

UNIVERSITY OF KWAZULU-NATAL
SCHOOL OF AGRICULTURAL, EARTH AND ENVIRONMENTAL SCIENCES
DIETETICS & HUMAN NUTRITION
EXAMINATION: NOVEMBER 2014
SUBJECT, COURSE & CODE: DIET 237 - P2
WEIGHT, DIABETES, HEART DISEASE

External Examiner: Dr K Pillay
Internal Examiner: Mrs S Ogilvie

DURATION: 3 HOURS

TOTAL MARKS: 150

NOTE: THIS PAPER CONSISTS OF EIGHT (8) PAGES AND APPENDIX A TWO (2) PAGES AND APPENDIX B ONE (1) PAGE
PLEASE CHECK THAT YOU HAVE THEM ALL.
PLEASE WRITE LEGIBLY AND ANSWER ALL QUESTIONS.
ANSWERS WRITTEN IN PENCIL WILL NOT BE MARKED

QUESTION 1

Nokwanda, a housewife with two children has been referred to you as she needs to learn how to do carbohydrate counting. She was diagnosed as a type I diabetic at the age of 11 years and started on Humulin 30/70. She is currently on Humalog 8 units TDS and Lantus 28 units at bedtime.

She monitors her blood sugar regularly 4 times daily.

She was running 4 times per week but stopped as she was getting “hypos” after exercise. At present her activity level is low.

She is afraid of “hypos” so tends to overeat to prevent hypoglycaemia.

She is compliant with her eating plan and is familiar with the exchanges as well as the glycaemic index.

You do a full assessment and dietary history and get the following information.

Weight	89 kg
Height	168 cm
Waist	97 cm
Age	38 years

1. Calculate her energy requirements using the Schofield equation and an appropriate PAL. (2)
2. What energy value will you give her to achieve a weight loss of 250g per week (1)
3. Work out her macro nutrients, using the energy value for weight loss. (3)
4. Calculate her BMI and classify. (1)
5. What is her IBW range (2)

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6. Calculate what % overweight she is. (1)

You take the following diet history, showing a typical week day and a typical weekend day.

	Weekday	Weekend
Breakfast	1 ¹ / ₃ c muesli ½ c low fat milk 3 t sugar	2 slices toast 2 t margarine 1 fried egg (1 t oil for frying) 1 T apricot jam ½ glass orange juice
Tea	1 cup tea 50 ml low fat milk	1 cup tea 25 ml low fat milk 1 muffin
Lunch	60 g tuna, in oil, drained 4 slices bread 4 t margarine 6 t mayonnaise 1 cup lettuce & tomato 1 banana	100 g meat pie (see analysis) 1 cup coleslaw (+ 4t mayonnaise)
Tea	1 cup coffee 75 ml low fat milk	1 cup coffee 50 ml low fat milk
Supper	150g roast chicken, dark meat – with skin 2 t oil for roasting 160 g baked potato 1/3 cup rice, boiled 2 t margarine for potato ½ c boiled carrots ½ c steamed broccoli 1 orange	Braai:-90 g wors, 60 g lamb chop + 90 g steak 1 c phutu 1 bread roll 2 t margarine 1 cup green salad ½ cup ice cream
Late snack	250 ml milo (250 ml low fat milk + 4 t milo)	250 ml milo (50 ml low fat milk + 4 t milo + water)

Meat pie	100 g
Prot	6.8 g
CHO	30 g
Fat	13.2 g

7. Translate her weekday diet history into exchanges.
Fill in your answer on table Appendix A1 (12)

8. Indicate the total CHO for each weekday and weekend meal (do not include snacks).
Fill in your answer on table Appendix A2 (6)

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9. Explain to her what insulin: CHO ratios are. (1)

10. Calculate her insulin: CHO ratio using the 500 rule as well as what her actual daily ratio is for weekday and weekend. Use total carbohydrate for the day ie meals and snacks. (3)

11. Her insulin: CHO ratios for weekdays and weekends are similar so why do you think she is often low on weekends in the afternoon and high after supper and what would you suggest she do to correct this, without changing her food intake (4)

12. How can you tell if the insulin: CHO ratio is correct? (1)

13. Use the 100 rule to calculate his insulin sensitivity factor. Explain what the ISF is. (2)

14. If her pre-prandial target is 6.0 mmol/l what correction dose would she need if her reading was 13.2 mmol/l? (2)

15. You want to encourage her to go back to gym. What advice would you give her to prevent hypos. (4)

16. Review the treatment goals of diabetes with her. (5)

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QUESTION 2

Dave Foster, a 37 year old businessman has been a known Type 2 diabetic for 6 years. His general practitioner has referred him to you for dietary guidance as his blood sugar control is poor. His medications include: Glucophage, Amaryl, Simvastatin, aspirin and two anti-hypertensive medications. He also takes 1 capsule of omega 3 daily. He does not enjoy doing exercise and smokes 15 cigarettes per day. He decided to stop the simvastatin as it made him feel tired, especially his legs. He has his own glucometer, but seldom tests his blood glucose levels.

You get the following information:-

Height	170 cm
Weight, current	92.5 kg
Blood pressure	170/110 mmHg
Blood glucose, post prandial	13.6 mmol/l
HbA1c	9.5 %
Total cholesterol	6.8 mmol/l
LDL	3.5 mmol/l
HDL	0.7 mmol/l
Triglycerides	3.2 mmol/l
Microalbuminuria	positive

1. Discuss his blood results with him and explain what values he should aim for. (6)
2. What target would you suggest for his blood pressure readings? (1)
3. Explain to him what microalbuminuria is and why it is important for him to monitor it annually? (3)
4. Why do you think his doctor has prescribed aspirin for him? (2)
5. List the risk factors for CHD that you know Mr Foster has? (10 x ½ =5)
6. What non dietary lifestyle changes would you recommend to him? (2)

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7. His wife has told him he should be taking 5 g fish oil daily. Discuss the beneficial effects of fish oil with him and tell him if this is the correct dose. (6)
8. He is concerned about his feet as he often has a sensation of pins and needles and his friend had a below knee amputation. Discuss peripheral neuropathy in detail. (9)
9. What are the two most important factors to prevent neuropathy developing? (2)
10. Explain to him when he should be testing his blood glucose. (8 x ½ = 7)
11. Explain to him what type of medication simvastatin is, how it works and include possible side effects. (7)

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QUESTION 3

- 3.1 Jessica Jones, a 20-year-old commerce student, weighs 54 kg and is 170 cm tall. Her percentage body fat measured by her gym instructor was 17 %. She has been feeling very tired, often feels shaky and dizzy a couple of hours after eating and is not coping with her exercise sessions lately. She craves sweets, chocolates and cake and does not eat regular meals. As she is very concerned about her health so consults her doctor who sends her for tests and then tells her that she has functional reactive hypoglycaemia. She has been referred to you for dietary treatment.
- 3.1.1 What test would be done to diagnose reactive hypoglycaemia (1)
 - 3.1.2 What type of reactive hypoglycaemia does she have? (1)
 - 3.1.3 Calculate and classify her BMI. (1)
 - 3.1.4 List two different methods of measuring body fat. (2)

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3.1.4 What information (dietary and non-dietary) would you give her to enable her to control the hypoglycaemia? (20)

3.1.5 She asks if you can include a few of her favourite foods into her diet. The items she wants included are Royco creamy cheddar tuna and Woolworths beef and lentil soup. She adds 60 g tuna to the creamy cheddar tuna when she prepares it. Convert the following information, into exchanges and explain how she can fit them into her meal plan.

Fill in your answer on the table Appendix A3 (8)

Beef and lentil soup:

Nutritional information	Per serving
Energy	1104kJ
Protein	18g
Carbohydrates	29.6g
Total Fat	5.8g

Creamy cheddar tuna

Nutritional information	Per serving
Energy	1103kJ ⁽⁵⁾
Protein	7.6g
Carbohydrates	48g
Total Fat	4.2g

3.1.5 She asks you about the glycaemic index. Give a brief definition of the GI and explain how it is categorised into three different groups. (5)

3.2 Multiple choice: choose the **one** correct answer e - negative marking will apply (12)

1. What is the rationale for the fat cell theory of obesity?
 - a. Fat cell number increases dramatically after puberty.
 - b. Fat cell number in an adult can decrease only by fasting.
 - c. Fat cell number increases most readily in late childhood and early puberty
 - d. Weight gain from overeating in adults takes place primarily by increasing the number of fat cells.

2. Obesity resulting from an increase in the size of fat cells is termed
 - a. hyperplastic obesity
 - b. hypertrophic obesity
 - c. idiopathic leptinemia
 - d. anaplastic hypometabolism

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3. Which of the following is known to promote fat storage in adipocytes?
 - a. Glucagon
 - b. Lipoprotein lipase
 - c. Lipoprotein synthetase
 - d. Hormone sensitive lipase

4. Which of the following describes a relationship between leptin and energy balance?
 - a. Fat cell sensitivity to leptin is higher in obese people
 - b. A deficiency of leptin is characteristic of all obese people
 - c. Blood levels of leptin usually correlate directly with body fat
 - d. Major functions of leptin include an increase in hunger and a decrease in metabolic rate.

5. What is the primary action of orlistat, a weight loss drug?
 - a. reduces taste sensation
 - b. inhibits lipoprotein lipase
 - c. inhibits pancreatic lipase
 - d. alters circulating leptin concentrations

6. The drug sibutramine reduces appetite by affecting
 - a. ketone production
 - b. insulin to glucagon ratio
 - c. leptin sensitivity of fat cells
 - d. serotonin utilization in the brain

7. To help prevent body fat gain daily moderate intensity activity should total
 - a. 20 minutes
 - b. 60 minutes
 - c. 1 ½ hours
 - d. 3 hours

8. Which anti obesity drug works by inhibiting lipase action?
 - a. Reductil
 - b. Alli
 - c. Duromine
 - d. Nobese

9. Upon beginning a meal, the satiety signal in the body is sent after a lag time of about
 - a. 10 minutes
 - b. 20 minutes
 - c. 40 minutes
 - d. 60 minutes

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10. What is the most likely explanation for why women readily store fat around the hips whereas men readily store fat around the abdomen?
- a. Differences in blood insulin levels
 - b. Differences in the activity of lipoprotein lipase
 - c. Differences in circulating lipid transport proteins
 - d. Differences in the activity of lipoprotein synthase
11. Which test for insulin resistance is regarded as the gold standard
- a. Homeostasis Model Assessment (HOMA)
 - b. Quantitative Insulin Sensitivity Check List (QUICKI)
 - c. Hyperinsulinemic euglycemic clamp
 - d. Frequently Sampled Intravenous Glucose Tolerance Test (FSIVGT)
12. Which substance advocated for weight loss is banned by the Olympic Committee
- a. Ephedra
 - b. Guarana
 - c. Gota Kola
 - d. Carnitine

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