Carbohydrate Counting and Insulin

Diabetes Care Group

www.diabetescaregrp.com

Objectives

- State carbohydrate grams in commonly eaten foods
- Determine total carbohydrate grams using a nutrition label or other resources
- List 2 benefits of intensive insulin therapy
- Calculate a mealtime insulin dose using an insulin to carbohydrate ratio
- Calculate a correction insulin dose using an insulin sensitivity factor/correction factor

DIABETES™ Care Group

The Carbohydrate Facts

- What is carbohydrate?
  - The body's basic source of energy
  - Any food that contains sugar or that turns into sugar after eaten
- Which foods are considered carbohydrate?
  - Sweets and regular sugar beverages
  - Starches and starchy vegetables
  - Fruit
  - Milk

DIABETES™ Care Group

Carb Counting Resources

- Nutrition labels
- Internet Resources
  - www.calorieking.com
  - Restaurant Websites
- Books
  - The Complete Book of Food Counts by Corinne Netzer
  - Calorie King
- Pump food database

DIABETES™ Care Group

Reading Labels

Nutrition Facts

Serving Size 5 Crackers (16g)
Servings Per Container About 28

Amount Per Serving

Calories 80 Calories from Fat 40

	% Daily Value*
Total Fat 4.5g	**7%**
Saturated Fat 1g	**5%**
Trans Fat 0g	
Polyunsaturated Fat 1.5g	
Monounsaturated Fat 2g	
Cholesterol 0mg	**0%**
Sodium 140mg	**6%**
Total Carbohydrate 9g	**3%**
Dietary Fiber less than 1g	**1%**
Sugars 1g	
Protein 1g	

Vitamin A	0%	Vitamin C	0%
Calcium	0%	Iron	2%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Total Carbohydrate

30 – 60gm/meal

- Fiber (25 – 35gm/day)
- Sugar alcohol

Total fat

50 – 66gm/day

Saturated fat

16 – 22gm/day

Sodium

2,000mg/day

DIABETES™ Care Group

1 Starch = 15gm Carbohydrate

• Bread	1 slice
• Waffle/Pancake	1 small
• Taco/Fajita	1 small
• English Muffin	½ muffin
• Small Hamburger Bun	½ bun
• Small Bagel	½ bagel
• Cornbread	2” square
• Roll	1 small

DIABETES™ Care Group

1 Starch = 15gm Carbohydrate

• Potatoes/Sweet Potatoes	½ cup
• Corn	½ cup
• Dried Beans	½ cup
• Peas	½ cup
• Oatmeal/Grits	½ cup
• Plain Cereal	¾ cup
• Rice	1/3 cup
• Pasta	1/3 cup

DIABETES™ Care Group

1 Fruit = 15gm Carbohydrate

• Fresh Fruit	1 small
• Cantaloupe/Honeydew	1 cup
• Strawberries/Watermelon	1 ¼ cup
• Grapes	17 small
• Banana	½ banana
• Canned Fruit	½ cup
• Dried Fruit	¼ cup
• Juice (orange/apple/pineapple)	½ cup

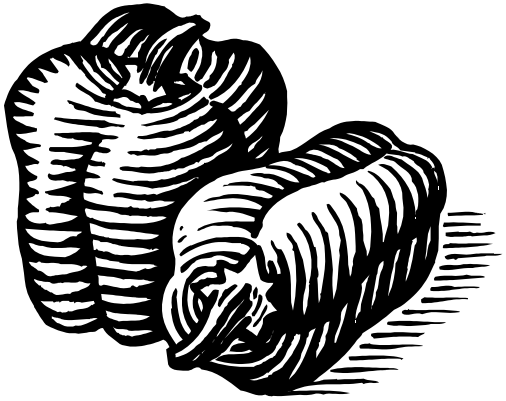
DIABETES™ Care Group

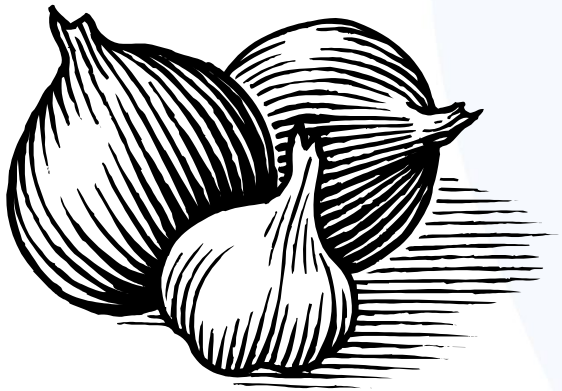
1 Milk = 12gm Carbohydrate

- 1 cup white milk
- ½ cup chocolate milk
- ½ cup evaporated milk

DIABETES™ Care Group

1 Vegetable = 5gm Carbohydrate





- 1 cup raw
- ½ cup cooked
  - Green Beans
  - Carrots/Beets
  - Broccoli/Cauliflower
  - Onions/Peppers
  - Squash/Zucchini
  - Cucumber/Tomato
  - Cabbage/Greens

DIABETES™ Care Group

Other Carbohydrates

- Sweets! Other carbohydrates are foods that are generally very high in carbohydrate due to a combination of sugar, starch, fruit, and/or milk content.
- These foods can be substituted for starches, fruit, and/or milk on a meal plan; however, these foods will contain more fat, calories, and cholesterol, with less vitamins and minerals.
- These foods should only be used for special occasions or dire situations.

DIABETES™ Care Group

Sweet Tooth Samples

Brownie, unfrosted

- 2” = 15gm carb

Cake, unfrosted

- 2” square = 15gm carb

Brownie, frosted

- 2” square = 30gm carb

Cake, frosted

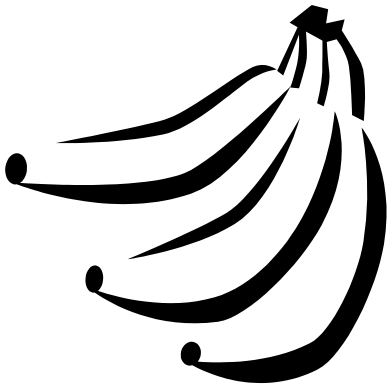
- 2” square = 30gm carb

Fruit pie

- 1/6 of pie = 45gm carb

DIABETES™ Care Group

Count it Out



- **Breakfast**
  - 2 wheat toast
  - 1T peanut butter
  - ½ banana
  - 1 cup skim milk

- **Total Carbohydrate**
  - 60gm

DIABETES™ Care Group

Quick Tips for Carb Counting

- Measure carbs at home to promote accurate estimations when dining out.
- Make a list of your favorite and most commonly eaten foods with their carb content.
- Make carb counting a priority for 2 or 3 weeks to set a good foundation and eliminate lots of guess work.

DIABETES™ Care Group

What is Intensive Therapy

Attempt to mimic a person's regular secretion of insulin

- 1-2 injections of long acting insulin
- Injections of rapid acting insulin with each meal

Or

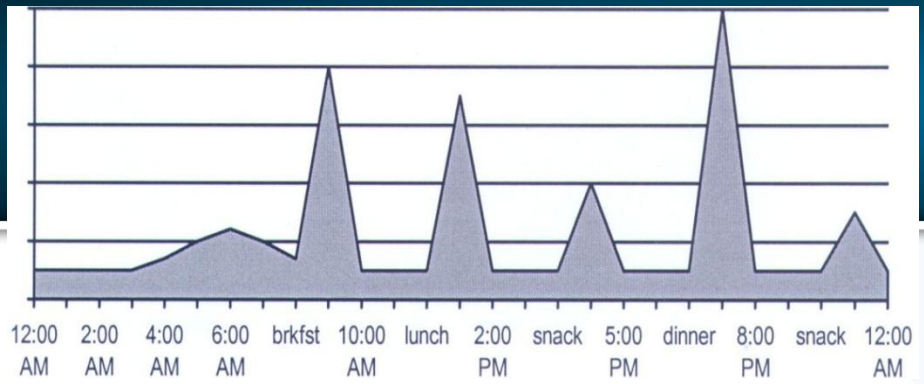
- Insulin pump

DIABETES™ Care Group

Benefits of Intensive Therapy

- Less variation in blood glucose
- More flexibility with meal timing
- More flexibility with sleep schedule
- Ability to adjust calories for weight loss
- Ability to fine tune insulin doses for high fat foods

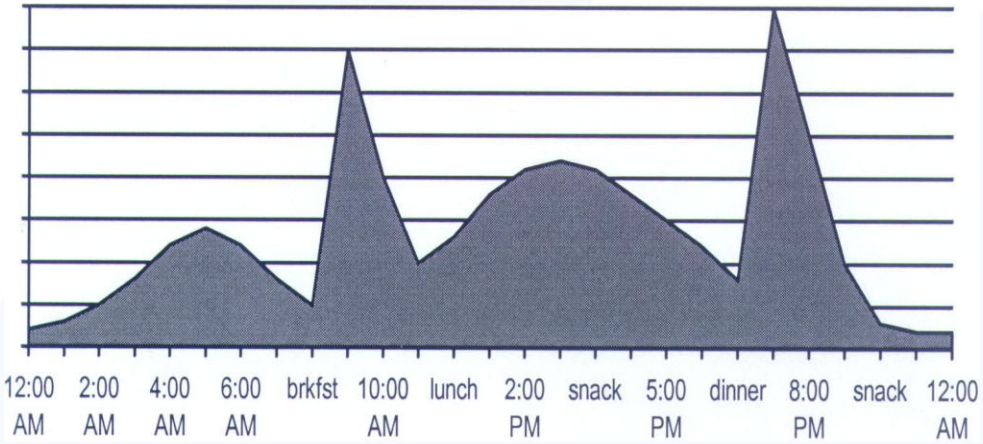
DIABETES™ Care Group

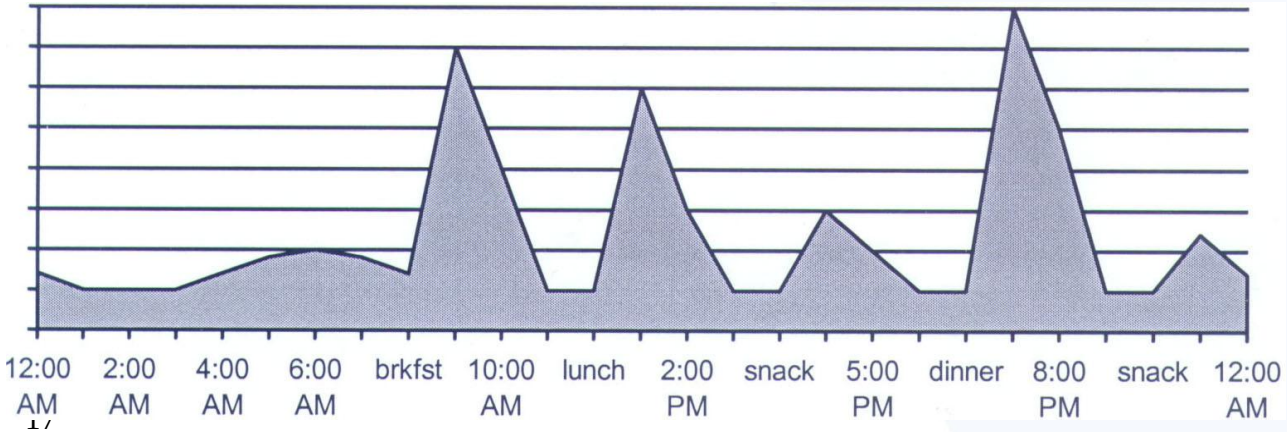


Without Diabetes

3 injections:

- N+R at bkfst
- R at supper
- N at bedtime

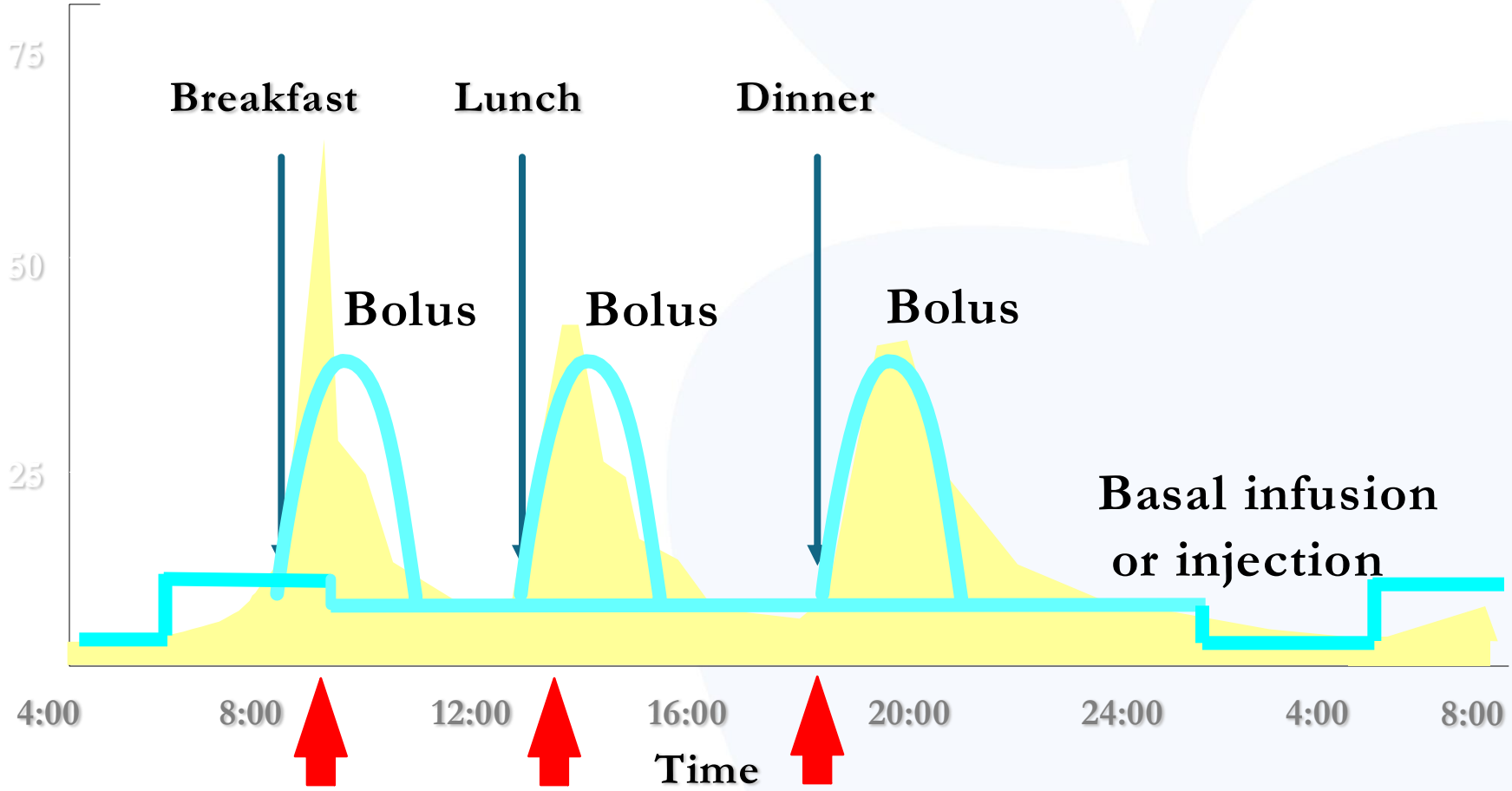




Insulin Pump delivery

DIABETES™ Care Group

Introducing Basal & Bolus



DIABETES™ Care Group

Insulin to Carb Ratio (ICR)

Before meals, take 1 unit of insulin for every ____ grams of carbohydrate

Determine your I:C Ratio:

1. Calculate your total daily dose of insulin
2. 600 ÷ total daily dose = I:C Ratio

Example: You take

Levemir 55 units daily and

Novolog 15 units before meals

1. 55 + 15 + 15 + 15 = 100 units(total daily dose)
2. 600 ÷ 100 = 6

Insulin to carb ratio = 1 unit for 6 grams of carb

DIABETES™ Care Group

Insulin Sensitivity Factor (ISF)

If BG is elevated before meals, take 1 unit of insulin to lower BG ____ points

Determine your Insulin Sensitivity Factor:

1. Calculate your total daily dose of insulin
2. 1800 ÷ total daily dose = Insulin Sensitivity Factor

Example: You take Levemir 55 units daily and Novolog 15 units before meals

1. 55 + 15 + 15 + 15 = 100 units(total daily dose)
2. 1800 ÷ 100 = 18

Insulin sensitivity factor = 1 unit lowers BG 18 points

DIABETES™ Care Group

Step 1
Calculating Insulin for Carbs

- Total Carbs ÷ Insulin to Carb Ratio
- Example: Total Carbohydrate 45 grams

  Insulin to Carb Ratio = 1:10
- 45 ÷ 10 = 4.5 units

- **Insulin for Carbs = 4 units**

DIABETES™ Care Group

Step 2
Calculating Insulin for High BG

(Actual BG – Goal BG) ÷ ISF = units

Example: Actual BG is 213
ISF/Correction Factor is 50
BG Target/Goal is 100

(213 – 100) ÷ 50 = 2.26

113 ÷ 50 = 2.26

Insulin for High BG = 2 units

DIABETES™ Care Group

Step 3
Calculating Total Insulin

- Total Carb Insulin + Total Correction Insulin
- Example: Total Carb Insulin = 4 units

  Total Correction Insulin = 2 units
- 4 +2 = 6 units

- **Total Insulin = 6 units**

DIABETES™ Care Group

What's your Dose?

Step 1	Step 2
Carb	High BG
Insulin	Insulin

DIABETES™ Care Group

Practice Makes Perfect

- Total Carbs = 60gm
- BG 238

- Total Carbs = 25gm
- BG 187

- Total Carbs = 35gm
- BG 122

- Total Carbs = 40gm
- BG 72

DIABETES™ Care Group

Insulin Pumps

DIABETES™ Care Group

Advantages of Pump Therapy

- Improved absorption of insulin.
- Delivery of steady, small doses.
- Predictable insulin delivery.
- Ability to match insulin to food and exercise.
- Ability to stabilize blood sugar between meals and snacks.
- Increase, decrease, or stop insulin delivery as situations demand.

DIABETES™ Care Group

Your Daily Routine

- Check BG before you eat
- Count carbohydrate grams in the meal
- Calculate your food and correction insulin
- Give injection or bolus
- Record BG, carbs, and insulin dose

DIABETES™ Care Group