Nutrition for the Non-nutritionist

WaterlooWellington DIABETES

Objectives

- Discuss the food sources of macronutrients and the effect on diabetes
- Discuss various nutrition strategies for diabetes management
- Provide an Introduction to Carbohydrate counting
- Provide nutrition strategies for people with complications or comorbidities
- Discuss the nutrition strategies for sick day management

Goals of Nutrition Therapy

- Blood Glucose levels as close to non diabetic range as possible without risk of hypoglycemia
- Lipids that reduce the risk of CVD
- Blood Pressure within target range
- Improve or continue quality of life
- Prevent or slow the development of complications

Food is to be Eaten and Enjoyed

It's not just about blood glucose

Components of Food

Carbohydrate

Carbohydrate

Carbohydrate → Glucose

Carbohydrate

- Primary source of fuel
  - Controlled not restricted
- RDA 130 g/day
- Sugar and Fibre are contained within carbohydrate values

Quality and Quantity

Carbohydrate

Awareness

Carbohydrate counting

Legend

1 cup (250 mL)
½ cup (125 mL)
¼ cup (60 mL)
1 tablespoon (15 mL)
1 teaspoon (5 mL)
measure after cooking
1 ounce (30 grams) by weight
Choose more often
Choose less often

INCHES 1 2 3 4 5 6 7 8

CARBOHYDRATE CONTAINING FOOD

1 serving=15 g available carbohydrates or 1 carbohydrate choice:

GRAINS & STARCHES

Bannock, whole grain baked	Barley, bulgur	Bread, whole grain	Cereal, hot			Bagel	Bagel	Bannock, fried	Bread, white	Bun, hamburger or hotdog
1.5x2.5 in	¼ cup	1 slice	¼ cup			½ large	½ small	1.5x2.5 in	1 slice	½
Chapati, roti, tortilla, whole wheat	Corn, kernel	English muffin, whole grain	Pasta, couscous			Cereal, flaked unsweetened	Crackers, soda type	Croutons	French fries	Naan bread
1 (6 in)	½ cup	½	½ cup			¼ cup	7	¾ cup	10	¼ (6 in)
Plantain, mashed, sweet potato	Pita bread, whole wheat	Potatoes, boiled, baked	Rice, millet	Soup, thick type		Pancake, waffle	Pita bread, white	Pizza crust	Taco shells	
⅓ cup	½ (6 in)	½ medium	⅓ cup	1 cup		1 (4 in)	½ (6 in)	⅛ (12 in)	2 (5 in)	

FRUITS

Apple	Applesauce, unsweetened	Banana	Blackberries, strawberries	Blueberries	Cherries	Grapes	Kiwi		Mixed dried fruit
1 medium	½ cup	1 small	2	¾ cup	15	15	2 medium		¼ cup
Mango	Melon	Orange	Peach	Pear	Pineapple	Plum	Canned fruit, in juice		Juice
½ medium	½ cup	1 medium	1 large	1 medium	¾ cup	2 medium	½ cup		½ cup

MILK & ALTERNATIVES

Chocolate milk, 1%	Evaporated milk, canned	Milk, low fat	Milk powder, skim	Soy beverage, flavoured	Soy beverage, plain	Soy yogourt, flavoured	Yogourt, low fat plain	Yogourt, artificially sweetened		
1 cup	½ cup	1 cup	4 tablespoon	1 cup	1 cup	½ cup	¾ cup	¾ cup		

OTHER CHOICES (sweet foods and snacks)

Milk pudding, skim no sugar added	Popcorn, air-popped low fat			Arrowroot, gingersnap cookies	Brownie or cake, unfrosted	Jam, jelly, honey	Muffin	Oatmeal granola bar	Pretzels, low fat	Sugar
½ cup	3 cup			3	2 in square	1 tablespoon	½ small	1 bar (28 g)	7 large/ 30 sticks	3 teaspoon

Beyond the Basics

Meal Planning for Healthy Eating and Diabetes Management

Meal Plan

TIME							
CARBOHYDRATES (grams / choices)							
GRAINS & STARCHES							
FRUITS							
MILK & ALTERNATIVES							
OTHER CHOICES							
VEGETABLES							
MEAT & ALTERNATIVES							
FATS							

VEGETABLES

Asparagus	Beans, yellow or green	Bean sprouts	Beets	Broccoli, cauliflower	Celery	Cabbage, greens	Carrots	Cucumber	Eggplant	
Mushrooms	Okra	Parsnips	Peas	Peppers	Salad vegetables	Snow peas	Squash	Tomatoes	Turnips	

MEAT & ALTERNATIVES

Cheese, skim <7% MF	Cheese, light <20% MF	Cottage cheese 1-2% MF	Egg	Fish, canned, drained	Fresh fish					Cheese, regular >20% MF
1 tablespoon	1 tablespoon	¼ cup	1 large	¼ cup	1 tablespoon					1 tablespoon
Hummus	Legumes	Meat, lean cut	Meat-game	Meat/poultry-ground, lean	Meat-organ and tripe				Meat, regular cut	Meat-ground, medium-regular
⅓ cup	½ cup	1 tablespoon	1 tablespoon	1 tablespoon	1 tablespoon				1 tablespoon	1 tablespoon
Meat prepared, low fat	Peameal/back bacon	Peanut butter	Poultry, skinless	Shellfish	Tofu, firm	Vegetarian meat alternatives			Meat prepared, regular fat	Poultry/wings, skin on
1 tablespoon	1 tablespoon	2 tablespoon	1 tablespoon	1 tablespoon	1.75x0.75 in (85 g)	1 tablespoon			1 tablespoon	1 tablespoon

FATS

Avocado	Bacon	Butter	Cheese, spreadable	Margarine, non hydrogenated	Mayonnaise, light	Nuts, seeds	Oil, canola or olive	Salad dressing, regular	Tahini	
⅛	1 slice	1 teaspoon	1 tablespoon	1 teaspoon	1 tablespoon	1 tablespoon	1 teaspoon	1 teaspoon	½ tablespoon	

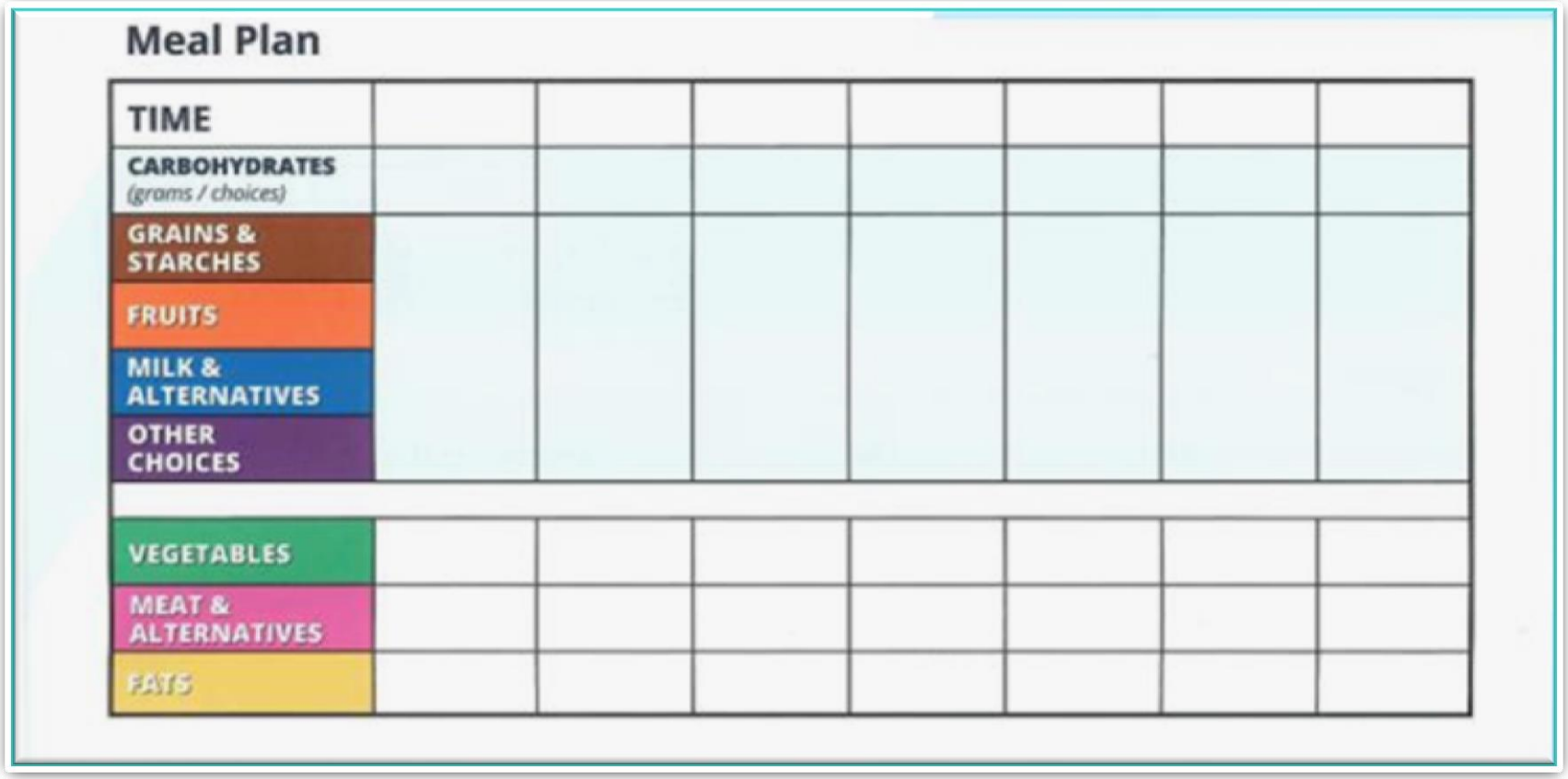
Beyond the Basics

- Each food ‘Choice’ contains approximately 15 grams of carbohydrate

- **Portion size is important**
- Groups containing carbohydrate are:
  - Grains and Starches
  - Fruits
  - Milk & Alternatives
  - Other Choices

Beyond the Basics

This needs to be filled out!



Meal Plan

TIME							
CARBOHYDRATES (grams / choices)							
GRAINS & STARCHES							
FRUITS							
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OTHER CHOICES							
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FATS							

CARBOHYDRATE CONTAINING FOOD

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GRAINS & STARCHES

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1.5x2.5 in		1 slice	¾ cup			¼ large	½ small	1.5x2.5 in	1 slice	½
Chapati, roti, tortilla, whole wheat	Corn, kernel	English muffin, whole grain	Pasta, couscous			Cereal, flaked unsweetened	Crackers, soda type	Croutons	French fries	Naan bread
1 (6 in)		½					7	⅜ cup	10	¼ (6 in)
Plantain mashed, sweet potato	Pita bread, whole wheat	Potatoes, boiled, baked	Rice, millet	Soup, thick type			Pancake, waffle	Pita bread, white	Pizza crust	Taco shells
½ cup	½ (6 in)	½ medium	⅓ cup				1 (4 in)	½ (6 in)	½ (12 in)	2 (5 in)

FRUITS

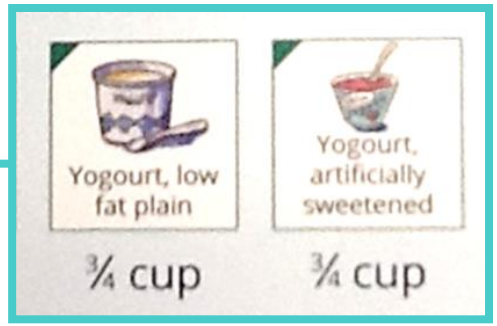
Apple	Applesauce, unsweetened	Banana	Blackberries, strawberries	Blueberries	Cherries	Grapes	Kiwi			Mixed dried fruit
1 medium		1 small	2		15	15	2 medium			
Mango	Melon	Orange	Peach	Pear	Pineapple	Plum	Canned fruit, in juice			Juice
½ medium		1 medium	1 large	1 medium	¾ cup	2 medium				

MILK & ALTERNATIVES

Chocolate milk, 1%	Evaporated milk, canned	Milk, low fat	Milk powder, skim	Soy beverage, flavoured	Soy beverage, plain	Soy yogourt, flavoured	Yogourt, low fat plain	Yogourt, artificially sweetened		
			4			⅓ cup	¾ cup	¾ cup		

OTHER CHOICES (sweet foods and snacks)

Milk pudding, skim no sugar added	Popcorn, air-popped low fat			Arrowroot, gingersnap cookies	Brownie or cake, unfrosted	Jam, jelly, honey	Muffin	Oatmeal granola bar	Pretzels, low fat	Sugar
	3			3	2 in square		½ small	1 bar (28 g)	7 large/ 30 sticks	3



Beyond the Basics

250 ml of:

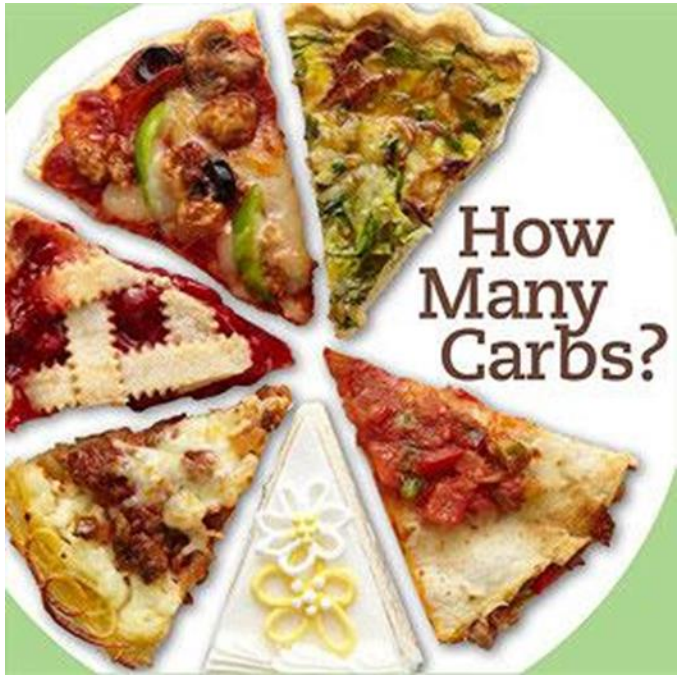
- Parsnips,
- peas and
- winter squash

are considered

1 Carbohydrate Choice

Know the food portions of the Beyond the Basics poster

Carbohydrate Counting



Carbohydrate Counting

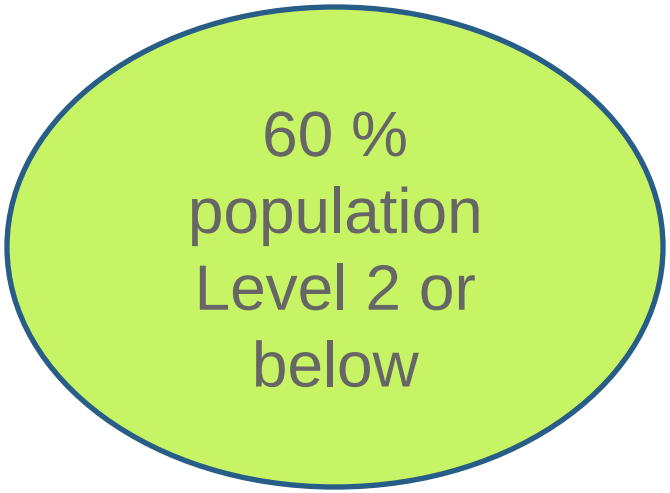
- Basic
  - Reading a label to identify 1 ‘Food Choice’
- Intermediate
  - Comparing the portion from a nutrient analysis to the budget of carbohydrate for a meal
- Advanced
  - Determining the amount of insulin to take based on the carbohydrate content of the meal

Carbohydrate Counting

- Type 1
- Insulin Pump
- Type 2 looking for tighter control
- Pregnancy

Health Literacy: Levels

1. Basic
2. Communicate and interact
   Extract information and apply
3. Critical Thinking
   Analyze information

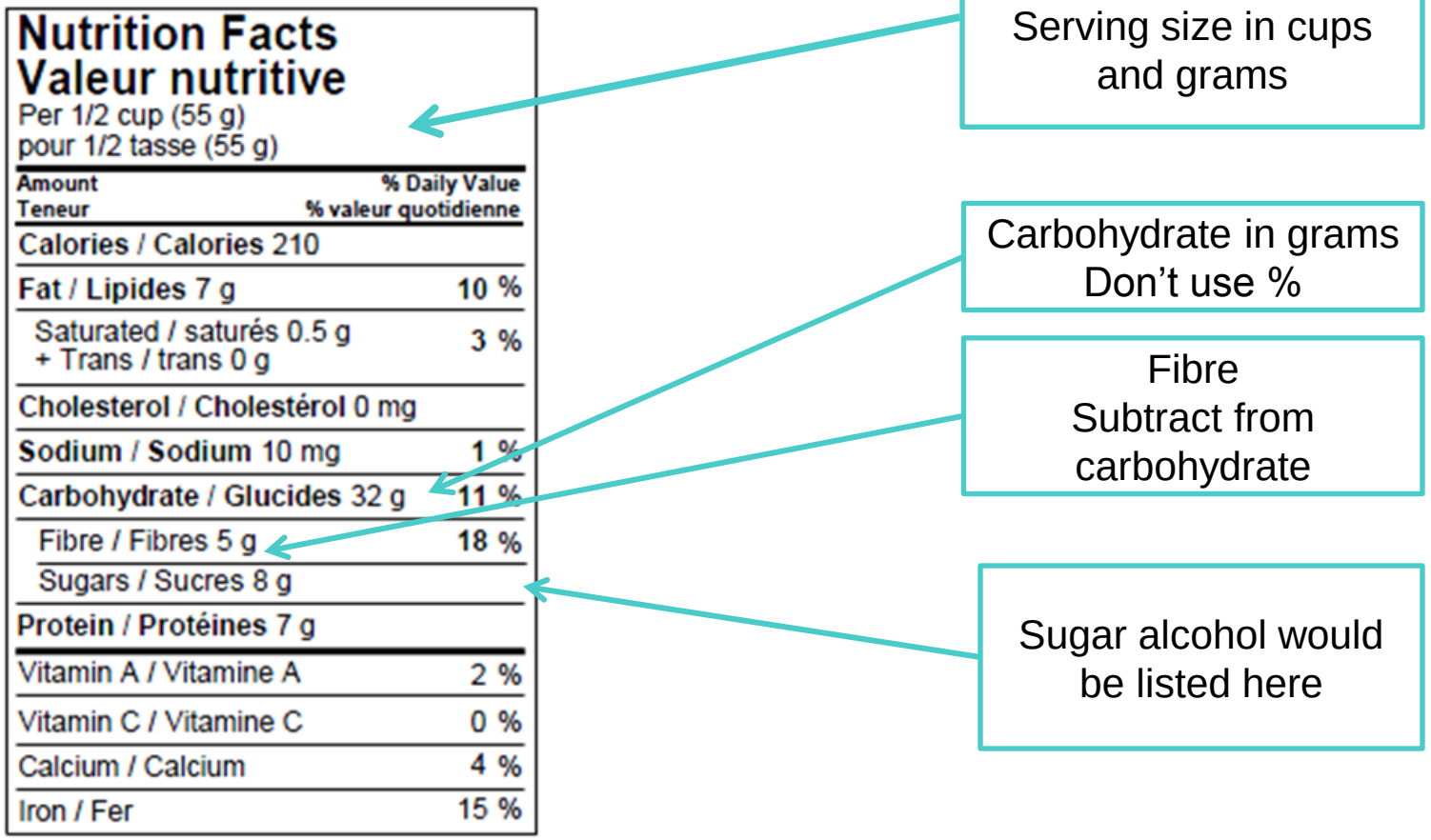


Carbohydrate Counting

Patient Requirements

- Literacy Skills
- Numeracy Skills
- Desire to do the work
- Equipment

Carbohydrate Counting: Labels



Carbohydrate Counting

- Literacy skills:
  - Read a label
  - Record written information
  - Follow instructions for record keeping
  - Use nutrient information from charts, books, internet, apps, etc.

Carbohydrate Counting

- Numeracy skills:
  - Read and write numbers
  - Do simple math calculations such as add and subtract numbers e.g. fibre from carbohydrate
  - Understand ratios
  - Utilize a ratio to calculate a number e.g. insulin dose
  - Be able to use and understand measuring cups, spoons and scales

Carbohydrate Counting

Portion Size

Nutrient Information available from:

- Food labels
- Nutrient content of common foods
- Calorie King
- My Fitness Pal
- Many apps

Carbohydrate Counting

500 Rule

Calculate Total Daily Dose (TDD) of insulin

500 divided by TDD =
 # grams of carbohydrate covered by 1 unit of rapid insulin

Carbohydrate Counting- 500 Rule

Sarah takes 20 units of SBE glargine and 30 units of lispro

Her TDD 20 + 30 = 50 units

Calculating her Insulin to Carbohydrate ratio using 500 Rule

500/50 = 10

Therefore 1 unit of insulin would cover 10 grams of carbohydrate

Carbohydrate Counting- 500 Rule

Sarah eats a sandwich and a small apple for lunch.

	Carbohydrate
Sandwich	30 g
Apple(small)	10 g
	40 g

1 unit of insulin covers 10 g carbohydrate

40/10 = 4

Sarah would take 4 units of insulin

Carbohydrate Counting - 500 Rule

Sample Question

Abdul uses aspart 10 units at breakfast, 6 units at lunch and 12 units at dinner. He takes 32 units of detemir at bedtime.

What would his insulin to carbohydrate ratio be using the 500 Rule?

1) 1:10
2) 1:15
3) 1:3
4) 1:8

Carbohydrate Counting- 500 Rule

Question

ses aspart 10 units at breakfast, 6 units at lunch
units at dinner. He takes 32 units of detemir at
.

he 500 Rule what would his insulin to
drate ratio be?

5

4) 1 :8

Insulin to Carbohydrate ratio

$$\frac{\text{\# grams carbohydrate}}{\text{\# units of rapid insulin}} = \text{1 unit of insulin per\_\_\_\_ gm CHO}$$

Insulin to Carbohydrate ratio

Lorne’s breakfast is 200 ml of oatmeal, 125 ml of milk, 30 ml raisins, 10 ml of brown sugar and a pinch of cinnamon. He takes 10 units of rapid insulin for this meal.

	Carbohydrate
Oatmeal	15 g
Milk	7.5 g
Raisins	7.5 g
Sugar	10 g
Total	40 g

Insulin to Carbohydrate ratio

Lorne's breakfast is 200 ml of oatmeal, 125 ml of milk, 30 ml raisins, 10 ml of brown sugar and a pinch of cinnamon. He takes 10 units of rapid insulin for this meal.

 # grams carbohydrate
_____ **= 1 unit of insulin per____ g Carbohydrate**
 # units of rapid insulin

$\frac{40}{10} = 4$

***I:C ratio would be 1:4**

Calculating Carbohydrate

Tanya's Lunch

250 ml rice, salad, chicken, 1 banana

Calculation:

	Carbohydrate(grams)
Rice	45
Salad	0
Chicken	0
Banana	20
Total	65

Calculating Carbohydrate

Tanya's I:C Ratio is 1:10
1 unit to cover 10 grams of carbohydrate

Lunch

250 ml rice, salad, chicken, 1 banana = 65 grams of carbohydrate

65 divided by 10 = 6

This person would take 6 units of insulin

Carbohydrate Counting

Tim Horton bagel and soup

Bagel 58 grams
Soup 24 grams
Total 82 grams

I:C ratio of 1 unit to cover 8 grams

This meal requires 10 units of insulin

Total Fibre 25-50 g/day

Insoluble

- Improved bowel habits

Total Fibre 25-50 g/day

Soluble

- Decrease pc meal blood glucose
- Decrease LDL
- Delayed gastric emptying

Sugar

Sucrose (fructose) 10% energy

Sugar

Calculations

Example

2000 calories

10% would be 200 calories

Carbohydrate has 4 calories per gram

To get grams divide calories by # grams

Divide by 4

200/4= 50

Sugar

50 grams of added sugar are allowed within 2000 calorie diet

Components of Food

Protein

Protein

- RDA 0.8 – 1.0 g/kg body weight
- Restricted in renal disease
- Most protein food contain fat
  - (meat and alternatives, milk, nuts)

- Encourage meat alternatives
- Low fat dairy
- Low fat meat selections

Protein

Fatty Fish 2-3 times/week

- Salmon, tuna, sardines, trout

Components of Food

Fat

Total Fat 20- 35 %

- Saturated less than 7% energy
- Trans fats: minimal
- Polyunsaturated: limit to 10% include omega 3
- Monounsaturated preferred

Calculating Percentage of Fat

2000 calories

- 30% fat = 600 calories
- Divide 600 by 9
- Fat has 9 calories per gram
- 600/9 = 66

66 grams of fat

Strategies for Nutrition Management

Prediabetes
Type 1
Type 2

Prediabetes

Reduce the risk of diabetes and potential risk of cardiovascular disease

Healthy Eating

Weight loss of 7% of body weight

Exercise (moderate) 150 minutes/week

Decreased incidence of diabetes by 58% in Diabetes Prevention Program (DPP)

Type 1

- Insulin to match carbohydrate
- Prevent hypoglycemia
- Adjust for activity
- Sick day management to prevent hypo or hyperglycemia

Type 2

People with type 2 should maintain regularity in timing and spacing of meals to optimize glucose control

Type 2

- Aim for weight reduction due to obesity and insulin resistance
- Reduction in saturated and trans fats
- Reduction in energy to promote weight maintenance or loss

Nutrition Strategies

No perfect combination of food types!

Food Intake is Individualized

- Carbohydrate 45-60%
- Protein 15-20%
- Fat 20-35%

Mediterranean Diet

- Fresh Vegetables
- Fresh Fruit
- Whole Grains
- Wine in moderation
- Fish
- Legumes/beans
- Nuts for snacks
- Olive oil 4 Tbsp/day (1/4 c)
- Red or processed meat is limited

Teaching Tools

- Just the Basics
- Diabetes Food Guide

DIABETES CANADA

Just the basics

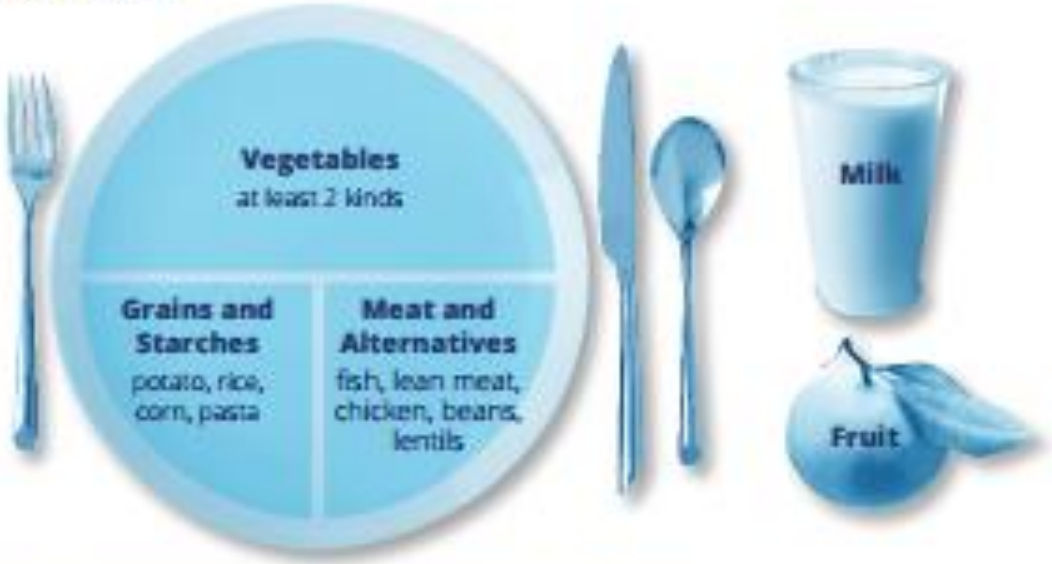
Diabetes is a condition in which your body cannot properly use and store food for energy. The fuel that your body needs is called glucose, a form of sugar. Glucose comes from foods such as fruit, milk, some vegetables, starchy foods and sugar.

To control your blood glucose you will need to eat healthy foods, be active and you may need to take pills and/or insulin.

Here are some tips to help you until you see a registered dietitian.

Tips:	Reasons:
Eat three meals per day at regular times and space meals no more than six hours apart. You may benefit from a healthy snack.	Eating at regular times helps your body control blood glucose levels.
Limit sugars and sweets such as sugar, regular pop, desserts, candies, jam and honey.	The more sugar you eat, the higher your blood glucose will be. Artificial sweeteners can be useful.
Limit the amount of high-fat food you eat such as fried foods, chips and pastries.	High-fat foods may cause you to gain weight. A healthy weight helps with blood glucose control and is healthier for your heart.
Eat more high-fibre foods such as whole grain breads and cereals, lentils, dried beans and peas, brown rice, vegetables and fruits.	Foods high in fibre may help you feel full and may lower blood glucose and cholesterol levels.
If you are thirsty, drink water.	Drinking regular pop and fruit juice will raise your blood glucose.
Add physical activity to your life.	Regular physical activity will improve your blood glucose control.

Plan for healthy eating

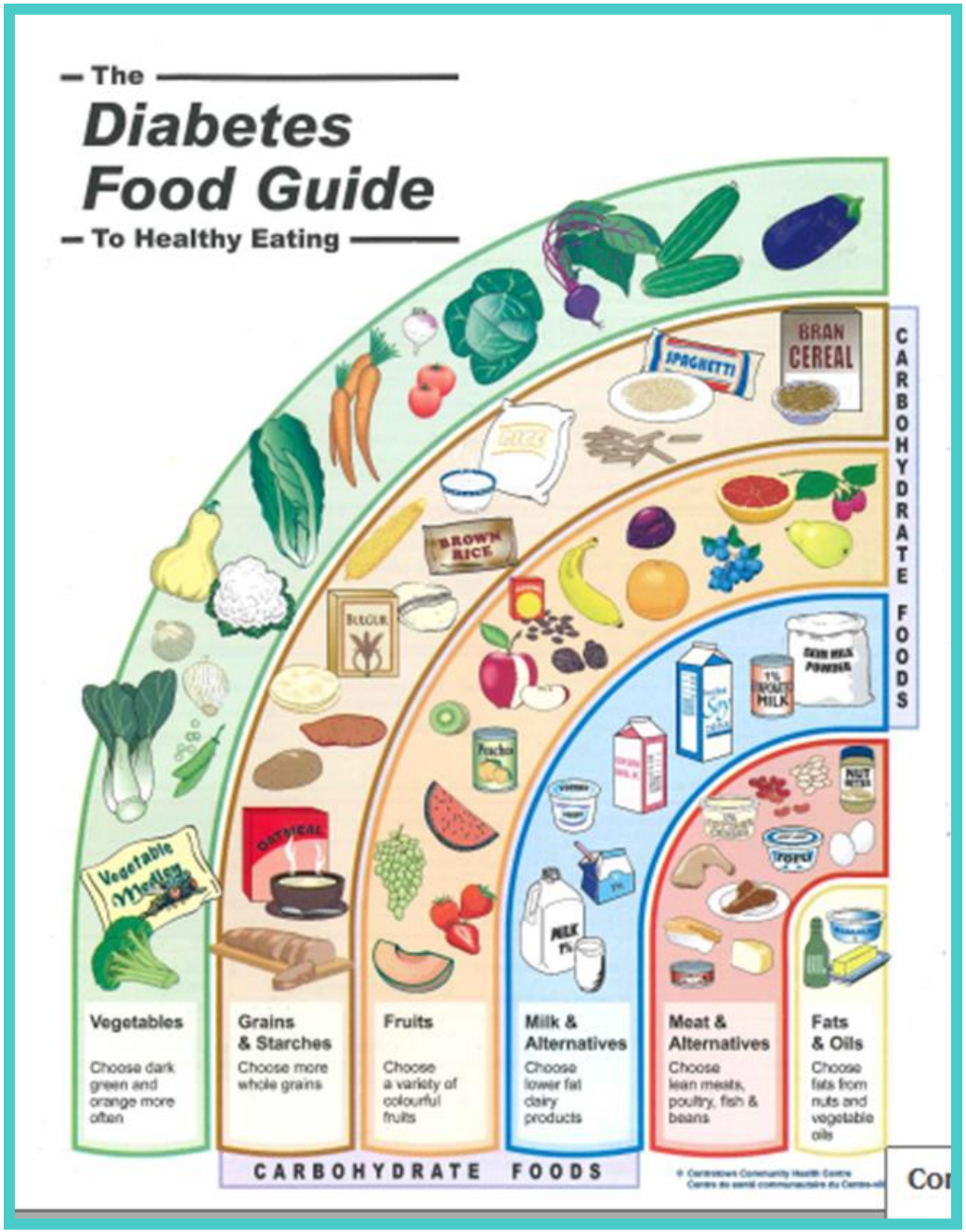


- Eat more vegetables. These are very high in nutrients and low in calories.
- Choose starchy foods such as whole grain breads and cereals, rice, noodles, or potatoes at every meal. Starchy foods are broken down into glucose, which your body needs for energy.
- Include fish, lean meats, low-fat cheeses, eggs, or vegetarian protein choices as part of your meal.
- Have a glass of milk and a piece of fruit to complete your meal.
- Alcohol can affect blood glucose levels and cause you to gain weight. Talk to your healthcare professional about whether you can include alcohol in your meal plan and how much is safe.


Non-Starchy Vegetables
Lean Proteins
Starchy Vegetables or Grains
Low-Fat Dairy
&
Fruit

Just the Basics- Concepts

- Eat 3 meals per day
- No more than 6 hours without eating
- Limit sweets
- Limit high fat foods
- Increase high-fibre foods
- Drink water
- Include physical activity


The
Diabetes
Food Guide
To Healthy Eating
BRAN CEREAL
SPAGHETTI
BROWN RICE
BULGUR
Peaches
1% MILK
Vegetable Medley
OATMEAL
CARBOHYDRATE FOODS
Vegetables
Choose dark green and orange more often
Grains & Starches
Choose more whole grains
Fruits
Choose a variety of colourful fruits
Milk & Alternatives
Choose lower fat dairy products
Meat & Alternatives
Choose lean meats, poultry, fish & beans
Fats & Oils
Choose fats from nuts and vegetable oils
CARBOHYDRATE FOODS

Other Aspect of Nutrition Strategies

Sweeteners
Alcohol
Glycemic Index

Sweeteners

Sweeteners		Sugar Alcohols
	Acceptable Daily Intake (ADI) mg/kg body weight	*Sugar alcohols do not have Acceptable Daily Intake (ADI). Large amounts (>10g/day) can cause diarrhea, cramps, gas and bloating.
Acesulfame potassium	15	Erythritol
Aspartame	40	Hydrogenated starch hydrolysates
D-tagatose	80	Isomalt
Neotame	2	Lactitol
Saccharin	5	Maltitol
Stevia glycosides	4	Maltitol syrup
Sucralose	9	Mannitol
Thaumatin	0.9	Sorbitol
		Sorbitol syrup
		Xylitol

DIABETES CANADA

Sugars and Sweeteners

Sweeteners that INCREASE blood glucose levels

Sweetener	Forms & uses	Other things you should know...
Sugars (Some examples)		
• Agave syrup • Barley malt • Brown rice syrup • Brown sugar • Corn syrup • Dextrose • Fructose • Fruit juice concentrates • Glucose • High fructose corn syrup • Honey • Icing sugar • Invert sugar • Lactose • Maltodextrins • Maltose • Maple syrup • Molasses • Sucrose • White sugar	• Used to sweeten foods and beverages • May be found in medications	• Sugars are carbohydrates that can affect your blood glucose, weight and blood fats. • There is no advantage to those with diabetes in using one type of sugar over another. • Sugars may be eaten in moderation by people with diabetes. Up to 10% of the days calories can come from added sugar. Their effect on blood glucose levels will vary. Talk to your dietitian about how to fit sugars into your meal plan.

Sweeteners that DON'T INCREASE blood glucose levels

Sweetener	Forms & uses	Other things you should know...
Sugar Alcohols		
• Hydrogenated starch hydrolysates (HSH) • Isomalt • Lactitol • Maltitol • Mannitol • Palatinit • Polydextrose • Polyol syrups • Polyols • Sorbitol • Xylitol	• Used to sweeten foods labelled "sugar free" or "no added sugar" • May be found in cough and cold syrups and other liquid medications (e.g. antacids)	• Sugar alcohols are neither sugars nor alcohols. Small amounts are found naturally in fruits and vegetables. They can also be manufactured. • They are only partly absorbed by your body, have fewer calories than sugar and have no major effect on blood glucose. • Check product labels for the number of grams of sugar alcohols per serving. If you eat more than 10 grams of sugar alcohols a day, you may experience side effects such as gas, bloating or diarrhea. • Talk to your dietitian if you are carbohydrate counting and want to use foods sweetened with sugar alcohols.

Health Canada has approved the following sweeteners as safe if taken in amounts up to the Acceptable Daily Intake (ADI). These sweeteners may also be used in medications. Please read the label. Ingredients may change. New products may be available.

Sweetener	Common/ Brand name	Forms & uses	Other things you should know...
Acesulfame Potassium (Ace-K)	Not available for purchase as a single ingredient	• Added to packaged foods and beverages only by food manufacturers	• Safe in pregnancy* • ADI=15 mg/kg body weight per day For example, a 50 kg (110 lb) person could have 750 mg of Ace-K per day. One can of diet pop contains about 42 mg of Ace-K.
Aspartame	• Equal® • NutraSweet® • Private label brand	• Available in packets, tablets or granulated form • Added to drinks, yogurts, cereals, low calorie desserts, chewing gum and many other foods • Flavour may change when heated	• Safe in pregnancy* • ADI=40 mg/kg body weight per day For example, a 50 kg (110 lb) person could safely have 2000 mg of aspartame per day. One can of diet pop may contain up to 200 mg of aspartame.
Cyclamate	• Sucaryl® • Sugar Twin® • Sweet'N Low® • Private label brand	• Available in packets, tablets, liquid and granulated form • Not allowed to be added to packaged foods and beverages • Flavour may change when heated	• Safe in pregnancy* (Be cautious of exceeding the ADI) • ADI=11 mg/kg body weight per day For example, a 50 kg (110 lb) person could have 550 mg of cyclamate per day. One packet of Sugar Twin® contains 264 mg of cyclamate.
Saccharin	• Hermesetas®	• Available as tablets • Not allowed to be added to packaged foods and beverages	• Safe in pregnancy* • ADI=5 mg/kg body weight per day For example, a 50 kg (110 lb) person could have 250 mg of saccharin per day. One tablet of Hermesetas® contains 12 mg of saccharin. • Available only in pharmacies
Sucralose	• Splenda®	• Available in packets or granulated form. Added to packaged foods and beverages • Can be used for cooking and baking	• Safe in pregnancy* • ADI=9 mg/kg body weight per day For example, a 50 kg (110 lb) person could have 450 mg of sucralose per day. One packet of Splenda® contains 12 mg of sucralose; one cup (250 mL) contains about 250 mg of sucralose.
Steviol glycosides	Stevia-based sweeteners such as: • Stevia • Truvia • Krisda • Pure Via	• Table top sweeteners • Added to drinks, breakfast cereals, yogurt, fillings, gum, spreads, baked products, snack foods	• Safe in pregnancy* • ADI= 4mg /kg body weight per day For example a 50kg (110 lb) person could have 200mg of Stevia per day. A 30g portion of breakfast cereal may contain 11mg of steviol glycosides

*For nutritional reasons, pregnant women should not consume excessive products containing artificial sweeteners, since such foods could replace more nutritious foods.

DIABETES CANADA **diabetes.ca | 1-800 BANTING (226-8464)**

Diabetes Canada is making the invisible epidemic of diabetes visible and urgent. Eleven million Canadians have diabetes or prediabetes. Now is the time to End Diabetes - its health impacts as well as the blame, shame and misinformation associated with it. Diabetes Canada partners with Canadians to End Diabetes through education and support services, resources for health-care professionals, advocacy to governments, schools and workplaces, and, funding research to improve treatments and find a cure.

Know the aceptable daily intake for aspartame and sucralose.

Alcohol

- Beer: 360 ml (12 fl oz) regular strength(5 % alcohol)
- Spirits: 45 ml (1.5 fl oz) (40% alcohol)
- Wine: 150 ml (5 fl oz) (12% alcohol)

Alcohol

- Men 15 drinks/week
  - No more than 3 per day
- Women 10 drinks/week
  - No more than 2 per day

Alcohol and Type 1

Caution due to the risk of Hypoglycemia

- Symptoms can be mistaken for being drunk
- Hypoglycemia can be delayed up to 24 hours
- Do not take insulin for the carbohydrate in alcoholic beverages

To prevent Hypoglycemia Risk

- Have food when having alcohol
- Decrease insulin
- Monitor blood glucose (especially before bed and during the night)
- Tell someone you have diabetes

Alcohol and Type 2

- Hypoglycemia if they use secretagogues or insulin
- Concern if they are a poor eater or miss meals
- Contributes to weight gain
- Increases blood pressure and triglycerides

Glycemic Index

LOW GI (55 OR LESS) *† Choose most often ✓✓✓	MEDIUM GI (56-69) *† Choose more often ✓✓	HIGH GI (70 OR MORE) *† Choose less often ✓
BREADS: 100% stone ground whole wheat Heavy mixed grain Pumpernickel	**BREADS:** Whole wheat Rye Pita	**BREADS:** White bread Kaiser roll Bagel, white
CEREAL: All Bran™ Bran Buds with Psyllium™ Oat Bran™	**CEREAL:** Grapenuts™ Puffed wheat Oatmeal Quick oats	**CEREAL:** Bran flakes Corn flakes Rice Krispies™
GRAINS: Barley Bulgar Pasta/noodles Parboiled or converted rice	**GRAINS:** Basmati rice Brown rice Couscous	**GRAINS:** Short-grain rice
OTHER: Sweet potato Yam Legumes Lentils Chickpeas Kidney beans Split peas Soy beans Baked beans	**OTHER:** Potato, new/white Sweet corn Popcorn Stoned Wheat Thins™ Ryvita™ (rye crisps) Black bean soup Green pea soup	**OTHER:** Potato, baking (Russet) French fries Pretzels Rice cakes Soda crackers

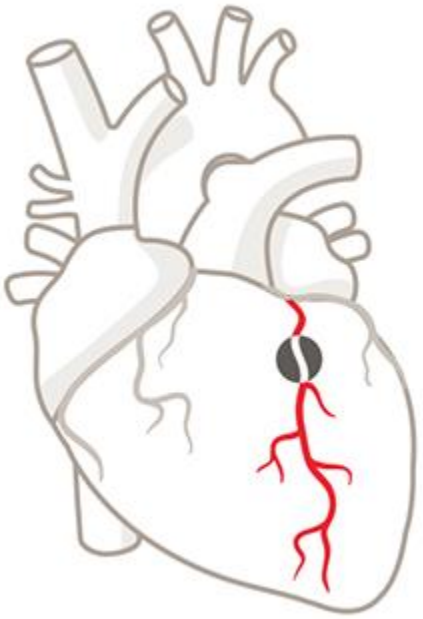
Glycemic Index

LOW GI (55 OR LESS) *† Choose most often ✓✓✓	MEDIUM GI (56-69) *† Choose more often ✓✓	HIGH GI (70 OR MORE) *† Choose less often ✓
BREADS: 100% stone ground whole wheat Heavy mixed grain Pumpernickel	**BREADS:** Whole wheat Rye Pita	**BREADS:** White bread Kaiser roll
CEREAL: All Bran™ Bran Buds with Psyllium™ Oat Bran™	**CEREAL:** Grapenuts™ Puffed wheat Oatmeal Quick oats	**CEREAL:** Bran flakes Corn flakes Rice Krispies™
GRAINS: Barley Bulgar Pasta/noodles Parboiled or converted rice	**GRAINS:** Basmati rice Brown rice Couscous	**GRAINS:** Short-grain rice
OTHER: Sweet potato Yam Legumes Lentils Chickpeas Kidney beans Split peas Soy beans Baked beans	Potato, new/white Sweet corn Popcorn Stoned Wheat Thins™ Ryvita™ (rye crisps) Black bean soup Green pea soup	**OTHER:** Potato, baking (Russet) French fries Pretzels Rice cakes Soda crackers

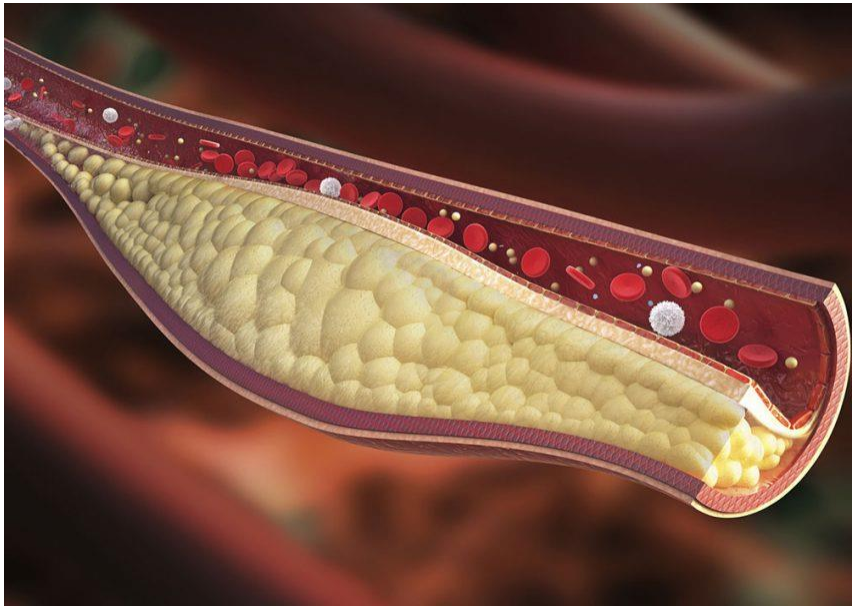
Complications and Comorbidities

Dyslipidemia
Hypertension
Gastroparesis
Renal
Celiac

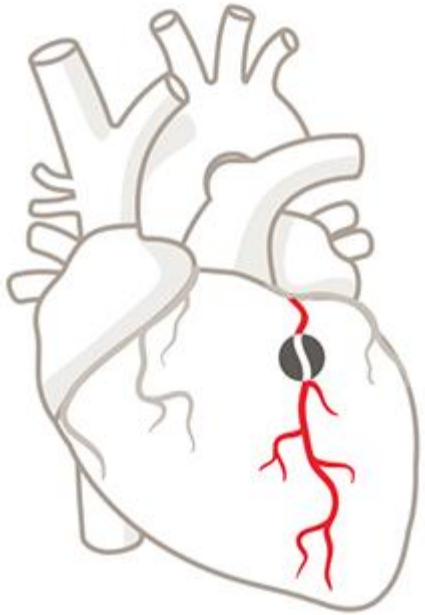
Dyslipidemia



- Patient's Goal
  - ↓Weight
  - ↑Physical Activity
  - D/C Smoking



Dyslipidemia

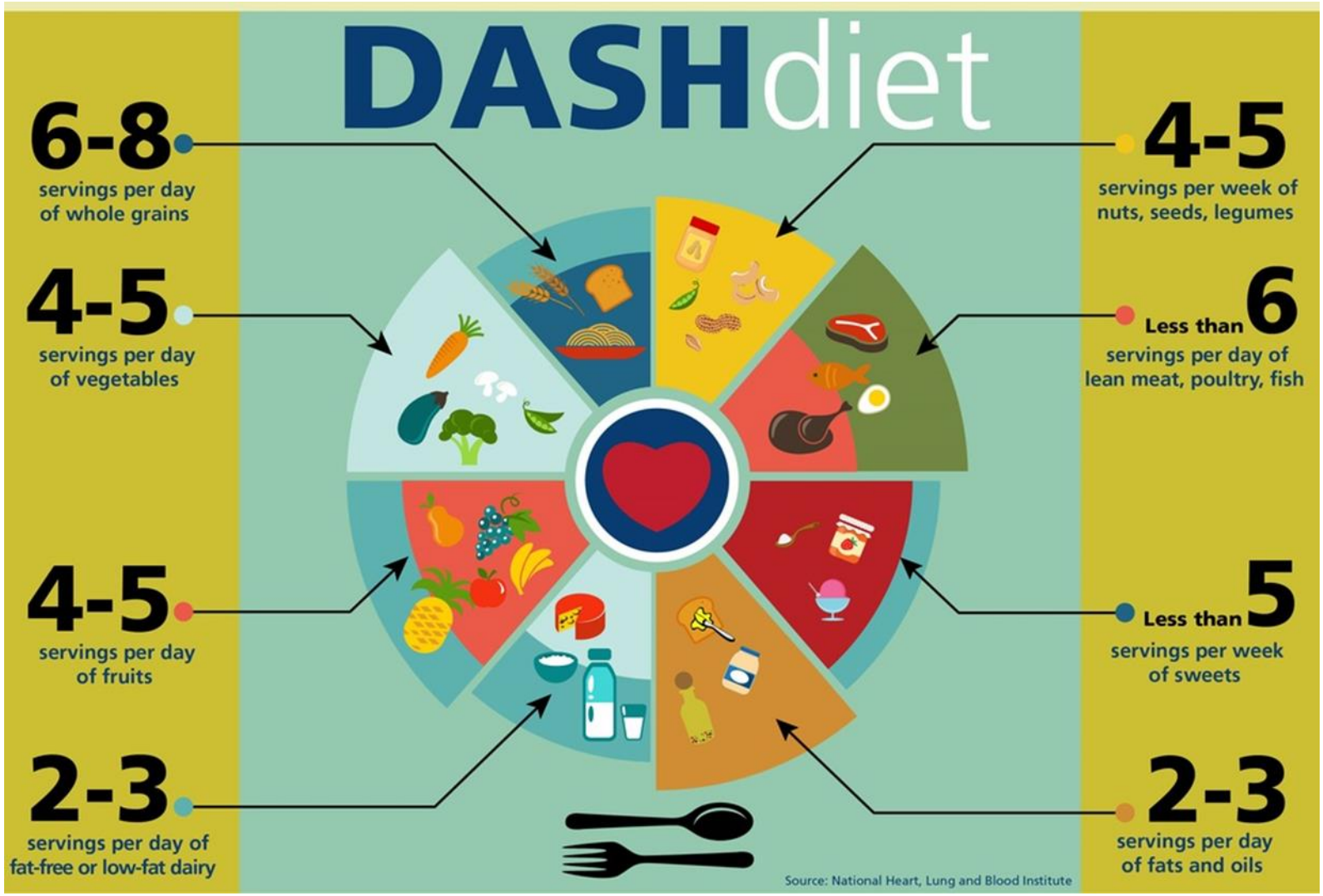


- Dietary Interventions
  - ↑Fibre
  - ↓Saturated Fat
  - ↑Monounsaturated Fat
  - ↓Dietary Cholesterol
  - Omega 3
  - Plant sterols
  - ↑Soy products

Hypertension

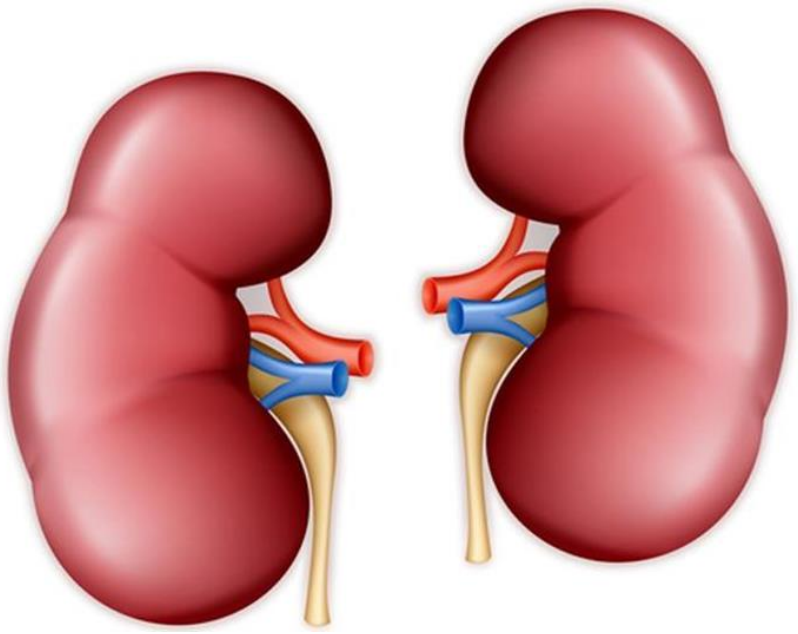
	Change in Systolic Blood Pressure mmHg
DASH	**8-14**
Sodium restriction	**2-8**
Alcohol reduction	**2-4**
Weight reduction (10 kg)	**5-20**
Increased physical Activity	**6-9**

DASH Dietary Strategies to Stop Hypertension



Know basic differences between the DASH diet and the Mediterranean diet

Kidney Disease

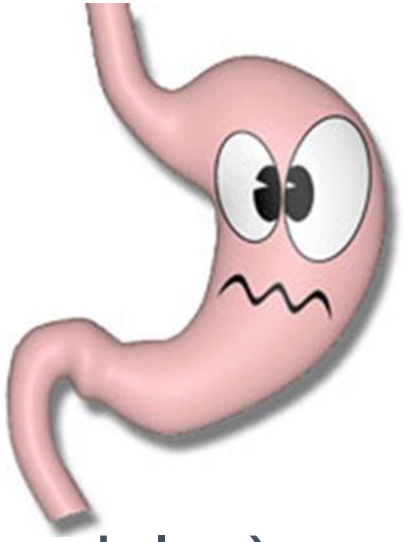


Complex Diet

- Potassium
- Sodium
- Phosphorus
- Protein
- Fluid

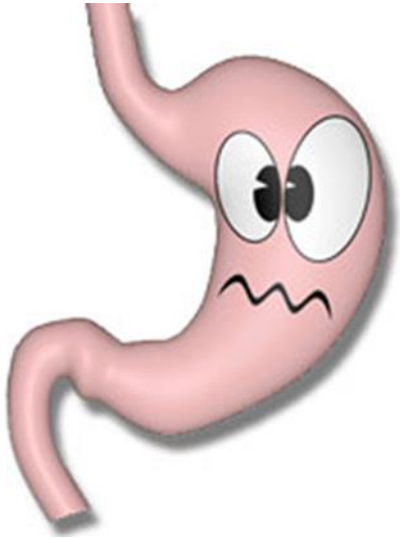
Blood Pressure and blood glucose control are important!

Gastroparesis



- Type of neuropathy
- Delayed gastric emptying (1-2 hour delay)
- Postprandial hypoglycemia
- Underdiagnosed
- Both Type 1 & Type 2

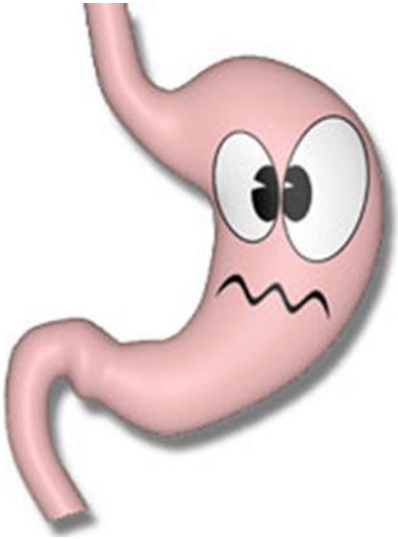
Gastroparesis



Symptoms:

- Nausea
- Vomiting
- Early Satiety
- Bloating
- Abdominal Pain
- Postprandial fullness
- Erratic Blood Glucose

Gastroparesis



Dietary Recommendations

- Low fat
- Low fibre
- Small meals
- Liquid based meals
- Avoid alcohol
- Avoid carbonated beverages

Celiac Disease

*Gluten FREE diet

- No wheat, rye, barley
- Oats can be used cautiously
- Gluten is HIDDEN in many
- Foods e.g. soy sauce

Long Term Risk:
Malabsorption of iron & calcium

Strategies for Sick Day Management

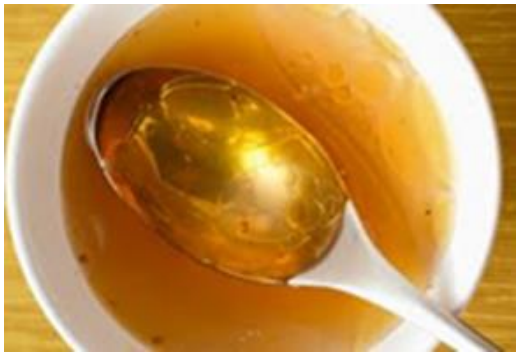
Sick Day Management

- Maintain Blood glucose:
  - preventing hyperglycemia (DKA)
  - Hypoglycemia
- Prevent dehydration

Sick Day Management

Convert solids to fluids to maintain carbohydrate intake

Contains 10 gm Carbohydrate	
Apple Juice	75 ml
Cranberry Juice(white)	50 ml
Cranberry Cocktail	75 ml
Cranberry Cocktail low cal	250 ml
Gatorade	200 ml
Grape Juice(white)	50 ml
Powerade	200 ml
Regular Jello	50 ml
Regular Gingerale	125 ml
Popsicle	1 stick



Sick Day Management

Blood Glucose mmol/L	Blood Ketones mmol/L	Urine Ketones	Action Required My rapid insulin is_____
< 3.9	negative		Decrease pre-meal insulin
4.0- 16.0	<0.6	+ or -	Usual insulin dose
4.0 – 16.0	≥ 0.6	Small light purple +2	Add an Extra 10% in addition to pre-meal dose
>16.0	<0.6	+ or -	Add an Extra 10% in addition to pre-meal dose
>16.0	≥0.7- 1.4	Moderate purple +3	Add an Extra 15% in addition to pre-meal dose
>16.0	≥1.5 – 3.0	Large dark purple +3	Add an Extra 20% every 4 hours in addition pre-meal dose Contact your Dr. or healthcare team as soon as possible.

Sick Day Management

Call your Health Care Team if you:

- Vomit more than twice in 12 hours
- Have severe stomach pain
- Have a rapid heart beat
- Have rapid breathing
- Have fruity smelling breath (ketones)
- Have difficulty staying awake

Contact me at: wendyg@langs.org

The competencies for the 2018 exam have changed from previous years. There is now more emphasis on carbohydrate counting, treatment of comorbidities and complications and continued emphasis on sick day management.

The objectives of this webinar are to give you an overview of the topics. By no means does it provide all the information you need to know. I have included slides with quotations to identify topics that have been on the exam in previous years.

The goals of nutrition therapy are taken from the Clinical Practice Guidelines. We should aim for blood glucose levels as close to the non-diabetic range, while limiting the risk of hypoglycemia. Blood lipids and blood pressure should be controlled. The quality of life need to be maintained or improved. Of course, we want to limit complications. Like all other aspects of diabetes, the focus should be more than just blood glucose.

Sometimes it is good to step back and remember “Food is to be Eaten and Enjoyed!” We do not want to impose undue restrictions without there being sound scientific evidence of the benefit. Food is much more than the composition of nutrients. It has meaning, it can be tied to emotions, it’s involved in family rituals, social occasions and celebrations. Not to mention, people have personal preferences that are reflected in their food intake. **WE EAT FOOD not nutrients!**

As we look at this Ethiopian family, we can contrast some of their food customs to the previous family we saw. Our assessment of a person from either family would include anthropometrics, review of lab data, medications and medical history. However, in completing our nutritional assessment we would investigate a range of topics:

- What are the families eating habits- in this case they eat from a communal dish, not an individual portion on a plate
- What is the food availability or security
- What are the cultural food practises
- Are there religious food restrictions, for example fast days
- What is the attitude towards health and disease
- Does food play a role in their health
- Is there family support for the individual with diabetes and their needs for food & medication
- What are the family stresses, individual’s stresses
- Is there disordered eating
- Alcohol etc

Once we have gained information from our assessment we consider the aspects we want to look at.

- Nutrition adequacy
- Eating Patterns
- Carbohydrate Intake- does the food match the action of the medication
- Is there potential for hypoglycemia

Then the most important aspect ***What is the patients goal!***

This should give you a good idea of some of the aspects involved in the nutrition assessment.

Carbohydrate has a big focus in the new competencies. So let’s consider its sources and how it effects the blood glucose.

All carbohydrate foods are broken down to create sugar in the blood. It doesn’t matter the source. A carb is a carb is a carb.

Carbohydrate is the main fuel of the body and emphasis is on CONTROL not restriction. The Recommended Daily Allowance for most adults would be 130 grams. This is the amount required to supply the brain, essential organs and nerves. To stay alive, the body does have backup mechanism for overnight and during times of starvation, but the brain needs glucose!

If you are looking at food labels, carbohydrate also includes sugar and fibre. Fibre does not affect blood glucose it is the exception on the carbohydrate list.

One of the challenges is to consider **Quality** versus **Quantity**. A sandwich, piece of fruit and glass of milk have the same 75 grams of carbohydrate as a large fries. But clearly, one has better quality than the other.

How does the client look at carbohydrate? Generally they are confused like the gentleman on the slide. This is often terminology they are not familiar with. Knowledge of carbohydrate can be on a continuum from simple awareness e.g. the rice has carbohydrate, to advanced knowledge which dictates the amount of insulin used for a meal. In this case the 625 ml of spaghetti and 200 ml of sauce would have 90 grams of carbohydrate and the person would take the amount of insulin based on their insulin to carbohydrate ratio.

The Beyond the Basics poster is often used to teach basic portions of carbohydrate containing foods. It is designed with the carbohydrate foods on the left and other components on the right.

One square is one portion or one ‘choice’. They can be exchanged for any other portion on the poster. It is important to teach portion sizes. The carbohydrate containing groups are identified here. Grains and Starches, Fruits, Milk and Alternatives and the Other choices.

The grid on the top right of the poster needs to be completed to give the client a carbohydrate budget or guideline. To use this tool people require transfer skills, to translate the number of servings from the cart to selecting squares or portions for a meals. It is surprising the number of clients that have difficulty with this concept.

You need to know the portions of carbohydrate foods for the exam. A few tips:

- Rice is 1/3 cup(75 ml) cooked
- Strawberries or blackberries are 2 cups (500 ml), while other berries are 1 cup (250 ml)
- Yogurt both plain and with sweetener are ¾ cup (175ml)

Some vegetables count as carbohydrate choices when eaten in larger amounts-peas, parsnips and winter squash.

Note 8 mini carrots have only 5 g available carbohydrate so would not be counted, 250 ml cooked carrots have 10 grams of available carbohydrate

On the exam all portions are in metric!

Carbohydrate Counting is usually in the realm of the dietitian….they are the foodies of the team and are often the professional who calculates the ‘insulin to carbohydrate ratio’ based on food and blood glucose records.

There are various levels of carbohydrate counting.

Basic is the ability to look at a label and determine the portion that would have 15 grams of carbohydrate and therefore be one choice.

Intermediate level would be knowing the carbohydrate target for a meal. Then the person could add up different foods based on the amount of carbohydrate to reach the target. It might also be considering the nutrient analysis from a package, menu or app to be within their budget, keeping the medication consistent.

The advanced level would be adjusting the medication e.g. insulin to the amount of carbohydrate they would eat at the meal, based on an insulin:carb ratio.

Carbohydrate counting is appropriate for people with type 1 diabetes- but not all people with type 1 do carb counting. For those on a pump carb counting is essential. The ratios are programmed into the pump and before each meal or snack the person enters in the amount of carbohydrate and the pump determines the insulin required. Many people with type 2 diabetes look to carbohydrate for tighter control often when using insulin. Carbohydrate counting is very useful for pregnant ladies as they can adjust their food intake and insulin to their appetite without compromising blood glucose control.

When considering our teaching strategies and particularly carbohydrate counting, it is useful to consider a person’s health literacy. The basic level indicates a person can read information. The second level is the ability to extract the information and apply it. For instance ‘mix 30 ml of powder with 250 ml of water and stir, before drinking’ or ‘ take 2 tablets in the morning on an empty stomach’. The 3rd level requires analysis. For instance, a person reviewing a blood glucose log and recognizing the post prandial blood glucose is elevated on a day after a bagel but not after oatmeal. Then they adjust the insulin for the increased carbohydrate of the bagel.

In the Waterloo region 60% of the population are at level 2 or below. The numbers are even smaller when we look at the elderly.

We really need to consider health literacy for both reading and numeracy ability before embarking on teaching carb counting. It is important to ensure the person has the equipment scales, measuring cups, nutrient content information or apps and are willing to do the work.

This slide identifies the areas on a label you need to know when reading.

As the expression goes….Size matters when it comes to carb counting!

Just a few places people can access nutrition information, however be careful not all apps allow the user to adjust the portion size, some have very small databases and some use only weights. How much is 100 grams without a scale?

Many textbooks use the ‘500 Rule’ for calculating insulin to carbohydrate ratios. This presumes the person is on the correct amount of insulin and blood glucose is within target. You require the amount of all insulins to calculate the TDD- total daily dose. Five hundred is divided by the TDD to give the grams of carbohydrate covered by 1 unit of insulin. It is normally written insulin:carb e.g. 1:10.

In this example Sarah’s total daily dose would be 20 + 30= 50 units. Doing the calculations 500/50=10.

Sarah’s ratio would be 1:10. Lots of people use a 1:10 ratio for the ease of calculations, however they may not actually have the correct ratio.

How would we apply this? See slide for formula.

Sarah’s lunch has 40 grams of carbohydrate, dividing by the ratio: 40/10=4

Sarah would need 4 units of insulin for this meal.

Just a reminder that you cannot take a calculator into the exam so practise your math skills.

Here is one for you to try. What would be the ratio?

1:8 is correct . 500/60= 8.3

The alternate method for calculating an insulin carbohydrate ratio is based on food records, blood glucose and insulin doses. The ratio at each meal may be different. The client would normally keep a record of food intake (being specific with portions and carbohydrate content), insulin dose and blood glucose results. This can be anywhere from a few days to a few weeks. The dietitian will normally review the food record and calculate the amount of carbohydrate for each meal. If the blood sugars are outside target, the data is disregarded.

The grams of carbohydrate for that meal are then divided by the insulin taken at that time. This gives you how many grams of carbohydrate will be covered by 1 unit of insulin.

It is usually written as Insulin:Carbohydrate and a ratio 1:6 for example.

Here is an example. Lorne’s breakfast is listed. Adding up all the carbohydrate of that me3al, he consumes 40 grams.

He took 10 units of rapid insulin for that meal. The carbohydrate is divided by the insulin, 40/10=4 or a **ratio of 1:4.**

How would you use this ratio? Tanya’s lunch carbohydrate is listed.

Her ratio is 1:10 (for ease of calculations). Her lunch had 65 grams of carbohydrate. Divide that by the 10.

65/10= 6.5.

If she was on a pump she could take 6.5 units of insulin, or if she had a pen which gave half units. If she had a regular pen she would take 6 units.

Here is another example of a Tim Hortons lunch. This person uses a ratio of 1:8.

The meal has 82 grams of carbohydrate, so 82 divided by 8 is 10 units.

82/8=10 This person would take 10 units of insulin for this meal.

Fibre is within the realm of carbohydrate. It is sometimes an indicator of the quality of the food, even though it does not contribute to blood glucose. The recommendation for fibre is 25-50 grams/day, similar to the regular population. It should be a combination of both types insoluble and soluble. Insoluble fibre is known for keeping the bowels functioning properly, examples being bran, the stringy bits in celery, the membranes and skins on fruit and the tough stalks on broccoli. It draws water into the bowel and helps keep them moving.

Soluble fibre creates a sticky gel in the digestive system, and slows the release of glucose into the blood stream. By slowing the digestion it gives a sense of satiety. It is beneficial in lowering LDL cholesterol. Examples include all types of legumes, barley, oats and some fruits.

For many years SUGAR was not allowed for people with diabetes. In actual fact, sugar is just another form of carbohydrate. According to the Clinical Practice Guidelines, sugar (sucrose) can make up to 10% of total calories, without affecting blood glucose control. So what does that look like…..

This calculation is for your understanding. On occasion a question like this appears on the exam. Using an example of a 2000 calorie diet, 10% could be sugar. 10% of 2000 = 200 calories. Any time we do calculation with calories we refer back to the fact carbohydrate has 4 calories per gram. We want to know how many grams of sugar you can use.

200 calories divided by 4 (calories per gram) = 50

So a 2000 calorie diet could have 50 grams of sugar incorporated into the foods, such as cereal, cookies etc. We generally don’t calculate this number.

Protein is required to build and repair cells. There is some debate as to the actual amount of protein we require. At the present time the guidelines we use suggest 0.8-1.0 g/kg body weight for most adults. In renal disease, protein is restricted generally below .8g/kg. The focus is on low fat choices as most sources of protein also contain fat.

Protein is generally not considered to contribute to blood glucose.

The exception to using low fat protein sources would be incorporating the fatty cold water fish such as salmon and tuna which provide omega 3 fats beneficial for elevated triglycerides.

Fat continues to be a controversial topic as research review past guidelines and we have newer research. These are the parameters we use at the present time. Saturate fat less than 7%. The aim is use minimal “trans fat” in food intake. This should become easier in September 2018 when the addition of trans fats to food will be banned in Canada.

Just like calculating the amount of sugar in the diet, there have been questions in the past where you need to calculate the amount of fat. Using the same 200 calorie diet, let’s consider we need to know how many grams of fat that would be. Fat has 9 calories per gram, more than carbohydrate or protein.

30 % of 2000 calorie would be 600 calories.

To get the grams of fat 600 is divided by 9 (calories per gram). 600/9= 66 grams

A 2000 calorie diet with 30% fat would have 66 grams of fat. This would include the added fat as well as the fat in the protein food and milk products and any other hidden fat in foods such as crackers, or prepared foods.

Nutrition strategies used differ depending on the type of diabetes.

Prediabetes has been studied in a variety of research trials. The goal is to prevent the progression to diabetes and reduce the risk of cardiovascular complications often seen in people at risk for diabetes. The most well know study is the Diabetes Prevention Program in Finland. They utilized healthy eating to promote weight reduction, with a goal of 7 % of initial body weight. Moderate intensity exercise was implemented and the goal was 150 minutes per week. They had a reduction in progression to diabetes of 58%!

For Type 1 diabetes the nutrition goals are about Balance- balancing the insulin and carbohydrate to maintain blood sugars. This gives people flexibility by using carb counting.

The challenge is to limit hypoglycemia as much as possible. This requires making adjustments for physical activity whether planned or unplanned. It may be adding extra food or decreasing insulin depending on the situation. The other challenge is keeping blood sugars balanced during illness. You can’t just stop eating when you have the flu or a sore throat. Once the insulin is injected you still need to provide carbohydrate whether in solids or fluids.

People with type 2 diabetes have a different challenge. They need regular meals and distribution of carbohydrate throughout the day. The battle of insulin resistance with obesity drives the need or at least the attempt towards weight reduction. As a general rule, the goal of reducing saturated fat is aimed at controlling blood lipids which are frequently elevated when type 2 diabetes is diagnosed.

At the present time, we do not have a “Perfect diet combination” for diabetes. The amounts of the various components are individualized based on personal preference, the incorporation of high fibre, low glycemic index food and blood values. The ranges for carbohydrate, protein and fat are listed here.

The Mediterranean diet has been shown to decrease the risk for cardiovascular disease and progression of prediabetes to diabetes. It has 9 components. An improvement in any one area still shows benefit in decreased risk of disease. It tends to be more of a lifestyle- eating fresh foods, cooking at home, eating with family and friends.

So what is available to teach these concepts to my patients?

The most popular tool is the ‘Just the Basics’. It was created so that anyone can provide general nutrition advice to someone with prediabetes or type 2 diabetes. It uses the plate concept, and the size of your hand or fist to estimate portions. Half the plate should be vegetables!

Various tools are available through diabetes GPS in different languages and include foods for different cultures.

The message is very simple- 3 meals, limit sweets and high fat foods etc.

An alternative resource is the Diabetes Food Guide. It adapts Canada’s Food Guide and identifies carbohydrate containing food groups, while promoting the non-starchy vegetable. It provides sample portion sizes equivalent to 15 grams of carbohydrate. It also give a range for the number of portions from each group.

What else do you need to know about nutrition strategies…..how about sweeteners, alcohol and glycemic index. In the past these were spelled out as topics to know. However, given the fact that these have shown up on the exam for the past 3 years it seems appropriate to include in this discussion.

The information on the table of sweeteners is extracted from the Clinical Practice Guidelines. ADI refers to the Acceptable Daily Intake for humans. Diabetes Canada has a handout available to discuss sweeteners with your patients. This is a good resource to review.

Every year there has been a question about the ADI for either aspartame or sucralose on the exam!

Alcohol portions and consumption for people with diabetes is the same as for those without diabetes. This first slide shows what we might think of as alcohol equivalents… a shot of hard liquor- 45 ml, a glass of wine- 150 ml and a glass or can of beer- 360 ml. Guidelines for consumption are the same as any adult, limiting the number of drinks per day and per week.

With type 1 diabetes we have other concerns. **There is a risk of hypoglycemia!** Alcohol suppresses the release of glucagon from the liver.

A low blood glucose could look like someone who has had a few too many, and delaying treatment could have disastrous consequences. The other concern is the potential delay in hypoglycemia, for example having a low overnight and being too intoxicated to wake up.

When the alcoholic beverage contains carbohydrate, people need to be advised not to take insulin for this carb.

Here are a few more tips to stay safe when consuming alcohol. Make sure someone else knows you have diabetes.

For someone with type 2 diabetes, hypoglycemia is only a concern if they take secretagogues or insulin. For these individuals concerns are the same as someone with type 1 diabetes. For others it is about poor nutrition, contribution to weight gain and the impact on blood pressure and triglycerides, both which will be elevated with alcohol.

The Glycemic Index (GI) is another tool used to help people navigate healthier food choices and blood glucose control. Foods are rated according to how fast glucose enters the blood. High GI means fast, low GI means slow. In diabetes, we aim for low glycemic index- something like having a low golf score. The food goes into the blood stream slower.

The GI of some foods are surprising. We look at Bran Flakes and think fibre, but it is actually high GI. Brown rice is medium GI, yet converted or parboiled is low GI. There are many factors that affect the GI including the physical form e.g. seeds , the acidity of the food, degree of cooking and the starch gelatinization.

The competency for dietary strategies for complications is a level 1, meaning there are more questions on this topic.

One of the most common complications we see is dyslipidemia. From a patient perspective, they have often been told to lose weight, increase their physical activity and stop smoking.However, there are a number of dietary strategies that are useful.

The addition of fibre, particularly soluble fibre has been shown to have a positive impact on blood lipids. Many people have difficulty adding beans and legumes due to the flatulence. Increasing these foods slowly and ensuring adequate water intake can be helpful. Reducing saturated fat also has had benefits. Often the saturated fat can be replaced with mono-fats, particularly olive and canola oil. In the past, the restriction of cholesterol has been recommended, limiting intake of eggs to 1-2/week. Omega 3 intake has been shown to be beneficial for those with elevated triglycerides. The Cardiovascular guidelines suggest 2 gm per day of EPA & DHA. Plant sterols found either in a powder form or added to food decrease LDL by up to 10% within a month. The dose is 2g /day. Soy products such as tofu, edamame or soy beverages can also be useful to decrease lipids. It is important to individualize the strategy to the patient.

There have been many studies looking at dietary intervention and hypertension. The DASH diet has been one of the most successful and well known in consumer magazines. Looking at this chart, weight reduction also has a beneficial effect and to a similar degree to DASH. We all know the challenges our patients have with weight reduction, and frustration with past failure, so that might not be the first strategy we recommend.

THE DASH- Dietary strategies to stop hypertension has several components.

- ↑vegetables
- ↑fruit
- ↑milk products
- ↓animal protein

Although there was a modest sodium restriction equivalent to a No-Added-Salt, the study was not about the sodium, it was about the healthy eating. Another interesting aspect was that the worse the initial diet, the better the benefit.

In the past there have been question about both the DASH and Mediterranean diet- so know the difference and when you would use each one.

The dietary restrictions for chronic renal failure are the most difficult of any restriction. Renal always trumps diabetes when it comes to diet. Not only are fruits and vegetables restricted because of the potassium content, sodium, phosphorus and protein are also restricted. Not to mention fluids. People with renal disease should be referred to a dietitian that specializes in renal disease.

Gastroparesis is a lesser known complication. The nerves of the digestive tract are affected. This affects the signalling of peristalsis and stomach contractions, resulting in delayed emptying. Many patients don’t mention the symptoms to the health care provider and consequently it is under diagnosed. Although more common in type 1, people with type 2 also have this complication.

You can see the list of symptoms on this slide. Interestingly it is nausea and vomiting that generally takes the patient to their health care provider.

The dietary recommendations are almost counterintuitive. We now want things to move out of the system as quickly as possible, so low fibre, low glycemic index. Small frequent meals can be beneficial but create challenges for insulin administration. The use of ‘regular insulin’ can be helpful due to the delayed absorption of glucose. Also dosing rapid insulin after meals has been used. In acute stages liquid supplements can be used. In all cases alcohol and carbonated beverages are restricted. Medication is often required to relieve symptoms.

The second most difficult diet in my opinion is for Celiac disease. It requires avoidance of gluten. In recent years, restricting gluten has been more popular and more products are available. Many patients find this difficult as they cannot use easy to prepare foods or even take out as gluten is hidden in so many products even soy sauce. Many people are asymptomatic so diagnosis is difficult. One clue may be uncontrolled blood sugars or elevated A1c with no know reason.

Sick Day Management is critical particularly for the person with type 1 diabetes. A bout of the flu and omission of insulin can quickly send a person into DKA. The goals are to prevent high blood sugars or lows. We also want to prevent dehydration.

Every year there is a question on the exam of converting foods to liquids during illness. This chart is from a resource on the Waterloo Wellington Diabetes website entitled Clear Fluids. Be sure to know the portions of popsicles, jello and ice cream.

Another aspect of sick day management for people with type 1 diabetes is monitoring ketones. Although this is not nutrition, it seemed like a good place to include this information. This chart shows adjustments required in insulin doses required with ketones present. The concepts of this chart are important to understand.

The last aspect of sick day management is when to get help. This is a common list of alerts when your patient should seek medical attention.

Good Luck with your studying.