

Cheat sheet for switching to Basal – Bolus regimen with Basaglar and Regular (R) insulin



Basaglar is a 24-hour basal insulin analogue that covers hepatically produced glucose to prevent high glucose between meals and overnight. Unlike NPH insulin, it does not provide mealtime coverage. Therefore, it is necessary to take **Regular (R) short acting insulin (e.g. Humulin R) as a bolus with all meals**. Basal insulin has no peak so there is less risk for hypoglycemia between meals or when food is not available. This regimen also allows the child/young adult to choose the time they eat and vary the meal size. The regimen requires 4 injections a day if the child/young adult eats 3 meals a day. Regular insulin lasts at least 5 hours, so it provides some insulin coverage for small snacks between meals and at bedtime.

- Basal insulin can be given at any time of the day but must be given at around the same time every day. It can be given with or without food. It can be given at the same or different time as regular insulin. Usually given at bedtime or evening meal (easier to remember). - Regular insulin should be injected up to 30 minutes before the start of the meal.		
How to calculate Basaglar and Regular (R) doses	Recommendations	Examples
- Calculate total daily insulin dose (TDD) based on age and pubertal status** Give 40% of TDD as Basaglar and remaining 60% as Regular insulin. Divide Regular between the number of meals eaten per day	**Calculate TDD: - Children under 3 years of age: start at 0.25 units/kg/day, may need up to 0.5 units/kg/day - Over 3-years of age prepubertal: start at 0.5 units/kg/day; may need up to 1.0 units/kg/day - Pubertal: start at 1.0 units/kg/day, may need up to 2.0 units/kg/day - Post pubertal: 0.4 - 1.0 units/kg/day.	Example: 16-year-old post menarche girl: 56kg x 1.0 units/kg/day = 56 units TDD 40% of the TDD as Basaglar = 56 x 0.4 = 22 units Basaglar (rounded up) 60% of the TDD as Regular = 34 units of Regular; divided into 3 meals = 11 units (rounded) Regular-this is the average dose for each meal (see page 2*). - Check that the sum of Basaglar and Regular is the TDD of 56 units.
**Age based calculation of Total Daily Dose (TDD). If child/young adult is new to insulin, <u>start on lower end of dosage range</u>. If transitioning from NPH&R or pre-mixed insulin, and if in doubt, also start on the lower end of dosage range. Be aware that the dose will probably require further adjustment, so a close follow up of blood glucose levels is required.		

***Dividing Regular short acting insulin dose between meals**

If the child/young adult does not eat the same amount of carbohydrates with every meal, it is necessary to vary the Regular dose at the different meals. For example, 3 cook spoons of rice will require more regular insulin than 1 cook spoon. One bowl of rice will require more insulin than one bowl of soup.

1. Obtain a complete diet history.
2. Determine the size of each meal (small, average, or large) based on the amount of carbohydrate consumed.
3. Divide the **total Regular dose by** the number of meals to get the **average** meal dose.
4. Increase or decrease the average meal dose (Regular insulin) depending on the size of the meal.
 - Large meal: Increase average meal dose by 1-2 units.
 - Small meal: Decrease average meal dose by 1-2 units.
 - **Not eating = Do not give Regular insulin**

Example: The 16-year-old girl eats the smallest amount of carbohydrates at breakfast (e.g. 1 egg on 1 slice of toast), a large amount of carbohydrate at lunch (e.g. large bowl of rice with sauce and 1 slice of bread) and an average amount of carbohydrate at dinner (e.g. small bowl of rice with some chicken and non-starchy vegetables).

If total Regular (R) is 34 units, she would get $34/3 = 11$ units (rounded) for the average meal.

Decrease this by 1-2 units for the small meal (9 units) and increase by 1-2 units for the large meal (13 units). This girl will take 9 units R at breakfast, 13 units at lunch, and 11 units at dinner. If she does not eat a meal, she does not need to take the Regular insulin at that time.

Making the Switch:

Day of starting Basaglar	Example
1. Morning dose: The young girl takes usual morning dose of Regular (R), intermediate acting Humulin NPH (or Humulin 70/30 - premixed insulin), then eats as usual	Existing dose: The young girl takes 9 units of R and 18 units of NPH before breakfast and 5 units R and 8 units NPH before the evening meal. Her TTD is 40 units. Give 40% of TDD as Basaglar and remaining 60% as Regular insulin Her new doses/regimen are: • 16 units Basaglar at bedtime and • 8 units Regular insulin at each average meal, or adjust according to her meal sizes (24 units of R in total) However, her morning insulin on the day of starting Basaglar is her existing dose of 9 units R and 18 units NPH.
2. Lunch dose: If the young girl takes R at lunch normally, this can be done as usual	This young girl takes no insulin at lunch time. If she would usually take Regular at lunch, she could take her usual dose on this day.
3. Evening meal dose: Give R according to new calculations prior to evening meal	She takes 8 units R for average evening meal
4. Give new dose of Basaglar at bedtime (or evening meal whatever is most convenient and easiest to remember)	She takes 16 units Basaglar at the evening meal (e.g., 22:00)
Check Blood Glucose level (BGL) at a minimum: before each meal, at bedtime, and at least once at 2-4am for the first two weeks after starting Basaglar.	

What to do if your child/young adult misses Basaglar in the evening and remembers on waking in the morning:	What to do if your child/young adult misses Basaglar and the next dose <u>is due in less than 6 hours</u>:
1. Give half the dose of missed Basaglar in the morning	1. Do not give missed dose at all
2. Test for urine ketones (if available); call clinic if +	2. Test urine for ketones; call clinic if +
3. “Correct” a high morning blood glucose level with Regular insulin according to the correction factor given to child/young adult	3. “Correct” a high blood glucose level with Regular insulin at the next meal according to the Insulin Sensitivity Factor given to child/young adult (see below under Advanced Topics)
4. Resume usual Basaglar dose at regular time	4. Resume usual Basaglar dose at regular time

ADVANCED TOPICS

Using Insulin Sensitivity Factor (ISF) as correction scale for child/young adults:

The **Insulin Sensitivity Factor (ISF)** also referred to as Correction Factor, is the amount that 1 unit of short acting Regular insulin drops the blood glucose level, for example: an ISF of 100 means 1 unit of insulin will drop the blood glucose level by 100 mg/dL

To calculate the ISF use the 1500 rule (or 83 rule if using mmol/L):

Example:

Child has **Total Daily Dose (TDD)** of 19 units for an average day (i.e. 8 units Basaglar, 5 units of Regular for breakfast, 3 units for lunch and 3 units for the evening meal)

- **If using mg/dL - 1500 divided by the TDD:** $1500 \div 19 = 79$ this means that 1 unit of Regular insulin drops the blood glucose level by 79 mg/dL.
- **If using mmol/L – 83 divided by the TDD:** $83 \div 19 = 4.4$ this means that 1 unit of Regular insulin drops the blood glucose level by 4 mmol/L (rounded down).

Suggestion if calculating the Insulin Sensitivity Factor is too complex, create a table to give to parents/young adult to take home:

- | | |
|---|--|
| <ul style="list-style-type: none">• If blood glucose level is > 200 – 300 mg/dL (> 11 - 16 mmol/L*) take 1 extra unit Regular insulin with meal.• If blood glucose level is > 300 - 400 mg/dL (> 16 – 22 mmol/L*), take 2 extra units' Regular insulin with meal.• If blood glucose level is > 400 mg/dL (> 22 mmol/L*), take 3 extra units' Regular insulin with meal. | } Add the extra Regular insulin to the meal dose before eating a meal. |
|---|--|

*rounded numbers

NOTE: only use short (or rapid) acting insulin to 'correct' high blood glucose levels

Adjusting Insulin in the Clinic

Principles of Insulin Adjustment

Parents/young adults should bring blood glucose level log and meter with them to every visit. Check meter against written record. Review blood glucose level history, looking for patterns.

Keep in mind blood glucose level targets:

Time of day	Target (mg/dL)	Action Needed if	Target (mmol/L)	Action Needed if
Pre meal [#]	70-144**	<70 or >180	4-8 mmol/L**	<4 or >10
Post meal [#]	70-180**	<70 or >200	4-10 mmol/L**	<4 or >11
Bedtime*	108 -180	<108	6-10 mmol/L	<6

****NOTE:** Blood glucose level (BGL) targets should be individualized: a BGL target of 80 or 90 mg/dL (4.4 or 5 mmol/L) for the lower limit, may be more practical in limited resourced settings to reduce the risk of hypoglycemia.

Source: [#][ISPAD Clinical Practice Consensus Guidelines 2024: Glycemic Targets](#); ^{*}[LFAC/ISPAD/IDF Pocket book guidelines, 2017](#); ^{**}[ISPAD Clinical Practice Consensus Guidelines 2022: Limited Resource Settings](#)

NOTE: Before making insulin adjustments, consider external or temporary factors: insulin storage, lipohypertrophy, illness, physical activity, menstrual cycle, change in food consumed or no food.

Which insulin to adjust:

If the blood glucose level is high	increase
Before breakfast	Basaglar
Before lunch	Morning regular dose
Before dinner	Lunch regular dose
At bedtime	Dinner regular dose

If the blood glucose level is low	decrease
Before breakfast	Basaglar
Before lunch	Morning regular dose
Before dinner	Lunch regular dose
At bedtime	Dinner regular dose

Adjust Regular insulin by 1 to 2 units, depending on whether child/young adult is taking small or large amount of insulin.

Adjust Basaglar by 1 to 2 units, depending on whether child/young adult is taking small or large amount of insulin.

Cheat sheet for Basaglar & R switch - developed by Dr Debra Cohen & Amanda Perkins NP; 2023; modified by Prof Carine De Beaufort for Life for a Child, 30 April 2024 & revised Jan 2025; reviewed by Dr Yeray Novoa-Medina, Feb and Aug 2025

Disclaimer

The content provided in this guide is of a general nature only and may be of assistance to healthcare professionals for educational and informational purposes. While the Life for a Child program conducted by Diabetes Australia tries to make sure the information is accurate, under no circumstances is it intended to constitute (or be used as a substitute for) professional or medical advice to any individual and should not be relied upon to diagnose, treat, cure or prevent diabetes. Diabetes Australia strongly recommends that people with diabetes seek advice from and consult with professionally qualified medical and healthcare professionals. To the maximum extent permitted by law, Diabetes Australia does not accept any liability or responsibility for the accuracy, currency or completeness of the information, opinions or recommendations provided in this guide. Diabetes Australia recommends that healthcare professional users of this guide ensure that they are working within the scope of clinical practice authorised by their local governing body. To the maximum extent permitted by law, Diabetes Australia does not accept any liability or responsibility for any injury, loss or damage that may result from the use of the information, opinions or recommendations contained within this publication.