
BLOOD GLUCOSE AND HbA_{1c} CORRELATIONS

If your lab is using methods certified by the National Glycohemoglobin Standardization Program, you can convert your glycosylated hemoglobin (HbA_{1c}) result into your average plasma glucose levels over the past 2–3 months. (Laboratories and most blood glucose meters give plasma glucose levels; however, we included whole blood glucose values here as well for people with older meters.)

HbA _{1c} (%)	PLASMA GLUCOSE LEVEL (mg/dl)	WHOLE BLOOD GLUCOSE LEVEL (mg/dl)
6	135	121
7	170	152
8	205	183
9	240	214
10	275	246
11	310	277
12	345	308

POSTPRANDIAL BLOOD GLUCOSE GOALS

Ideally, your plasma glucose level about an hour after finishing a meal or snack should be in the range specified here and less than 80 mg/dl higher than it was before the meal or snack. Goals are somewhat more liberal for children than for adults.

AGE	POSTPRANDIAL GOAL
Adult (older than 18)	less than 180 mg/dl
Teen (12–18)	less than 200 mg/dl
School age (6–11)	less than 225 mg/dl
Preschool (up to age 5)	less than 250 mg/dl

GLYCEMIC INDEX OF COMMON FOODS

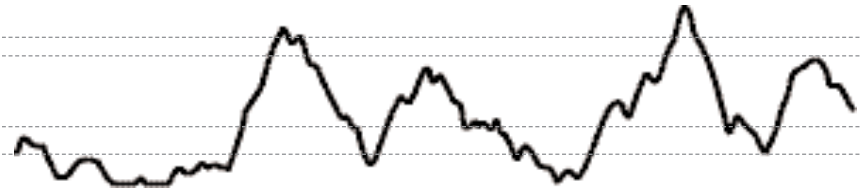
The glycemic index of a food is a measure of how quickly it raises blood glucose after eating. The higher the number, the faster it raises blood glucose.

BREAD/CRACKERS		Special K	66	Macaroni	45
Bagel	72	Total	76	Spaghetti	41
Crispbread	81	Waffles	76	Spaghetti, whole wheat	37
Croissant	67	COMBINATION FOODS		Tortellini	50
French baguette	95	Chicken nuggets	46	RICE	
Graham crackers	74	Fish fingers	38	Brown rice	55
Kaiser roll	73	Macaroni and cheese	64	Instant rice	87
Pita bread	57	Pizza (cheese)	60	Long grain rice	56
Pumpernickel	51	Sausages	28	Risotto	69
Rye, dark	76	Stuffing	74	SNACK FOODS	
Saltines	74	Taco shells	68	Corn chips	74
Sourdough bread	52	DAIRY		Granola bars	61
Stoned Wheat Thins	67	Chocolate milk	34	Nutri-Grain bars	66
White bread	71	Ice cream	62	Peanuts	15
Whole wheat bread, high-fiber	68	Milk, skim	32	Popcorn	55
CAKES/COOKIES/MUFFINS		Milk, whole	27	Potato chips	54
Banana bread	47	Pudding	43	Pretzels	81
Blueberry muffin	59	Yogurt, low-fat	33	Rice cakes	77
Chocolate cake	38	FRUITS & JUICES		SOUPS	
Corn muffin	102	Apple	38	Black bean	64
Cupcake with icing	73	Apple juice	41	Lentil	44
Doughnut	76	Banana	55	Minestrone	39
Oat bran muffin	60	Cantaloupe	65	Split pea	60
Oatmeal cookie	55	Cherries	22	Tomato	38
Pound cake	54	Cranberry juice	68	SPORTS BARS/DRINKS	
Shortbread cookie	64	Fruit cocktail	55	Gatorade	78
CANDY		Grapefruit	25	PowerBar	58
Chocolate bar	49	Grapefruit juice	48	SUGARS & SPREADS	
Jelly beans	80	Grapes	46	Glucose tablets	102
LifeSavers	70	Orange	44	High-fructose corn syrup (found in most regular sodas)	62
M&M, peanut	33	Orange juice	52	Honey	58
Skittles	69	Peach	42	Pancake syrup	66
Snickers bar	40	Pear	37	Strawberry jam	51
Twix bar	43	Plum	39	Table sugar (sucrose)	64
CEREALS/BREAKFAST FOODS		Raisins	64	VEGETABLES	
All-Bran	42	Watermelon	72	Carrots, boiled	49
Bran Chex	58	LEGUMES		Carrots, raw	16
Cheerios	74	Baked beans	48	Corn	46
Cornflakes	83	Black beans	30	French fries	75
Cream of Wheat	70	Black-eyed peas	42	Potato, baked	85
Grape-Nuts	67	Chickpeas	33	Potato, boiled	88
Oatmeal	49	Lentils	25	Potato, instant	83
Pancakes	67	Pinto beans	45	Potato, mashed	91
Pop-Tarts	70	Red kidney beans	19	Sweet potato	44
Raisin Bran	73	PASTA		Tomato	38
Rice Krispies	82	Couscous	65		
Shredded Wheat	69	Fettuccini	32		

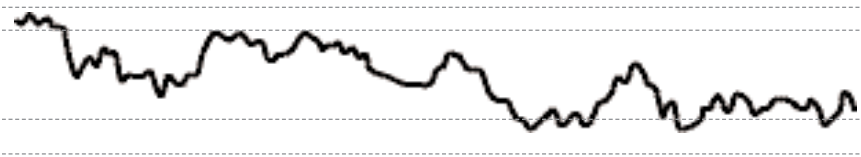
HOW BOLUS TIMING AFFECTS AFTER-MEAL SPIKES

When Gary took his mealtime insulin boluses as he sat down to eat, the result was after-meal spikes as shown in Graph 1. When he took boluses 15 minutes before meals and snacks, the spikes flattened out, as shown in Graph 2.

GARY'S 1st CGMS



GARY'S 2nd CGMS



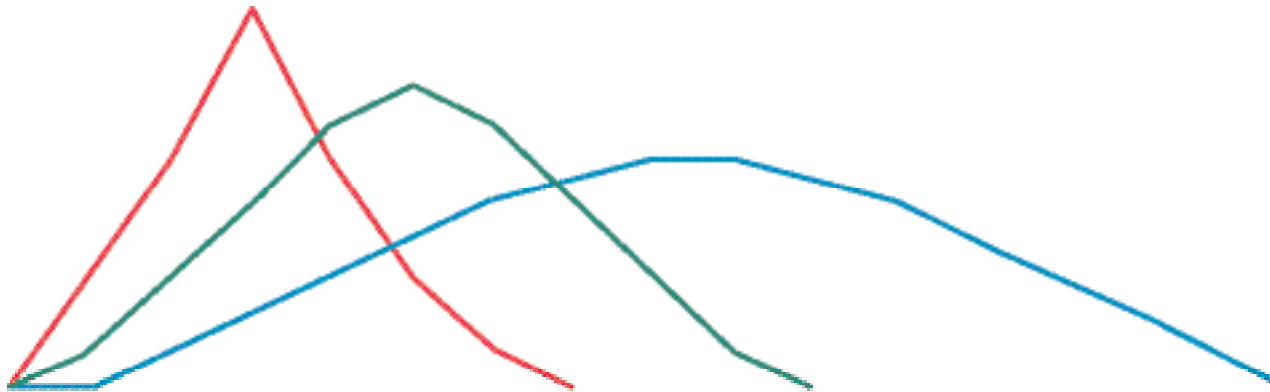
BOLUS TIMING IN RELATION TO MEALS

Both your premeal blood glucose level and the glycemic index of the foods you are planning to eat should be taken into consideration when deciding when to take a mealtime insulin dose. The timing shown here assumes you use lispro (Humalog) or aspart (NovoLog) to “cover” meals. If you use Regular, by itself or in a premixed preparation, back up the timing by 20–30 minutes.

	FOR HIGH-GI FOODS	FOR MODERATE-GI FOODS	FOR LOW-GI FOODS
Blood glucose above target range	30–40 minutes before eating	15–20 minutes before eating	0–5 minutes before eating
Blood glucose within target range	15–20 minutes before eating	0–5 minutes before eating	10–15 minutes after eating
Blood glucose below target range	0–5 minutes before eating	15–20 minutes after eating	30–40 minutes after eating

HOW THE GLYCEMIC INDEX AFFECTS BLOOD GLUCOSE LEVEL

Carbohydrates that break down quickly, and therefore have a high glycemic index value, cause a fast and high blood-glucose rise after meals. Carbohydrates that break down slowly and have a low glycemic index value release glucose into the bloodstream more gradually.



MAKING LOWER GLYCEMIC INDEX FOOD CHOICES

Substituting foods with a lower glycemic index for those with a higher glycemic index may help keep your after-meal blood glucose levels closer to target range. Here are some ideas for food substitutions.

MEAL	HIGH-GI CHOICES	LOWER-GI CHOICES
Breakfast	Typical cold cereal, bagel, toast, waffle, pancake, corn muffin	High-fiber cereal, oatmeal, yogurt, whole fruit, milk, bran muffin
Lunch	Sandwich made with white or whole wheat bread, French fries, tortillas, canned pasta	Chili, pumpernickel bread, corn, carrots, salad vegetables
Dinner	Rice, rolls, white potato, canned vegetables	Sweet potato, pasta, beans, fresh or steamed vegetables
Snacks	Pretzels, chips, crackers, cake, doughnut	Popcorn, fruit, chocolate, ice cream, nuts
