

Standard Bolus

- Useful for meals with average carb and fat content
- Useful for High Glycemic foods
- Also used for correction boluses
- **Realize that many post meal surges in BG are related to underestimating carb counts. Make sure your carb counting correctly before you try other boluses. Use a measuring cup and a food scale to accurately check portions.**
- Timing of the meal bolus may also make a huge difference.
 - CGM has shown that eating food can cause a spike in sugar 60 minutes later.
 - Rapid acting insulin doesn't peak until 90 minutes after injections.
 - For insulin to better match the blood sugar peak it should be given 15-20 min prior to the meal.

Extended/ Square Wave

- **Given over a set amount of hours and is equally distributed throughout those hours.**
- Grazing –eating small amounts over > 30 minutes (popcorn at the movies)
- Slower picky eaters (If your child normally will eat a whole bowl of pre-measured carb, but consumes meals slowly > 30 minutes)
- Not for buffets. It is better to enter more frequent standards boluses
- Slower absorbing , high fiber foods: beans, oatmeal, quinoa, high fiber pasta.

Combination/ Dual Wave

- **High fat meals (Pizza, Mac and Cheese, Chicken Nugget, Burgers, Fries)**
- Recommended starting point: 50% given as normal bolus + 50% given as an extended bolus over 2 hours. Post meal range should be around 180 mg.
- Percentage of standard + extended portion is set by the user- (Ex: 30:70/ 40:60/ 50:50)
- The extended portion can be given over 30 minutes to several hours. (Ex: 50:50 over 2 hours or 30:70 over 4 hours).
- Testing BG or following the CGM trends are the only ways to determine which settings will work.
- Use caution when using a lengthy bolus, especially past bedtime.
- Always manage hyperglycemia first if pre-meal BG is high: Give correction immediately. Wait for at least 15-20 minutes before eating so that insulin can start to bring BG down. Pre-meal BG should be in range before “testing” a new bolus.
- High fat (>20g) and high protein (>25g):
 - Meal Size:
 - <45g of carbs, do not add extra insulin
 - 45-60g of carbs, add 15g to carb bolus
 - 60-75g of carbs, add 20g to carb bolus
 - 75-90g of carbs, add 25g to carb bolus
 - >90g of carbs, add 30g to carb bolus
 - Start with a 50/50 combination bolus over 3-4 hours

Temporary Basal Rates

- Allows the pump user to increase or decrease the basal rates for a specific period of time (length of time is set by the user). Goal is to prevent hypoglycemia.
- **Useful for the following:** Exercise, Sick days, Stress, Menstrual period, vacation, any changes from usual activity
- **Exercise:** Basal rate changes should be set at **least 1 hour before you think the low will occur.**
 - Different exercise (Anaerobic vs. aerobic) =different effects on BG. Pay attention to your body patterns.
 - **Lower BG can result with the following:** 30 minutes or more of moderate to intensive aerobic activity: Running, biking, swim, hikes.
 - If you go low with exercise 25-50% of the time: A 75% basal rate may be helpful to prevent low BG. If still running low try a 50% basal rate.
 - If you are eating a meal within 2 hours of exercise-Cover 30-50% of the carbs instead of 100%.
 - Consider a 15-30 gram snack if sugar is below 150 mg prior to activity.
 - Sometimes a temp basal of 80% (-20%) overnight from 9pm-3am helps reduce overnight lows. CGM helps recognize these patterns.

Sick Day Management

Illness can cause insulin resistance- more insulin is usually needed to manage hyperglycemia.

- 1) **Temporary basal rates:** Start with increasing basal by 20%-30% for 6-8 hours.
 - If blood sugars have normalized, continue with increased temp basal rate. As blood sugars start to decrease, cancel temp basal.
 - If hyperglycemia continues, increase temp basal by 10-20% every 6-8 hours as needed.
- 2) **Duration of insulin action/Insulin on board**
 - Adjust from 3-2 hours allowing for a greater amount for correction bolus
- 3) Check BG frequently
- 4) Check for ketones even if BG is in normal range.
- 5) **For ketones moderate/large:** Give 1-3 extra units of insulin (depending on age of child). Call MD on Call for assistance with management if ketones continue to be present and/or nausea/vomiting are present.