Nutrition for the non nutritionist

CDE Exam Preparation
by Wendy Graham
Waterloo Wellington Diabetes
March 23, 2017
Goals of Nutrition Therapy

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

It’s not just about blood glucose
Food is to be Eaten and Enjoyed!
Type 1

- Insulin to match carbohydrate
- Prevent hypoglycemia
- Adjust insulin or food for activity
- Sick day management

Type 2

- Obesity and insulin resistance
- Increase exercise
- Decrease energy saturated, trans fats & cholesterol
- Reduce sodium
People with type 2 should maintain regularity in timing and spacing of meals to optimize glucose control.
Pre-diabetes

Reduce risk of diabetes and CVD

Diabetes Prevention Program (DPP)
- lifestyle intervention
- weight loss 7% initial body weight
- 150 minutes exercise week

Decreased Incidence by 58%
Nutrition Assessment

Clinical-BMI, weight history, labs, SMBG, family history, medications
Other supplements, natural health products
Client’s desires or expectations for the session
Client’s goals, history, strengths, barriers
Diet History-24 hour recall, food frequency, food records
Previous education, previous nutrition/diet experiences, knowledge
Health literacy
Attitudes
Cultural food practices
Stage of change
Social History, support, finances, work, recreation, travel, alcohol, smoking
Food safety and availability
Stress
Social determinants of health
Nutrition Assessment

Nutritional adequacy
Carbohydrate intake
Eating patterns
Problematic eating
Potential for hypoglycemia
Does food intake match medication
Nutrition

Assessment
Nutrition Diagnosis
Nutrition Intervention
  goal setting
  plans
  education
  implementation
Monitoring and Evaluation
What reduction in A1c would you expect from nutrition therapy when newly diagnosed with diabetes?

a) 0.5%
b) 1-2%
c) 0.25-0.75%
d) A1c reduction requires medication
Sample Question

What reduction in A1c would you expect from nutrition therapy when newly diagnosed with diabetes?

a) 0.5%

b) 1-2%

c) 0.25-0.75%

d) A1c reduction requires medication
Basics Tools of Nutrition Therapy

- Canada’s Food Guide
- Just the Basics
- Diabetes Food Guide
- Beyond the Basics
- Carbohydrate Content of foods

- http://guidelines.diabetes.ca/PatientResources#SME
Canada’s Food Guide (CFG)
Carbohydrate

Carbohydrate Awareness

Consistent Carbohydrate Food Choices

Carb to Insulin Ratio
Carbohydrate

Carbohydrate Awareness

Many Patients will not move beyond Carbohydrate awareness
Just the Basics

• Healthy Plate

3 meals, no more than 5 hours apart
Limit sweets
Reduce high fat foods
Encourage high fibre foods
Drink water
Exercise
Beyond the Basics

- Foods containing approximately 15 grams of carbohydrate are considered 1 ‘Choice’

- Food groups
  - Grains and Starches
  - Fruits
  - Milk Products
  - Other Choices

- Portion sizes are Important
- Is not specific enough for carbohydrate counting
# Carbohydrate Containing Food

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

## Grains & Starches

<table>
<thead>
<tr>
<th>Food Item</th>
<th>Serving Size</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bannock, whole grain baked</td>
<td>1.5 x 2.5 in</td>
<td>1 slice</td>
</tr>
<tr>
<td>Barley, bulgur</td>
<td>1 (6 in)</td>
<td>½ cup</td>
</tr>
<tr>
<td>Bread, whole grain</td>
<td>1 slice</td>
<td>¼ cup</td>
</tr>
<tr>
<td>Cereal, hot</td>
<td>¼ large</td>
<td>½ small</td>
</tr>
<tr>
<td>Bagel</td>
<td>1.5 x 2.5 in</td>
<td>1 slice</td>
</tr>
<tr>
<td>Bagel</td>
<td>1 slice</td>
<td>½</td>
</tr>
<tr>
<td>Bannock, fried</td>
<td>1 slice</td>
<td>½</td>
</tr>
<tr>
<td>Bread, white</td>
<td>1 slice</td>
<td>½</td>
</tr>
<tr>
<td>Bun, hamburger or hotdog</td>
<td>1 slice</td>
<td>½</td>
</tr>
<tr>
<td>Chapati, roti, tortilla, whole wheat</td>
<td>1 (6 in)</td>
<td>½</td>
</tr>
<tr>
<td>Corn, kernel</td>
<td>1 (6 in)</td>
<td>½</td>
</tr>
<tr>
<td>English muffin, whole grain</td>
<td>1 (6 in)</td>
<td>½</td>
</tr>
<tr>
<td>Pasta, couscous</td>
<td>1 (6 in)</td>
<td>½</td>
</tr>
<tr>
<td>Cereal, flaked unsweetened</td>
<td>7</td>
<td>¾ cup</td>
</tr>
<tr>
<td>Crackers, soda type</td>
<td>10</td>
<td>¼ (6 in)</td>
</tr>
<tr>
<td>Croutons</td>
<td>10</td>
<td>¼ (6 in)</td>
</tr>
<tr>
<td>French fries</td>
<td>10</td>
<td>¼ (6 in)</td>
</tr>
<tr>
<td>Naan bread</td>
<td>10</td>
<td>¼ (6 in)</td>
</tr>
<tr>
<td>Plantain mashed, sweet potato</td>
<td>½ cup</td>
<td>½ (6 in)</td>
</tr>
<tr>
<td>Pita bread, whole wheat</td>
<td>½ medium</td>
<td>¼ cup</td>
</tr>
<tr>
<td>Potatoes, boiled, baked</td>
<td>½ medium</td>
<td>¼ cup</td>
</tr>
<tr>
<td>Rice, millet</td>
<td>½ medium</td>
<td>¼ cup</td>
</tr>
<tr>
<td>Soup, thick type</td>
<td>½ medium</td>
<td>¼ cup</td>
</tr>
<tr>
<td>Pancake, waffle</td>
<td>1 (4 in)</td>
<td>½ (6 in)</td>
</tr>
<tr>
<td>Pita bread, white</td>
<td>1 (4 in)</td>
<td>½ (6 in)</td>
</tr>
<tr>
<td>Pizza crust</td>
<td>1 (4 in)</td>
<td>½ (6 in)</td>
</tr>
<tr>
<td>Taco shells</td>
<td>2 (5 in)</td>
<td>½ (6 in)</td>
</tr>
<tr>
<td>Fruits</td>
<td>Serving Size</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>Apple</td>
<td>1 medium</td>
<td></td>
</tr>
<tr>
<td>Applesauce, unsweetened</td>
<td>1 small</td>
<td></td>
</tr>
<tr>
<td>Banana</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Blackberries, strawberries</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Blueberries</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Cherries</td>
<td>2 medium</td>
<td></td>
</tr>
<tr>
<td>Grapes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kiwi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mango</td>
<td>½ medium</td>
<td></td>
</tr>
<tr>
<td>Melon</td>
<td>1 medium</td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td>1 large</td>
<td></td>
</tr>
<tr>
<td>Peach</td>
<td>1 medium</td>
<td></td>
</tr>
<tr>
<td>Pear</td>
<td>¾ cup</td>
<td></td>
</tr>
<tr>
<td>Pineapple</td>
<td>2 medium</td>
<td></td>
</tr>
<tr>
<td>Plum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canned fruit, in juice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juice</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MILK & ALTERNATIVES

- Chocolate milk, 1%
- Evaporated milk, canned
- Milk, low fat
- Milk powder, skim
- Soy beverage, flavoured
- Soy beverage, plain
- Soy yogurt, flavoured
- Yogurt, low fat
- Yogurt, artificially sweetened

- 4
- 1/2 cup
- 3/4 cup
- 3/4 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
- 1/2 small
- 1 bar (28 g)
- 7 large/30 sticks
- 3
Carbohydrate

Consistent Carbohydrate Food Choices

Meal Plan

<table>
<thead>
<tr>
<th>TIME</th>
<th>CARBOHYDRATES (grams / choices)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GRAINS &amp; STARCHES</td>
</tr>
<tr>
<td></td>
<td>FRUITS</td>
</tr>
<tr>
<td></td>
<td>MILK &amp; ALTERNATIVES</td>
</tr>
<tr>
<td></td>
<td>OTHER CHOICES</td>
</tr>
<tr>
<td></td>
<td>VEGETABLES</td>
</tr>
<tr>
<td></td>
<td>MEAT &amp; ALTERNATIVES</td>
</tr>
<tr>
<td></td>
<td>FATS</td>
</tr>
</tbody>
</table>
Health Literacy: Levels

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

60 % population
Level 2 or below
Carbohydrate Counting Patient requirements

- Literacy skills
- Numeracy skills
- Equipment
Requires Record Keeping and Work!

<table>
<thead>
<tr>
<th>Food Record</th>
<th>Breakfast</th>
<th>Lunch</th>
<th>Dinner</th>
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<tbody>
<tr>
<td>Date</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hunger/Feelings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food/portion</td>
<td>grams Carb</td>
<td>Food/portion</td>
<td>grams Carb</td>
</tr>
<tr>
<td>Blood Sugar</td>
<td></td>
<td>Blood Sugar</td>
<td></td>
</tr>
<tr>
<td>PC Blood Sugar</td>
<td></td>
<td>PC Blood Sugar</td>
<td></td>
</tr>
<tr>
<td>Insulin</td>
<td></td>
<td>Insulin</td>
<td></td>
</tr>
<tr>
<td>Total Carb</td>
<td></td>
<td>Total Carb</td>
<td></td>
</tr>
<tr>
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<td></td>
<td>Blood Sugar</td>
<td></td>
</tr>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Insulin</td>
<td></td>
<td>Insulin</td>
<td></td>
</tr>
<tr>
<td>Total Carb</td>
<td></td>
<td>Total Carb</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td>Location</td>
<td></td>
</tr>
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<td></td>
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</tr>
<tr>
<td>Blood Sugar</td>
<td></td>
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<td></td>
</tr>
<tr>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Insulin</td>
<td></td>
<td>Insulin</td>
<td></td>
</tr>
<tr>
<td>Total Carb</td>
<td></td>
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<td></td>
</tr>
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</tr>
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<td></td>
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<td></td>
</tr>
<tr>
<td>PC Blood Sugar</td>
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<td>PC Blood Sugar</td>
<td></td>
</tr>
<tr>
<td>Insulin</td>
<td></td>
<td>Insulin</td>
<td></td>
</tr>
<tr>
<td>Total Carb</td>
<td></td>
<td>Total Carb</td>
<td></td>
</tr>
</tbody>
</table>
Carbohydrate Counting

- Type 1
- Insulin Pump
- Type 2 people looking for tighter control
Carbohydrate Counting

- Simple using a label to incorporate a food based on label information
- Utilizing the amount of carbohydrate to be consumed to determine an insulin dose
- “Insulin: Carbohydrate Ratio”
Carbohydrate Counting: Labels

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Amount</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>210</td>
<td></td>
</tr>
<tr>
<td>Fat / Lipides</td>
<td>7 g</td>
<td>10 %</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0 mg</td>
<td></td>
</tr>
<tr>
<td>Sodium</td>
<td>10 mg</td>
<td>1 %</td>
</tr>
<tr>
<td>Carbohydrate / Glucides</td>
<td>32.5 g</td>
<td>11 %</td>
</tr>
<tr>
<td>Fibre / Fibres</td>
<td>5 g</td>
<td>18 %</td>
</tr>
<tr>
<td>Sugars / Sucres</td>
<td>8 g</td>
<td></td>
</tr>
<tr>
<td>Protein / Protéines</td>
<td>7 g</td>
<td></td>
</tr>
<tr>
<td>Vitamin A / Vitamine A</td>
<td>2 g</td>
<td>2 %</td>
</tr>
<tr>
<td>Vitamin C / Vitamine C</td>
<td>0 g</td>
<td>0 %</td>
</tr>
<tr>
<td>Calcium / Calcium</td>
<td>4 g</td>
<td>4 %</td>
</tr>
<tr>
<td>Iron / Fer</td>
<td>15 g</td>
<td>15 %</td>
</tr>
</tbody>
</table>

Serving size in cups and grams

Carbohydrate in grams
Don’t use %

Fibre
Subtract from carbohydrate

Sugar alcohol would be listed here
Carbohydrate Counting

- Portion Size
Information about Carbohydrate content of Foods

- Food Labels
- Nutrient Content of Common Foods
- Calorie King
- My Fitness Pal
- Many apps
Carbohydrate Counting

-500 Rule
-Insulin to Carbohydrate Ratio
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

Example
Insulin: Lantus 25 + Apidra 6 + 9 + 10 = 50

500/50 = 10
I unit of insulin would cover 10 grams of carbohydrate
Carbohydrate Counting - 500 Rule

**Breakfast:** 200 ml oatmeal, 125 ml milk, 30 ml raisins, 1 slice whole wheat toast

<table>
<thead>
<tr>
<th>Food</th>
<th>Carbohydrate (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oatmeal</td>
<td>15</td>
</tr>
<tr>
<td>Milk</td>
<td>6</td>
</tr>
<tr>
<td>Raisins</td>
<td>15</td>
</tr>
<tr>
<td>Toast</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>51</strong></td>
</tr>
</tbody>
</table>
Carbohydrate Counting- 500 Rule

1 unit of insulin would cover 10 grams of carbohydrate

Calculate the amount of insulin for this breakfast

Carbohydrate divided by ratio

51 divided by 10 = 5.1

This person would take 5 units of insulin
Carbohydrate Counting -
Insulin to Carbohydrate ratio

# grams carbohydrate  
____________________ = 1 unit of insulin per____ gm  CHO
# units of rapid insulin
Calculating Carbohydrate Insulin to Carbohydrate ratio

Lunch
250 ml rice, salad, chicken, 1 banana

Calculation:

<table>
<thead>
<tr>
<th></th>
<th>Carbohydrate (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>45</td>
</tr>
<tr>
<td>Salad</td>
<td>0</td>
</tr>
<tr>
<td>Chicken</td>
<td>0</td>
</tr>
<tr>
<td>Peach</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
</tr>
</tbody>
</table>
Calculating Carbohydrate Insulin to Carbohydrate ratio

If 1:C Ratio was 1:6
1 unit to cover 6 grams of carbohydrate

Calculate the amount of insulin based on the lunch using the ratio
60 divided by 6 = 10

This person would take 6 units of insulin
Carbohydrate Counting
Insulin to Carbohydrate ratio

Tim Horton bagel and soup

Bagel 58 grams
Soup 24 grams
Total 82 grams

I:C ratio of 1 unit to cover 8 grams

How much Insulin would this person need?
Carbohydrate Counting
Insulin to Carbohydrate ratio

I:C ratio of 1 unit to cover 8 grams

Carbohydrate: 82
82 divided by 8 = 10

This person would use 10 units of insulin
## Comparing Food Choices to Carb Counting

<table>
<thead>
<tr>
<th>Food</th>
<th>Food Choice Method 1 choice = 15 gm</th>
<th>Carb Counting Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 slice of bread</td>
<td>1 choice</td>
<td>18 gm CHO</td>
</tr>
<tr>
<td>1 apple</td>
<td>1 choice</td>
<td>20 gm CHO</td>
</tr>
<tr>
<td>7 crackers</td>
<td>1 choice</td>
<td>14 gm CHO</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>45 grams</strong></td>
<td><strong>52 grams</strong></td>
</tr>
</tbody>
</table>
Carbohydrate

Primary source of fuel
❖ controlled not restricted
Quantity that effects blood glucose
RDA 130 g/day
Sugar is contained within carbohydrate

Quality and Quantity
Fibre 25-50 g/day

**Insoluble**
- Bread
- Wheat

**Soluble**
- Barley
- Oats
- Beans
- Figs
- Prunes
- Sweet potatoes
Fibre 25-50 g/day

Insoluble
• Improved bowel habits

Soluble
• Decrease pc meal blood glucose
• Decrease LDL
• Delayed gastric empty
Protein

RDA 0.8-1.1 g/kg body weight
Restricted in renal disease
Most protein foods contain fat
  meat and alternatives, milk, nuts

Encourage meat alternatives
Low fat dairy products
Low fat meat selections
*Fish
Fish

Fatty fish rich in omega 3:
2 times per week
Salmon, tuna, sardines, trout
**Basic Nutrition**

- **Carbohydrate**: 4 cal/g  
  45-60%
- **Protein**: 4 cal/g  
  15-20%
- **Alcohol**: 7 cal/g  
- **Fat**: 9 cal/g  
  20-35%
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
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
Snacks who needs them?

Individualized
Mixed insulin
NPH insulin
Long periods between meals
To prevent hypoglycemia
Sample Question

Approximately how much carbohydrate does this meal have?

250 ml chicken noodle soup, 4 crackers, 30 g cheese, 15 grapes

a) 30 grams
b) 50 grams
c) 35 grams
d) 45 grams
Sample Question

Approximately how much carbohydrate does this meal have?
250 ml chicken noodle soup, 4 crackers, 30 g cheese, 15 grapes

a) 30 grams
b) 50 grams
**c) 35 grams**
d) 45 grams
Sample Question

How much sucrose could be incorporated into an 1800 calorie diet?

a) 20 %

b) 50 grams

c) 35 grams

d) 45 grams
Sample Question

How much sucrose could be incorporated into an 1800 calorie diet?

a) 20 %
b) 50 grams
c) 35 grams
d) 45 grams
### Sweeteners approved by Health Canada

<table>
<thead>
<tr>
<th>Sweeteners</th>
<th>Sugar Alcohols</th>
<th>Acceptable Daily Intake (ADI) mg/kg body weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acesulfame potassium</td>
<td>Erythritol</td>
<td>15</td>
</tr>
<tr>
<td>Aspartame</td>
<td>Hydrogenated starch hydrolysates</td>
<td>40</td>
</tr>
<tr>
<td>D-tagatose</td>
<td>Isomalt</td>
<td>80</td>
</tr>
<tr>
<td>Neotame</td>
<td>Lactitol</td>
<td>2</td>
</tr>
<tr>
<td>Saccharin</td>
<td>Maltitol</td>
<td>5</td>
</tr>
<tr>
<td>Stevia glycosides</td>
<td>Maltitol syrup</td>
<td>4</td>
</tr>
<tr>
<td>Sucralose</td>
<td>Mannitol</td>
<td>9</td>
</tr>
<tr>
<td>Thaumatin</td>
<td>Sorbitol</td>
<td>0.9</td>
</tr>
</tbody>
</table>

*Sugar alcohols do not have Acceptable Daily Intake (ADI). Large amounts (>10g/day) can cause diarrhea, cramps, gas and bloating.

Know aspartame and sucralose!
Alcohol and Type 2

Hypoglycemia if they use secretagogues or insulin
Concern if poor eater or missed meals
Contributes to weight gain
Increased blood pressure and triglycerides
Alcohol and Type 1

Caution Risk of hypoglycemia

Symptoms can be mistaken for being drunk

Delayed – up to 24 hours

Do not take insulin for 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
What is a ‘standard drink’

- Beer: 360 mL (12 fl.oz) of regular strength beer (5% alcohol)
- Spirits: 45 mL (1.5 fl.oz) of spirits (40% alcohol)
- Wine: 150 mL (5 fl.oz) of wine (12% alcohol)
Alcohol

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

A lot of starchy foods have a high Glycemic Index (GI). Choose medium and low GI foods more often.

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

*expressed as a percentage of the value for glucose  **Canadian values where available

Adapted with permission from: Foster-Powell K, Holt SH, Brand-Miller JC. International table of glycemic index and glycemic load values. Am J Clin Nutr. 2002;76:5-56
# Glycemic Index

## Factors that affect the Glycemic Index (GI)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low degree of starch gelatinization</td>
<td>Spaghetti, oatmeal</td>
</tr>
<tr>
<td>Physical form of food</td>
<td>Pumpernickel and whole grains breads, legumes, barley, al dente pasta</td>
</tr>
<tr>
<td>High amylose to amylopectin ratio</td>
<td>Basmati rice, legumes and cornstarch</td>
</tr>
<tr>
<td>Fibre</td>
<td>Rolled oats, beans and lentils, apples</td>
</tr>
<tr>
<td>Sugar</td>
<td>Some cookies and breakfast cereals</td>
</tr>
<tr>
<td>Acidity</td>
<td>Vinegar, lemon juice, salad dressings, acidic fruits e.g. oranges, sourdough bread</td>
</tr>
<tr>
<td>Fat</td>
<td>Potato chips are lower GI than baked potato</td>
</tr>
</tbody>
</table>
Sample Question

Which meal has the lowest glycemic index

a) Bran flakes, milk, banana
b) Brown rice with vegetable
c) Converted rice, fried chicken
d) Soda crackers and cheese
Sample Question

Which meal has the lowest glycemic index
a) Bran flakes, milk, banana
b) Brown rice with vegetable
b) Converted rice, fried chicken
d) Soda crackers and cheese
Sick Days

Maintain blood glucose:
Preventing hyper (DKA) or hypoglycemia

Prevent dehydration
S  **Sugar**  Check every 2-4 hours
I  **Insulin**  Continue to take it!
C  **Carbohydrate**  Take some every 1-2 hours
K  **Ketones**  Test if your blood glucose is above 16
Sick Days

Convert solids to fluids to maintain carbohydrates

Carbohydrate Beverages
Each contain 10 grams of carbohydrate and can be substituted in the menu:

Apple Juice: 75 ml
Cranberry Juice (white): 50 ml
Cranberry Cocktail (white): 75 ml
Cranberry Cocktail Low Calorie: 250 ml
Gatorade: 200 ml
Grape Juice (white): 50 ml
Powerade: 200 ml
Regular Jello: 50 ml
Regular Iced Tea: 75 ml
Regular Gingerale: 125 ml
Regular Popsicle: 1 stick
### Sick Days

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

Call your Health Care provider if you:

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

Goal is to reduce LDL Cholesterol

- ↓ Saturated Fat
- ↓ Weight
- D/C smoking
- ↑ Fibre
- ↑ Plant sterols
- ↑ Omega 3
- ↑ Physical Activity
# Dyslipidemia

<table>
<thead>
<tr>
<th>Change</th>
<th>LDL Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturated fat</td>
<td>8–10%</td>
</tr>
<tr>
<td>Decrease to less than 7% of calories</td>
<td></td>
</tr>
<tr>
<td>Dietary cholesterol</td>
<td>3–5%</td>
</tr>
<tr>
<td>Decrease to less than 200 mg/day</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>5–8%</td>
</tr>
<tr>
<td>Lose 10 pounds if overweight</td>
<td></td>
</tr>
<tr>
<td>Soluble fiber</td>
<td>3–5%</td>
</tr>
<tr>
<td>Add 5–10 grams/day</td>
<td></td>
</tr>
<tr>
<td>Plant sterols/stanols</td>
<td>5–15%</td>
</tr>
<tr>
<td>Add 2 grams/day</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20–30%*</td>
</tr>
</tbody>
</table>
Kidney Disease

Complex Diet
- Potassium
- Sodium
- Phosphorus
- Protein
- Fluid

Blood pressure and blood glucose control are important!
Hypertension
## Hypertension

<table>
<thead>
<tr>
<th>Modification</th>
<th>Recommendation</th>
<th>Approximate Systolic BP Reduction, Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>Maintain normal body weight (BMI: 18.5-24.9)</td>
<td>5-20 mmHg/10-kg weight loss</td>
</tr>
<tr>
<td>DASH diet</td>
<td>Consume diet rich in fruits, vegetables, lower-fat milk products</td>
<td>8-14 mmHg</td>
</tr>
<tr>
<td>Dietary sodium</td>
<td>Reduce sodium intake to no more than 2400 mg sodium or 6000 mg salt (sodium chloride)</td>
<td>2-8 mmHg</td>
</tr>
<tr>
<td>Physical activity</td>
<td>Engage in regular aerobic physical activity at least 30 minutes/day most days of the week</td>
<td>4-9 mmHg</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Limit consumption to ≤2 drinks/day for men and ≤1 drink/day for women</td>
<td>2-4 mmHg</td>
</tr>
</tbody>
</table>

Abbreviations: BMI: body mass index, BP: blood pressure; DASH: Dietary Approaches to Stop Hypertension.
* For overall cardiovascular risk reduction, stop smoking. The effects of implementing these modifications are dose and time dependent and could be higher for some individuals.

Adapted from Chobanian et al.*
Gastroparesis

Delayed gastric emptying 1-2 hours
Type of neuropathy
Postprandial hypoglycemia
Gastroparesis-Symptoms

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

- Low fibre
- Low fat
- Small meals
- Liquid based meals
- Avoid alcohol
- Avoid carbonated drinks
Celiac

Autoimmune disease
4-6% of type 1 diabetes
Often asymptomatic
Symptoms may be:
• Vomiting
• Diarrhea
• Constipation
• Decreased vitamin status
• Unexplained blood sugars
Celiac

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
of malabsorption iron, calcium
Compensation for Physical Activity

Type 1

- Add additional food
- Decrease Insulin
- Both
# Compensation for Physical Activity

<table>
<thead>
<tr>
<th></th>
<th>Insulin</th>
<th>Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light exercise</td>
<td>Reduce bolus by 10%</td>
<td>Add 10 grams before activity (May not be needed)</td>
</tr>
<tr>
<td>Moderate Exercise</td>
<td>Reduce Bolus by 20%</td>
<td>Add 15-30 grams before exercise</td>
</tr>
<tr>
<td>Vigorous Activity</td>
<td>Reduce Bolus by 30-50%</td>
<td>Add 30-60 before or after exercise</td>
</tr>
</tbody>
</table>
Compensation for Physical Activity

Also consider:

- Timing of exercise compared to meal
- Blood glucose before starting exercise
- Weight goal: maintenance or loss
# Compensation for Physical Activity

## Things to consider to prevent Hypoglycemia

<table>
<thead>
<tr>
<th>Injection site- avoid working muscles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing of exercise versus insulin action</td>
</tr>
<tr>
<td>Food Intake</td>
</tr>
<tr>
<td>Alcohol</td>
</tr>
</tbody>
</table>

Hypoglycemia can occur up to 24 hours after an activity.
Compensation for Physical Activity

Type 2
Only necessary if using insulin or secretagogues
Caution as additional food contributes to weight gain
Questions

Contact me at: wendyg@langs.org

Check out information at: waterloowellingtondiabetes.ca