

**What is Type 1 Diabetes (T1D) ?**

**Glucose (sugar):** Main source of energy, or fuel. Comes from food & the body (like a glucose factory)

**Insulin:** Helps cells use glucose      **Type 1 Diabetes:** The pancreas is not able to make insulin. Without insulin:

1. There is a build-up of glucose in the blood, called **HYPERglycemia**. **HYPERglycemia** causes dehydration, tiredness & damage to the blood vessels in the heart, brain, kidneys, legs, eyes & nerves.
2. Cells get energy from fat & protein instead, which causes loss of fat & muscle.
3. The blood stream is overloaded with acid (DKA) which leads to cardiac arrest unless treated with **INSULIN**.

**\*\* INSULIN is the ONLY TREATMENT that STOPS & PREVENTS ACID OVERLOAD from DKA. BASAL insulin prevents DKA**

**\*\* IF BG is 70 mg/dL or less, EAT carbohydrates to RAISE the blood glucose & TAKE BASAL insulin.**

( Might need to lower the BASAL dose a little, but **NEVER EVER** skip BASAL insulin )

**HYPOglycemia:** Low Blood Sugar, 70 mg/dL or less

Symptoms: shaky, sweating, dizzy, hungry, headache, nervous, irritable, light-headed, heart racing, "feel bad"

For symptoms above, check blood glucose (BG)...

**Treatment:**

1. For BG 70 mg/dL or less, eat 15 grams (gm) rapid-acting carbohydrate (carb) RESCUE, ie 4 oz juice
2. Recheck BG in 15 minutes
3. For BG 70 mg/dL or less, eat 15 gm rapid-acting carb RESCUE again. Recheck BG in 15 minutes.
4. Repeat treatment up to 3 times till BG over 70 mg/dL
5. For BG still 70 mg/dL or less after 3 treatments, CALL 911 and re-treat while waiting OR just keep treating w/15 gm carb RESCUE + BG recheck 15 min
6. Once BG over 70 mg/dL, eat meal OR 15 gm carb + protein snack, ie 8 oz milk or ½ PB sandwich
7. Instruct support persons how to inject Glucagon for HYPOglycemia along with erratic behavior, seizure, or coma

**Prevent HYPOglycemia:**

- Don't skip meals and take insulin as prescribed.
- See if insurance will cover a continuous glucose monitor
- Make insulin dose adjustments promptly, as needed.
- Check BG 4 times per day; more when exercising or ill
- If bedtime BG less than 100 mg/dL, have a 15 gm carb + protein snack
- Ask provider about decreasing insulin before exercise.
- Always carry a 15 gm rapid-acting carb RESCUE
- Teach support persons signs of low BG & how to help
- Talk to diabetes provider before consuming alcohol
- Contact diabetes provider...
  - For any unexplained BG 70 mg/dL or less
  - For BG 70mg/dL or less, occurring 2 or more times/week
  - For any BG < 54 mg/dL

**HYPERglycemia:** High Blood Sugar, greater than 180 mg/dL

Symptoms: extreme tiredness and thirst, frequent urination, nausea, hunger, irritable, headache, stomach pain, blurry vision, confusion

For symptoms above, check blood glucose (BG)...

**Treatment: D- I- N- E- R ( K )**

1. For BG over 180 mg/dL ...
  - a) Drink 8-16 oz water OR caffeine + sugar-free beverage every hour till BG < 180 mg/dL (unless fluid restriction)
  - b) Insulin. If prescribed: give **CORRECTION** dose of rapid-acting insulin every 3 hours, until BG 180 mg/dL or less (MUST be 3 hours between insulin doses)
  - c) No carbs till BG 180 mg/dL or less
    - \*\* For **SICK DAY**, no carbs until BG less than **400 mg/dL**
  - d) Exercise; walk 10-30 min, unless ill or **urine ketones** present
    - \*\* For **BGs over 300 mg/dL**, start **exercising & check BG in 15 min to be sure BG is dropping**
  - e) Recheck BG every 3 hours, until BG 180 mg/dL or less
2. **Ketones:** For BG over 180 mg/dL after 6 hours of above treatment or 2 unexplained BGs over 300 mg/dL in 6 hours
  - a) FOLLOW **D- I- N- E- R** steps above
  - b) Check urine ketones every 3 hours, until BG 180 mg/dL or less and urine ketones are **NEG**
    - ketones **NEG - SMALL:** Contact diabetes provider
    - ketones **MOD - LG:** See diabetes provider **NOW**
    - ketones **VERY LG:** Give **CORRECTION** insulin dose & go to the emergency room

**Prevent Hyperglycemia:**

- Check BG 4 times per day; more if BG over 180, ill, extra carbs
- Take insulin as prescribed; See provider every 3 months.
- Exercise regularly; take a brief walk after every meal
- Eat **MORE** whole grains, beans, veggies, and low carb fruits (cantaloupe, honeydew melon, kiwi, peaches and strawberries)
- Eat **LESS** simple carbohydrates (soda, sweets, white bread...)

**GENERAL BG Goal** (may vary by age and illness)

- Hemoglobin A1C ..... less than 7.0%
- BG fasting or pre - meal ... 100 to 140 mg/dL
- BG 2 hours after meal ..... 180 mg/dL or less

**BG Monitoring** (frequency may vary)

- Before meals
- With exercise
- Before bed
- If feeling ill
- \* Record BGs in log for diabetes provider

♥ **Exercise** (walk/be active)

- 30 min/day, 5 days/week
- or
- Walk 10 min after meals

**Guidelines for SICK DAYS, or feeling unwell**

fever, excess fatigue, headache, sore throat, sinus drainage, cough, stomach upset, burning with urination, etc

- DON'T hold BASAL insulin due to illness. Before illness occurs, ask diabetes provider if insulin doses will need to be changed when ill.
- Before taking over-the-counter meds that may increase BG, discuss with diabetes provider
- Drink 8-16 oz water or sugar/caffeine-free beverage (diet ginger-ale or crystal light) every hour
- Eat or drink 45 gm carbs every 3 hours (12 oz regular ginger-ale OR ½ cup apple sauce + 2 slice toast)
  - \*\* No carbs if BG over 400 mg/dL \*\*
- Check BG and urine ketones every 3 hours
  - BG over 180 mg/dL & ketones NEG-LG: USE the HYPERglycemia treatment plan
  - BG 180 mg/dL or less & ketones MOD-VRY LG: USE HYPERglycemia treatment plan & call provider NOW
  - ANY BG & ketones VERY LG: GO to the ER

**Consider calling DM provider if:**

- prescribed steroids
- fasting for a medical test
- BG over 180mg/dL after 6 -12 hours of HYPERglycemia
- unsure of insulin dose or how to take it

**Consider seeking EMERGENCY care for...**

- Persistent vomiting or diarrhea over 6 HRs
- New /severe symptom that may need immediate medical attention: chest pain, cough, shortness of breath, stomach pain, change in urination, severe headache, dizziness, weakness, numbness, fever, speech or vision changes, swelling or redness
- BG over 400 mg/dL

**Controlling Carbohydrate (Carb) Intake**

**Carbohydrates** ( food that turns into glucose )

- Found in milk products, beans, grains (cereal, pasta, bread), rice, starchy vegetables, fruit, soda, juice, syrup, sugar, sweets & prepared foods ( pizza / fried chicken )
- Number of "grams of carbohydrates" or "carb servings"
- A "carb serving" is a portion of food with 15 gm of carbohydrates (½ cup potatoes, ⅓ cup cooked rice or pasta)

**Read food labels** (Free online: My Fitness Pal, Calorie King)

- Find the "Total Carbohydrate" grams per serving
- If it is around 15 gm, then it is 1 carb serving. If it is around 30 grams then it is 2 carb servings and so on
- Check the serving size at top of the label to see how many carb servings you will eat

**TIPS to HELP control carb intake, blood glucose, & diabetes**

- Eat meals often to prevent HYPOglycemia from diabetes med
- Avoid juice, sweet tea & soda, unless treating HYPOglycemia
- Eat maximum of 4 carb servings per meal (2 - 4 carb servings per meal is sufficient for most adults to control weight & BG)
- Eat the same number of carb servings per meal
- Use the plate method (in addition to carb counting)
  - ½ plate non-starchy veggies: salad, spinach, broccoli
  - ¼ plate carbohydrates: grains or starchy vegetables
  - ¼ plate protein: lean meat, chicken, fish, egg, nuts, cheese



**\* Insulin and precautions**



Nov, 2018

<p><b>BASAL:</b> controls BG between meals. Moves glucose that is "made-by-the-body" into cells. Given once or twice a day, even if fasting.</p>	<p><b>Long-acting 24 hours:</b> Lantus U100®, Levemir U100®, Basaglar U100®, Tresiba U100®, Tresiba U200®, Toujeo U300®</p> <p><b>Intermediate-acting 12 hours:</b> NPH</p> <p>*Adjust dose per fasting BG</p>	<p><b>May cause:</b></p> <p>weight gain</p> <p>or</p> <p>HYPO-glycemia</p>	<p><b>HYPO-Glycemia</b></p> <p><b>OR</b></p> <p><b>HYPER-glycemia</b></p> <p><b>OR</b></p> <p><b>Illness ?</b></p> <p>Contact diabetes Provider.</p>
<p><b>NUTRITIONAL:</b> gets glucose from food into cells</p> <p><b>CORRECTION:</b> treats HYPERglycemia ; gets BG back into normal range</p>	<p><b>Rapid-acting 3-4 hours:</b> Novolog U100®, Humalog U100®, Admelog U100, Apidra U100®, Humalog U200®</p> <p><b>Short-acting 5-6 hours:</b> U100 Regular</p> <p>Given before meals.</p> <p>* Adjust future dose, based on BG 3-4 hours after dose was given</p>		
<p><b>Insulin pump</b></p> <p>Continuous insulin infusion into skin using Novolog®, Humalog®, Regular or U500® (off - label)</p>	<p><b>Basic Settings:</b> BASAL rate, Carb ratio (NUTRITIONAL) &amp; Sensitivity factor (CORRECTION)</p> <p><b>BG over 400 mg/dL four hours after treating HYPERglycemia with pump?</b> Inject correction insulin by syringe (call provider for dose, if needed). <b>Possible pump or site failure?</b> Call pump company. Place new pump site.</p>		
<p><b>Mixed insulins: 50/50, 70/30, 75/25</b></p> <p>Numerator: % of NPH. Denominator: % of <u>rapid</u> or <u>short-acting</u> insulin</p> <p>Given twice per day</p>	<p>Less optimal regimen. Does the job of BASAL &amp; NUTRITIONAL insulin. "BASAL-heavy" = fasting HYPOglycemia risk + insufficient insulin for meals + cannot skip meals</p>		

