



# Diabetes Life Lines

## Type 2 Diabetes (T2): When Insulin Might Be a Good Idea

You've followed your doctor's advice to eat better, get plenty of exercise, and take your medicines for years. This worked for a long time, but now your hemoglobin A1C is creeping up. You haven't changed anything so what is going on?

It may be that you are simply following a normal path for adults with type 2 diabetes. As you know, people with type 2 diabetes usually have problems making enough insulin (insulin production) AND using the insulin that they have (insulin resistance). In our bodies, insulin is made by cells in the pancreas called beta cells. When your diabetes was first diagnosed, it is likely that up to one-half of your beta cells were not working well<sup>1</sup>. Over time, more beta cells stopped working. One study suggests they fail at a rate of 4 percent each year<sup>2</sup>. So, there may come a time when the insulin you make is just not enough to get the job done. This may happen even if you've been 'good' about following lifestyle changes and taking your oral medications<sup>3</sup>. By 8-10 years after diagnosis, many adults with type 2 diabetes may benefit from adding insulin.

## Reasons to Start Insulin

There are a few reasons a health care provider might decide a person with type 2 diabetes needs to start insulin. These include:

1. **You are no longer meeting your goals** (i.e. fasting and post-prandial blood glucose and hemoglobin A1C goals) on your current treatment. This can be a clue that your medications need to change.
2. **Your C-peptide level.** C-peptide is a widely used measure of how well your pancreatic beta cells work. It can tell the doctor what type of diabetes a person has, how long they have likely had diabetes, and possibly how well some treatments may work, including insulin<sup>4</sup>. Your doctor may order this test to help decide if insulin is right for you.
3. **Short term illness.** Insulin may be prescribed for a short time to manage high blood glucose during illness, hospitalization, or due to other medications such as steroids.



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Many people with type 2 diabetes can benefit from insulin therapy. And like most medications, it carries some risks. The most serious risk is low blood glucose or hypoglycemia. If untreated, low blood glucose can be a medical emergency. Weight gain can also be a side effect. If your doctor prescribes insulin to treat your diabetes, she will talk with you about managing these risks. She may suggest you meet with a diabetes educator to learn how to give insulin injections and review meal planning and other tools to control blood glucose and weight.

### The Take Home

There are a few key points. First, you are not a failure if your current treatment isn't working like it used to. Second, it's common for your medication needs to change over time. And third, starting insulin can be a positive step toward reaching your treatment goals and preventing problems from type 2 diabetes, such as heart attack, stroke, vision loss, nerve or kidney problems.

### References:

1. Gastaldelli A, Ferrannini E, Miyazaki Y, Matsuda M, DeFronzo RA. Betacell dysfunction and glucose intolerance: results from the San Antonio metabolism (SAM) study. *Diabetologia*. 2004;47(1):31–39.
2. U.K. Prospective Diabetes Study 16. Overview of 6 years' therapy of type II diabetes: a progressive disease. U.K. Prospective Diabetes Study (UKPDS) Group [published correction appears in *Diabetes*. 1996;45(11): 1655]. *Diabetes*. 1995;44(11):1249–1258.
3. Meece J. Dispelling myths and removing barriers about insulin in type 2 diabetes. *Diabetes Educ*. 2006;32:9S-18S.
4. Leighton E, Sainsbury CAR, Jones GC. A Practical Review of C-Peptide Testing in Diabetes. *Diabetes Ther* [Internet]. 2017 Jun [cited 2018 Mar 24]; 8(3): 475–87. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5446389>

## T2: Insulin Bootcamp

Insulin sounds scary...and confusing. If you and your health care team are thinking of starting insulin as part of your treatment plan, arm yourself with facts and the vocabulary to ask good questions. The more you know, the more confident you will be in self-managing your type 2 diabetes.

### What is insulin?

Insulin is a hormone made in the pancreas. It is the key to unlocking cells so your body can use or store the energy (glucose) it gets from food. For people with type 2 diabetes, their body usually doesn't produce enough insulin AND it resists the insulin it does make. So injected insulin is used to supplement what your body makes. You may hear this as "exogenous" insulin (which just means it comes from outside your body). Injectable insulin acts similarly to insulin made in the body (endogenous) and may be a part of your treatment. We will be talking about the injectable kind.

### What are the Types of Insulin?

There are different types of injectable insulin. They get put in categories based on how quickly they work and how long they last. Table 1 gives an overview of insulin types. While your doctor will choose the insulin that is right for you, it may help you to know a little about the categories and names.



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**Table 1: Insulin Types and Names**

Type	Generic Name	Some Brand Names
<b>Rapid acting</b>	Insulin lispro	Admelog, Humalog, Lyumjev
	Insulin aspart	Fiasp, NovoLog
	Insulin glulisine	Apidra
<b>Short acting</b>	Insulin regular	Humulin R, Novolin R
<b>Intermediate acting</b>	Insulin NPH	Humulin N, Novolin N
	Insulin isophane suspension (mixed with human insulin)	Novolin 70/30,
	Insulin lispro protamine (mixed with rapid acting insulin lispro)	Humalog Mix 75/25 or 50/50
	Insulin aspart protamine (mixed with rapid acting aspart)	Novolog Mix 70/30
<b>Long acting</b>	Insulin glargine	Basaglar, Lantus
	Insulin detemir	Levemir (intermediate to long acting)
<b>Very long acting</b>	Insulin degludec	Tresiba
	Insulin glargine 300 units/mL	Toujeo
	Insulin regular concentrated	Humulin Reg U500 concentrated

From: [https://www.uptodate.com/contents/type-2-diabetes-insulin-treatment-beyond-the-basics?topicRef=1737&source=see\\_link](https://www.uptodate.com/contents/type-2-diabetes-insulin-treatment-beyond-the-basics?topicRef=1737&source=see_link)

### How Do I Get Started?

Most insulin must be injected into the fat under your skin for it to get into your blood. (See side bar ‘Is There a Pill for That?’) When getting started with insulin, your health care provider may recommend “basal” insulin. Basal insulin means background insulin. It is the level of insulin that helps keep blood glucose steady through the day and night. Intermediate and/or long acting forms of insulin are used to do this. See Table 1 for names of intermediate and long acting insulin types. You will likely be told to inject basal insulin once or twice per day, either in the morning or at bedtime. Some people may also need to take rapid acting insulin before 1 or more meals daily. Just like with oral medications, your insulin type, amount, and number of injections may change over time. Insulin comes in vials (small jars) for injection with a syringe or in prefilled pens for added convenience.



### What About the Needle?

Thankfully, needles used for insulin are very small and usually well accepted. And there is research proving that needles as small as 4 to 5 mm are effective in delivering insulin. (An inch is 25.4mm so needle lengths are roughly 1/5 -1/6 of an inch – pretty small!).<sup>1</sup> Still, there are things you can do to help avoid or limit pain with injections. Table 2 lists several tips.

**Tips to avoid or limit pain with injections**

- Use short and narrow-gauge needles. ( 4 to 5mm by 32Gauge)
- Use room temperature insulin. (Room temperature is between 56°F and 80°F)
- Allow alcohol wipe moisture (if using) to dry before injecting.
- Relax your muscles at site when injecting.
- Use distraction methods like coughing or deep breathing.
- Quickly insert needle in skin.
- Do not change direction of the needle during insertion or withdrawal.
- Do not reuse needles.
- Use an injection device that puts pressure on the skin around the injection site.
- If an injection seems painful, apply pressure for 5 to 8 seconds after the injection, without rubbing.

From: *Strategies for Insulin Injection Therapy in Diabetes Self-Management. Am Assoc of Diabetes Educators. 2011.*

[https://diabetesed.net/page/\\_files/AADE-Strategies-for-Insulin-Therapy-2011-PDF-1.2-MB.PDF](https://diabetesed.net/page/_files/AADE-Strategies-for-Insulin-Therapy-2011-PDF-1.2-MB.PDF)

**What else should I know?** Insulin can be used alone or with other medications (i.e. an oral or injected medication plus insulin). Combining insulin with other medications generally means that you can take a lower dose of insulin compared to someone who only takes insulin. As insulin can cause weight gain, combining insulin with other medications may reduce your chances of gaining weight. (Meal planning and exercise are still important and help avoid extra pounds!) Work with your health care provider to see how your body responds.

Having the right support is important for being successful with insulin. Medicare Part B covers diabetes self-management training. If you have Medicare, you get a one-time

benefit of 10 hours of diabetes education. This often happens during the first year after diagnosis but can be ordered anytime by your doctor. After the first year, a Medicare enrollee can receive up to 2 hours of self-management training each year. Diabetes educators provide this training. Plus, your health care provider can also order medical nutrition therapy with a Registered Dietitian. This benefit is covered by Medicare for up to 3 hours in the first year and 2 hours a year after. Many other private and public insurance companies see the importance of diabetes self-management training and offer similar benefits. Check with your insurance company for your benefits.

**Is there a pill for that?**

Insulin is not available in pill form yet. To work properly, insulin must be inhaled or injected. Your stomach would break down the current forms of insulin before they had a chance to work.

There is one type of inhaled insulin available currently in the United States. It is rapid-acting and typically used before meals. Ask your doctor if this is right for you.

Long acting insulin can only be injected.

**The Take Home**

Knowing a little bit about insulin can make it less scary and more do-able. Remember to write your questions down before you go to the doctor. Your health care team wants you to be successful at diabetes self-management and to feel like you are in control of your health.

## Why is Sleep Important?

We all know we are supposed to get a good night's rest. You probably know that you are more alert the day following a good sleep. And you may understand that getting enough sleep is important for overall health. But did you know that sleep habits and trouble sleeping are related to diabetes?

## What is the Link Between Sleep and Diabetes?

There is a clear link between difficulty falling asleep, staying asleep, or sleeping too much and diabetes.<sup>1</sup> People who have these problems sleeping are more likely to have high blood sugar. That is because trouble sleeping can cause poor insulin sensitivity (your body's ability to use insulin) and reduced glucose tolerance (leading to high blood glucose).<sup>2</sup> Poor sleep is a risk factor of getting type 2 diabetes, especially when the person snores or has sleep apnea (a sleep disorder in which breathing stops and starts).<sup>3</sup> Also, people who already have diabetes have more problems sleeping than people without diabetes.<sup>4</sup>

The good news is that by paying attention to what you eat, exercise, and blood glucose levels, you can improve your sleep quality....and maybe even your overall health.

## 10 helpful tips for getting a good night's sleep

1. Focus on controlling your blood glucose. Blood glucose highs and lows can make it harder to sleep. Work with your health care team if you regularly have big changes in your blood glucose at night.
2. Exercise. Another reason to exercise most days of the week is that it can help improve the quality of your sleep. Try for at least 30 minutes of exercise five days a week.
3. Aim for a healthy weight. Another reason to set goals and work toward a healthy weight is that losing even 10% of your body weight can reduce the risk of sleep apnea.<sup>5</sup>
4. Be consistent. Go to bed at the same time every night. Wake up at the same time each morning, including weekends. Your body will naturally start to get tired when there is a consistent bedtime.
5. Avoid blue screens before bed. Cell phones, television, and really any glowing screen can wake you up. Try old-fashioned books before you sleep to quiet your mind and lessen the strain on your eyes.
6. Remove distractions. Turn off or silence your phone. Use an old-fashioned alarm to wake you up so you don't have to rely on your cell phone's alarm app. Make your bedroom a place to rest.
7. Create white noise. Remove distracting noises (think garbage collectors or that neighbor leaving for an early-morning job) that wake you up with the use of a ceiling, desk, or central air fan.
8. Avoid caffeine or alcohol late at night. Likewise, avoid heavy meals right before bedtime.
9. Yoga anyone? Light yoga or meditation can calm your mind and prepare your body for sleep. There are many free apps like *Yoga for Beginners Mind & Body* and *Down Dog*. Another one, *Underbelly*, offers a 14 day free trial.
10. Is Fido waking you up? You love your pets, but they can disturb your sleep. If so, try to keep them off the bed or out of your room altogether if you have allergies (diabetes alert dogs excluded, of course).

### References:

1. Grandner, M. A., Jackson, N. J., Pak, V. M., & Gehrman, P. R. (2012). Sleep disturbance is associated with cardiovascular and metabolic disorders. *Journal of sleep research*, 21(4), 427–433. <https://doi.org/10.1111/j.1365-2869.2011.00990.x>
2. Tasali E, Leproult R, Ehrmann DA, Van Cauter E. Slowwave sleep and the risk of type 2 diabetes in humans. *Proc Natl Acad Sci USA*. 2008;105:1044–1049.
3. Wise J. Women with sleeping problems may be more likely to develop diabetes. *BMJ*. 2016 Jan 29;352:i548. doi: 10.1136/bmj.i548. PMID: 26825977.
4. Cappuccio FP, D'Elia L, Strazzullo P, Miller MA. Quantity and quality of sleep and incidence of type 2 diabetes: a systematic review and meta-analysis. *Diabetes Care*. 2010 Feb;33(2):414-20. doi: 10.2337/dc09-1124. Epub 2009 Nov 12. PMID: 19910503; PMCID: PMC2809295.

# Recipe Corner

## Chicken-Fruit Salad

Makes 6 servings

- 2 cups diced, cooked turkey or chicken
- 2 apples, diced
- ¼ cup chopped nuts (optional)
- 3 tablespoons vanilla low-fat yogurt
- ¾ teaspoon curry powder
- 1 cup drained pineapple chunks



### Directions

1. Wash hands and assemble clean equipment.
2. Toss all ingredients together. Chill.

### Nutrition Facts

Calories: 187

Carbohydrates: 15 grams

Protein: 16 grams

Fat: 8 grams

Cholesterol: 37 milligrams

Fiber: 2 grams

Sodium: 246 milligrams

#### Contributors:

Alison C. Berg, PhD, RDN, LD, Extension Nutrition and Health Specialist

Laurel Sanville, MS, RDN, LD Assistant Nutrition Educator, University of Georgia

#### Editorial Board:

Ian C. Herskowitz, MD FACE, University Health Care System, Augusta, Georgia

Melanie Cassity, RN, MSN, CDE, Piedmont Athens Regional, Athens, Georgia

## The University of Georgia Cooperative Extension

College of Agricultural and Environmental Sciences / Athens, Georgia 30602-4356

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If you would like more information, please contact your local county Extension Office.

Yours truly,

County Extension Agent

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