Getting started

Your guide to understanding diabetes, developing good treatment habits and adopting a healthy lifestyle

Important contact information

My diabetes care team

Primary health care provider:

Phone: Email:

Diabetes care and education specialist:

Phone: Email:

Endocrinologist:

Phone: Email:

Pharmacist:

Phone: Email:

Dietitian:

Phone: Email:

Foot care provider:

Phone: Email:

Eye care provider:

Phone: Email:

Dentist:

Phone: Email:

Make sure you always have enough medication and supplies.
If you inject insulin, consider discussing automatic refills of your pen needles and insulin syringes with your pharmacist.

Table of contents

Important contact information 3

Understanding diabetes and injection therapy 4

BD™ Diabetes Care App 5

Understanding diabetes 6

The benefits of managing diabetes 12

Know your numbers 14

Types of diabetes treatment 18

Understanding insulin therapy 23

Managing hyperglycemia 27

Managing hypoglycemia 28

The importance of proper injection technique 29

Communication is key 30

How to inject with a 4 mm pen needle 31

How to inject with a 6 mm insulin syringe needle 33

Needle length and injection technique 36

Injection site rotation 39

Lipohypertrophy 42

Safe sharps disposal 43

Frequently asked questions about common injection issues 44

Healthy living with diabetes 47

Healthy eating 48

Activity 49

Travel with diabetes 51

Diabetes and sick days 52

Diabetes resources 54

Making a diabetes toolkit 55

Diabetes log book 56

Diabetes communities and resources 57

Connect with BD 60

Understanding diabetes and injection therapy

Diabetes 101

Living with diabetes can sometimes seem overwhelming—whether you've been newly diagnosed or making a change to your treatment plan like adding insulin injections. Diabetes is a disease that changes over time. Learning about diabetes and your treatment options can help you feel more confident. This may help you and your diabetes care team work together to better manage your blood sugar levels.

In this section, you'll learn more about:

- BD™ Diabetes Care App
- Types of diabetes
- Your important diabetes-related numbers
- Diabetes treatment options
- Insulin
- Managing hyperglycemia *(high blood sugar)* and hypoglycemia *(low blood sugar)*

ADCES FAVORABLY REVIEWED

Association of Diabetes Care & Education Specialists

BD™ Diabetes Care App

Your healthcare team will teach you what to do to manage diabetes. Use the BD™ Diabetes Care App as a resource to help with your day-to-day management of diabetes.

With support in the palm of your hands, the BD™ Diabetes Care App offers:

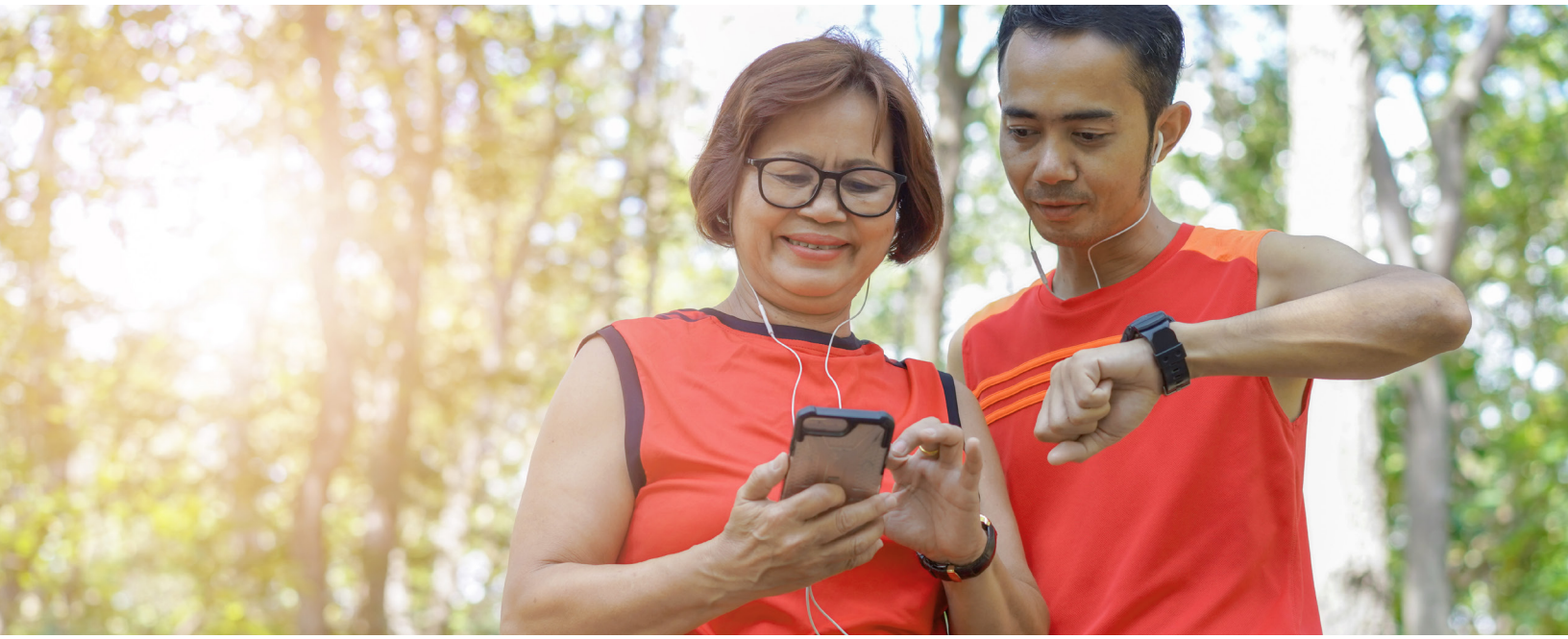
- Diabetes-friendly recipes
- Data logging
- Injection tracking
- How-to videos
- Personalized educational articles
- Goal setting

Download the BD™ Diabetes Care App

SCAN ME

Use your smart phone camera to hover over the QR code or text BD Diabetes to 31996.

The BD™ Diabetes Care App is the only diabetes self-management app whose content has been Favorably Reviewed by the Association of Diabetes Care & Education Specialists



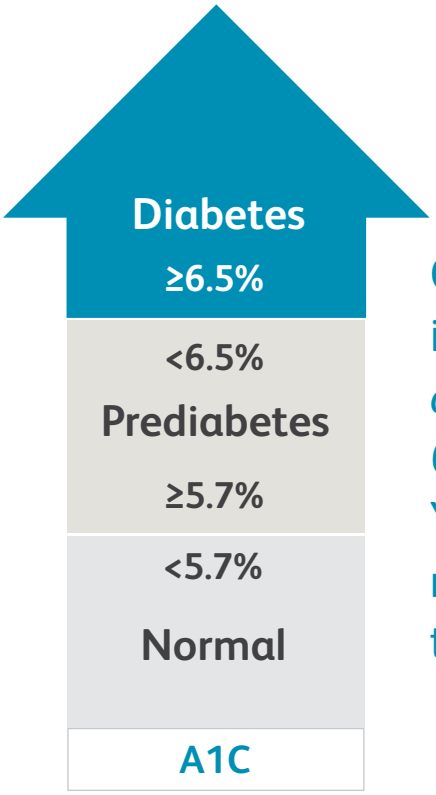
The Favorably Reviewed logo indicates this material has been reviewed for educational content and does not imply endorsement of any product.

Understanding diabetes

Diabetes *(also called diabetes mellitus)* is a disease that interferes with your body's ability to use blood sugar for energy. As a result, people with diabetes have blood sugar levels that are too high *(hyperglycemia)*. There are a few different types of diabetes, which we will review below.[1]

Prediabetes[2]

Before people develop type 2 diabetes, they usually develop prediabetes—a condition where blood sugar levels are higher than normal, but not quite high enough for a diabetes diagnosis. Having prediabetes puts you at higher risk of developing type 2 diabetes and cardiovascular disease.



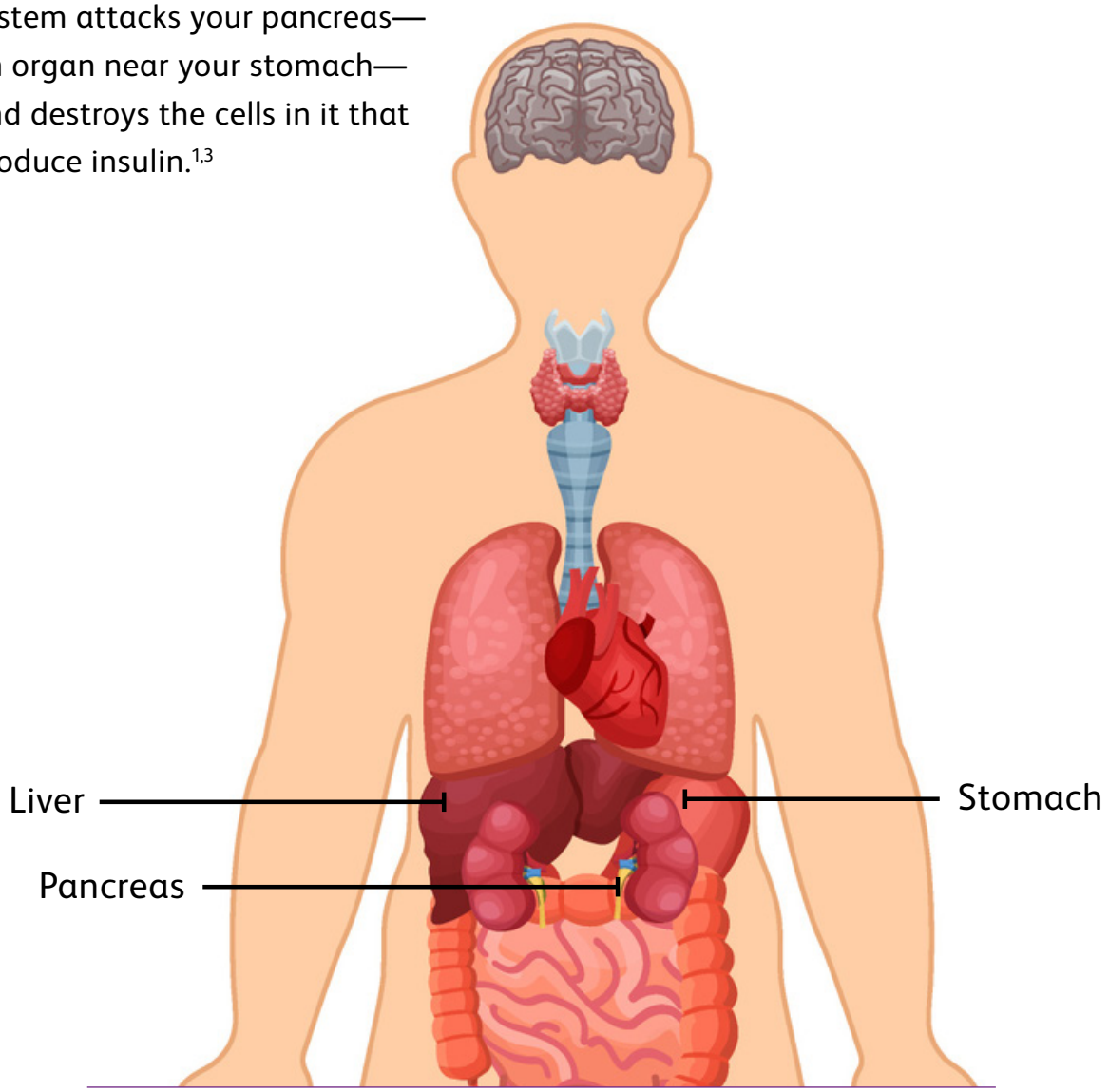
One way to check for prediabetes is with an A1C blood test *(learn more on p.16)*. If your A1C is from 5.7% to 6.4%, you may have prediabetes. Your diabetes care team will usually repeat these tests on a second day to be sure of the results.

If you have prediabetes, you should be checked for type 2 diabetes yearly. It doesn't mean that you will develop type 2 diabetes. In fact, with activity and weight management, it may be possible to get your blood sugar levels back into the normal range.

Type 1 diabetes

In type 1 diabetes, your body does not produce any insulin, leading to high blood sugar.[1,3]

In type 1 diabetes, your immune system attacks your pancreas—an organ near your stomach—and destroys the cells in it that produce insulin.[1,3]



Because your body no longer produces any insulin, you have to take insulin to manage your blood sugar. With proper treatment, you can still live a long and healthy life.[3]

Type 1 diabetes in pediatrics

Finding out that your child has been diagnosed with diabetes is often a surprise. There is so much to learn, remember and do. As a parent, you are concerned about your child's health and his or her future. You should be aware that there have been many advances in treatment and technology that may allow your child to live a full life similar to their classmates.

Your healthcare provider will work with you to educate you and your child on managing diabetes and incorporate needed self-care behaviors into everyday life. Your child will still be able to go to school, attend birthday parties, and play in sports, just like everyone else. All you need is a plan.

Keeping track of blood sugar using charts and apps may assist you in managing your child's blood glucose levels. Two examples of tracking methods are the blood sugar logs in the back of this book and the BD™ Diabetes Care App.

It's also important to have conversations with your child to ensure that they feel comfortable with the tasks required to manage their diabetes. You should continue to have ongoing conversations with your health care provider and diabetes care and education specialist about when your child is ready to assume some of the responsibilities for some of his/her self-care.

Type 2 diabetes[4]

In type 2 diabetes, your body does not use the insulin that it makes properly. Health care providers call this *insulin resistance*. To make up for insulin resistance, your pancreas works harder to make even more insulin. Over time, your pancreas isn't able to keep up with your body's insulin needs. It stops being able to produce enough insulin to keep your blood sugar levels normal.

Some people living with type 2 diabetes can manage their blood sugar with healthy eating and keeping active—but many people also need to add pills or injections. Type 2 diabetes progresses over time, and you will likely need to add more medications later on.

Type 2 diabetes is the most common form of diabetes, and while it can affect people at any age, it mostly affects people as they get older. African Americans, Latinos, Native Americans, Asians and Pacific Islanders are at a higher risk of developing type 2 diabetes.

Gestational diabetes

Women who have never had diabetes before can develop high blood sugar levels while they are pregnant—also called *gestational diabetes mellitus* (GDM). Women are typically tested for gestational diabetes at 26 weeks of pregnancy. As pregnancy progresses, hormones from the placenta block the mother's ability to use insulin in her body properly. This kind of insulin resistance is similar to what happens in type 2 diabetes. Women who have had GDM are more than 7 times as likely to develop type 2 diabetes later in life compared to women who don't have gestational diabetes.[5,6]

If left untreated, gestational diabetes can hurt your baby. The extra glucose in your blood can pass through the placenta to your baby, causing the baby's pancreas to work harder to get rid of the extra sugar.[5]

Because the baby is getting more energy than it needs from increased sugar in the blood, the baby's body will store the extra energy as fat. This can lead to complications during birth, larger babies, low blood sugar levels at birth, breathing problems—and a higher risk for obesity and type 2 diabetes later in life.[5]

If you are diagnosed with gestational diabetes, there are plenty of lifestyle and treatment options to help you reach your blood glucose targets. If insulin injection therapy is started, ask your healthcare provider about proper injection site information.

Other causes of hyperglycemia

In addition to diabetes, there are some other health-related reasons why you may need to take medications *(like insulin)* to control your blood glucose

Stress-induced hyperglycemia

When your body is under stress—like from an injury or surgery—it can cause your blood sugar to rise.[7]

Steroid-induced hyperglycemia

Steroids can be used to treat many different conditions *(like inflammation)*, but one of their most common side effects is high blood glucose levels.[8]

Neither of these conditions means that you have diabetes. They are simply part of the body's natural response to injury or medication, and you should only need to take insulin for a period of time to help control your elevated blood glucose.

The benefits of managing diabetes

No matter what kind of diabetes you have, it's important to work with your diabetes care team to properly manage it. If you do—and get your blood sugar in target range—you can reduce your risk of serious diabetes-related complications.

Symptoms of unmanaged diabetes[9]

The following symptoms are typical of diabetes:

- Urinating frequently
- Feeling very thirsty
- Feeling very hungry—even though you are eating normally
- Extreme fatigue
- Blurry vision
- Cuts or bruises healing very slowly

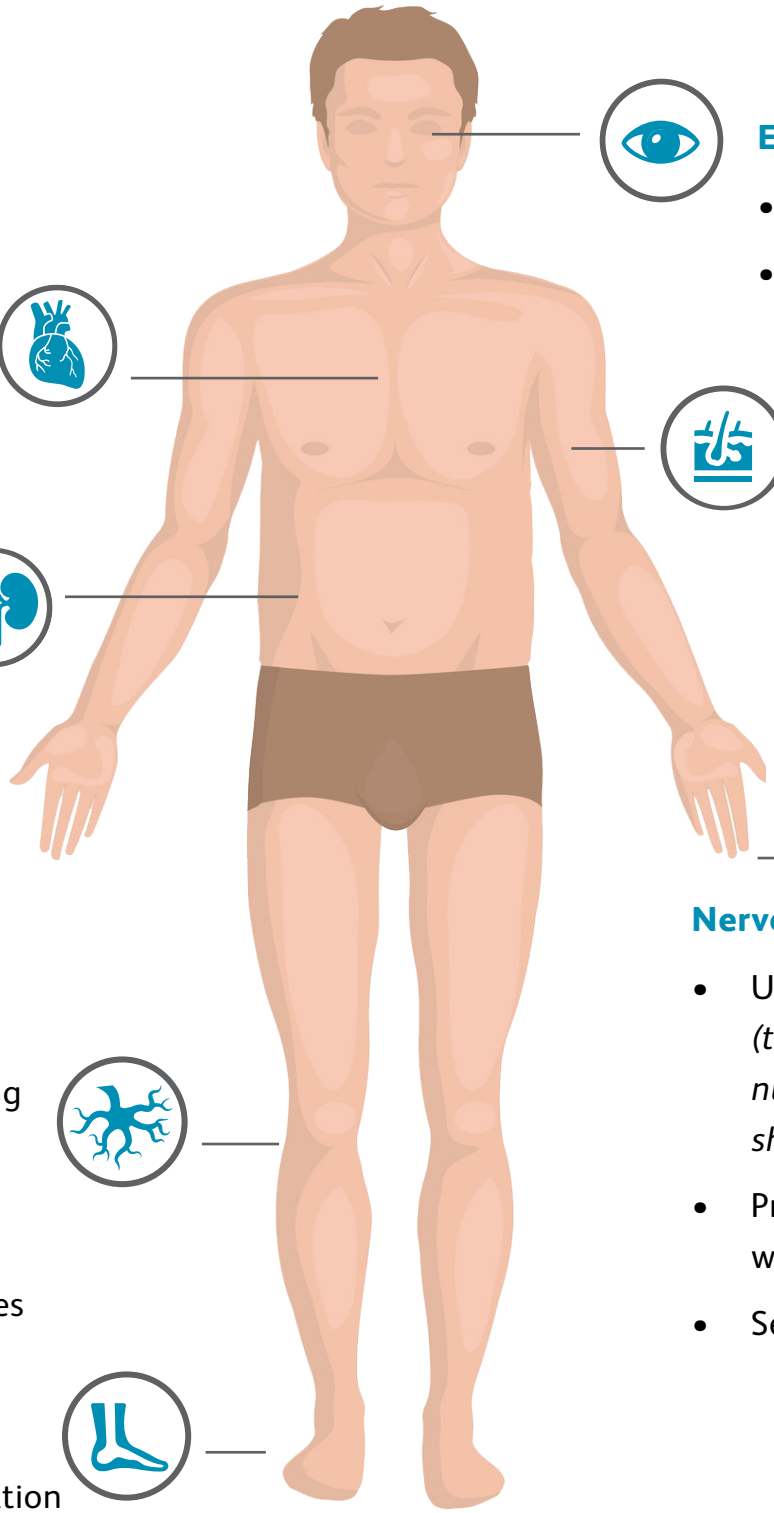
Lower your blood sugar to manage your symptoms and reduce your risk[10]

Managing your blood sugar not only allows you to feel better, it reduces your diabetes symptoms and it can significantly reduce your risk of serious diabetes-related complications.

There are many benefits to managing your blood sugar—it's an important way to stay healthy!

High blood glucose and diabetes complications[11]

If not well managed, diabetes increases your risk for serious health problems. But with proper blood sugar management, you can reduce your risk.



Heart

- Chest pain
- Shortness of breath
- May not have any symptoms

Kidneys

- Swelling in feet and legs
- Increase in blood pressure

Blood vessels

- Slow healing of wounds

Feet

- Skin changes
- Calluses
- Foot ulcers
- Poor circulation

Eyes

- Blurred vision
- Vision loss

Skin

- Bacterial and fungal infections
- Itching
- Skin discoloration

Nerves

- Unusual sensations *(tingling, burning, numbness or shooting pain)*
- Problems with digestion
- Sexual dysfunction

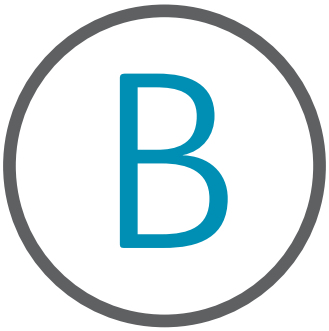
Know your numbers

While managing your blood glucose is a very important part of diabetes, there are some other numbers that you can monitor with your diabetes care team. The **American Diabetes Association (ADA)** recommends certain targets, but always follow your diabetes care team's advice on the right numbers for you.

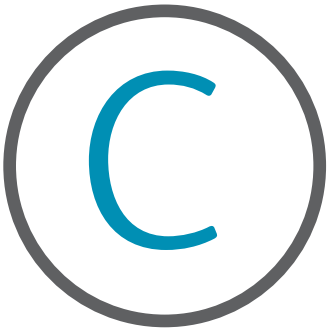
First things first: brush up on your ABCs[12]

Keeping your ABCs in your target range will help lower your risk of heart disease or stroke.

is for **A1C**



is for **blood pressure**



is for **cholesterol**

Blood sugar targets for many non-pregnant adults with diabetes[13]

A1C – This measures your average blood glucose level over the past two to three months. It is a measure of your diabetes management and tells you if you are moving in the right direction. This is a blood exam your health care provider orders and is done in a lab.[1]

Pre-meal blood glucose – This measures your blood glucose level *before* eating a meal. You check this level yourself with your blood glucose meter.[1] This tells you if you ate the right amount of food for the medicine/insulin you are taking.

The ADA recommends the following Glycemic Targets

Measurement	Levels
A1C	Less than 7%
Pre-meal glucose	80–130 mg/dL
Peak post-meal glucose	Less than 180 mg/dL

Post-meal blood glucose – This measures your blood glucose one to two hours *after* eating a meal. This is a test you do yourself with your blood glucose meter.[1] This tells you if you ate the right amount of food for the medicine/insulin you are taking.

Check your blood sugar using test strips and blood glucose meter or CGM *(Continuous Glucose Monitor)*. Some examples include FreeStyle Libre 2, Dexcom, and Medtronic etc. It's important to work with your diabetes care team to develop a blood glucose monitoring plan that's right for you. Some common times to check your blood glucose include:

- When you wake up
- When you go to bed
- Before or after you inject insulin
- Before or after you eat
- Any time you feel symptoms of high or low blood glucose
- Before and after activity
- Before driving

You can use the log book on p.56 or the BD™ Diabetes Care App to record your blood glucose values

Pregnant women can speak to their diabetes care team about appropriate targets during pregnancy.

Work with your healthcare provider to set your A1C goal

- Fill in the first bar up to your current A1C and see where your blood sugar falls most of the time
- Fill in the second bar up to your goals for A1C and see where your blood sugar will fall most of the time.

Current

A1C (%)	Average Blood Sugar (mg/dL)
14	355
13	326
12	298
11	269
10	240
9	212
8	183
7	154
6	126
5	97

Goal

A1C (%)	Average Blood Sugar (mg/dL)
14	355
13	326
12	298
11	269
10	240
9	212
8	183
7	154
6	126
5	97

My A1C Goal is _____

Track your blood glucose using the **BD™ Diabetes Care App**

Blood pressure targets for adults[14]

What the numbers mean	Healthy blood pressure	Early high blood pressure	High blood pressure
Systolic pressure The pressure in your blood vessels when your heart beats.	Below 120	120 to 140	Above 140
Diastolic pressure The pressure in your blood vessels when your heart relaxes between beats.	Below 80	80 to 90	Above 90

Cholesterol—the healthy and the unhealthy[15]

"Unhealthy" cholesterol	"Healthy" cholesterol	"Unhealthy" blood fat
LDL *Low-density lipoproteins*	**HDL** *High-density lipoproteins*	**Triglycerides**
LDL can cause a build-up of cholesterol in your arteries, damaging them.	HDL helps remove cholesterol from your body, clearing your arteries.	Raises your chances for heart attack or stroke.
In general, the lower your LDL, the better.	**In general, the higher your HDL, the better.**	**In general, the lower your triglycerides, the better.**

Talk to your diabetes care team about how often you should have your cholesterol checked, and what appropriate targets are for you.

Blood sugar, blood pressure and cholesterol are all linked. One value can throw off the others, and all are risk factors for heart disease.

Talk to your diabetes care team about working on your ABCs to reduce your risk!

Types of diabetes treatment

Depending on the type of diabetes you have, and how well-controlled your blood glucose is, there are several approaches you and your diabetes care team can take to manage your diabetes so you can live a healthy life. They can involve anything from making changes to your lifestyle to taking prescription medications, based on your needs.

Lifestyle changes[16]

There are three main areas that can make the biggest change to your blood sugar:

Meal plan

Living with diabetes doesn't mean you can't enjoy the foods you love—you just need to eat well-balanced meals to help manage your blood glucose *(learn more on p.48 or download the BD™ Diabetes Care App)*.

Activity

By getting—and staying—active, you can manage your blood glucose and lower risk of complications associated with diabetes. The goal is to reach 150 minutes of activity per week, such as brisk walking (to learn more download the BD™ Diabetes Care App).

Weight management

With the right meal plan and activity plan, you can manage your weight, manage your blood sugar, have more energy and start feeling better. Even a small weight loss can help!

Remember: Always talk to your diabetes care team about making the right lifestyle changes before starting any kind of new meal plan or activity routine.

Oral medications *(pills)*

If lifestyle changes like meal plan, activity and weight management aren't enough to bring your blood glucose into target range, oral medications are likely to be the first type of treatment that most people with type 2 diabetes will use.[17]

There are many different classes *(and brands)* of oral medications that work differently to help your body manage blood sugar:[18]

Examples: Brand (Generic)	Class	Mechanism of Action
Metformin	**Biguanides**	Decreases the amount of glucose that's produced by the **liver**, and makes muscle tissue more sensitive to insulin.
Rybelsus (semaglutide)	**GLP-1 receptor agonist**	Stimulates the **pancreas** to produce more insulin and decreases the amount of glucose that's produced by the **liver.**
Jardiance (empagliflozin) **Invokana** (canagliflozin) **Farxiga** (dapagliflozin) **Steglatro** (ertuglilozin)	**SGLT2 inhibitors**	Prevents **kidneys** from reabsorbing glucose, so that it can be passed out of the body in urine
Januvia (sitagliptin) **Onglyza** (saxagliptin) **Tradjenta** (linagliptin) **Nesina** (alogliptin)	**DPP4 inhibitors**	Prevents the breakdown of a compound in the body called GLP-1, which naturally lowers blood glucose.
Glucotrol (glipizide) **Amaryl** (glimepiride)	**Sulfonylureas**	Stimulates **pancreas** to make more insulin.
Actos (pioglitazone)	**TZDs** (thiazolidinediones)	Decreases the amount of glucose that's produced by the **liver**, and makes the muscle and fat tissues more sensitive to insulin.

List is not all inclusive.

It's also possible that your health care provider may prescribe combinations of the different types of drugs above to help you achieve your blood glucose targets if a single medication isn't lowering your blood sugar effectively. This could mean taking multiple pills, or a single pill that contains multiple medications. Health care providers call this *oral combination therapy*.[18]

Insulin

Starting insulin is a concern for most people, but insulin injections with shorter needles can be virtually painless. By injecting insulin, you can replace the insulin your body doesn't make, or help supplement the insulin that it does make but is not using well.

There are different ways to deliver insulin:

Pen and pen needle

Vial and insulin syringe

Insulin pump

Inhaled insulin

Insulin storage tips:[19]

- Before use, you can store insulin in the fridge
- The bottle of insulin you're using can be kept at room temperature *(generally for up to 1 month. Check your manufacturer's instructions)*
- Don't store insulin near extreme heat or cold
- Always check the expiration date before using

Non-insulin injectable medications[20]

These medications may help lower blood glucose levels, minimize the risk for hypoglycemia, and may help with weight loss. These medications are available in a pen injector device.

Drug class	Examples	How it works
GLP-1 receptor agonist	**Ozempic** *(semaglutide)* **Trulicity** *(dulaglutide)* **Victoza** *(liraglutide)* **Bydureon** *(exenatide ER)* **Adlyxin** *(lixisenatide)* **Byetta** *(exenatide)*	Stimulates your pancreas to produce more insulin and decreases the amount of glucose that's produced by your liver.
Amylin mimetic	**Symlin** *(pramlintide)*	Slows food from moving too quickly through your stomach and helps keep your after-meal blood glucose from going too high.

Combination injectable medications

Similar to how you can take multiple pills in *oral combination therapy*, there are some combinations of injectable medications that your health care provider could prescribe. Some examples include:

- Two different types of insulin together *(also called premixed insulin)*
- Insulin and a GLP-1 receptor antagonist[21]

Work with your diabetes care team to find the lifestyle changes and medications that work the best for you.

Understanding insulin therapy

What is insulin, and why do I need to inject it?[22]

Insulin is the most effective treatment option for lowering blood sugar. It is a hormone *(a chemical messenger)* that is made by your pancreas *(an organ near your stomach)*. Insulin helps your body use sugar for energy and balance your blood sugar *(also called **blood glucose**)*.

Your insulin therapy journey depends on your type of diabetes[23]

Type 1 diabetes

Since people with type 1 diabetes do not make insulin, they require multiple injections each day. This usually entails one injection with long-acting basal insulin and several injections of short-acting daily before meals.

Type 2 diabetes

After pills alone are no longer effective in managing their blood glucose, many people with type 2 diabetes will eventually need to start insulin therapy. This usually starts with one injection per day of basal insulin. Some patients may eventually need to add short acting bolus insulin with one or all of their meals.

What is basal-bolus insulin therapy?

A basal-bolus treatment plan consists of **long acting** and **short acting** insulin, similar to the way your body uses insulin. Also called "flexible therapy" because it allows for greater flexibility throughout the day. Meals do not have to be eaten at the same time every day and insulin can be taken prior to meals, whenever those meals are scheduled.

Definitions to Review:

Onset of action: The length of time before insulin reaches the bloodstream and starts working.

Peak of action: The time insulin is at its maximum strength or working the hardest to lower blood glucose.

Duration: How long the insulin continues to work in the body.

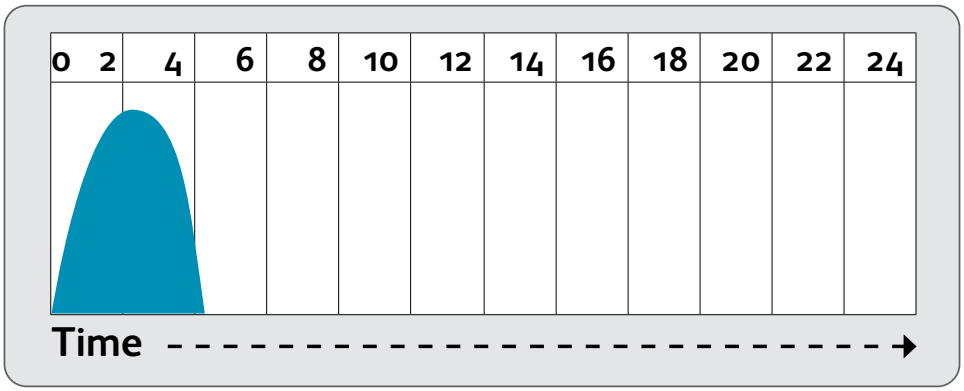
Basal: Steady and long-acting insulin that works between meals and throughout the night.

Bolus: Rapid burst of insulin that works to match food or lower high blood glucose.[24]

How your insulin works[1,25]

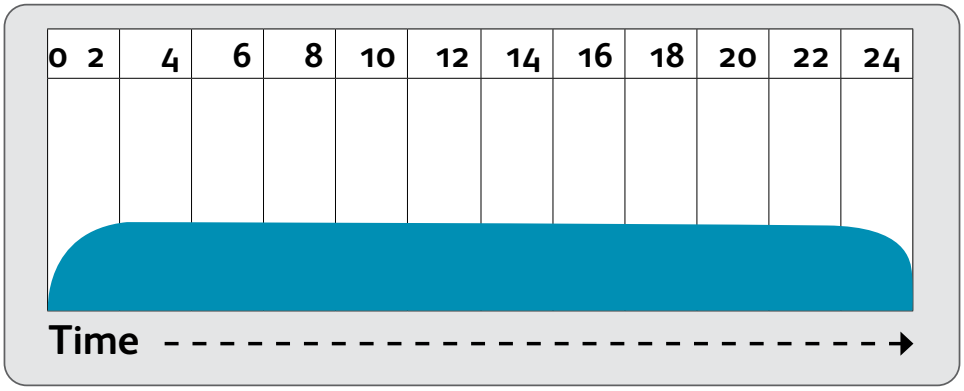
Short-acting insulin: Starts to work very quickly, but lasts only a few hours. Injection is usually taken before a meal. This is a type of bolus insulin.

Type of insulin: Humalog®, NovoLog®, Apidra®
Onset of Action: Within 15 minutes
Peak Action: 1 to 2 hours
Duration: 3 to 4 hours



Long-acting insulin: Provides 24-hour insulin coverage and may be given 1 to 2 times per day. Injection is usually taken before bedtime and/or in the morning. This is a type of basal insulin.

Type of insulin: Lantus®, Levemir®, Basaglar®, Tresiba® (greater than 24 hours), and Toujeo®
Onset of Action: 2 to 4 hours
Peak Action: No peak, stable
Duration: 20 to 24 hours



My Insulin Dosing Plan is _____

How do I know how much insulin to inject?

Your healthcare team will develop a treatment plan to meet your personal needs.

Checking your blood regularly using a blood glucose meter or continuous glucose monitor (CGM)is an important part of healthy living with diabetes, and can help you feel well and avoid serious complications like hypoglycemia *(low blood sugar)* and hyperglycemia *(high blood sugar)*.[25]

The following factors can influence how much insulin you need to inject:

- What you eat
- How much sleep you get
- How much activity, and when
- Where you inject your insulin
- When you take your insulin injections
- Illness
- Stress, both physical and psychological[7]

Managing hyperglycemia

Watch for the signs, and know what to do

Hyperglycemia[26] *(high blood sugar)*
Above 200 mg/dL*

Signs and symptoms can occur
slowly—over hours to days

What to do:

- Set blood sugar goals with your health care provider
- Check your blood sugar frequently
- Test your urine for ketones if instructed by your healthcare provider

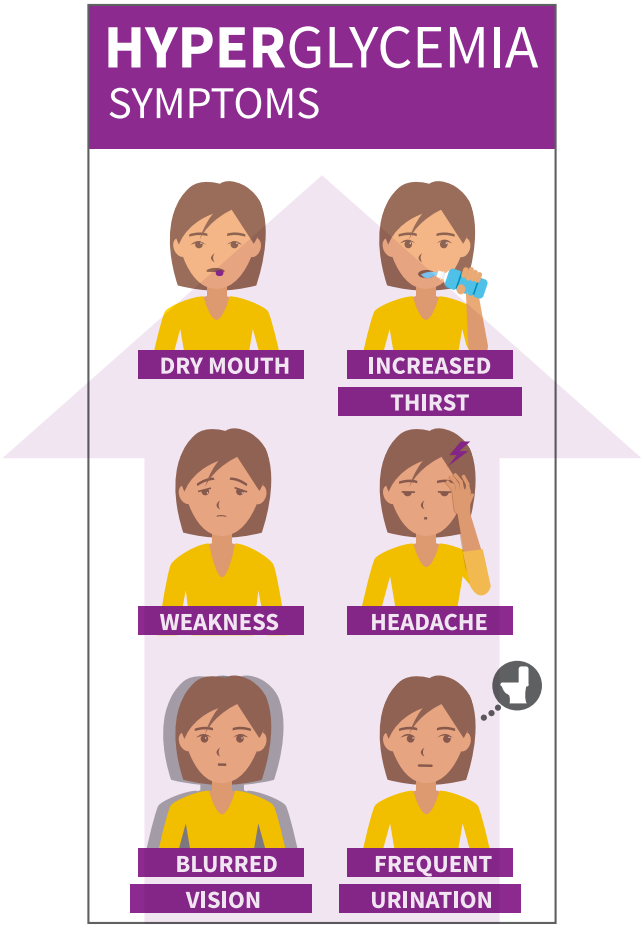
Causes:

- Not enough insulin
- Stressful events *(for example, illness, trauma, surgery)*

Recommendations:

- Drink sugar-free fluids *(if you can swallow)*
- Participate in a healthy activity, such as going for a walk

List is not all inclusive.



* This is a general reference. Your diabetes care team may set different blood glucose ranges for you.

Managing hypoglycemia

Watch for the signs, and know what to do

Hypoglycemia[27] *(low blood sugar)*
Less than 70 mg/dL*

*Signs and symptoms can occur **very quickly—within minutes***

What to do:

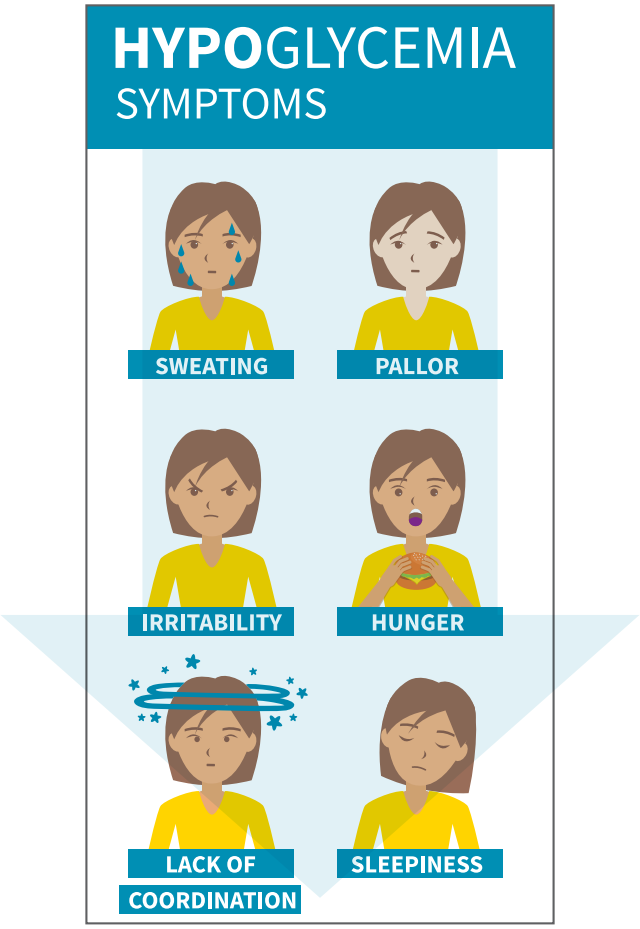
- Check your blood sugar *(if possible)*
- If less than 70 mg/dL or feeling symptoms of low blood glucose, treat with 15 grams of glucose *(Rule of 15)*
- Wait 15 minutes and recheck your blood sugar
- If your blood sugar is still less than 70 mg/dL, treat again with glucose tablets, liquids or foods containing sugar. Follow with your next meal or snack
- Do not give anything by mouth if the person is not conscious
- If the person is unconscious, give glucagon according to package directions and call 911[28]

Causes:[27,29]

- Taking too much insulin
- Not eating enough food, or delayed meal or snack
- More activity than normal
- Recent weight loss

Recommendations:

- Eat/drink simple carbohydrates *(examples of 15–20 grams of simple include)*:
  - Glucose tablets *(follow package instructions)*
  - 4 ounces *(½ cup)* of juice or regular soda *(not diet)*



* This is a general reference. Your diabetes care team may set different blood glucose ranges for you.

The importance of proper injection technique

How you inject matters

Recent recommendations from diabetes experts state that proper injection technique is *essential* to achieve optimal diabetes management.[30]

In this section, you'll learn more about:

- Reducing pain and discomfort
- How to inject insulin using different devices
- Why needle length affects how you inject
- How to properly rotate injection sites
- Tips for reducing your risk of developing lipohypertrophy
- Safe medical sharps disposal
- Common questions from people living with diabetes

Check out the **BD™ Diabetes Care App** for step-by-step instructions on proper injection technique including videos and tutorials.

SCAN ME

Inject with confidence

Communication is key[30]

You and your diabetes care team can explore and discuss all your feelings about injecting insulin.

Practice injecting with your healthcare provider until you're fully comfortable giving yourself injections. Injection practice could include demonstration devices or trial injections with saline. Injection demonstration videos can be found on the BD™ Diabetes Care App.

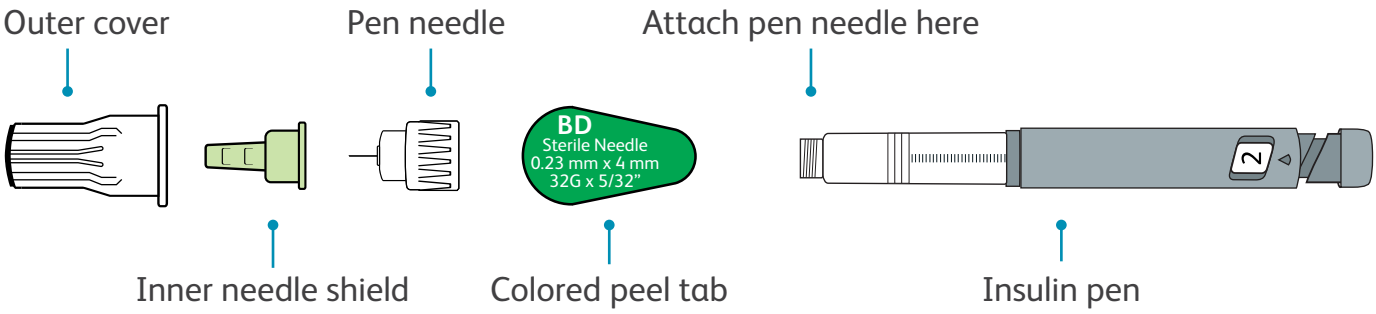
SCAN ME

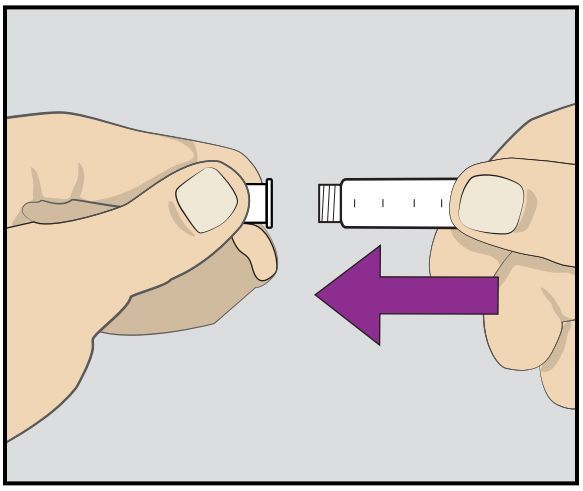
Check out the **BD™ Diabetes Care App** for step-by-step instructions on proper injection technique including videos and tutorials.

How to inject with a 4mm pen needle*

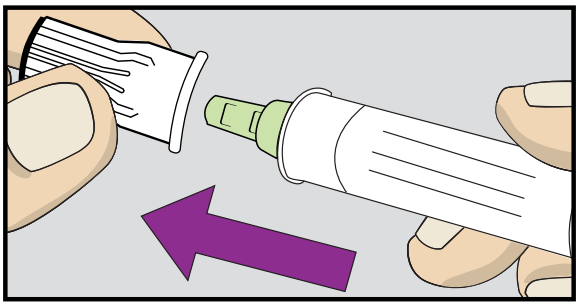
Parts of a pen needle

Please be sure to consult the pen manufacturer's instructions for additional preparation steps, including but not limited to, removing the pen cap, dosage dialing and skin cleaning.

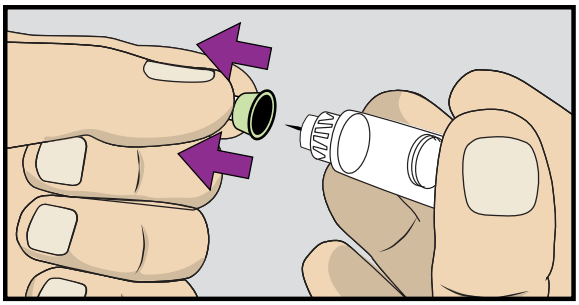




1 Wash hands.
Remove peel tab and push the new needle straight onto the pen. **Do not put the needle on at an angle.** Screw on tight.

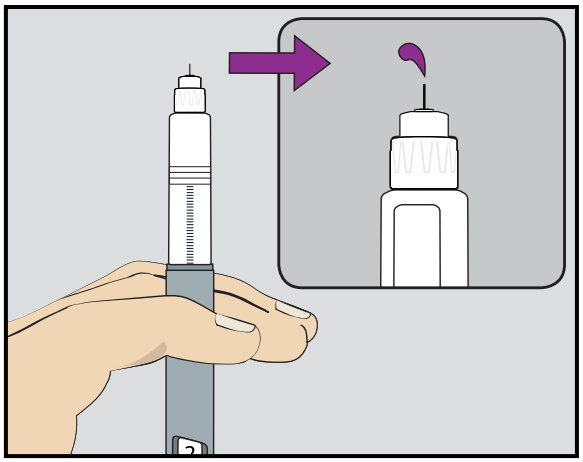


2a Remove outer cover and retain for disposal after injection.

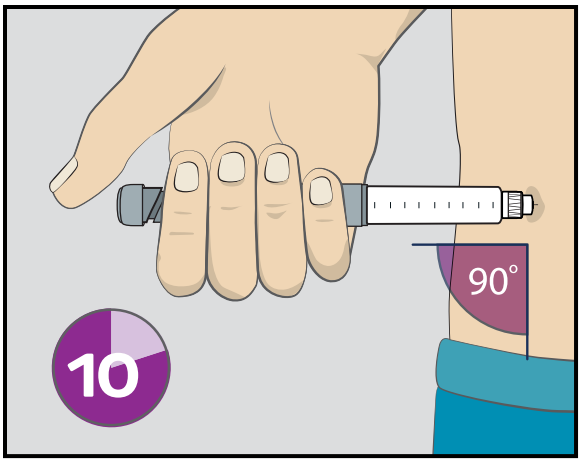


2b Remove inner needle shield and **discard.**

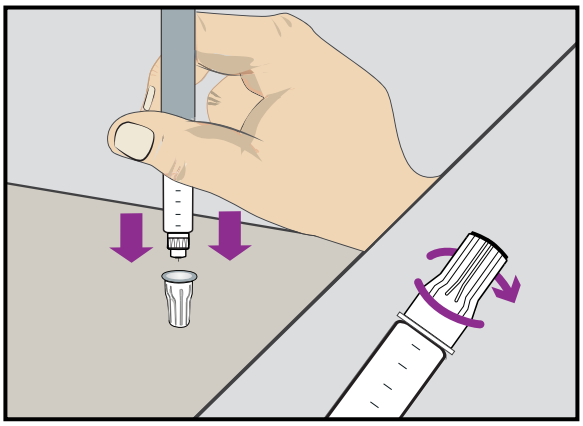
Warning: Remove both the outer cover and the inner needle shield before an injection. If both the outer cover and the inner needle shield are not removed before use, the medication or dose may not be injected, which may result in serious injury or death.



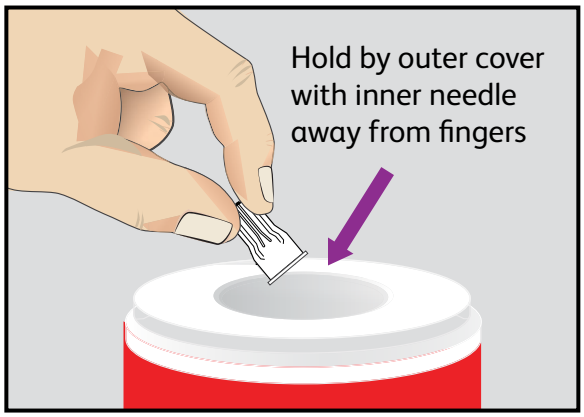
3 Check the flow of medication by dialing 2 units and injecting into the air, until you see a drop. Repeat if no drops are seen. Dial dose.



4 Inject straight in.* Push thumb button and count for 10 seconds before removing straight out from skin to help ensure an accurate dose. Refer to your insulin Instructions for Use for specific hold times.



5 If you need to recap, place the outer cover on a flat surface and recap using one hand by pushing the pen needle directly down into it gently. Unscrew pen needle off pen.



6 **Safely dispose of pen needle immediately in appropriate sharps container.**

For additional information, visit bd.com/sharpsdisposal

Consult the Instructions for Use and/or your Healthcare Professional about proper injection technique.

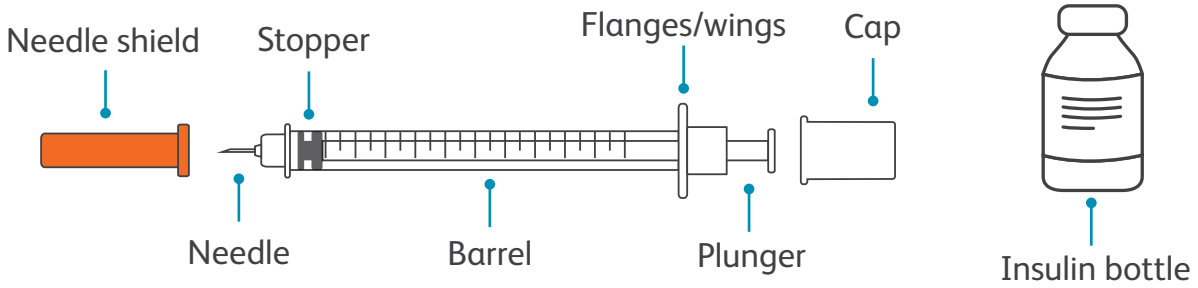
*Persons age 2-6, or those who are extremely lean may require a pinch-up.

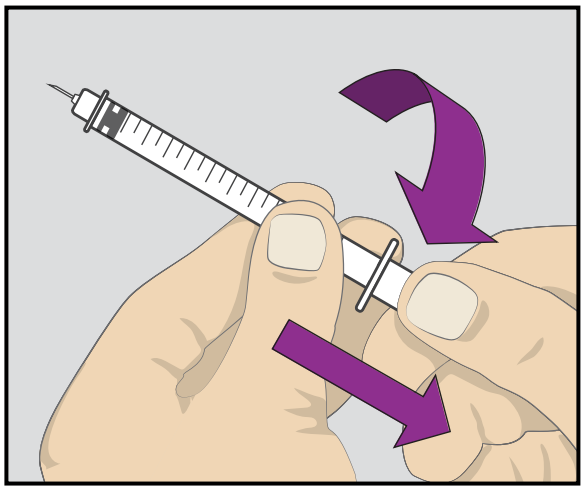
How to inject with an insulin syringe with a 6mm needle

Check out the
BD™ Diabetes Care App
for syringe injection therapy

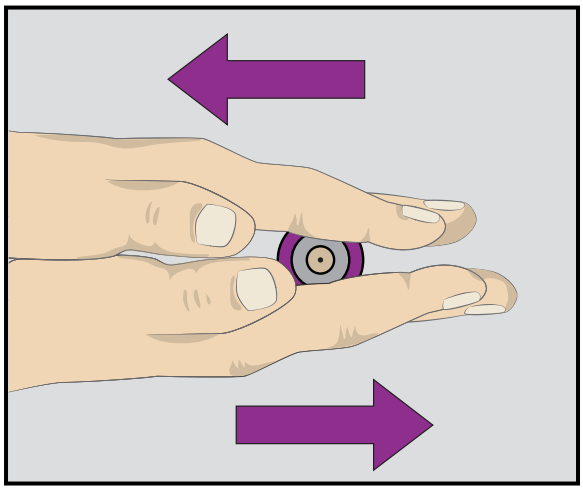
SCAN ME

Parts of an insulin syringe

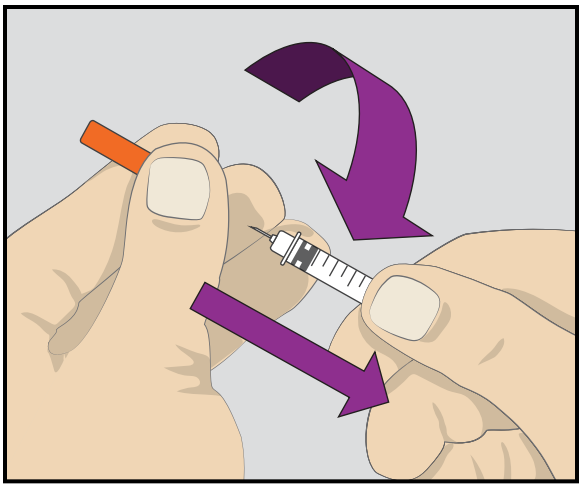




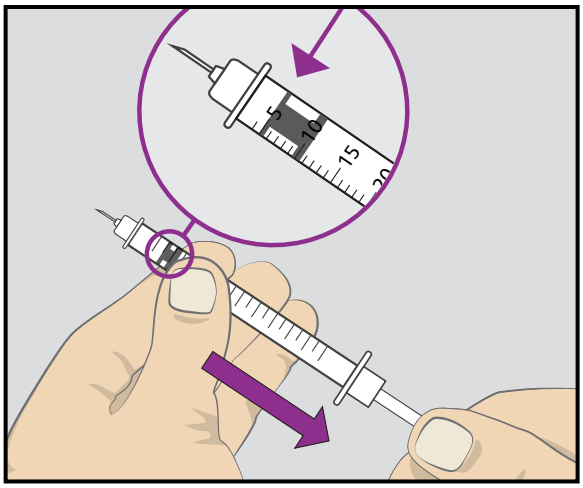
1 Wash hands and gather supplies. To expose plunger, twist white cap then pull off.



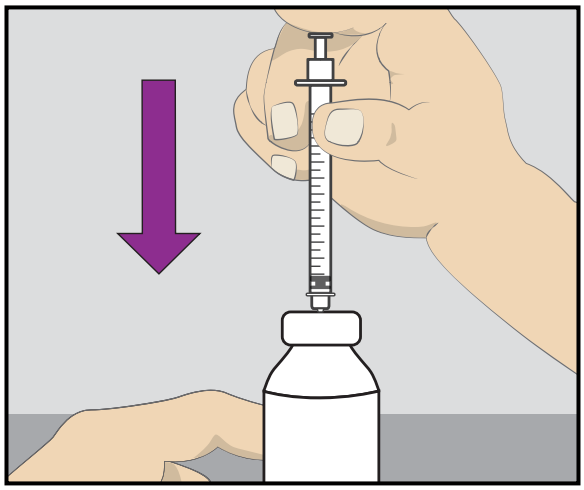
2 Wipe top of insulin bottle with a BD™ Alcohol Swab. If you are taking cloudy insulin, roll the bottle between your hands until it is uniformly cloudy. To avoid the formation of air bubbles do not shake the bottle of insulin.



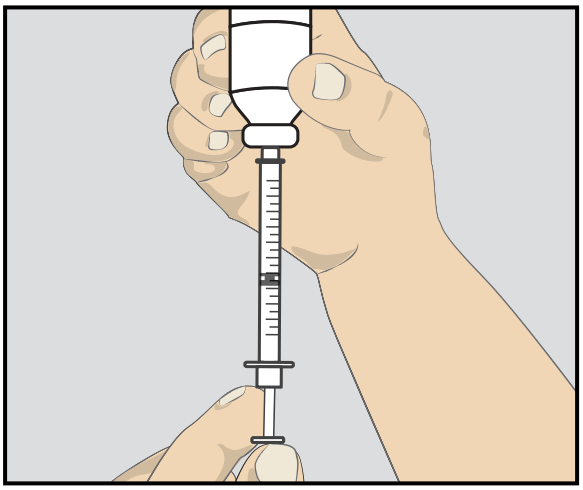
3 To expose the needle, twist the orange shield, then pull straight off, being careful not to bend the needle or let the needle touch anything.



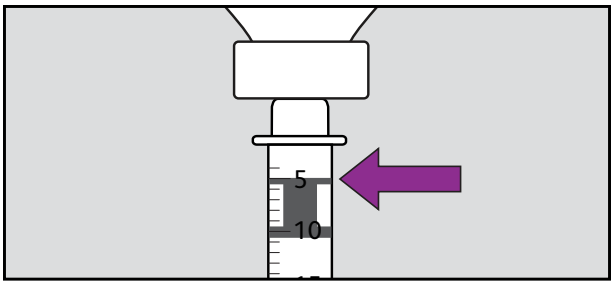
4 Pull the syringe plunger down to the desired number of units. You need air in the syringe equal to the amount of insulin you will take.



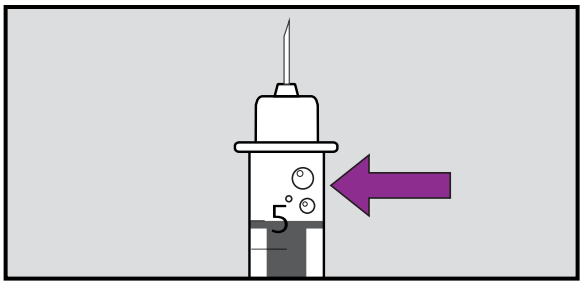
5 Push the needle through the center of rubber top of insulin bottle and push plunger down completely.



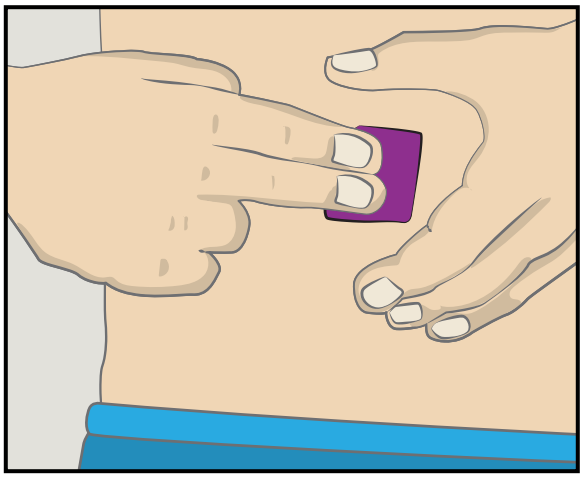
6 Leave the needle in the insulin bottle. Carefully turn the bottle and syringe upside down, so the bottle is on top.



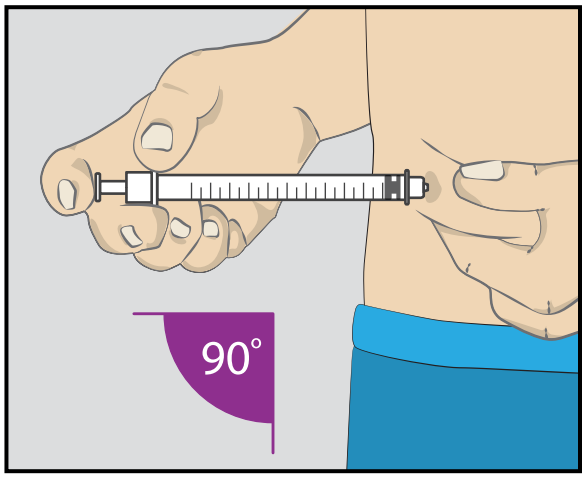
7 Pull the plunger down slowly, aligning the thin black line of the plunger with the desired number of units on the syringe.



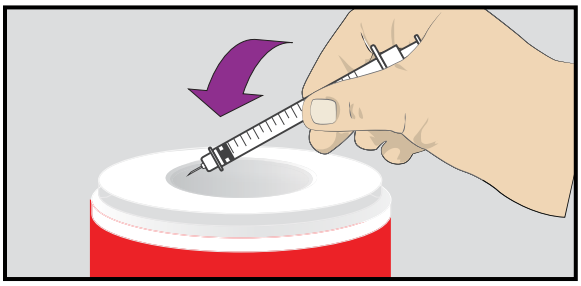
8 If air bubbles appear in syringe, push the plunger up, injecting insulin back into bottle and redraw insulin to desired number of units. Pull the syringe out of the bottle.



9 Confirm the dose is correct and then clean a small area of skin. Ensure the skin surface is completely dry before injecting.



10 Hold the syringe like a pencil. Pinch up your skin and push the needle quickly through the skin at 90°(straight in) to the skin surface. Push the insulin in with the plunger. Pull the needle out of your skin. Release the skin pinch.



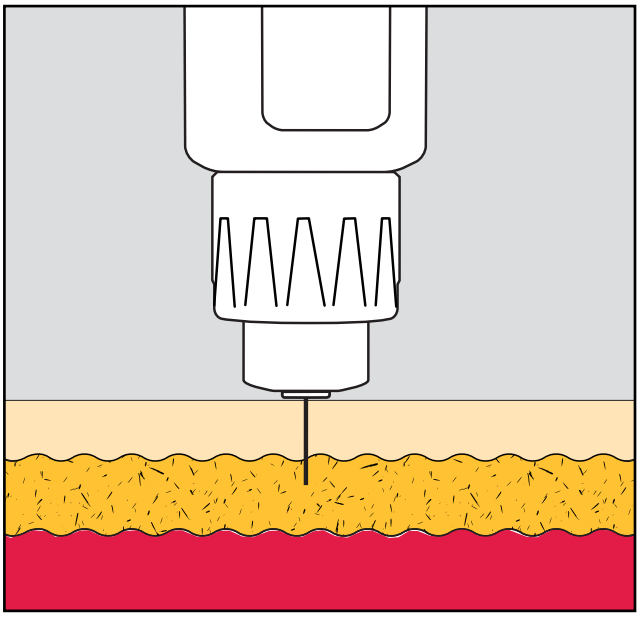
Do not recap used needles.
Use the needle once and dispose of it properly.

Consult the Instructions for Use and/or your Healthcare Professional about proper injection technique.

Needle length and injection technique

The length of the needle you use to inject insulin has a very important impact on how you inject.

Why it's important to use a shorter needle[30]



If the needle is too long and the insulin goes into your muscle *(intramuscular injection)*, it can cause the insulin absorption to be unpredictable.

To work properly, insulin needs to be deposited into the SC layer just below your skin.

American Diabetes Association (ADA) supports the use of shorter needles *(e.g., 4mm pen needles and 6mm needle insulin syringes)* as effective and well tolerated when compared with longer needles, including adults with obesity.[31]

Shorter needles may help avoid accidentally injecting into the muscle.* Ask your diabetes care team about the shortest needles currently available from BD!

- BD Nano™ 2nd Gen Pen Needles
- BD Veo™ Insulin Syringes with BD Ultra-Fine™ 6mm needle

Accidentally injecting insulin into your muscle changes how it works in your body, which can result in a low blood sugar event.

Blood sugar management

Unpredictable action of insulin in your body can cause unpredictable and shifting blood sugar levels—including excessive swings between highs and lows.

Hypoglycemia

Unpredictable insulin action can also lead to frequent and unexplained low blood sugar *(hypoglycemia)*, which can be dangerous if it takes you by surprise.

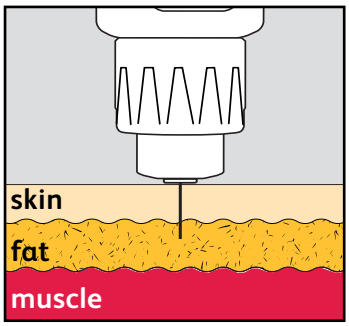
*Compared to longer needles

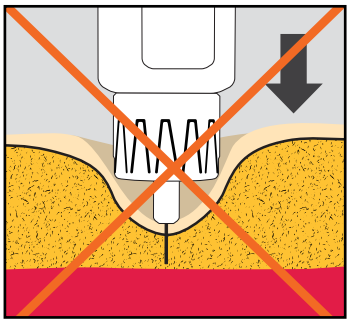
Use the correct technique for your length of needle[32*]

When injecting with 4mm or 5mm needles:

No pinch-up is required[33*]

Inject at 90-degrees *(straight in)* to the skin



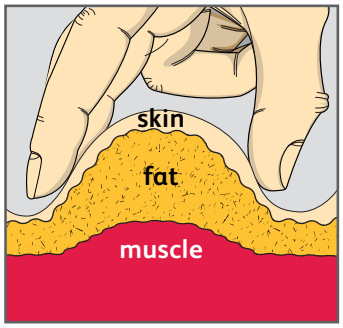


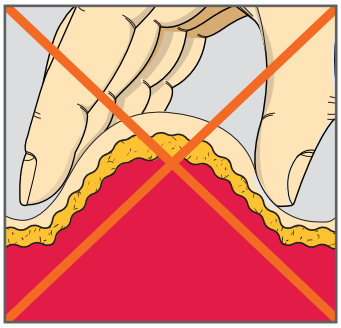
A correct no pinch-up technique requires light pressure when inserting the needle into the skin, just touching the pen needle base to the skin.

When injecting with 6mm needles or longer:[30]

Pinch-up injection technique is recommended[*]

Inject at 90-degrees *(straight in)* to the pinch-up





To do a pinch-up, loosely pinch about 1 inch of skin and fat tissue, using the thumb and the index finger *(and possibly adding the middle finger)*. If the skin is lifted using the whole hand, muscle may be lifted as well as fat tissue, which can lead to IM injections.

The pinch-up should be held until the injection is complete and the needle has been removed from the skin.

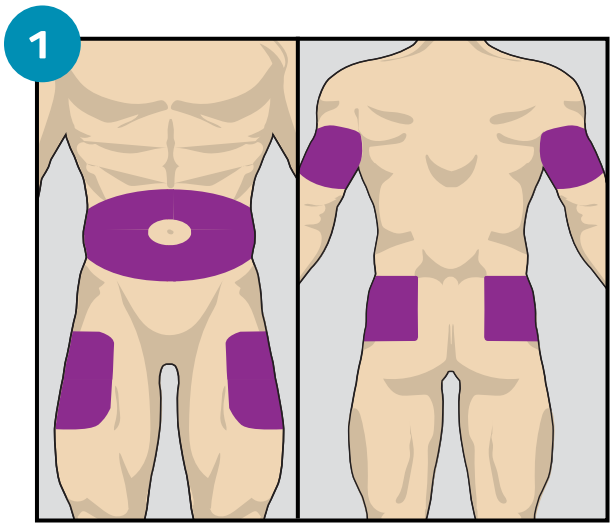
* Consult the Instructions for Use and/or your healthcare provider about proper injection technique.

Injection site rotation

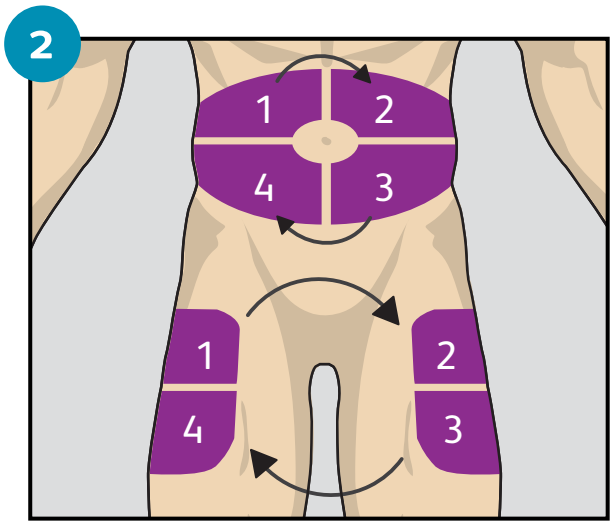
There are several areas on your body that are recommended for injecting insulin—and you can use as many as possible. Diabetes experts recommend consistent injection site rotation as the best way to keep your injection sites healthy.[30]

Where can I inject?

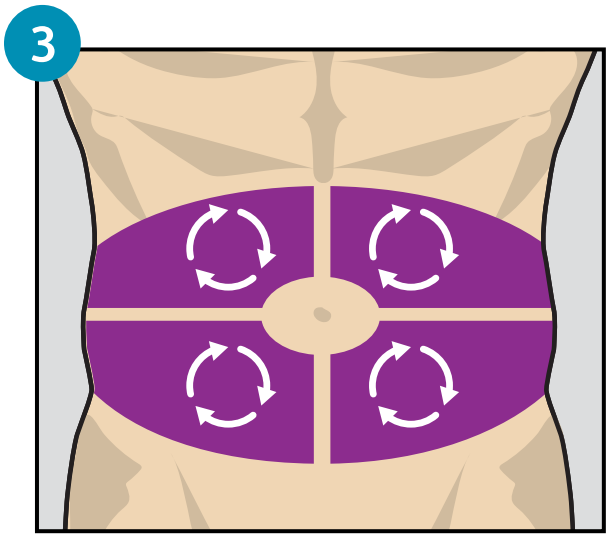
It's generally recommended that you inject insulin into your:
abdomen, thighs, arms, and buttocks. Talk to your diabetes care team about the best injection areas for you.



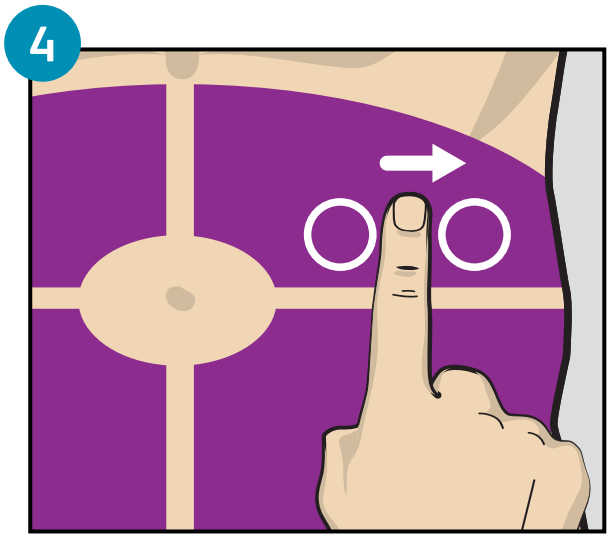
Choose an area.



Divide that area into four sections.



Select an injection site in a section to start injecting. Use one section per week.

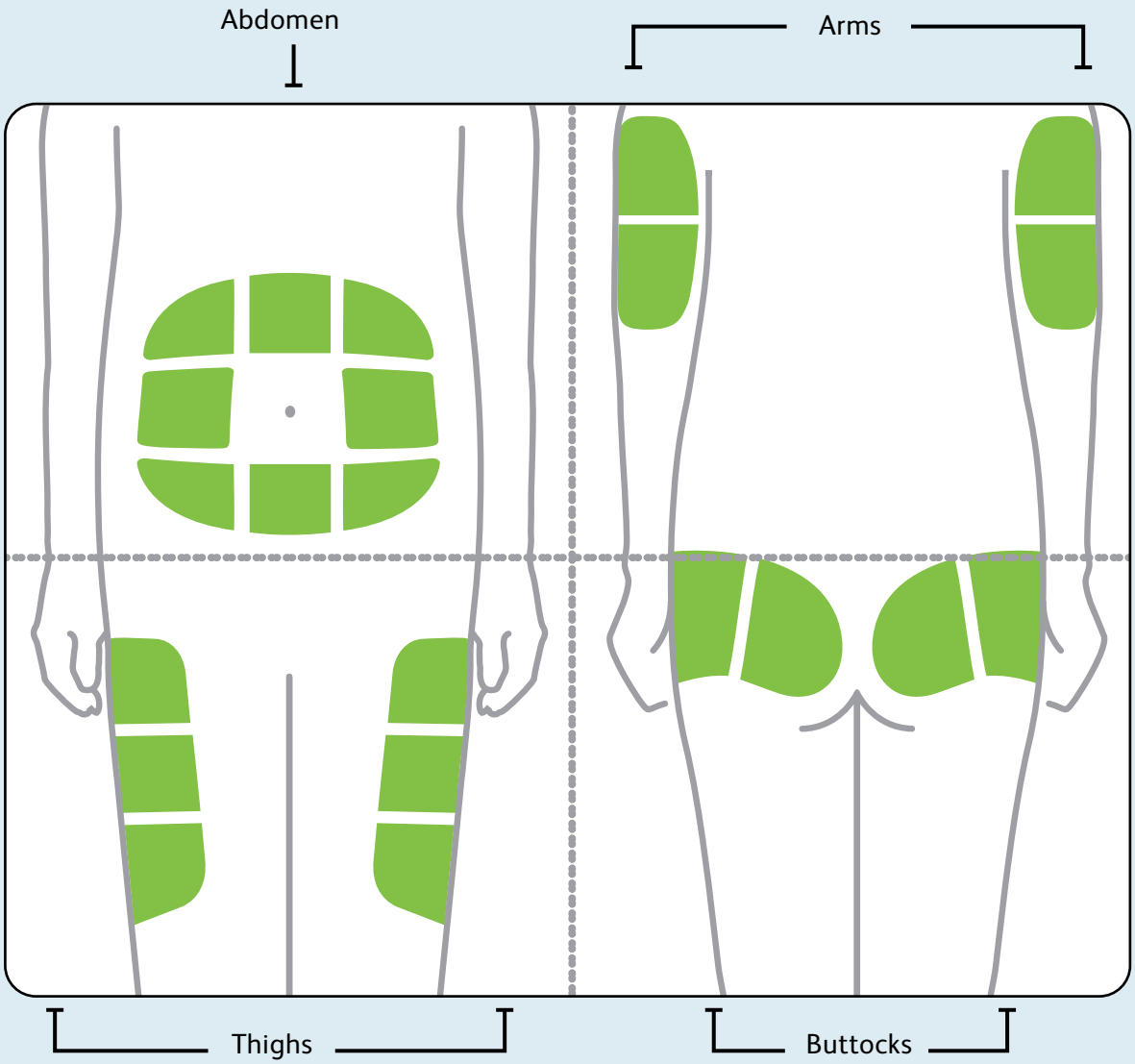


Inject within sites at least one finger width apart from your last injection.

Always rotate your injection sites[30]

Use the Injection Tracking Tool on the **BD™ Diabetes Care App** to help you! This is how it appears on the app.

SCAN ME

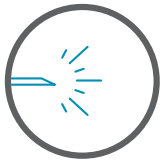


Talk with your health care provider or diabetes care and education specialist to develop a rotation plan that's right for you.

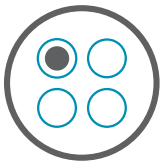
Always inject with a new needle[30]

- Pen needles and insulin syringes should only be used once—they are no longer sterile after use.
- Pen needles and insulin syringes are designed for single use. Reuse has been reported to increase injection pain and bleeding.

Why is it important to always **replace and rotate**?[30]



Replace your needle every time you inject.



Always rotate injection sites.

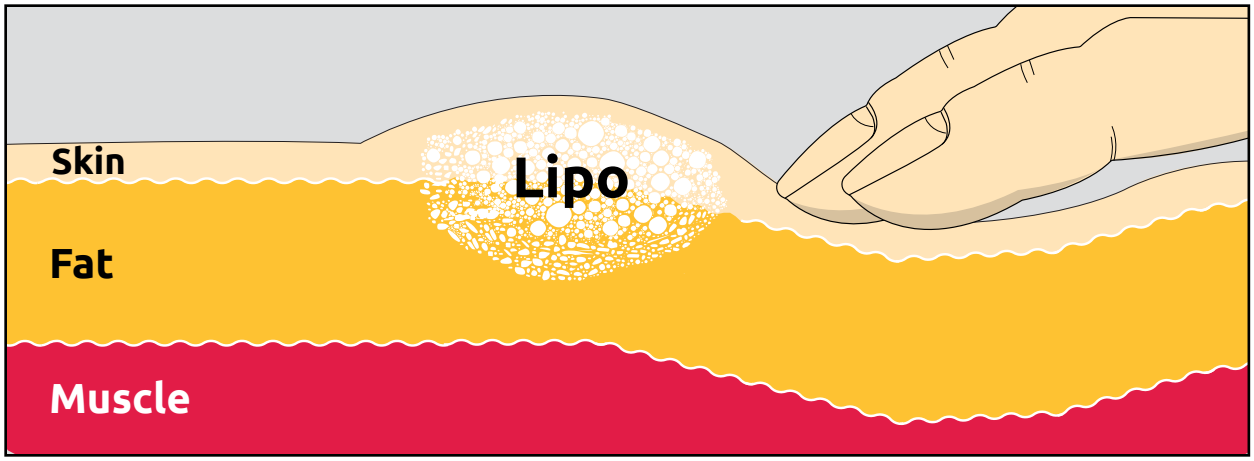
Following these two simple steps with every injection can reduce your risk of developing lipohypertrophy—unhealthy lumps and bumps that can form under the skin of people who inject insulin or other diabetes medications *(learn more on p.42)*.

Lipohypertrophy *(lipo)*

What is lipo?[34]

A common complication of insulin injections, is **a buildup of fat below the surface of the skin, causing lumps.** Lipohypertrophy may be caused by repeated injections of insulin in the same spot.

- Injecting into the lipo can cause inconsistent insulin absorption over a period of time

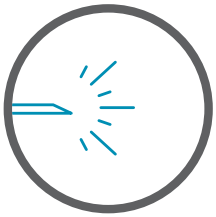


Why does this happen?[35†]

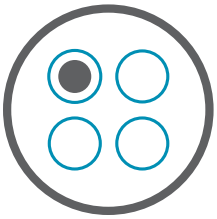
- Not rotating injection sites properly
- Not using a new needle with each injection

Reducing lipo[30]

It's important that you keep your injection sites healthy by preventing lipo. There are two ways you can prevent lipo with every injection:



1 Replace your needle.



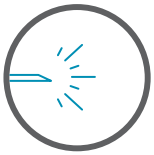
2 Rotate injection sites.

Remember, as part of your injection routine, these two small steps may make a difference

Safe sharps disposal

Used medical sharps, like insulin syringe needles and pen needles, should be properly disposed of according to your local regulations. Using a proper medical sharps container is one way you can practice safe disposal.[30]

Always safely dispose of used needles



After use, needles should be disposed of immediately.
Pen needles should not be left attached to the pen, and should not be recapped.

Always dispose of sharps in a medical sharps container.
Used sharps should never be discarded directly into household or public trash.

Check your local guidelines
Guidelines for the safe and environmentally responsible disposal of medical waste like used sharps vary across the country. You can find more information and confirm your local rules by visiting safeneedledisposal.org

Ask your diabetes care team about:

BD™ Home Sharps Container
To discard used insulin syringes, pen needles and lancets

BD Safe-Clip™ device
A portable device that helps you clip used insulin syringes and pen needles for disposal

Check out the
BD™ Diabetes Care App
for more information

SCAN ME

Frequently asked questions about common injection issues

Talk to your diabetes care team about any issues you're having, but some of these FAQs may help you overcome common issues.

How do I make my injections more comfortable?[30]

There are several steps you can take to have more comfortable injections:

- Use needles with the latest technology.
- Always use a new needle for each injection.
- Inject your insulin when it's at room temperature.

Why does insulin drip **from the needle** after injection?[30]

Insulin dripping from the needle means that your full dose has not been delivered:

- If you use an insulin pen, be sure you are holding count for up to 10 seconds after the thumb button is pressed all the way down before you remove the needle from your skin. Refer to pen manufacturer's instructions for specific hold time
- If you're taking large doses of insulin, it may be helpful to split them and inject less per injection *(but still take your total dose)*.

Why does insulin leak **from my injection site** after injection?[30]

A small amount of leakage *(a tiny pearl of liquid)* can generally be ignored because it's an insignificant amount, but you can reduce the risk of injection site leakage by:

- Using needles with thin-wall or extra-thin-wall technology.
- Counting to 10 after the plunger or thumb button is fully depressed before removing the needle from your skin.
- Checking your injection technique with your diabetes care team—it's possible you're making a mistake that's causing the leakage.

Why are there bubbles in my insulin syringe or pen?[30]

Bubbles in your insulin aren't dangerous, but they can affect the accuracy of your dosing.

- If you use an insulin syringe, tap on the barrel to make the bubbles rise to the surface. Push the plunger *(injecting the insulin back into the vial)* to remove the bubbles, and slowly draw up your dose again.
- If you use an insulin pen, don't leave the needle attached to the pen. This can allow air bubbles into the cartridge and affect your dose accuracy.
- If you're mixing cloudy insulin to re-suspend it, don't shake it vigorously. This can cause bubbles. Gently roll or tip it back and forth ten times instead.

Why is my insulin syringe or pen clogged?[30]

If you find you can't press down the thumb button on your insulin pen or plunger on your insulin syringe, the needle may be clogged or blocked.

- Throw out that dose and start again with a new pen needle or insulin syringe.
- Always use a new needle for every injection.
- If you use an insulin pen, always prime it with the 2-unit air shot before injecting *(following the manufacturer's instructions)* to ensure a free flow of medication. Manufacturers provide extra insulin for this purpose.[36]
- Make sure cloudy insulin is properly mixed before injecting.
- If you use an insulin syringe, fill it close to injection time. If left sitting, insulin can dry inside the needle.

Healthy living with diabetes

Live your life and manage your diabetes at the same time

Healthy living with diabetes is more than medication and blood glucose levels. Eating right and being active play a big part in helping you achieve your goals.

In this section, you'll learn more about:

- Healthy eating and meal planning
- Activity
- Diabetes-friendly travel tips
- Managing diabetes when you're sick

Check out the
BD™ Diabetes Care App
to help you manage
a lifestyle with diabetes

BD

SCAN ME

Healthy eating

Meal planning doesn't need to be a chore when you're living with diabetes. You just need to make smart choices to eat balanced meals and enjoy healthy snacks. The more you know about the food you're eating, the easier those choices will be.[16]

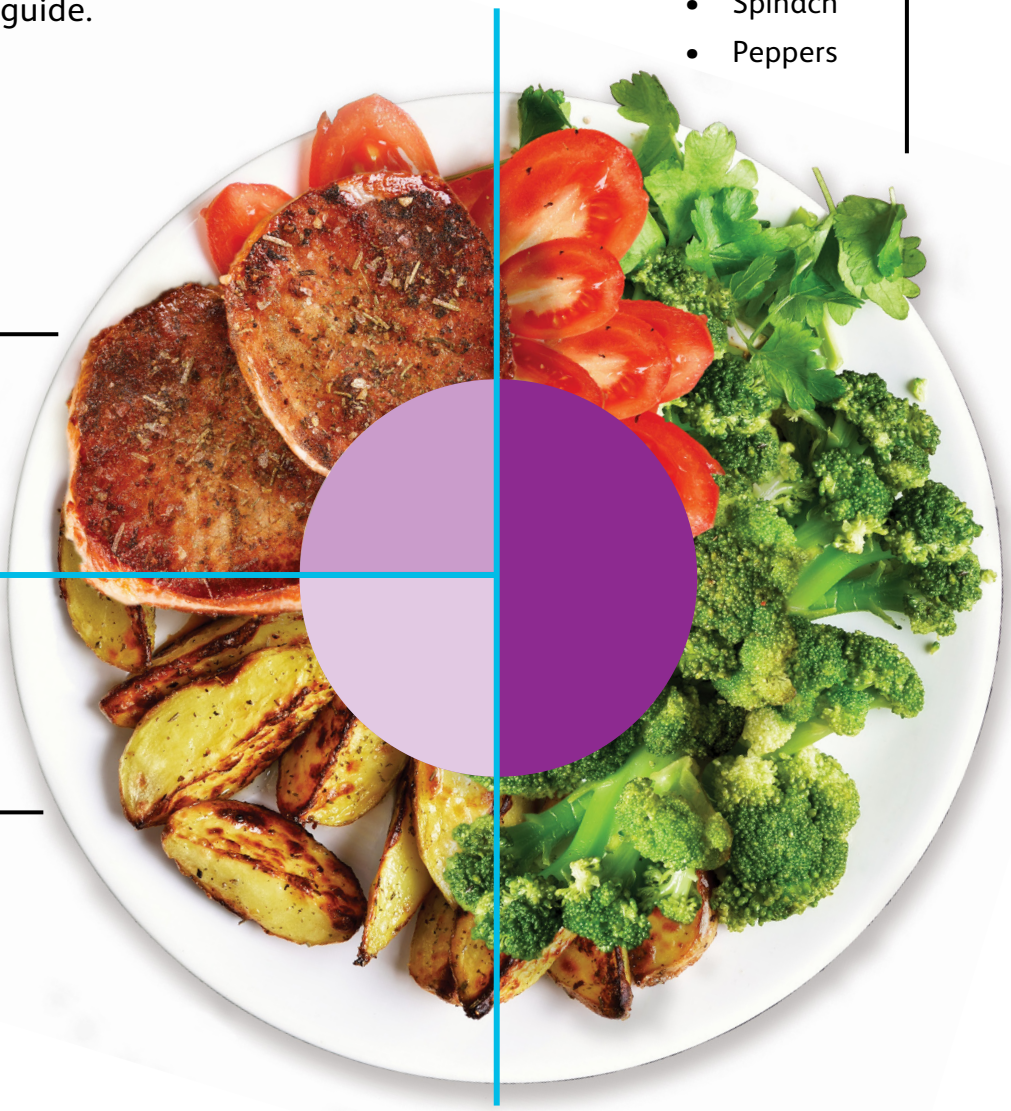
The *Diabetes Plate Method*

The Diabetes Plate Method is a simple method of meal planning. The American Diabetes Association recommends you follow this simple guide.

1/2
Vegetables
- Carrots
- Spinach
- Peppers

1/4
Protein
- Pork
- Chicken
- Fish

1/4
Grains and carbohydrates
- Corn
- Potato
- Quinoa



Check out the **BD™ Diabetes Care App** for other methods of meal planning, carb counting and recipes.

Activity*

Get moving—it's good for your whole body! Activity not only helps your body use insulin better, it also strengthens your heart and bones, improves blood circulation, lowers blood glucose and blood pressure, improves cholesterol levels and relieves stress.[37]

Aerobic activity[16]

The American Diabetes Association (ADA) recommends **30 minutes of moderate- to vigorous-intensity physical activity at least five days a week**, for a total of 150 minutes per week. Remember to avoid a sedentary lifestyle and be sure to get up and move around every 30 minutes when sitting for long periods.

Examples of aerobic activities:

- Brisk walking
- Dancing
- Swimming
- Hiking
- Skating

* Always check with your diabetes care team before starting or changing any activity routine.

Strength activity[16]

The ADA also recommends strength training at least 2 times per week, in addition to aerobic activity. It helps your diabetes and reduces your risk of osteoporosis and injury.

Examples of strength training activities:

- Weight machines or free weights
- Resistance bands
- Lifting light objects at home
- Calisthenics *(using your own body weight)*
- Heavy yardwork

Travel with diabetes

Living with diabetes doesn't have to keep you from exploring the world. With a little planning and preparation around your medications and treatment plan, you'll be set to take on whatever adventures your heart desires.

Make a travel checklist to make packing easier[38]

Packing for a trip is challenging at the best of times, and living with diabetes adds an extra layer of things to think about. Start planning what you'll pack well in advance with a list that includes items like:

- All your necessary diabetes medications and other medications and supplies *(e.g., glucagon, antidiarrheal medication, antibiotic ointment).* **Always carry your diabetes supplies in your carry-on.**
- Blood and urine testing supplies *(including extra batteries for your blood glucose meter)*
- A snack pack, including some form of sugar *(e.g., glucose tablets, hard candy)* to treat low blood sugar

Be prepared for airport security

- Check the TSA website *(tsa.gov)* for the latest updates.[39]

SCAN ME

Check out the **BD™ Diabetes Care App** for travel tips

Diabetes and sick days

In response to the stress of illness, your body releases extra sugar into the blood to fight on the infection. This can cause high blood sugars.

Stock up on sick day supplies[40]

You should always keep your cupboard stocked with basic supplies that can help you manage your blood sugar and stay hydrated.

- A small supply of non-diet soft drinks
- Broth
- Applesauce
- Regular *(non-diet)* gelatin
- Blood sugar testing strips and extra batteries for your blood glucose monitor
- Urine ketone testing strips, if advised by your healthcare professional
- Thermometer

Keep taking your medications[40]

It's especially important when you're sick to keep taking all your medications as prescribed by your health care provider—and maybe even modify them based on the sick-day plan you create with your healthcare team.

- You may need more insulin if your blood sugar is abnormally high.
- If you're not currently taking insulin, your diabetes care team may add it to your sick day plan for a short time, if you can't keep your blood sugar in range.

Know when to call your healthcare team[40]

With a good plan and some preparation, you can be well equipped to look after yourself. But you should contact your healthcare team if:

- You've been sick or have a fever for a couple of days and aren't getting better.
- You've had diarrhea or been vomiting for more than 6 hours.
- You have moderate to large amounts of ketones in your urine.
- Your blood glucose levels are higher than 240 mg/dL for 24 hours or more.
- You have symptoms of ketoacidosis, dehydration or other serious conditions *(your chest hurts, you're having trouble breathing, your breath smells fruity, your lips or tongue are dry and cracked)*.
- You cannot think clearly.
- You have blood glucose values less than 70 mg/dL.

Check out the **BD™ Diabetes Care App** for more information when you are sick

SCAN ME

Diabetes resources

The diabetes community is here to support you

An estimated 34.2 million Americans—just over 1 in 10—have diabetes. 88 million American adults—approximately 1 in 3—have prediabetes. While that number is a reflection of the huge burden of diabetes, it also means that you're not alone. There is a massive community of people living with diabetes, their families, caregivers and diabetes care teams out there who are all trying their best to live healthier lives and support one another.[41]

In this section, you'll learn more about:

- Creating a diabetes toolkit
- Diabetes communities and resources
- Connecting with BD

Check out the
BD™ Diabetes Care App
for more information

SCAN ME

Making a diabetes toolkit

Make diabetes management easier by keeping all your supplies together in a kit. You can use whatever you have on hand—like a small makeup bag, travel cooler or plastic container.

- Method of recording *(blood sugar, insulin, meals, activities, etc.)*
- Blood glucose meter or continuous glucose monitor
- Lancets
- Diabetes medications *(pills and insulin or other injectable medications)*
- Insulin pen needles or insulin syringe needles
- Ketone testing strips, if prescribed
- Diabetes medical identification
- Some form of sugar or carbohydrate to treat low blood sugar

Diabetes log book

My blood glucose

Date:	Before	Insulin Dose	After	Comments
	Time, blood glucose	**Units**	**Time, blood glucose**	
Breakfast				
Lunch				
Dinner				
Bedtime				
Night				

Date:	Before	Insulin Dose	After	Comments
	Time, blood glucose	**Units**	**Time, blood glucose**	
Breakfast				
Lunch				
Dinner				
Bedtime				
Night				

Date:	Before	Insulin Dose	After	Comments
	Time, blood glucose	**Units**	**Time, blood glucose**	
Breakfast				
Lunch				
Dinner				
Bedtime				
Night				

Diabetes communities and resources

Connect with other online communities for additional information.

American Diabetes Association. diabetes.org

The American Diabetes Association (ADA) is a nonprofit that seeks to educate the public about diabetes and to help those affected by it through funding research to manage, cure and prevent diabetes.

JDRF IMPROVING LIVES. CURING TYPE 1 DIABETES.

Juvenile Diabetes Research Foundation jdrf.org

JDRF is a nonprofit organization that funds type 1 diabetes research and provides a broad array of community and activist services to the T1D population.

ADCES Association of **Diabetes Care & Education Specialists**

diabeteseducator.org/living-with-diabetes/Tools-and-Resources

The Association of Diabetes Care & Education Specialists (ADCES) is an organization dedicated to improving prediabetes, diabetes and cardiometabolic care through innovative education, management and support.

eat right. Academy of Nutrition and Dietetics eatright.org

The Academy of Nutrition and Dietetics is the world's largest organization of food and nutrition professionals committed to improving the nation's health and advancing the profession of dietetics through research, education and advocacy.

TCOYD TAKING CONTROL OF YOUR DIABETES tcoyd.org

Taking Control Of Your Diabetes (TCOYD) educates and motivates people with diabetes to take a more active role in their condition and provides continuing education to medical professionals caring for people with diabetes.

CDC Centros para el Control y la Prevención de Enfermedades CDC 24/7: Salvamos vidas. Protegemos a la gente™

cdc.gov/diabetes/spanish/basics/diabetes.html

La División de Diabetes Aplicada de los CDC cree en el poder de la ciencia para cambiar las tendencias en la epidemia de diabetes. Nos dedicamos a poner esa ciencia en práctica por medio de programas y políticas que ayudan a las personas a prevenir la diabetes tipo 2 y a mejorar la salud de todas aquellas que tengan diabetes.

This is not meant as a BD endorsement.

References

1. American Diabetes Association. Common terms. Accessed August 13, 2021 at http://www.diabetes.org/diabetes-basics/common-terms/. **2.** American Diabetes Association. Diagnosing diabetes and learning about prediabetes. Accessed August 13, 2021 at http://www.diabetes.org/are-you-at-risk/prediabetes/. **3.** American Diabetes Association. Type 1 diabetes. Accessed August 13, 2021at https://www.diabetes.org/diabetes/type-1. **4.** American Diabetes Association. Facts about type 2. Accessed August 13, 2021 at http://www.diabetes.org/diabetes-basics/type-2/facts-about-type-2.html. **5.** American Diabetes Association. What is gestational diabetes? Accessed August 13, 2021 at http://www.diabetes.org/diabetes-basics/gestational/what-is-gestational-diabetes.html. **6.** American Diabetes Association. Gestational diabetes—lower your risk. Accessed August 13, 2021 at http://www.diabetes.org/are-you-at-risk/lower-your-risk/gdm.html. **7.** Marik PE, Bellomo R. Stress hyperglycemia: an essential survival response! Crit Care. 2013;17*(2)*:305. **8.** Tamez-Pérez HE, Quintanilla-Flores DL, Rodríguez-Gutiérrez R, González-González JG, Tamez-Peña AL. Steroid hyperglycemia: Prevalence, early detection and therapeutic recommendations: A narrative review. World J Diabetes. 2015;6*(8)*:1073-1081. **9.** American Diabetes Association. Diabetes symptoms. Accessed August 13, 2021 at http://www.diabetes.org/diabetes-basics/symptoms/. **10.** Stratton IM, Adler AI, Neil HA, et al. Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes *(UKPDS 35)*: prospective observational study. BMJ. 2000;321*(7258)*:405-412. **11.** Diabetes Association. Diabetes complications. Accessed August 13th, 2021 at http://www.diabetes.org/living-withdiabetes/complications/. **12.** American Diabetes Association. 12. Healthy ABCs. Accessed August 13, 2021 at http://www.diabetes.org/living-with-diabetes/complications/heart-disease/healthy-abcs.html. **13.** American Diabetes Association. All about blood glucose. Accessed August 13, 2021 at https://professional.diabetes.org/sites/professional.diabetes.org/files/media/All_about_Blood_Glucose.pdf. **14.** American Diabetes Association. High blood pressure. Accessed August 13, 2021 at http://www.diabetes.org/are-you-at-risk/lower-your-risk/bloodpressure.html. **15.** American Diabetes Association. All about cholesterol. Accessed August 13, 2021 at http://www.diabetes.org/are-you-at-risk/lower-your-risk/cholesterol.html. **16.** American Diabetes Association. Food & fitness. Accessed August 13, 2021 at http://www.diabetes.org/food-and-fitness/. **17.** American Diabetes Association. Oral medication. Accessed August 13, 2021 at http://www.diabetes.org/living-with-diabetes/treatment-and-care/medication/oral-medications/. **18.** American Diabetes Association. What are my options? Accessed August 13, 2021 at http://www.diabetes.org/living-with-diabetes/treatment-and-care/medication/oralmedications/what-are-my-options.html. **19.** American Diabetes Association. Insulin storage and syringe safety. Accessed August 13, 2021 at http://www.diabetes.org/living-with-diabetes/treatment-and-care/medication/insulin/insulin-storage-and-syringe-safety.html. **20.** American Diabetes Association. Other injectable medications. Accessed August 13, 2020 at http://www.diabetes.org/living-with-diabetes/treatment-and-care/medication/insulin/other-injectable-medications.html. **21.** Medscape. Two new combination injectable drugs for type 2 diabetes coming to market. Accessed August 13, 2021 at https://www.medscape.com/viewarticle/874537. **22.** Centers for Disease Control and Prevention. Basics about diabetes. Accessed August 13, 2021 at https://www.cdc.gov/diabetes/basics/diabetes.html. **23.** American Diabetes Association. Insulin routines. Accessed August 13, 2021 at http://www.diabetes.org/living-with-diabetes/treatment-and-care/medication/insulin/insulin-routines.html. **24.** Basal bolus – basal

bolus injection regimen. Accessed August 13, 2021 at http://www.diabetes.co.uk/insulin/basal-bolus.html. **25.** UC San Fransisco. Accessed August 13, 2021 at https://dtc.ucsf.edu/types-of-diabetes/type2/treatment-of-type-2-diabetes/medications-and-therapies/type-2-insulin-rx/types-of-insulin/. **26.** American Diabetes Association. Hyperglycemia *(high blood glucose)*. Accessed August 16, 2021 at http://www.diabetes.org/living-with-diabetes/treatment-and-care/bloodglucose-control/hyperglycemia.html. **27.** American Diabetes Association. Hypoglycemia *(low blood glucose)*. Accessed August 16, 2021 at http://www.diabetes.org/living-with-diabetes/treatment-and-care/blood-glucose-control/hypoglycemia-low-blood.html. **28.** Kedia 2011. Treatment of severe diabetic hypoglycemia with glucagon: an underutilized therapeutic approach. https://pubmed.ncbi.nlm.nih.gov/21969805/. **29.** Mayo Clinic. Hypoglycemia. Accessed August 16, 2021 at http://www.mayoclinic.org/diseases-conditions/hypoglycemia/basics/causes/con-20021103. **30.** Frid AH, Kreugel G, Grassi G, et al. New insulin delivery recommendations. Mayo Clin Proc. 2016;91*(9)*:1231–1255. **31.** American Diabetes Association. Standards of Medical Care in Diabetes – 2021. Diabetes Care. 2021;44*(Suppl 1)*:S1-S232. **32.** Gibney MA, Arce CH, Byron KJ, Hirsch LJ. Skin and subcutaneous adipose layer thickness in adults with diabetes at sites used for insulin injections: implications for needle length recommendations. Curr Med Res Opin. 2010;26*(6)*:1519–1530. **33.** Blanco M, Hernandez MT, Strauss KW, Amaya M. Prevalence and risk factors of lipohypertrophy in insulin-injecting patients with diabetes. Diabetes Metab. 2013;39*(5)*:445–453. **34.** Frid AH, Hirsch LJ, Menchior AR, Morel DR, Strauss KW. Worldwide injection technique questionnaire study: injecting complications and the role of the professional. Mayo Clin Proc. 2016;91*(9)*:1224–1230. **35.** Famulla S, Hovelmann U, Fisher A, et al. Insulin injection in lipohypertrophic tissue: blunted and more variable insulin absorption and action and impaired postprandial glucose control. Diabetes Care. 2016;39*(9)*:1486–1492. **36.** Pearson 2010. Practical aspects of insulin Pen Devices. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2901027/. **37.** American Diabetes Association. What we recommend. Accessed August 16, 2021 at http://www.diabetes.org/food-and-fitness/fitness/types-of-activity/what-we-recommend.html. **38.** American Diabetes Association. What we recommend. Accessed August 16, 2021 at https://www.diabetes.org/resources/know-your-rights/discrimination/public-accommodations/air-travel-and-diabetes. **39.** Transportation Security Administration. Travel Tip: Traveling with Diabetes. Accessed August 16, 2021 at https://www.tsa.gov/blog/2020/11/13/travel-tip-traveling-diabetes. **40.** American Diabetes Association. When you're sick. Accessed August 16, 2021 at https://www.diabetes.org/diabetes/treatment-care/planning-sick-days. **41.** American Diabetes Association. Statistics about diabetes. Accessed August 16, 2021 at http://www.diabetes.org/diabetes-basics/statistics/.

Connect with BD

BD Customer Support

1.888.BD.CARES
(1.888.232.2737)

Monday–Friday,
8 a.m.–8 p.m. EST

BD Diabetes Care

Information for people with diabetes.
livingwithdiabetes.bd.com

BD™ Diabetes Care App (Facebook)

facebook.com/BDDiabetesCareApp/

Join a supportive, welcoming Facebook community to learn more about insulin delivery and healthy living.

BD YouTube Channel

SCAN ME

Watch educational videos on proper injection technique and how to use the BD™ Diabetes Care App

BD™ Diabetes Care App

SCAN ME

The BD™ Diabetes Care App can support you in managing a lifestyle with diabetes.

BD, Franklin Lakes, NJ 07417, U.S.

bd.com

BD, the BD Logo, Nano, Safe-Clip, Ultra-Fine and Veo are trademarks of Becton, Dickinson and Company or its affiliates. All other trademarks are the property of their respective owners. © 2021 BD. All rights reserved. 2108639685GSB