Libre Flash Glucose Sensor Guidelines
Scanning Frequency and Adjusting Insulin Using Trend Arrows
<u>Insulin Sensitivity Factor (ISF) of 1.4 to 2.7</u>

The Libre Flash glucose sensor gives current and past glucose data when scanned, plus trend arrows. Trend arrows estimate how your glucose level will change in the next 30 minutes. You can use this information to help prevent high or low glucose levels. Talk with your healthcare provider before using the suggestions in this handout. Follow all product instructions as provided by the manufacturer.

When to Scan

What do you want to do?	How to do this:	Why this helps:
Get continuous data	Scan every 8 hours	The sensor only holds 8 hours of data.
Decide on meal doses	Scan before meals	Meal doses depend on carbohydrate to be eaten, current glucose level and trend arrow.
Assess meals & snacks	Scan hourly for 2-4 hours after eating	Specific foods, portions and meals can affect glucose levels. Make notes in your app or scanner so the next time you eat a certain meal, you can look back and decide how to use insulin, portions or exercise to help reach your target glucose.
Get a good night's sleep	Scan before bed	Low or high readings overnight may be prevented by using the current glucose reading and trend arrow. Consider scanning during the night if the day's activity or food was different from usual.
Treat a low	Scan every 15 minutes after eating fast-acting carbohydrate.	You may need to re-treat. If still below 4 mmol/L, consider a finger stick check before re-treating. The sensor glucose may not accurately reflect blood glucose levels that change quickly.
Treat a high	Scan hourly for 2-4 hours after giving correction insulin.	Readings should be dropping. If you have type 1 diabetes, follow guidelines to prevent DKA.
Assess patterns	Review reports on your scanner, app or the LibreView cloud.	Reports make it easier to find trends – times of the day when your readings are in target or out of target. This helps focus your attention.
Stay safe with exercise	Scan • before exercise • every 15-30 min • right after • 6-8 hours after	Glucose levels can change quickly during exercise. You may need finger stick checks. The sensor glucose may not accurately reflect blood glucose levels that change quickly. A "low" glucose can occur hours after exercise.

Pre-Meal Suggestions (ISF 1.4 to 2.7)

Once you are comfortable using the Libre and understand its results, you may want to use the trend arrows to help adjust your pre-meal insulin dose (meal and correction insulin). Discuss these suggestions below with your healthcare provider before using.

- "Up Arrows" at meal time means you <u>add</u> units to your usual meal and correction insulin.
- "Down Arrows" at meal time means you <u>subtract</u> units from your usual meal and correction insulin.

Total pre-meal insulin dose = Meal Insulin + Correction +/- Arrow Adjustment Units

LIBRE ARROW Pre-meal	GLUCOSE CHANGE [1]	WHAT TO DO [2] **Meal Bolus + Correction +/- Arrow Adjustment** Calculate your usual meal bolus and correction dose, then add or subtract units for ARROW ADJUSTMENT below.
↑	Rising Quickly: More than 3.0 mmol/L in 30 minutes	Add **2.5** units If you are NOT going to exercise
↗	Rising: 1.8 to 3.0 mmol/L in 30 minutes	Add **1.5** units If you are NOT going to exercise
→	Changing Slowly: Less than 1.8 mmol/L up or down in 30 minutes	No adjustment
*Note: If you have any down arrows and are 5.5 mmol/L or less before eating, consider doing a finger stick check. You may be low already and need fast-acting carbohydrate.		
↘	Dropping: 1.8 to 3.0 mmol/L in 30 minutes	Subtract **1.5** units See notes above*
↓	Dropping Quickly: More than 3.0 mmol/L in 30 minutes	Subtract **2.5** units See notes above*

Pre-Meal Example:

Here's how Susan planned for supper insulin on two occasions. In each case, she waited 15 minutes to see if her Libre trend arrows changed. They did not. She did not plan exercise after these meals. Susan has an insulin sensitivity factor (ISF) of 2 and an insulin to carbohydrate ratio of 1 unit for 10 grams. Her target glucose is 7.0 mmol/L.

11.0 ↑ mmol/L	11.0 ↓ mmol/L
Friday Supper	**Sunday Supper**

Friday Supper	**Sunday Supper**
1. Decide on meal bolus as usual	**1. Decide on meal bolus as usual**
Grams of carbohydrate 50	Grams of carbohydrate 50
Insulin to Carb Ratio ÷ 10	Insulin to Carb Ratio ÷ 10
Meal dose 5.0 units	Meal dose 5.0 units
2. Decide on correction dose as usual	**2. Decide on correction dose as usual**
Libre reading: 11.0 mmol/L ↑	Libre reading: 11.0 mmol/L ↓
Subtract target: - 7.0 mmol/L	Subtract target: - 7.0 mmol/L
Amount to drop: 4.0 mmol/L	Amount to drop: 4.0 mmol/L
Divide by ISF: ÷ 2	Divide by ISF: ÷ 2
Correction Dose 2.0 units	Correction Dose 2.0 units
3. Add units for arrow adjustment	**3. Subtract units for arrow adjustment**
Usual food dose 5.0 units	Usual food dose 5.0 units
Usual correction dose + 2.0 units	Usual correction dose + 2.0 units
Arrow ↑ adjustment + 2.5 units	**Arrow ↓ adjustment - 2.5 units**
Total meal insulin 9.5 units	Total meal insulin 4.5 units

Your Turn Before Meals: Meal Bolus + Correction +/- Arrow Adjustment

1. Before lunch, your Libre 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 ↓. Fill in the blank.

2. 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 + Correction dose. According to the chart on page one, would you add or subtract any units for arrow adjustment?

3. 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

4. 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 Libre Trend Arrows 2-4 hours After Meal	
Glucose reading 2-4 hours after eating	**WHAT TO DO: If arrow ⬈ or ⬆**
10.1 mmol/L or more	• If you have Type 1 diabetes, test for ketones if glucose 14 mmol/L or greater. Follow the guidelines for preventing DKA. If you have ketones do a finger stick check before giving 1.5 times the correction dose. • Do not add units for arrow adjustment. • Take usual correction dose (or the dose recommended in the guidelines for preventing DKA if you have type 1 diabetes). • Correct to 10.0 mmol/L if it's only 2 hours after eating. • Avoid correcting again for at least another 2 hours. • Scan in 1 hour and if "up" arrow, confirm with a finger stick
10 mmol/L or less	• Scan in 1 hour and If "up" arrow, confirm with a finger stick

Hypoglycemia Prevention: Using Libre Trend Arrows 2-4 hours After Meal	
Glucose reading 2-4 hours after eating	**WHAT TO DO: If arrow: ⬊ or ⬇**
10 mmol/L or less	• If 5.5 mmol/L or lower, consume 15 g fast-acting carbohydrate • Scan in 15 minutes • Consider a finger stick check if: ○ ↓ arrow at any time, as glucose changing rapidly or ○ Reading is less than 4 mmol/L or ○ You think you need another 15 g fast-acting carbohydrate, reading continues dropping or hasn't responded as you'd expect.
10.1 mmol/L or more	• Scan in 15 minutes • If ↓ arrow, consider a finger stick check as glucose changing rapidly

After meal (2-4 hour) examples:

1. Your glucose reading 3 hours after eating is 14.1 mmol/L ↑. What could you do?
2. Your glucose reading 2 hours after eating is 13.1 mmol/L ↑. What could you do?
3. Your glucose reading 3 hours after eating is 5.4 mmol/L→. This is a stable arrow. Do you need fast-acting carbohydrate?
4. Your glucose reading 2 hours after eating is 5.2 mmol/L ↓. Do you need fast-acting carbohydrate?

References:
1. Freestyle LibreLink App User Manual – Canada 08/18
2. Adapted from: Kudva YC et al. Approach to Using Trend Arrows in the FreeStyle Libre Flash Glucose Monitoring Systems in Adults. Journal of the Endocrine Society 2018: 2(12).