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CE JUST FOR TECHNICIANS

Tech Talk CE is the only national continuing education program for Canadian pharmacy technicians.

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ANSWERING OPTIONS

1. Answer the lesson online and get your results instantly at www.CanadianHealthcareNetwork.ca

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To pass this lesson, a grade of 70% (11 out of 15) is required. If you pass, you will receive 1 CEU. You will be advised of your results in a letter from *Tech Talk*. Please allow 8 to 12 weeks.

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Diabetes and nutrition

by Michael Boivin, BScPhm, Clinical Pharmacist

Learning Objectives:

Upon successful completion of this lesson, the pharmacy technician should be able to do the following:

1. Review the concept of proper eating with diabetes patients.
2. Discuss the role of carbohydrates, carbohydrate counting, and the glycemic index in patients with diabetes.
3. Review the impact of protein and fat in the diet.
4. Discuss the effects of alcohol and sugars or sweeteners on glycemic control.
5. Work within the collaborative care practice model to provide patients with information to reach optimal nutrition targets.

Introduction

Diabetes is one of the most common chronic conditions seen in community pharmacy practice. The Public Health Agency of Canada estimates that approximately two million Canadians (1 in 16 people) have been diagnosed with diabetes.⁽¹⁾ This number is expected to grow to almost 2.8 million people by the year 2012.⁽¹⁾ If prediabetes is included, the Canadian Diabetes Association (CDA) predicts that approximately nine million Canadians are affected.⁽²⁾

Most patients with diabetes are managed through a combination of lifestyle changes and medications. Nutrition therapy is the cornerstone of diabetes treatment.⁽³⁾ Without appropriate nutrition therapy, it is unlikely that patients will ever reach their diabetes treatment goals. However, many patients find that adherence to nutrition therapy is one of the most difficult components of diabetes management.⁽⁴⁾

The CDA clinical practice guidelines advise that all patients with diabetes have a dietitian assess their current diets and offer counselling to make improvements.⁽³⁾ The role of pharmacists and

pharmacy technicians in the provision of lifestyle education can vary depending on the legislation in each province. For this reason, it is important for pharmacy staff to determine their optimal role in providing education to help patients manage their diabetes. If they are unable to provide the required education, then they should refer the patient to the appropriate healthcare professional to further enhance the patient's level of diabetes education.

The "diabetic diet"

One of the first things that patients commonly asked when diagnosed with diabetes is, "What is the diabetic diet?" There is no diabetic diet. The current CDA guidelines recommend that each patient with diabetes have an individualized eating plan based on preferences, age, needs, culture, lifestyle, and economic status.⁽³⁾ This might seem complicated, but most patients should follow the same healthy diet recommendations for all Canadians, as listed in Eating Well With Canada's Food Guide (www.healthcanada.gc.ca/foodguide).⁽³⁾ This involves consuming foods from each of the four food groups (ie, vegetables and

fruits, grains, milk and alternatives, meat and alternatives).⁽³⁾

A key patient education point is that the food a person with diabetes should eat is the same food that everyone should eat. The same diet choices for a person with diabetes can be recommended for other members of his or her family. The primary difference is that a person with diabetes will feel the effects of not eating a proper diet much more rapidly compared with a person without diabetes.

Carbohydrates

Carbohydrates are one of the most important components of a proper diet. They are the major energy source of a healthy diet. Common sources of carbohydrates include bread, rice, pasta, and starchy vegetables (eg, potatoes, yams). Canadian Diabetes Association guidelines recommend that people with diabetes obtain 45%–60% of their calories from carbohydrates.⁽³⁾

Impact of carbohydrates on blood sugar.

A large portion of carbohydrates (90%–100%) ingested is converted to blood glucose in the body. The amount of carbohydrates eaten at a meal has the largest effect on blood sugar levels after a meal.

Because carbohydrates have such a large effect on blood sugar, people with diabetes should try to eat a consistent amount of carbohydrates each day, spaced out evenly throughout the day.⁽⁵⁾ This is especially important for people using insulin to control their diabetes. A consistent carbohydrate intake can make it much easier to adjust insulin doses before a meal and might lead to a lowered risk of hypoglycemia (low blood sugar) and hyperglycemia (high blood sugar).⁽⁵⁾

Carbohydrate counting. Carbohydrate counting is a method used to estimate the amount of available carbohydrates in a meal, allowing patients to eat a large variety of foods without causing major changes to their blood-sugar levels. People with diabetes who require pre-meal insulin injections commonly count carbohydrates, allowing them to better estimate the right dose of insulin they require for the meal.

Carbohydrate counting is done by reading the carbohydrate information on the

nutritional label of a food or checking nutritional tables in references such as

- CDA's Beyond the Basics (www.diabetes.ca/for-professionals/resources/nutrition/beyond-basics) and
- Health Canada's Nutrient Value of Some Common Foods (http://dsp-psd.pwgsc.gc.ca/collection_2009/sc-hc/H164-49-2008E.pdf).

Patients can look at the portion size of whatever they are eating and, using the nutritional label or nutritional tables, can estimate the number of carbohydrate servings in that portion. One serving of carbohydrate is 15 grams of available carbohydrate.

A commonly asked question is the number of carbohydrate servings that should be consumed at each meal. Nutrition plans for diabetes patients need to be customized for the individual. Patients will have different optimal carbohydrate servings depending on their weight, their activity levels, and the recommendations of their dietitians.

Glycemic index

Researchers have found that not all carbohydrates are created equal. Some carbohydrates cause a smaller increase in blood sugar levels compared with others. The glycemic index (GI) is used to measure the degree to which foods containing carbohydrates will cause a rise in blood sugar compared with an equal amount of white bread or glucose.

White bread has a high GI because the body can easily break it down, causing a large rise in blood glucose compared with low GI foods. Low GI foods also tend to be much higher in fibre.⁽³⁾

The CDA recommends that people with diabetes substitute high GI foods with low GI foods because this has a positive effect on blood sugar control and heart disease reduction.⁽³⁾ The CDA has some great resources on the GI, which can be found at www.diabetes.ca/for-professionals/resources/nutrition/glycemic-index.

Protein

Foods such as eggs, meat, and meat alternatives (eg, beans, lentils, tofu) are all common protein sources. Protein is broken down into amino acids when ingested.⁽⁵⁾ Amino acids are used to synthesize muscle protein and are also involved in the production of enzymes, hormones, and

other constituents of cells.⁽⁵⁾

The CDA recommends that people with diabetes obtain 15%–20% of their calories from protein sources.⁽³⁾ Protein is different from carbohydrates in the following ways:

- Approximately 50%–58% of ingested protein is metabolized to glucose (compared with 90%–100% of carbohydrates).⁽⁵⁾
- Protein is not immediately converted to blood glucose.

For these reasons, the protein content of a meal does not immediately affect blood glucose levels.⁽⁴⁾ From a practical standpoint, a person with diabetes does not need to adjust his or her insulin dose based on the protein content of the meal.

People with diabetes might think that if protein does not cause a major increase in blood glucose then they should eat a high protein diet. The problem is that the body has a limited capacity to eliminate amino acids, which can be toxic when consumed in excess.⁽³⁾

Fat

The fat intake of a meal does not increase blood glucose levels, but can affect the way a meal is digested by the body.⁽⁴⁾ The fat in a meal slows

- digestion of food,
- the release of food from the stomach, and
- the peak blood glucose level after a meal.⁽⁴⁾

Current CDA guidelines recommend that patients limit their daily calories from fat to less than 35%.⁽³⁾ Some patients might wonder why the CDA limits fat intake if the fat in a meal can lower peak blood glucose levels. The reason is that fat intake is related to the patient's risk of heart disease.

More than 75% of deaths in people with diabetes are linked to heart disease and stroke.⁽³⁾ Diets high in saturated or trans fat have been linked to a higher risk of heart disease.⁽³⁾

Like carbohydrates, not all fats are created equal. Some tips on fat consumption in people with diabetes are outlined here.

Reducing saturated fat and trans fat intake:

- Saturated fat should make up less than 7% of daily calories and trans fat intake should be kept to a minimum.⁽³⁾
- Saturated fat raises LDL (bad) cholesterol and can increase the risk of heart disease. Foods from animals are the most common sources of saturated fats: dairy, eggs, and meat.

- Trans fat raises LDL cholesterol AND lowers HDL (good) cholesterol. Increased trans fat intake has been strongly linked to heart disease. Food sources include fast foods and prepared baked foods (eg, doughnuts, cookies, crackers, and muffins).

Substituting saturated fat with polyunsaturated fat can lower the risk of heart disease.

- Polyunsaturated fats are found mostly in fish, nuts, seeds, and oils from plants.

Vegetables

The CDA now classifies most vegetables as “free.”⁽⁶⁾ This means most patients with diabetes should be encouraged to consume vegetables for their nutritional benefits.⁽⁶⁾ Many vegetables that have a high carbohydrate count also have a high fibre count (eg, carrots). This translates to a lower impact on blood glucose compared with other carbohydrate sources.⁽³⁾ The CDA has a great resource on the effects of vegetables on blood glucose. It can be downloaded at www.diabetes.ca/files/Long%20list%20Vegetables%20Dec%202005.pdf.

Sugar

Many people with diabetes completely avoid sugar when diagnosed with diabetes. This is not necessary. The current CDA guidelines state that people with diabetes can consume up to 10% of their daily calories from sucrose or sucrose-containing foods.⁽³⁾ However, many of the foods containing sucrose are not the best food choices for people with diabetes (ie, high sucrose, high fat, and little nutritional benefit).

Sweeteners

Sugar alcohols. Sugar alcohols are a group of sweeteners that are found naturally in a variety of plants; they can also be commercially produced.⁽⁵⁾ These sweeteners are commonly added to sweeten food, but also to add texture.⁽⁵⁾ They are commonly used in “sugar-free” lozenges, hard candy, and chocolates. The most common sugar alcohols are maltitol, mannitol, sorbitol, lactitol, isomalt, and xylitol.⁽³⁾

The conversion of sugar alcohols is very slow, variable, and has no significant effect on blood glucose.⁽³⁾ For this reason current CDA guidelines

TABLE 1 - Acceptable daily intake of sweetener, by type⁽³⁾

Sweetener	Acceptable daily intake (mg/kg body weight)
Acesulfame potassium	15
Aspartame	40
Cyclamate	11
Saccharin	5
Sucralose	9

indicate that an intake of less than 10 g daily is acceptable.⁽³⁾

High doses of sugar alcohols are linked to a high risk of gastrointestinal side effects, such as diarrhea.⁽³⁾

Artificial sweeteners. Artificial sweeteners are commonly added to many foods, including foods targeted to patients with diabetes or those marketed to promote weight loss. The artificial sweeteners approved by Health Canada are as follows⁽³⁾:

- acesulfame potassium,
- aspartame,
- cyclamates,
- saccharin, and
- sucralose.

All have been shown to be safe for use in patients with diabetes when consumed within daily intake limits.⁽³⁾ The amounts of each sweetener that can be safely consumed on a daily basis over a person's lifetime without any adverse effects are listed in Table 1.⁽³⁾ The use of cyclamates and saccharin is not recommended during pregnancy owing to a lack of evidence of their safety.⁽³⁾

Determining the safe quantity of a sweetener can be challenging for many people with diabetes. To give an example of the broad safety profile of a sweetener, let's examine the safe consumption of diet cola (containing aspartame) in a woman weighing 130 lbs (59 kg). In this woman, the safe daily intake would be 40 mg/kg × 59 kg—2,360 mg of aspartame. The amount of aspartame in one popular brand of diet cola is 124 mg per can. This woman can safely consume 19 cans of this diet cola per day.

Alcohol

Many people think that drinking alcohol will increase their blood glucose levels because many alcoholic beverages have high levels of sugar and carbohydrates. In fact, drinking alcohol can cause

hypoglycemia, hyperglycemia, or even have no effect on blood glucose.⁽⁷⁾

Hypoglycemia can occur because alcohol blocks the pathway where glucose is made from non-carbohydrate sources.⁽⁸⁾ Alcohol can also block the release of hormones that the body uses to help balance hypoglycemia (eg, cortisol and growth hormone).⁽⁷⁾

The current CDA guidelines recommend that people with diabetes use the same recommendations for alcohol intake as the general population.⁽³⁾ These recommendations are as follows:

- Men—1 or 2 standard drinks per day up to a maximum of 14 drinks per week.
- Women—1 or 2 standard drinks per day up to a maximum of 9 drinks per week.

A standard drink is considered to be as follows⁽³⁾:

- 341 mL (12 ounces) of beer,
- 142 mL (5 ounces) of wine,
- 43 mL (1.5 ounces) of spirits, and
- 85 mL (3 ounces) of fortified wine (sherry, port).

Some key recommendations for people with diabetes who will be consuming alcohol⁽³⁾:

- Hypoglycemia is more common in elderly patients.
- People using insulin or insulin secretagogues (eg, glyburide, gliclazide, repaglinide) should be aware of the risk of delayed hypoglycemia that can occur up to 24 hours after alcohol consumption.
- Alcohol can mask the symptoms of hypoglycemia; more frequent blood glucose testing may be recommended.
- People with diabetes should not consume alcohol when they are by themselves because of the risk of hypoglycemia.
- It is better to consume alcohol with a meal to reduce hypoglycemia risk.

Vitamins

Many people take vitamins regularly to

promote good health. There is very little scientific data to recommend vitamins and minerals in people with diabetes. For this reason, current CDA guidelines do not recommend routine vitamin or mineral supplementation for most people with diabetes.⁽³⁾ People with diabetes should try to get all of their nutritional requirements from their diet.

The main exceptions to this rule are calcium and vitamin D supplements, which should be taken to prevent osteoporosis, and folic acid supplements, which should be taken during pregnancy.

Portion size

Many people with diabetes eat the right foods, but the problem is they eat too much of these foods. Portion control is important for maintaining weight and improving blood glucose control. One of the easiest things people with diabetes can do is to use their plates to help limit their portion sizes. The best way to do this is to divide the plate as follows⁽³⁾:

- Half the plate should be vegetables, at

least two kinds (eg, salad, asparagus, broccoli).

- A quarter of the plate should be grains or starches (eg, potato, rice, corn, pasta).
- A quarter of the plate should be meat or meat alternatives (eg, fish, lean meat, chicken, beans, lentils).
- This can be supplemented with a glass of milk and a piece of fruit to complete the meal.

With the plate method, people with diabetes are encouraged to eat just one serving and not go back for second or third portions. The CDA has a great handout for patients called Just the Basics: Tips for Healthy Eating, Diabetes Management and Prevention, which discusses dos and don'ts of nutrition and diabetes and includes a picture of the plate method of portion control. This handout can be accessed at www.diabetes.ca/diabetes-and-you/nutrition/just-basics.

A great way to promote this method is to have diabetes patients purchase a plate

from the pharmacy or a local retailer that has sections dividing the plate into a half and two quarters. This can be an easy way for the person to learn the principles of portion control.

Role of the technician

With the expanded scope of practice for both pharmacists and pharmacy technicians, there will be a continually changing set of responsibilities for both professionals. Pharmacy technicians working in the collaborative care model can direct patients with diabetes to resources that can help them improve both blood glucose control and their overall health.

Although a dietitian should design a customized meal plan for patients with diabetes, both pharmacists and pharmacy technicians can provide the information that many people with diabetes require to stay on track.

References are available at www.CanadianHealthcareNetwork.ca, CE section, Quick search CCCEP # 1065-2011-324-I-T

QUESTIONS

Please select the best answer for each question or answer online at www.CanadianHealthcareNetwork.ca for instant results.

Henrietta P. (60 years old) is in the pharmacy for blood glucose meter training. She was recently diagnosed with type 2 diabetes and was started on metformin, 500 mg BID. While you are demonstrating the key features of her blood glucose meter, she says that she is a bit overwhelmed. Earlier that day Henrietta visited the dietitian at the diabetes education centre; however, she now finds that the notes she took are not that clear. She wonders if you or the pharmacist can provide some clarification.

1. Henrietta asks about the diabetic diet. Which of the following statements is the MOST appropriate answer?
- The diabetic diet contains no sugar or meat
 - The diabetic diet is only good for people with diabetes
 - The diabetic diet is very restrictive and people with diabetes can't change the foods they eat
 - There is no single diabetic diet for every patient

2. Henrietta asks about carbohydrates in her diet. Which of the following is an example of a common carbohydrate food?

- Bread
- Pork chop
- Spinach
- All of the above

3. What percentage of Henrietta's daily calories should come from carbohydrates?

- 10%–15%
- 20%–30%
- 35%–45%
- 45%–60%

4. Henrietta asks about the impact of carbohydrates on blood sugar levels. Which of the following statements about carbohydrates is true?

- Carbohydrates have little impact on blood glucose
- Carbohydrates are the major energy source for people with diabetes
- Only about half of the carbohydrates eaten are converted to blood glucose
- A low carbohydrate diet is always recommended for people with diabetes

5. She asks about carbohydrate consistency. What does it mean?

- It means always eating the same foods every day
- It means adhering to the diabetic diet
- It means trying to eat the same amount of carbohydrates each day
- All of the above

6. She has some notes on the glycemic index. Which of the following statements is true?

- People with diabetes should try to select foods with a low glycemic index
- High glycemic foods are usually high in fibre
- White bread has a low glycemic index
- All of the above

7. What percentage of Henrietta's daily calories should come from proteins?

- 5%–10%
- 15%–20%
- 30%–40%
- 50%–60%
- 60%–75%

QUESTIONS (Continued)

Please select the best answer for each question or answer online at www.CanadianHealthcareNetwork.ca for instant results.

8. She asks some more questions about protein. Which of the following statements is true?

- a) Protein in a meal is not converted to blood glucose
- b) Common protein sources include beans, lentils, and tofu
- c) A high-protein diet is recommended for most people with diabetes
- d) Most people taking insulin will need to adjust their pre-meal dose based on the amount of protein in the meal

9. What percentage of Henrietta's daily calories should come from fat?

- a) < 5%
- b) < 20%
- c) < 35%
- d) < 65%

10. You start discussing fat choices with Henrietta. Which of the following is NOT a common source of trans fats?

- a) Cookies
- b) Fish
- c) Crackers
- d) Muffins

11. You start discussing the different types of fat with Henrietta. Which of the following statements is true?

- a) Saturated fat should make up less than 7% of daily calories
- b) Trans fat should make up less than 20% of daily calories
- c) Patients should use saturated fat instead of polyunsaturated fat
- d) All of the above

12. She asks about a specific type of candy that is sugar free. You look at the ingredients see that it sugar alcohols. Which of the following statements is true?

- a) Sugar alcohols should be avoided in people with diabetes
- b) Sugar alcohols can cause a spike in blood glucose levels
- c) High doses of sugar alcohols are linked to diarrhea
- d) People with diabetes should eat less than 2 g of sugar alcohols daily

13. Henrietta asks about alcohol. Which of the following is true?

- a) Alcohol can cause low, high, or have no effect on blood glucose levels
- b) Women should limit to intake to less

- than 14 drinks per week
- c) A standard drink of beer is 5 ounces
- d) Alcohol should always be consumed on an empty stomach

14. Henrietta asks about vitamins in people with diabetes. Which of the following statements is true?

- a) All people with diabetes should take vitamins
- b) There is strong evidence that vitamins help people with diabetes
- c) Calcium and vitamin D are commonly recommended for patients her age
- d) All of the above

15. The discussion concludes with a discussion of the plate method of portion control. Which one of the following plates has the proper breakdown?

- a) ½ chicken, ½ salad
- b) ½ beans, ½ broccoli
- c) ½ corn, ¼ peas, ¼ fish
- d) ½ salad, ¼ rice, ¼ lean meat

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Diabetes and nutrition

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Type of practice <input type="checkbox"/> Drug chain or franchise <input type="checkbox"/> Banner <input type="checkbox"/> Independent <input type="checkbox"/> Mass merchandiser		<input type="checkbox"/> Grocery store pharmacy <input type="checkbox"/> Hospital pharmacy <input type="checkbox"/> Other (specify): _____	
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		Are you a certified technician? <input type="checkbox"/> Yes <input type="checkbox"/> No	

Please help ensure this program continues to be useful to you by answering these questions.

1. Do you now feel more informed about diabetes and nutrition?
 Yes No
2. Was the information in this lesson relevant to you as a technician?
 Yes No
3. Will you be able to incorporate the information from this lesson into your job as a technician? Yes No N/A
4. Was the information in this lesson... Too basic Appropriate Too difficult
5. How satisfied overall are you with this lesson?
 Very Somewhat Not at all
6. What topic would you like to see covered in a future issue? _____

HOW TO ANSWER: Answer ONLINE for immediate results at www.CanadianHealthcareNetwork.ca

For information about CE marking, please contact Mayra Ramos at 416-764-3879 or fax 416-764-3937 or email mayra.ramos@rci.rogers.com. All other inquiries about Tech Talk CE should be directed to Tasleen Adatia at 416-764-3926 or tasleen.adiatia@rci.rogers.com.

REFERENCES

1. Public Health Agency of Canada. Diabetes in Canada. Ottawa, ON: Public Health Agency of Canada; 2010. www.phac-aspc.gc.ca/publicat/diic-dac99/d05-eng.php (accessed January 12, 2010).
2. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. The prevalence and costs of diabetes. Toronto, ON: Canadian Diabetes Association; 2010. www.diabetes.ca/diabetes-and-you/what/prevalence (accessed January 12, 2012).
3. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. *Can J Diabetes* 2008;32(Suppl 1):S1-201.
4. Beebe C. Diet therapy in type 1 diabetes mellitus. In: *Diabetes mellitus: a fundamental and clinical text*. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2003.
5. Heins J, Beebe C. Nutritional management of diabetes mellitus. In: *Management of diabetes mellitus: perspectives of care across the lifespan*. 2nd ed. St Louis, MO: Mosby; 1996.
6. Canadian Diabetes Association. Helpful hints for educators using *Beyond the Basics: Meal Planning for Healthy Eating*. Diabetes Prevention and Management. Toronto, ON: Canadian Diabetes Association; 2008. www.diabetes.ca/files/for-professionals/BeyondTheBasicsTips_4.pdf (accessed January 12, 2012).
7. Cryer PE, Davis SN, Shamon H. Hypoglycemia in diabetes. *Diabetes Care* 2003;26(6):1902-12.
8. Glaser B, Leibowitz G. Hypoglycemia. In: *Joslin's diabetes mellitus*. 14th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2007.