

STEPP-UP Instructors Manual

SESSION 3: INSULIN SELF-ADJUSTMENT

Objectives

Goals of Class:

The purpose of this class is to provide information to patients with type 1 diabetes that will help them to learn appropriate insulin self-adjustments. Specifically, the classes will address what is a carbohydrate ratio, correction factor, how to figure out a correction factor and correction dose. We will also discuss what a pre-meal or bolus dose is. A practice worksheet will be available for practice. Patients' understanding of the knowledge will translate into specific skills. Patients will be frequently assessed to determine their comprehension of knowledge and acquisition of skills.

After this session, participants will be able to:

- Describe the difference between a carb ratio, correction factor and correction dose
- Calculate their correction factor and dose
- Explain what a pre-meal or bolus dose is

Materials Needed

- Sign-in sheet
- Pens, pencils, markers
- Name tags
- Flip chart - to keep track of “parking lot items” or questions, participant responses
- Calculators
- Copy of guide: How Can I Manage My Type 1 Diabetes Better? (pages 17-20)
- Handouts in English and Spanish:
 1. Agenda
 2. Correction Factor and Dose handout

Before the Session

- Give all participants a reminder call the day prior to class.
 - Ask them to bring water, a snack in case of low blood sugar, and bring a pen or something to write with. Instruct them on class logistics (parking, location, floor, etc.).
- Set up the classroom with enough tables and chairs. Try to arrange it in a formation that facilitates group participation (such as a circle or U shape).
- Prior to class, set up the food models for the activities [If you have assistants, they can set up food model activities while the discussion is taking place].

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Agenda	Estimated Time
I. Welcome	3 minutes
II. Introduction a. Icebreaker	5 minutes
III. Nutrition Session a. What is a carb ratio? b. What is a correction factor? c. How do I know what my correction factor is? d. What is a correction dose? e. When do I give a correction dose? f. What is a pre-meal or bolus dose? g. Practice Time: High and Low BG doses	50 minutes
IV. Closing	2 minutes

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I. WELCOME (3 MINUTES)

- A. Greet participants as they arrive, give them a nametag to fill out.
- B. Give each participant a participant notebook with handouts

II. INTRODUCTION (5 MINUTES)

[If the space allows, set up tables and chairs in a U shape so everyone can see each other. Make the nutrition session as interactive as possible; ask questions frequently and get everyone involved.]

A. *Welcome everyone to the program. Begin* by introducing the staff and any volunteers. We are here to learn about Insulin self-adjustment.

B. Today you will:

- Understand the difference between a carb ratio and a carb factor.
- Identify your carb ratio
- Identify your correction factor
- Identify what a pre-meal and bolus dose
- Calculate correction factors and doses

C. *Set some initial ground “rules.”* [Have these already written out on the flipchart, with space to add additional rules. These can be referred to throughout the program if necessary. If there are no new people, just remind everyone about the rules.]

1. Everyone is to respect each other.
2. One person talks at a time.
3. Please refrain from using your cell phone and texting. If you need to make or receive a call, please step out of the room.
4. Confidentiality—everyone should respect each other’s privacy by not talking about one another outside of the program.
5. Note that some people prefer to say blood glucose and others blood sugar. Have your audience decide which terminology they prefer.

Ask the group if there are any other rules they would like to suggest.

Finally, we encourage all questions. NO question is a stupid question.

Sometimes you might ask a question that we do not know the answer to right away. When this happens, we will write it down on this flip chart to remind us to find out the answer.

-Ask if there are any other rules they would like to add.

-Ask if everyone in the group can agree to all of the rules.

D. **Icebreaker:** *Form a circle and have each person introduce himself or herself and tell the group their favorite food they enjoy eating. You can use a ball to facilitate the process. For example: Jackie has the ball and states: “My name*

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is Jackie, and I enjoy pasta with meatballs.” Jackie would then toss the ball to someone else, and it is then that person’s turn. Repeat until everyone has had a chance to introduce themselves and state an activity they enjoy.

III. INSULIN SELF-ADJUSTMENT SESSION (50 MINUTES)

A. What is a carbohydrate ratio?

(5 minutes)

Can anyone tell me what a carb ratio is?

Allow participants to respond. Key concepts to add to participant response if not given.

A carbohydrate ratio is also known as a carb ratio. A carb ratio is how many carbs one unit of insulin will cover.

In general, a carb ratio is 1 to 15. This means 1 unit of insulin for every 15 grams of carbs.

But, your diabetes team will figure out your carb ratio with you. If you are very resistant to insulin this could be something like 1 to 5 or 1 to 7. This means you need more insulin for each gram of carbs.

Many people find they need different carb ratios at different times of day. For breakfast people often need more insulin for their food. At lunch people often need less and at dinner somewhere in between the two.

Ask participant if they know what their carbohydrate ratio is? If they don’t they can ask their doctor during their next visit. If any participants are using a pump they can get the information from their pump. Pump users may have different carb ratios for the different times of the day so you can ask them if they know if they have multiple carb ratios.

B. What is a correction factor?

(5 minutes)

Can anyone tell me what a correction factor is?

Allow participants to respond. Key concepts to add to participant response if not given.

This is how much 1 unit of rapid acting insulin will lower your blood glucose over 2 to 4 hours. Some people need more insulin to do this and some need less. In most cases, a good starting point is a factor of 1 to 50. This means 1 unit of insulin will bring your blood sugar down by a 50 point drop.

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Ask participant if they know what their correction factor is? If they don't know, they can ask their doctor during their next visit. If participant use a pump they can get the information from their pump.

1. How do I know what my correction factor is?

(5 minutes)

Your diabetes team sets your correction factor. Your team also changes it as needed.

Your correction factor can be a lower number, such as 10. A low number means that you are resistant to insulin. This means that you need more insulin to bring your sugar level down.

If your correction factor is a higher number such as 75 or 100, it means you are very sensitive to insulin. This means you will need less insulin to bring your blood sugar down. In most cases the correction factor is in the range of 30 to 50.

2. What is a correction dose?

(10 minutes)

This is the dose of insulin you give yourself to bring your blood sugar level back down to normal if your blood sugar is high.

To figure out how much insulin you will need, you have to do some math using your correction factor. Some of you already know your correction factor and some of you don't. I am going to show you an example with a correction factor of 1 to 50. Remember – this means that 1 unit of insulin will reduce your blood sugar by 50 points. For instance, let's say your blood sugar level is 200. Let's say you want to have a blood sugar level of 150. And let's say your correction factor is 1 to 50. You will give one unit of insulin to bring your blood sugar level down by 50 to be at the 150 level.

****Activity****

[Go through example of a large white pad or white board. Demonstrate a few different examples.]

The correction factor math looks like this:

Current blood sugar level is 200 minus 150, which is your desired sugar level.

$$200 - 150 = 50$$

So, 50 is how much you need to correct your sugar down.

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Since the correction factor is 50 that means you divide 50 correction factor by 50 that you want to bring down by 1 unit of insulin.

$$50 \div 50 = 1$$

Then 1 is the correction dose you would give yourself to bring your sugar level down.

You may need different correction doses through the day. Most often people need a different correction dose, more for breakfast and less for lunch.

3. When do I give a correction dose?

(5 minutes)

It is important to check your blood sugar before you eat a snack or a meal so you can know if you need to give a correction dose.

Before a meal after checking your blood sugar:

The best time to give a correction dose is before a meal. This is so your blood sugar does not go too low or too high.

Between meals if you snack or eat something:

If you are giving a correction dose between meals, you will need to consider the insulin that is still in your body from the last shot.

4. How do I give a correction dose between meals if I am going to eat something?

(2 minutes)

With the insulin pump:

You will enter the amount of carbs you plan to eat and your blood sugar. The pump will subtract the dose still in your body from your correction dose.

With insulin shots:

A good rule is to give half a correction if you are correcting between meals or at bedtime. This avoids stacking. Stacking means giving too much insulin too often. That can lead to a low blood sugar reaction.

5. What is a pre-meal bolus dose?

(3 minutes)

This is the total dose of insulin you give before you eat. It consists of a correction dose if you need one and a dose of insulin to cover the amount of carbs you are about to eat. It can also be called a carb dose or carb bolus.

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It is important to check your blood sugar before you eat. If your blood sugar is high, you will need to add a correction dose and the carb dose. This is an example if your correction factor is 1 to 50 and you plan to eat 15 carb grams.

Your blood sugar is 200 and should be 150. You want to eat a small apple that is 15 grams of carbs. Your correction dose is 1 unit of insulin and your carb bolus is 1 unit of insulin. You will need to give yourself 2 units of insulin.

If you are low you may need to subtract insulin from the total dose, in most cases by 1 or 2 units. This is an example if your correction factor is 1-50, your blood sugar is 70 and you plan to eat 30 grams of carbs.

You need to eat. You plan to eat 15 carb grams of cereal and 15 carb grams of milk. That is 30 total carb grams. You would normally give yourself 2 units of insulin. You check your blood sugar. It is at 70 and should be 120. You would subtract 1 unit of insulin from the total carb dose of 2 units.

You would only need 1 unit of insulin to cover the food you plan to eat and bring your blood sugar up from the low.

****Activity****

Have subjects pull out their practice sheet. Explain how to use the sheet. For participant who know their correction factor, have them use it. For those that do not, have them use a correction factor of 50. Some people may not know their pre-meal blood glucose. Have them choose a number that is common for them to have prior to eating. Some people may not have a target blood glucose. Have them use a target blood glucose of 120. Volunteers can assist participants. Review the example from the previous activity and Insulin Dosing Work Sheet.

IV. Closing (2 MINUTES)

Remind everyone that we will be meeting again in two week, same time and place.
Topics for next week: **Sick Day Rules and Physical Activity Dose Adjustments.**

STEPP-UP Handouts

Agenda	Estimated Time
I. Welcome	3 minutes
II. Introduction a. Icebreaker	5 minutes
III. Nutrition Session a. What is a carb ratio? b. What is a correction factor? c. How do I know what my correction factor is? d. What is a correction dose? e. When do I give a correction dose? f. What is a pre-meal or bolus dose? g. Practice Time - High and Low BG doses	50 minutes
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STEPP-UP Handouts

Insulin Dosing High Blood Sugar Worksheet

Insulin to Carb Ratio

1 unit = _____ grams of carbs

Target blood sugar _____

Correction factor _____

Calculate insulin dose for food:

- Add up all the carbohydrates in your meal.
- Divide the total carbohydrates by the insulin to carbohydrate ratio.
- The result is the amount of insulin units needed

Total Carbs: _____

÷ insulin to carb ratio _____

= units of insulin needed



Calculate insulin dose to correct a high blood sugar:

- If pre-meal blood sugar is high, take the blood sugar reading and subtract target blood sugar.
- Divide what remains by the correction factor.
- The result is the amount of insulin needed to correct high blood sugar.

Actual blood sugar _____ -

Target blood sugar _____ = _____

÷ correction factor _____

= units of insulin needed

Calculate total insulin dose:

- Add the number of units needed for food to the number of units needed to correct blood sugar to get your total dose of insulin.



Food insulin _____

+ Correction insulin _____

= Total insulin

STEPP-UP Handouts

Insulin Dosing High Blood Sugar Worksheet Sample

Insulin to Carb Ratio

1 unit = 15 grams of carbs

Target blood sugar 120

Correction factor 50

Calculate insulin dose for food:

- Add up all the carbohydrates in your meal.
- Divide the total carbohydrates by the insulin to carbohydrate ratio.
- The result is the amount of insulin units needed

Total Carbs: 30

÷ insulin to carb ratio 15 (30 ÷ 15)

= units of food insulin needed

2

Calculate insulin dose to correct a high blood sugar:

- If pre-meal blood sugar is high, take the blood sugar reading and subtract target blood sugar.
- Divide what remains by the correction factor.
- The result is the amount of insulin needed to correct high blood sugar.

Actual blood sugar 200
Target blood sugar 120 = 80

÷ correction factor 50 (80 ÷ 50)

= units of correction insulin needed

1.6

Calculate total insulin dose:

- Add the number of units needed for food to the number of units needed to correct blood sugar to get your total dose of insulin.

Food insulin 2

+ Correction insulin 1.6 (2+1.6)

= Total insulin needed

3.6

STEPP-UP Handouts

Insulin Dosing Low Blood Sugar Worksheet

Insulin to Carb Ratio

1 unit = _____ grams of carbs

Target blood sugar _____

Correction factor _____

Calculate insulin dose for food:

- Add up all the carbohydrates in your meal.
- Divide the total carbohydrates by the insulin to carbohydrate ratio.
- The result is the amount of insulin units needed

Total Carbs: _____

÷ insulin to carb ratio _____

= units of insulin needed

Calculate insulin dose to correct a high blood sugar:

- If pre-meal blood sugar is high, take the blood sugar reading and subtract target blood sugar.
- Divide what remains by the correction factor.
- The result is the amount of insulin needed to correct high blood sugar.

Actual blood sugar _____ -

Target blood sugar _____ = _____

÷ correction factor _____

= units of insulin needed

Calculate total insulin dose:

- Add the number of units needed for food to the number of units needed to correct blood sugar to get your total dose of insulin.

Food insulin _____

+ Correction insulin _____

= Total insulin

STEPP-UP Handouts

Insulin Dosing Low Blood Sugar Worksheet Sample

Insulin to Carb Ratio

1 unit = 15 grams of carbs

Target blood sugar 120

Correction factor 50

Calculate insulin dose for food:

- Add up all the carbohydrates in your meal.
- Divide the total carbohydrates by the insulin to carbohydrate ratio.
- The result is the amount of insulin units needed

Total Carbs: 30

÷ insulin to carb ratio 15 (30 ÷ 15)

= units of food insulin needed

2

Calculate insulin dose to correct a high blood sugar:

- If pre-meal blood sugar is high, take the blood sugar reading and subtract target blood sugar.
- Divide what remains by the correction factor.
- The result is the amount of insulin needed to correct high blood sugar.

Actual blood sugar 90
Target blood sugar 120 = -30

÷ correction factor 50 (-30 ÷ 50)

= units of correction insulin needed

.6

Calculate total insulin dose:

- Add the number of units needed for food to the number of units needed to correct blood sugar to get your total dose of insulin.

Food insulin 2

+ Correction insulin .6 (2 + .6)

= Total insulin needed

1.4