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Insulin to Carbohydrate Ratio (ICR)

What is the ICR?

Insulin to Carb Ratio (ICR) equals the **number of grams** of carbohydrate that **1 unit** of rapid-acting insulin will cover.

Everyone is different. **Your ratio** could vary from meal to meal.

Why would I need to calculate it?

You may want to learn to calculate your ICR to improve your blood sugars and have a more flexible lifestyle.

When you improve your blood sugar control, you lower your risk of diabetes-related problems (e.g., kidney, nerve, heart, vision problems).

How do I figure out my ICR?

Work with your healthcare team to monitor and record:

- Your **blood sugar** levels before and 2 hours after your first bite of food.
- The **food** you ate, how much (portion size), and the number of grams of carbohydrate you ate at that meal. (Remember to subtract the fibre). Your healthcare provider will help you figure out the carbohydrates in your diet.
- The number of units of rapid-acting **insulin** you took at that meal.
- Any **extra activity** or exercise. It's best to do about the same amount of exercise every day when figuring out your ICR ratio.

Choose a meal where your blood sugar is in target. If the ratio is right, your blood sugar should rise 2 to 4 mmol/L, 2 hours after eating.

It may be best to try to figure out one meal at a time.

Healthy Blood Sugar Targets

Before a Meal	2 hours After First Bite
4 – 7 mmol/L ✓	5 – 10 mmol/L ✓

How do I do the math?

$$\frac{\text{Grams of Carbohydrate Eaten}}{\text{Units of Rapid-Acting Insulin Taken}} = \text{Carbohydrate Ratio}$$

<i>Example:</i> MEAL	CARBOHYDRATES
2 slices of whole wheat toast	30 gm
1 Tbsp. peanut butter	0 gm
Strawberry yogurt	17 gm
1 cup 1% milk	12 gm
<u>TOTAL</u>	<u>59 gm</u>

(Pre-breakfast blood sugar = 4.3 mmol/L)

(2 hours after breakfast blood sugar = 7.8 mmol/L)

$$\frac{59 \text{ gm carbohydrates}}{5 \text{ units of rapid acting insulin}} = 11.8^* \text{ units}$$

*If your answer is a decimal, always **round up** to the nearest whole number (e.g., 11.8 rounds up to 12).

Your ICR is 1 unit to 12* gm.

★ This ratio will need to be reassessed from time to time.

Now, what can I do with this information?

With your ICR, you can manage any meal. It can tell you how much insulin you'll need.

$$\frac{\text{Grams of Carbohydrate}}{\text{Carbohydrate Ratio}} = \text{Insulin Dose for Carbohydrate}$$

<i>Example:</i> MEAL	CARBOHYDRATES
Grilled chicken wrap	40 gm
Minestrone soup	26 gm
Vanilla Greek yogurt and berries	35 gm
<u>TOTAL:</u>	<u>101 gm</u>

$$\frac{101 \text{ gm carbohydrates}}{12 \text{ (using above ratio example)}} = 8.4^* \text{ units}$$

* If your answer is a decimal, always **round down** to the nearest whole number (e.g., 8.4 rounds down to 8).

You will need 8* units of rapid-acting insulin.