



My Doctor Says I Need to Take Diabetes Pills and Insulin...” What Do I Do Now?



BD Getting Started™
**Combination
Therapy**



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Combination Therapy

- Adding medication



and/or insulin to
better manage
diabetes



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What is Type 2 Diabetes?



- Most common form of diabetes
- Glucose is unable to enter cells to provide fuel or energy
 - Insulin made does not work properly
 - Enough insulin is not made
 - Result is high blood glucose
- Progressive Disease
 - People with type 2 diabetes lose around 10% of their ability to produce insulin each year.

1. United Kingdom Prospective Diabetes Study Group: Overview of Six Years' Therapy of Type 2 Diabetes Progressive Disease. Diabetes (1995) 44:1249-1258.



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Causes of High Blood Glucose

1. Insulin Resistance

More insulin than usual is needed to control blood glucose – the insulin made does not work properly. The cells ***resist*** the action of insulin.

2. Lack of exercise and overweight may cause ***insulin resistance***.



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Causes of High Blood Glucose

3. Release of stored glucose, due to inadequate amounts of insulin

- Liver releases stored glucose during the night. The pancreas cannot respond with enough insulin
- Fasting blood glucose usually highest of the day



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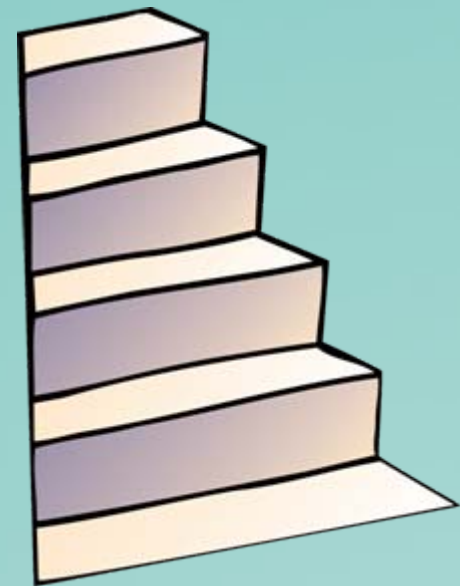
Achieve *Target Blood Glucose Goals* Most of the time



- Target Blood Glucose Goals:
The range that blood glucose readings should fall into **most** of the time.
- Target Blood Glucose is chosen by the doctor and the person with diabetes.

Stepped Approach to the Treatment of Type 2 Diabetes

- Four steps lead to blood glucose control:
 - Step 1: Meal Planning focus and Exercise
 - Step 2: Diabetes Pills
 - Combination Therapy:
When at least two different pills are used to reach target blood glucose goals



Treatment of Type 2 Diabetes

- Step 3: Injectable Medications: Incretin Mimetics

- Adding exenatide (Byetta®) to diabetes pills lowers blood glucose in some people.



- Step 4: Insulin Therapy

- Adding insulin to diabetes pills may lower blood glucose when it is out of target.
- Insulin is the single most effective therapy to lower blood glucose



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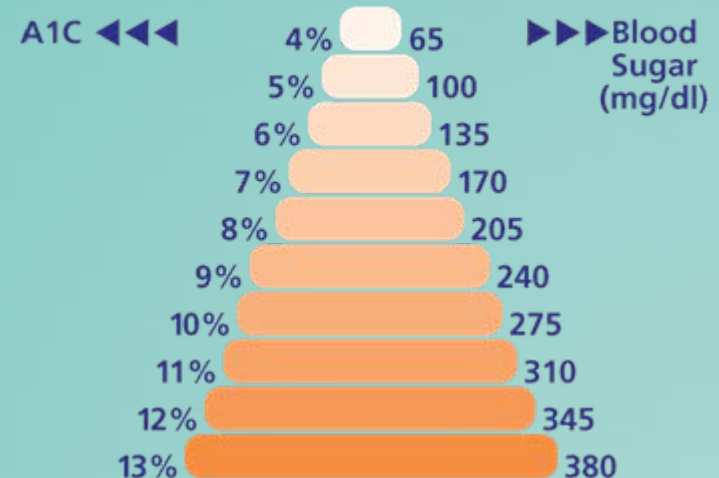
How Will You Know if Your Diabetes Medications are Working?



- Self-Monitoring of Blood Glucose

- A1C

HOW TO COMPARE*



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ADA Recommended Target Goals

- Before meals
70-130 mg/dl
- Two hours after meals
<180 mg/dl
- Bedtime
110 -150 mg/dl

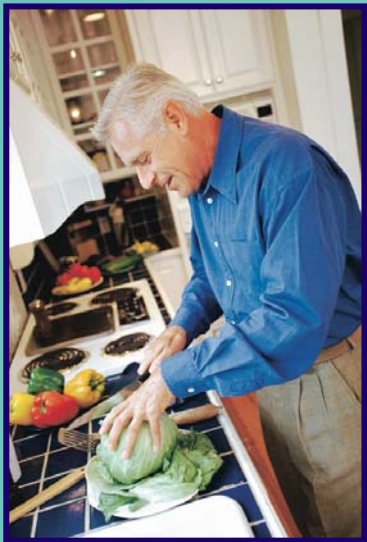


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Learning the Impact of Food on Blood Glucose

**BG Before
Dinner**

120 mg/dl



**Food Eaten at
Dinner**

Chicken, mashed potatoes,
bread, broccoli, juice



**BG After
Dinner**

240 mg/dl



What are the possible causes of change in blood glucose?



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How Do Diabetes Pills Work?

- Each “group” of pills works in a different way to lower blood glucose.
- Pills from more than one group may be needed to “attack” diabetes from different directions.
- All diabetes pills lower blood glucose, with different degrees of effectiveness.



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What Diabetes Pills Do

(Grouped by Action)

- Group 1: Biguanides
- Group 2: Thiazolidinediones (TZDs)
- Group 3: Alpha-glucosidase inhibitors
- Group 4: Sulfonylureas
- Group 5: Meglitinides
- Group 6: Combination Medicines
- Group 7: DPP-4 Inhibitors



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Group 1: Biguanides (by-GWAN-ides)

- Metformin or Glucophage®
- Slows down the release of glucose made by the liver; also helps cells use glucose
- May also lower blood fat and cholesterol
- Will not cause hypoglycemia (low blood sugar) by itself



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Group 2: Thiazolidinediones

(THIGH-ah-ZO-li-deen-DYE-wons) or “TZDs”

- Actos[®], Avandia[®]
- Lower insulin resistance
- Help muscles and fat cells use glucose better
- Do not cause low blood sugar by themselves



Avandia[®]



Group 3: Alpha-glucosidase inhibitors (AL-fa-gloo-KOS-ih-dayss in-HIB-it-ers)

- Precose[®]
- Slows the rate at which starchy foods change to glucose, in the intestine.
- Slower and lower rise of blood glucose after meals, during the day.
- Does not cause hypoglycemia

Precose[®]



Group 4: Sulfonylureas (SUL-fah-nil-YOO-ree-ahs)

- Glynase[®], Diabeta[®], Glucotrol[®], Amaryl[®]
- Help the pancreas make more insulin
- May cause low blood sugar

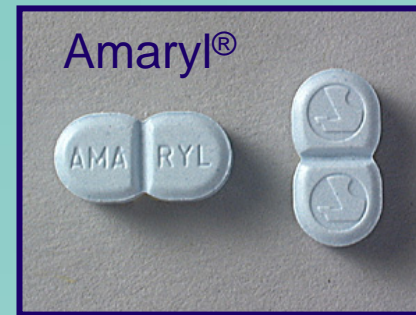
Glynase[®]



Glucotrol[®]



Amaryl[®]



Diabeta[®]



Amaryl[®]



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Group 5: Meglitinides (meh-GLIT-in-ides)

- Prandin[®], Starlix[®]
- Help the pancreas make more insulin, taken right before meals.
- Lower blood glucose *the most* 1 hour after a meal
- May cause low blood sugar

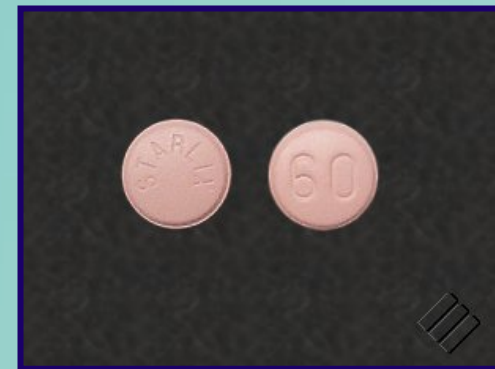


Prandin[®]



Starlix[®]

Starlix[®] (60)



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Group 6: DPP-4 Inhibitors

- Januvia™ (sitagliptin)
- Lowers blood glucose only when high, usually after a meal.
- Does not cause hypoglycemia
- Reduces amount of stored glucose released from liver



Group 7: Combination Medicines

- Two medicines that work differently, combined into one pill
 - Glucovance[®] = metformin + Diabeta[®]
 - Avandamet[®] = metformin + Avandia[®]
 - Janumet[®] = metformin + Januvia[®]

Glucovance[®]



Janumet[®]



Avandamet[®]



Group 7: Combination Medications

- Metaglip® = metformin + Glynase®
- Actoplus Met® = metformin + Actos®

Metaglip®



Actoplus®



Exenatide: Byetta®

- Is given as an injection 2x/day with a pen device.
- Four major actions:
 - Works to increase the release of insulin – only when BG levels are high
 - Slows the movement of food from the stomach.
 - Makes you feel full.
 - Reduces elevated levels of glucagon – slows the rate of release of glucose from the liver



Exenatide: Byetta®

- May help some people lose weight;
- Nausea a common side effect



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Adding Insulin

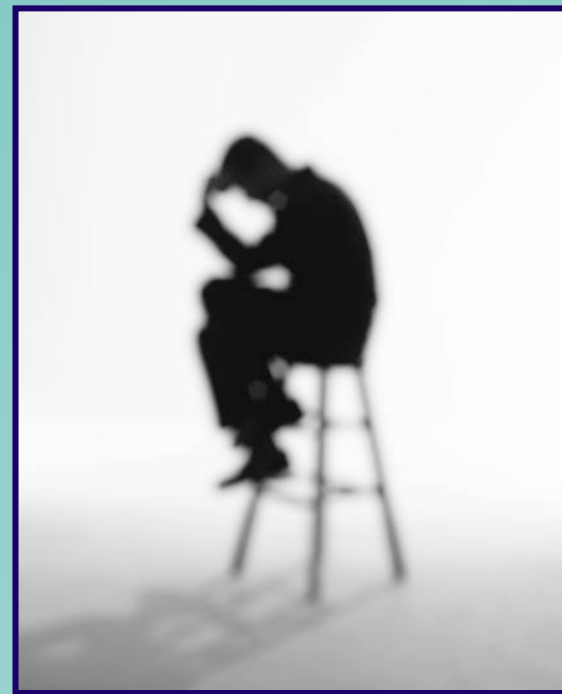
- If diet, exercise, pills and Byetta® aren't controlling blood sugar, then insulin is needed
- There are several different types of insulin – your doctor will recommend one or more types of insulin to take



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Concerns about Insulin

- Filling the syringe and giving the insulin
- Fear of needles
- Hypoglycemia
- Gaining weight
- Effect on lifestyle
- “It caused someone I know to lose their leg....”



The Good News

- Once they start taking insulin, most people report a sense of *feeling better*.
- Insulin needles are very small and thin.
 - Less painful than lancing the finger for a blood sample
 - Most people say insulin injections don't hurt
- Insulin treatment has been proven to reduce diabetic complications by lowering BG levels – in both type 1 and type 2 diabetes



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Fear of Hypoglycemia



- Hypoglycemia can be avoided by:
 - Eating meals on time
 - Taking medications at the same time each day
 - Understanding the time of day when the insulin will lower the blood glucose the most.
- Hypoglycemia can be easily treated.

Weight Gain

- Calories that were lost in the urine are no longer lost when blood glucose is lowered.
- Eating the same amount of calories as *before* insulin will cause weight gain.
- Reviewing the meal plan with a Registered Dietitian can help prevent weight gain.



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Quality of Life

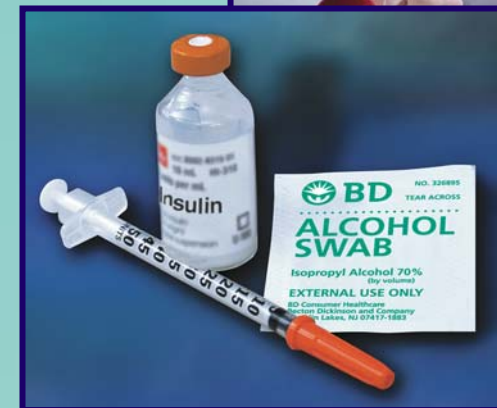
- UKPDS found that insulin therapy did not have a negative impact on quality of life².
- Insulin delivery devices are easy to use and convenient.



² United Kingdom Prospective Diabetes Study Group: Quality of Life in Type 2 Diabetic Patients is Affected by Complications, But Not by Intensive Policies to Improve Blood Glucose or Blood Pressure Control. Diabetes Care (1999) 42:120-121.

Why Combine Insulin with Diabetes Pills?

- Pills alone are not controlling blood glucose.
- Insulin replaces what the pancreas is not making
- Pills may make the body more sensitive to the insulin given



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Why Combine Insulin with Diabetes Pills?

Example:

an injection of long-acting insulin at night
(to control fasting blood glucose)

plus pills during the day
(to control blood glucose after meals)



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How Many Injections of Insulin Will You Need?

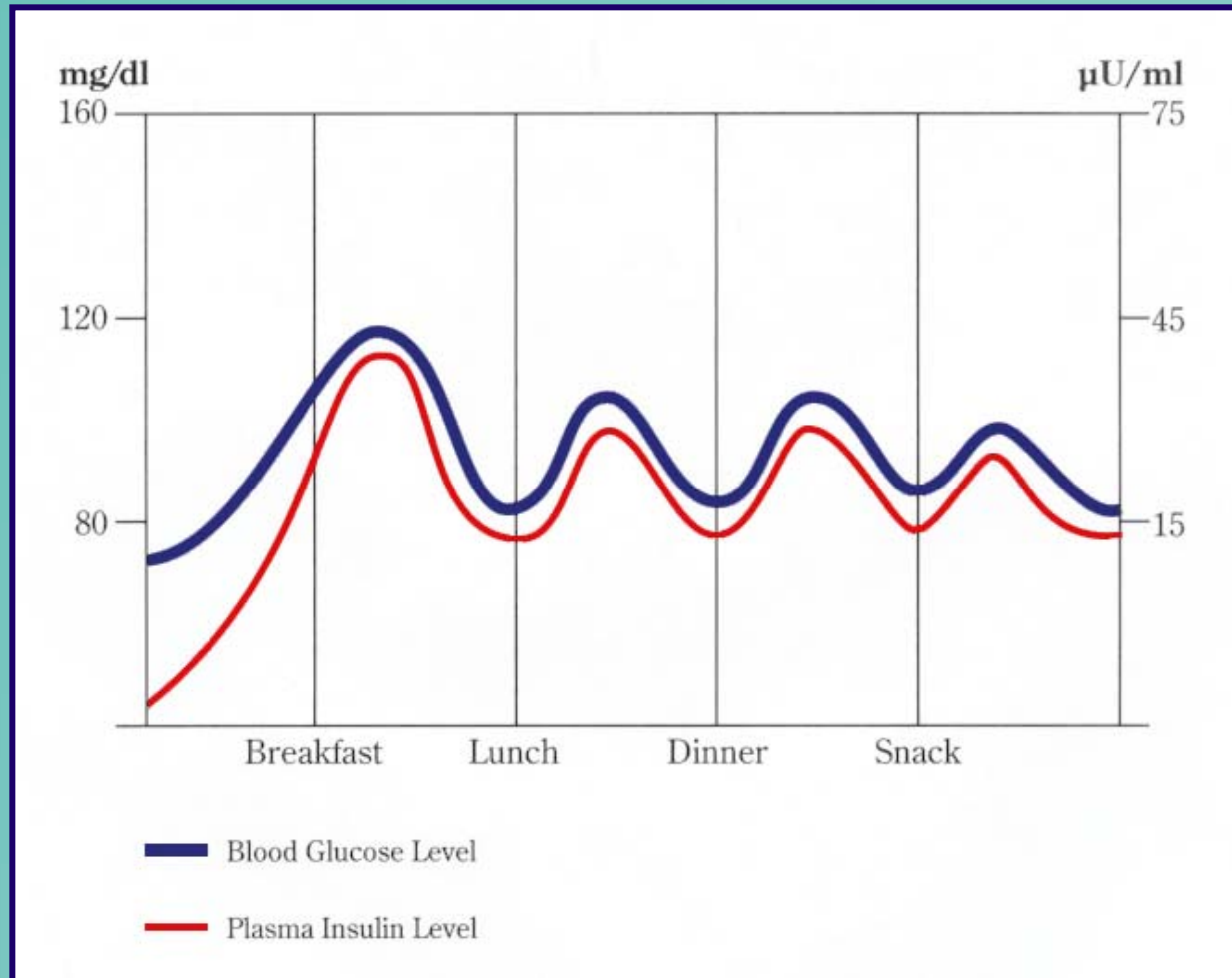


- Everyone is different!
 - Some people need 1 shot a day
 - To help keep their blood sugar in control at night and during the day.
 - Some people need 2 shots a day
 - To give them enough insulin to cover their meals.
 - Some people need 4 shots a day.
 - To give them enough insulin to cover their meals and throughout the day and night.



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Normal Blood Sugar and Insulin Levels



Types of Insulin

- Insulin Type

- lispro
- aspart
- glulisine

- Regular Insulin

- NPH

- Insulin glargine
- Insulin detemir

- Speed of Action

- Rapid Acting

- Short-Acting Insulin

- Intermediate Acting

- Long Acting



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You Can Do It!

- It is a lot of work, but controlling Diabetes is worth it!



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Helpful Hints

- Take medicine after brushing teeth



- Set watch or cell phone alarm to time to take medicine



- Leave nighttime medicine next to lamp



- Leave medicine to be taken at meals on table.

- Get instructions for what to do if medication is forgotten.



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