

Continuous Glucose Monitoring (CGM): Dexcom Trend Arrows

Preventing high and low glucose readings by ADJUSTING UNITS

For Insulin Sensitivity Factor (ISF) of less than 1.4

CGM devices show current glucose readings and trend arrows. This handout reviews one method for using trend arrows to prevent high or low glucose levels. Talk with your educator about other methods.

Pre-Meal Suggestions

- “Up Arrows” at meal times mean you add units to your usual meal and correction insulin.
- “Down Arrows” at meal times mean you subtract units from your usual meal and correction insulin.
- Total pre-meal insulin dose = Meal Insulin + Correction +/- Arrow Adjustment Units

DEXCOM ARROW Pre-meal Receiver / app	PREDICTED GLUCOSE CHANGE	WHAT TO DO: Meal Bolus + Correction +/- Arrow Adjustment Calculate your usual meal bolus and correction dose, then add or subtract units for ARROW ADJUSTMENT.
	Rise of more than 5.0 mmol/L in 30 minutes.	Add 4.5 units
	Rise of 5.0 mmol/L or less in 30 minutes	Add 3.5 units
	Rise of 3.4 mmol/L or less in 30 minutes	Add 2.5 units
	No significant change in glucose	No adjustment
<p>*Notes: If you have <u>any</u> down arrows and are 5.5 mmol/L or less before eating, consider if you need to:</p> <ul style="list-style-type: none"> ○ do a finger stick test. You may already be low and need glucose. ○ eat 15g glucose (or more if you have insulin on board or ↓↓). ○ confirm with finger stick check every 15 minutes if sensor reading continues dropping or hasn't responded as you'd expect. 		
	Drop of 3.4 mmol/L or less in 30 minutes	Subtract 2.5 units See notes above*
	Drop of 5.0 mmol/L or less in 30 minutes	Subtract 3.5 units See notes above*
	Drop of more than 5.0 mmol/L in 30 minutes	Subtract 4.5 units See notes above*

Before Meal Example:

Here's how Susan planned for supper insulin on two occasions. In each case, she waited 15 minutes to see if her Dexcom trend arrows changed. They did not. She did not have exercise planned after these meals. Susan has an insulin to carbohydrate ratio of 1 unit for 5 grams and an insulin sensitivity factor (ISF or Correction Factor) of 1. Her target glucose is 7.0 mmol/L.

 Friday Supper	 Sunday Supper																																																
<p>1. Decide on meal bolus as usual</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Grams of carbohydrate</td> <td style="text-align: right;">50</td> </tr> <tr> <td><u>Insulin to Carb Ratio</u></td> <td style="text-align: right;"><u>÷ 5</u></td> </tr> <tr> <td>Meal dose</td> <td style="text-align: right;">10.0 units</td> </tr> </table> <p>2. Decide on correction dose as usual</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Dexcom reading:</td> <td style="text-align: right;">11.0 mmol/L ↑↑</td> </tr> <tr> <td>Subtract target:</td> <td style="text-align: right;"><u>- 7.0 mmol/L</u></td> </tr> <tr> <td>Amount to drop:</td> <td style="text-align: right;">4.0 mmol/L</td> </tr> <tr> <td><u>Divide by ISF:</u></td> <td style="text-align: right;"><u>÷ 1</u></td> </tr> <tr> <td>Correction Dose</td> <td style="text-align: right;">4.0 units</td> </tr> </table> <p>3. Add units for arrow adjustment</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Usual food dose</td> <td style="text-align: right;">10.0 units</td> </tr> <tr> <td>Usual correction dose</td> <td style="text-align: right;">+ 4.0 units</td> </tr> <tr> <td><u>Arrow ↑↑ adjustment</u></td> <td style="text-align: right;"><u>+ 4.5 units</u></td> </tr> <tr> <td>Total meal insulin</td> <td style="text-align: right;">18.5 units</td> </tr> </table>	Grams of carbohydrate	50	<u>Insulin to Carb Ratio</u>	<u>÷ 5</u>	Meal dose	10.0 units	Dexcom reading:	11.0 mmol/L ↑↑	Subtract target:	<u>- 7.0 mmol/L</u>	Amount to drop:	4.0 mmol/L	<u>Divide by ISF:</u>	<u>÷ 1</u>	Correction Dose	4.0 units	Usual food dose	10.0 units	Usual correction dose	+ 4.0 units	<u>Arrow ↑↑ adjustment</u>	<u>+ 4.5 units</u>	Total meal insulin	18.5 units	<p>1. Decide on meal bolus as usual</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Grams of carbohydrate</td> <td style="text-align: right;">50</td> </tr> <tr> <td><u>Insulin to Carb Ratio</u></td> <td style="text-align: right;"><u>÷ 5</u></td> </tr> <tr> <td>Meal dose</td> <td style="text-align: right;">10.0 units</td> </tr> </table> <p>2. Decide on correction dose as usual</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Dexcom reading:</td> <td style="text-align: right;">11.0 mmol/L ↓↓</td> </tr> <tr> <td>Subtract target:</td> <td style="text-align: right;"><u>- 7.0 mmol/L</u></td> </tr> <tr> <td>Amount to drop:</td> <td style="text-align: right;">4.0 mmol/L</td> </tr> <tr> <td><u>Divide by ISF:</u></td> <td style="text-align: right;"><u>÷ 1</u></td> </tr> <tr> <td>Correction Dose</td> <td style="text-align: right;">4.0 units</td> </tr> </table> <p>3. Subtract units for arrow adjustment</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Usual food dose</td> <td style="text-align: right;">10.0 units</td> </tr> <tr> <td>Usual correction dose</td> <td style="text-align: right;">+ 4.0 units</td> </tr> <tr> <td><u>Arrow ↓↓ adjustment</u></td> <td style="text-align: right;"><u>- 4.5 units</u></td> </tr> <tr> <td>Total meal insulin</td> <td style="text-align: right;">9.5 units</td> </tr> </table>	Grams of carbohydrate	50	<u>Insulin to Carb Ratio</u>	<u>÷ 5</u>	Meal dose	10.0 units	Dexcom reading:	11.0 mmol/L ↓↓	Subtract target:	<u>- 7.0 mmol/L</u>	Amount to drop:	4.0 mmol/L	<u>Divide by ISF:</u>	<u>÷ 1</u>	Correction Dose	4.0 units	Usual food dose	10.0 units	Usual correction dose	+ 4.0 units	<u>Arrow ↓↓ adjustment</u>	<u>- 4.5 units</u>	Total meal insulin	9.5 units
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Your Turn Before Meals: Meal Bolus + Correction +/- Arrow Adjustment

- Before lunch, your glucose reading is 10.0 mmol/L ↓↓. According to the chart on page one, you would subtract units from your usual lunch insulin. E.g. Meal Bolus PLUS Correction MINUS ___ units for ↓↓.
- Before breakfast, your glucose level is 10.0 mmol/L →. You can expect your glucose to stay stable as you don't plan to exercise. You calculate your usual meal bolus and correction. According to the chart on page one, would you add or subtract any units for arrow adjustment?
- Before supper, your glucose level is 5.0 mmol/L ↑. You don't plan on exercising. How would you calculate your supper insulin? Remember: Meal Bolus + Correction +/- Arrow Adjustment
- Before supper, your glucose level is 5.0 mmol/L ↓↓. What would you do?

After Meal Suggestions (2-4 hours after a meal):

Hyperglycemia Prevention Using Trend Arrows 2-4 hours After Meal	
Avoid corrections for the first 2 hours after a meal bolus to prevent insulin stacking.	
Glucose reading 2-4 hours after eating	WHAT TO DO: If arrow  or 
8.3 -13.9 mmol/L	<ul style="list-style-type: none"> • Take your usual correction dose. Do not add units for arrow adjustment. • Consider correcting to 10.0 mmol/L if it's only 2 hr after eating. • Avoid correcting again for at least another 2 hours.
14.0 mmol/L and greater	<ul style="list-style-type: none"> • Confirm with finger stick test. • Check for ketones if 14.0 mmol or higher. If ketones are present, follow guidelines for preventing DKA. • Take usual correction dose. Do not add units for arrow adjustment. • If  one hour after this correction <ul style="list-style-type: none"> ○ Confirm with finger stick ○ Follow guidelines for preventing DKA if ketones are present. ○ Take additional correction insulin. Do not add units for arrow adjustment. ○ Change infusion site if on an insulin pump.

Hypoglycemia Prevention Using Trend Arrows 2-4 hours After Meal	
Glucose reading 2-4 hours after eating	WHAT TO DO: If arrow:  or  or 
Near 8.3 mmol/L	<ul style="list-style-type: none"> • Recheck in 15 minutes
Near 5.5 mmol/L or lower	<ul style="list-style-type: none"> • Take 15 g fast-acting carbohydrate (30 g if ) • Check glucose level again in 15 minutes. If CGM reading is less than 4.0 mmol/L with arrows down, confirm with finger stick blood glucose test and take another 15 g glucose. • Check CGM every 15 minutes. If CGM continues to show arrows down, confirm with finger stick blood glucose test.

After meal (2-4 hours) examples:

1. Your blood sugar 2 hours after eating is 13.5 mmol/L . What could you do?
2. Your blood sugar 3 hours after eating is 5.2 mmol/L . Do you need to add a snack?
3. Your blood sugar 2 hours after eating is 5.2 mmol/L . Do you need glucose?

Adapted from:

1. Dexcom G5 Treatment Decisions: Advanced arrow adjustment 2018
2. Aleppo G, Laffel LM, Ahmann AJ et al. A Practical Approach to Using Trend Arrows on the Dexcom G5 CGM System for the Management of Adults with Diabetes. Journal of the Endocrine Society 2017 Nov 20;1(12):1445-1460. doi: 10.1210/je.2017-00388. eCollection 2017 Dec 1.