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Recommended
Oral Glucose Gel



glutose15™

Glutose 15™ has been awarded the #1 most recommended OTC product in the *Oral Glucose Gel Category* from the American Pharmacists Association's flagship journal, *Pharmacy Today*.^{*} This prestigious award was established through an annual survey encompassing 3000+ pharmacists.

Glutose 15™ is an oral glucose gel for fast, effective treatment of hypoglycemia (low blood sugar) and is available in both grape and lemon flavors. The 15 gram one-dose tube offers convenience and confidence by eliminating counting, chewing and measuring while delivering the recommended 15 grams of carbohydrate per tube.

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*Pharmacy Today Annual Over-the-Counter Product Survey, February 2008. The #1 Pharmacist Recommended OTC Award does not indicate Pharmacy Today or APhA endorsement of any product or service.



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Implementing Carbohydrate to Insulin Ratio for Type 1 Diabetes Patients

By Catherine Kessler RD, CDE
Oakland, CA

As diabetes educators, we have a unique role to play with our type 1 patients. We teach the tools to determine meal insulin requirements based on carbohydrate content of meals and pre-meal blood sugar levels. We strive to impart all of the knowledge necessary to maintain stable diabetes control.

For most patients, the process is logical and straightforward, but the implementation day in and day out can be daunting and exhausting.

By listening to our patients' difficulties inherent with daily intensive management, we learn how to become better educators. A CDE working in this area should also consider personally trying the methods taught, to learn more and to understand the pitfalls.

Using equations developed by Paul Davidson MD and the Atlanta Diabetes Center¹ (they assessed insulin needs in 1500 early pump users), we can calculate a beginning Carbohydrate to Insulin Ratio (CIR) which is the number of grams of carb per unit of pre-meal insulin. CIR is calculated as 2.8 times the body weight in lbs divided by the total daily dose of insulin.

$$CIR=2.8 \cdot BW\#/TDD$$

We establish an "insulin sensitivity factor" or a Correction Factor (CF) for high blood sugars. Divide the total daily dose of insulin into 1700. This equals the number of points of blood sugar lowered by 1 unit of fast-acting insulin.²

$$CF=1700/TDD$$

We encourage a safe pre-meal target blood sugar, i.e. 130 to 150 mg/dl.

The right level of basal insulin must be in place for this system to work well. For most individuals, that means the basal to bolus ratio is about 50:50.

Determine a real-life, individualized plan by being a detective. Analyze the meter download for time of the pre-meal BG test, have the patient record the time of injection, all food eaten, the estimated portion sizes and carbohydrate count, units of insulin given, activities performed in the after meal period and the post-meal BG results. Analyze food records for at least 3 days to confirm the CIR, and try to analyze food data from both weekday and weekend records.

Determine if your patient needs a morning CIR that is different from the evening CIR.

Once the CIR, Correction Factor, and basal insulin are established, your patient must understand the necessary steps:

1. Always check blood sugar **just prior** to a meal.
2. For high readings, calculate the number of points over target, divided by the correction factor. Do not correct a high blood sugar until 5 hours have elapsed since the last bolus. Insulin aspart and lispro have duration of up to 5 hours.
3. Decide the menu. Use a scale, measuring cups, or practiced estimating to figure the portion size of foods that are carb sources. Figure the grams



Mark Your Calendar!

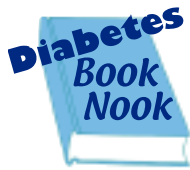
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Articles

◆ Insulin-to-Carbohydrate Ratio
Barbara A Bradley, MS RN CDF
<http://www.diabeteshealth.com>

◆ Carbohydrate Counting: A Practical Meal-Planning Option for People with Diabetes
Karmeen D. Kulkarni, MS RD. BC-ADM, CDE
<http://clinical.diabetesjournals.org>



The CalorieKing® Calorie, Fat & Carbohydrate Counter 2008

by: Allan Borushek



This book is great for people with diabetes, helping them understand the carbs in over 11,000 foods, including information from 200 fast food and major restaurants.

Available online at:
<http://amazon.com>



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- of carb in each portion. Total all carbs in the meal; subtract all dietary fiber if known. Divide by the CIR to determine the units of insulin for the meal.
4. Add correction and food insulin units together.
5. Subtract appropriate units of insulin for planned exercise in the next 5 hours.
6. Take additional insulin if more carbs (additional portions or dessert) are eaten than originally planned at start of meal. (go back to #3).

In actual practice some of the difficulties may be:

- Starting to eat before remembering to test
- Hasty meal preparation and not enough time to measure breakfast cereal, etc.
- No appetite for all the food served at start of the meal yet already injected the insulin for that amount of carb
- Snacking that needs between meal injections if carbohydrate content was significant
- Unexpected delay in meal, insulin injected and BG starting to drop
- Unknown carbohydrate content of restaurant meals
- Portion size was different than planned
- Parties and buffets promote grazing over several hours

We can help give our patients the best chance for success by encouraging them to:

- Memorize the carbs in their portion size of frequently eaten foods (Carrying a short list of typical foods with portion and carb count helps)
- Recheck portion sizes occasionally with measuring cups and spoons at home
- Use a scale at home to weigh baked goods, pancakes, fruits, potatoes among others
- Search the Internet for unknown carb counts before going to a new restaurant
- Periodically keep detailed records to recheck CIRs
- Create standard breakfast and lunch menus with known carbs to help simplify busy times of day
- Use bowls and cups at home that hold a known volume
- For high fat, replace with high protein and/or high fiber meals that could slow digestion. Experiment with split boluses for these meals (1/2 the bolus at the start of the meal, 1/2 of the bolus 2 hours after the end of the meal)
- Re-calculate CIR if body weight has changed
- Read food labels at home and in the grocery store
- Use books and varied websites for carbohydrate data

Most of all, express to your patients that progress, not perfection, is success.

Example

Patient = 150 lbs

Total Daily Dose of Insulin = 40 units

CIR = 1:10

Correction factor (Insulin Sensitivity Factory) = 1:40

1. Check pre-breakfast blood sugar = 225
2. 225-130 (pre-meal target) = 95 points over target. $95 / 40 =$ about 2 units to lower to target (Correction Units)
3. Breakfast will be 1 1/2 cups of cereal (38g carb), 1/8 cup of almonds (1.5g carb), 3/4 cup of milk (12g carb), 1 tangerine (8g carb) and coffee with 1/4 cup of skim milk (4g carb). Total Carbohydrate for this meal = 64g.
 $64 \text{ g} / 10 = 6.4$ or 6 units (Food Units)
4. Add Correction units to Food units, $2 + 6.4 = 8.4$ or 8 units of insulin.
5. No planned physical exercise before lunch.

¹ Paul C. Davidson, Harry R. Hebblewhite, Bruce W. Bode, "Basal Bolus: The Strategy for Managing Diabetes," 2003. San Antonio, 2 May, 2003 <<http://adaendo.com/pcdslides.html>>

² Paul. Davidson, H. Hebblewhite, R. Steed, B. Bode., A Deductive Framework to Aid in Understanding CSII Parameters: Car to Insulin Ratio. Program and Abstract of the 63rd Scientific Sessions of the ADA. 13-17 June, 2003.

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