans: _____.
10. What is the efficient way to minimize diseases of affluence?
Ans: _____.
11. What are the basis of description models that predict the number of smokers?
Ans: _____.
12. What is the estimated population of the world?
Ans: _____.
13. Where did tobacco smokers increase in the last century?

Questions 14-20

Complete each of the sentences, 14-20, with a word or short phrase from one of the texts. Each answer may include words, numbers or both.

14. Cholesterol is one among the leading causes of _____ and morbidity.
15. Current intervention options for _____ in principle include reducing calorie intake.
16. Overweight and obesity can cause _____ outcomes including cancers, diabetes, and osteoarthritis.
17. Preventing obesity should be a priority during economic growth and _____ of a nation.
18. There have been major recent transformations in global _____, marketing, and regulatory control.
19. There was an inverse relationship between BMI/cholesterol and the food share of _____.
20. Factors of these illnesses are things which many people would regard as _____.