



INSULIN DELIVERY

Syringes...
pumps...
jet injectors...
pens...
infusers...
they all do
the same
basic thing—
deliver insulin.
These items
carry insulin
through the
outermost
layer of skin
and into fatty
tissue so it
can be used
by the body.
This section
will also cover
injection aids,
products
designed to
make injecting
easier.

Syringes

Today's syringes are smaller and have finer points and special coatings that work to make injecting as easy and painless as possible. When insulin injections are done properly, most people discover they are relatively painless.

Check with your doctor or diabetes educator and test several brands before you buy. Your equipment should suit your needs.

Questions to ask:

- Does the syringe dose match your insulin strength? If you take U-100 insulin, use U-100 syringes. *(Note: All insulin syringes in the United States take U-100 insulin.)*
- Does your syringe match your insulin dosage? If you take 30 units or less of insulin, you may use the $\frac{3}{10}$ -cc syringe. The $\frac{1}{2}$ -cc syringe may be used by those taking 50 units or less, and the 1-cc syringe is designed for those needing up to 100 units of insulin. If your insulin needs have

been increasing, you might want to buy syringes that give you an opportunity to increase your dose if need be. For example, if you take 29 units, consider buying a 50-unit syringe. Using a syringe that more closely matches your dose may help you more accurately draw up your insulin.

If you are changing the syringe you use, check dosage lines carefully. In some syringes, one line is equal to one unit of insulin, but in others, each line is equal to two units of insulin.

- Be familiar with the gauge of your needle and what it means. The higher the gauge number of your needle, the thinner it is.
- Can you easily draw up your dosage in a particular syringe? Does the syringe barrel have the kind of markings you can read easily—or are they too close together? Does having a plunger that's a different color make it easier for you?
- Would a shorter needle be a better choice for you or your child with

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SYRINGES (U-100)

Manufacturer/Distributor and Name	Needle Gauge	Needle Size	Packaging
1-cc syringes			
Abbott Laboratories			
Pharmacy brands*	29G	½"	100 (individually sterile wrapped)
Precision Sure Dose	29G	½"	100 (individually sterile wrapped)
Precision Sure Dose	28G	½"	100 (individually sterile wrapped)
Aimsco Ultra Thin II Short	30G	⅝"	100 (individually sterile wrapped)
Aimsco Ultra Thin II	29G	½"	100 (10 packs of 10 individually wrapped)
Aimsco Maxi Comfort	28G	½"	100 (10 packs of 10 individually wrapped)
Aimsco Uni Body Ultra II	29G	½"	100 (10 packs of 10)
Aimsco Uni Body Ultra II	28G	½"	100 (10 packs of 10)
Aimsco Safety Syringe	29G	½"	100 (individually sterile wrapped)
Allison Medical, Inc.			
SureComfort	31G	⅝"	100 (10 packs of 10)
SureComfort	30G	½"	100 (10 packs of 10)
SureComfort	30G	⅝"	100 (10 packs of 10)
SureComfort	29G	½"	100 (10 packs of 10)
SureComfort	28G	½"	100 (10 packs of 10)
BD SafetyGlide Syringe	29G	½"	100 (individually sterile wrapped) safety-engineered
BD Safety-Lok Syringe	29G	½"	100 (individually sterile wrapped) safety-engineered
BD Integra Syringe	29G	½"	100 (individually sterile wrapped) safety-engineered
BD Ultra-Fine II Short	31G	⅝"	100 (10 packs of 10)
BD Ultra-Fine	30G	½"	100 (10 packs of 10)
BD Micro-Fine IV	28G	½"	100 (10 packs of 10)
Can-Am Care Corp.			
Monoject Ultra Comfort Short	31G	⅝"	100 (individually sterile wrapped)
Monoject Ultra Comfort Short	30G	⅝"	100 (individually sterile wrapped)
Monoject Ultra Comfort 29	29G	½"	100 (individually sterile wrapped)
Monoject Ultra Comfort 28	28G	½"	100 (individually sterile wrapped)
Various store brands†	31G	⅝"	100 (individually sterile wrapped)
Various store brands†	30G	⅝"	100 (individually sterile wrapped)
Various store brands†	29G	½"	100 (individually sterile wrapped)
Various store brands†	28G	½"	100 (individually sterile wrapped)
Medicore Lite Touch	30G	⅝"	100 (10 packs of 10)
Medicore Lite Touch	29G	½"	100 (10 packs of 10)
Medicore Lite Touch	28G	½"	100 (10 packs of 10)
UltiMed, Inc.			
UltiCare, UltiSmooth	28G	½"	100 (10 packs of 10)
UltiCare, UltiFine	29G	½"	100 (10 packs of 10)
UltiCare, UltiThin	30G	½"	100 (10 packs of 10)
UltiCare, UltiThin Short	30G	⅝"	100 (10 packs of 10)
UltiCare, UltiFine II Short	31G	⅝"	100 (10 packs of 10)
UltiGuard, UltiFine**	29G	½"	100 (10 packs of 10) with disposable container
UltiGuard, UltiThin**	30G	½"	100 (10 packs of 10) with disposable container

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SYRINGES (U-100) *continued*

Manufacturer/Distributor and Name	Needle Gauge	Needle Size	Packaging
UltiGuard, UltiThin Short**	30G	5/16"	100 (10 packs of 10) with disposable container
UltiGuard, UltiFine II Short**	31G	5/16"	100 (10 packs of 10) with disposable container
½-cc syringes			
Abbott Laboratories			
Pharmacy brands*	30G	3/8"	100 (individually sterile wrapped)
Pharmacy brands*	29G	1/2"	100 (individually sterile wrapped)
Precision Sure Dose	30G	5/16"	100 (individually sterile wrapped)
Precision Sure Dose	29G	1/2"	100 (individually sterile wrapped)
Precision Sure Dose	28G	1/2"	100 (individually sterile wrapped)
Aimsco Ultra Thin II Short	31G	5/16"	100 (10 packs of 10 individually wrapped)
Aimsco Ultra Thin II Short	30G	5/16"	100 (individually sterile wrapped)
Aimsco Ultra Thin II	29G	1/2"	100 (10 packs of 10 individually wrapped)
Aimsco Maxi Comfort	28G	1/2"	100 (10 packs of 10 individually wrapped)
Aimsco Uni Body Ultra II	29G	1/2"	100 (10 packs of 10)
Aimsco Uni Body Ultra II	28G	1/2"	100 (10 packs of 10)
Allison Medical, Inc.			
SureComfort	31G	5/16"	100 (10 packs of 10)
SureComfort	30G	1/2"	100 (10 packs of 10)
SureComfort	30G	5/16"	100 (10 packs of 10)
SureComfort	29G	1/2"	100 (10 packs of 10)
SureComfort	28G	1/2"	100 (10 packs of 10)
BD SafetyGlide Syringe	29G	1/2"	100 (individually sterile wrapped) safety-engineered
BD Safety-Lok Syringe	29G	1/2"	100 (individually sterile wrapped) safety-engineered
BD Ultra-Fine II Short	31G	5/16"	100 (10 packs of 10)
BD Ultra-Fine	30G	1/2"	100 (10 packs of 10)
BD Micro-Fine IV	28G	1/2"	100 (10 packs of 10)
Can-Am Care LLC			
Monoject Ultra Comfort Short	31G	5/16"	100 (individually sterile wrapped)
Monoject Ultra Comfort Short	30G	5/16"	100 (individually sterile wrapped)
Monoject Ultra Comfort 29	29G	1/2"	100 (individually sterile wrapped)
Monoject Ultra Comfort 28	28G	1/2"	100 (individually sterile wrapped)
Various store brands†	31G	5/16"	100 (individually sterile wrapped)
Various store brands†	30G	5/16"	100 (individually sterile wrapped)
Various store brands†	29G	1/2"	100 (individually sterile wrapped)
Various store brands†	28G	1/2"	100 (individually sterile wrapped)
Medicare Lite Touch	30G	5/16"	100 (10 packs of 10)
Medicare Lite Touch	29G	1/2"	100 (10 packs of 10)
Medicare Lite Touch	28G	1/2"	100 (10 packs of 10)
UltiMed, Inc.			
UltiCare, UltiSmooth	28G	1/2"	100 (10 packs of 10)
UltiCare, UltiFine	29G	1/2"	100 (10 packs of 10)
UltiCare, UltiThin	30G	1/2"	100 (10 packs of 10)
UltiCare, UltiThin Short***	30G	5/16"	100 (10 packs of 10)

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diabetes? Some syringes now have shorter needles that many people find to be more comfortable. However, the depth of the injection can change the rate of absorption. Ask your doctor or diabetes educator to assess whether this would be a good alternative to your current syringe.

■ Does this brand come packaged as you prefer?

Cost is another factor because many stores use insulin syringes as key sale items. Shop around for a good price, but ask yourself: Is giving up a good local pharmacist to save \$2 at an out-of-the-way store worth the money?

You may be interested in reusing your syringes. Most manufacturers do not recommend this, and there may be some increased risk to patients (i.e., needle dullness causing discomfort, possible infection, or tissue damage). While this practice remains controversial, many patients reuse syringes without any problems. Once again, your health care team can advise you on the practice. (Pen needles, however, should *always* be removed immediately after use; when left in place, they create an open passage to the insulin chamber. The open passage may allow bacteria into the chamber or fluid to leak out, which may alter the strength of the insulin.)

And please, always follow appropriate guidelines when disposing of your syringes and lancets. Some states have very specific laws governing disposal of such items, while others lack guidelines. Even if no guidelines exist in your state, you

EVEN IF NO GUIDELINES EXIST IN YOUR STATE, YOU SHOULD BE CONSIDERATE OF THOSE WHO COULD POSSIBLY COME IN CONTACT WITH USED SYRINGES AND LANCETS.

should be considerate of those who could possibly come in contact with used syringes and lancets. Used syringes and lancets can be safely placed in a puncture-proof container that can be sealed shut before it is placed in the trash. (Label the container “USED SHARPS” with a heavy magic marker.)

Pumps

The insulin pump is not an artificial pancreas (because you still have to monitor your blood glucose level), but pumps can help some people achieve better control, and many people prefer this continuous system of insulin delivery over injections.

Insulin pumps are computerized devices, about the size of a cell-beeper, that you can wear on your



belt or in your pocket. They deliver insulin in two ways: in a steady, measured, and continuous dose (the “basal” insulin) and as a surge (“bolus”) dose, at your direction, around mealtime. Doses are delivered through a flexible plastic tube called a catheter. With the aid of a small needle, the catheter is inserted through the skin into the fatty tissue and is taped in place. In the newer products, the needle is removed and only a soft catheter remains in place.

If you use rapid-acting insulins, you can direct your pump to release a bolus dose close to mealtime to blunt the rise in blood glucose after a meal. If you use regular insulin, you would usually take the bolus dose about 30 minutes before you eat.

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SYRINGES (U-100) *continued*

Manufacturer/Distributor and Name	Needle Gauge	Needle Size	Packaging
UltiCare, UltiFine II Short***	31G	5/16"	100 (10 packs of 10)
UltiGuard, UltiFine**	29G	1/2"	100 (10 packs of 10) with disposable container
UltiGuard, UltiThin**	30G	1/2"	100 (10 packs of 10) with disposable container
UltiGuard, UltiThin Short**	30G	5/16"	100 (10 packs of 10) with disposable container
UltiGuard, UltiFine II Short**	31G	5/16"	100 (10 packs of 10) with disposable container
3/10-cc syringes			
Abbott Laboratories			
Pharmacy brands*	30G	3/8"	100 (individually sterile wrapped)
Pharmacy brands*	29G	1/2"	100 (individually sterile wrapped)
Precision Sure Dose	30G	5/16"	100 (individually sterile wrapped) 1/2-unit barrel markings
Precision Sure Dose	30G	5/16"	100 (individually sterile wrapped)
Precision Sure Dose	29G	1/2"	100 (individually sterile wrapped)
Aimsco Ultra Thin II Short	31G	5/16"	100 (10 packs of 10 individually wrapped)
Aimsco Ultra Thin II Short	30G	5/16"	100 (10 packs of 10)
Aimsco Ultra Thin II	29G	1/2"	100 (10 packs of 10)
Allison Medical, Inc.			
SureComfort	31G	5/16"	100 (10 packs of 10)
SureComfort	30G	1/2"	100 (10 packs of 10)
SureComfort	30G	5/16"	100 (10 packs of 10)
SureComfort	29G	1/2"	100 (10 packs of 10)
BD SafetyGlide Syringe	29G	1/2"	100 (individually sterile wrapped) safety-engineered
BD Safety-Lok Syringe	29G	1/2"	100 (individually sterile wrapped) safety-engineered
BD Ultra-Fine II Short	31G	5/16"	100 (10 packs of 10)
BD Ultra-Fine	30G	1/2"	100 (10 packs of 10)
BD Micro-Fine IV	28G	1/2"	100 (10 packs of 10)
Can-Am Care LLC			
Monoject Ultra Comfort Short	31G	5/16"	100 (individually sterile wrapped)
Monoject Ultra Comfort Short	30G	5/16"	100 (individually sterile wrapped)
Monoject Ultra Comfort 29	29G	1/2"	100 (individually sterile wrapped)
Various store brands†	31G	5/16"	100 (individually sterile wrapped)
Various store brands†	30G	5/16"	100 (individually sterile wrapped)
Various store brands†	29G	1/2"	100 (individually sterile wrapped)
UltiMed, Inc.			
UltiCare, UltiFine	29G	1/2"	100 (10 packs of 10)
UltiCare, UltiThin	30G	1/2"	100 (10 packs of 10)
UltiCare, UltiThin Short	30G	5/16"	100 (10 packs of 10)
UltiCare, UltiFine II Short	31G	5/16"	100 (10 packs of 10)
UltiGuard, UltiFine**	29G	1/2"	100 (10 packs of 10) with disposable container
UltiGuard, UltiThin**	30G	1/2"	100 (10 packs of 10) with disposable container
UltiGuard, UltiThin Short**	30G	5/16"	100 (10 packs of 10) with disposable container
UltiGuard, UltiFine II Short**	31G	5/16"	100 (10 packs of 10) with disposable container

SOLD AT** Brooks Pharmacy and CVS stores. †**SOLD AT** Albertson's, Wal-Mart (ReliOn), Medicine Shoppe, Kroger, Leader, Longs, Kmart (Value Plus), Meijer, Sunmark, Brite Life, Good Neighbor, Family Pharmacy, Shop Rite, Preferred Plus, Winn Dixie. *SOLD UNDER** CareOne Rx brand at Stop & Shop, Giant, and Tops. *****SOLD UNDER** Schnuck's brand.

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MISCELLANEOUS SYRINGE PRODUCTS

Product Name (Manufacturer/Distributor)	Comments
BD Home Sharps Container (BD)	For disposal of used insulin syringes, pen needles, and lancets. Holds 70 to 100 syringes or 300 pen needles.
BD Safe-Clip (BD)	Needle clipping and storage device. Clips and stores up to 1,500 needles. Portable.
BD Sharps Disposal by Mail (BD)	For disposal of insulin syringes, pen needles, and lancets by mail. Holds 70 to 100 syringes or 300 pen needles.
UltiGuard Syringes & Disposable Container Unit (UltiMed, Inc.)	UltiGuard syringe line combines 100 syringes with a syringe dispenser and disposal unit. UltiGuard syringe sizes include 1-cc, ½-cc, and ⅓-cc syringes in 29G, 30G, and 31G.

INJECTION AIDS

Product Name (Manufacturer/Distributor)	Description	Syringe Used	Needle Visible	Adjustable Depth of Skin Penetration	Comments
Autoject, Autoject 2 (Owen Mumford, Inc.)	Spring-loaded plastic syringe holder positioned over skin. Press device against site, push button to insert needle automatically without seeing the needle penetrate the skin to deliver the dose.	Autoject: most 1-cc, ½-cc, and ⅓-cc plastic syringes; Autoject 2: Abbott Labs, Precision Sure Dose 1-cc, ½-cc; BD 1-cc, ½-cc	no	yes	Increases injection-site alternatives.
BD Inject-Ease Automatic Injector (BD)	Spring-loaded plastic syringe holder positioned over skin. Insert syringe needle at the touch of a button. Designed for those who have anxiety about injections.	BD 1-cc, ½-cc, and ⅓-cc syringes	no	yes (1 adjustment)	Increases injection-site alternatives, 5-year guarantee.
Inject-Ease (Palco Labs, Inc.)	Spring-loaded plastic syringe holder designed to shield injection from view and reduce pain of injection. One-handed use helps reach alternative sites. Single-button activation inserts needle at proper angle.	BD 1-cc, ½-cc, and ⅓-cc syringes	no	yes (2 adjustments)	Includes clear plunger cap to preload syringes.
Instaject (Medicool, Inc.)	Combination syringe injector and blood lancet device. Button-activated.	Most 1-cc, ½-cc, and ⅓-cc syringes	no	yes	Self-contained as injector. Lancet adapter only.
NeedleAid (Needle Aid, Ltd.)	Stabilizing guide for injection using an insulin pen or syringe. Broad base hides the needle, masks the sensation of needle entry, provides safety as needle is automatically withdrawn, and ensures injection at the proper angle and to proper depth. Insulin is injected manually. Needle is hidden from view to reduce fear and pain perception.	FlexPen, NovoPen 4, 3, 1.5, Junior, Novo Nordisk disposable pens; Lilly insulin pens; most 1-, ½-, ⅓-cc syringes	no	no	Appropriate for needle phobia, visually impaired, beginning insulin users, and home care.
NovoPen 3 PenMate (Novo Nordisk, Inc.)	Attachment to conceal the needle to help reduce pain perception.	Fits NovoPen Junior and NovoPen 3 insulin-delivery systems	no		

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Because the pump also releases incredibly small doses of insulin continuously, this delivery system most closely mimics the body's normal release of insulin. Also, pumps deliver very precise insulin doses for different times of day, which in many instances are necessary to correct for situations like the dawn phenomenon, the rise of blood glucose that occurs in the hours before and after waking.

Many people have chosen the insulin pump because it enables them to enjoy a more flexible lifestyle. To use a pump, however, you must be willing to check your blood glucose frequently and learn how to make adjustments in insulin, food, and physical activity in response to those test results. (These things should be done with insulin injections as well!)

You'll want to check with your insurance carrier before you buy a pump and all the supplies. Although most carriers do cover these items, some do not. (Please note: Medicare now covers pumps and supplies for people with diabetes [both type 1 and type 2] who meet its eligibility requirements, including those regarding fasting C-peptide levels.)

If you are interested in using a pump, talk to your health care team to see if one might be appropriate for you. Your health care team can provide the forms and letters needed to start the process. Pump company representatives can also help with the process. You and your team can select the brand. For more information on the basic features of each pump see the tables on pages RG30 and RG31.

TO USE
A PUMP,
HOWEVER,
YOU MUST
BE WILLING
TO CHECK
YOUR BLOOD
GLUCOSE
FREQUENTLY.

Injection Aids And Alternatives

This category includes devices that make giving injections easier as well as syringe alternatives.

Talk with your doctor or diabetes educator about these kinds of products. Oftentimes, they will make sample products available to you before you make a purchase. You'll want to look for an item that is easy for you to use and is durable. Some items require more skill and dexterity on the part of the user than others, so try several before you buy.

Make sure that the injection aid you purchase works with your brand of syringe and needle length. Some injection aids have adapters for short needles.

Insertion aids. These devices accelerate needle insertion into the skin. Some even aid in pushing down the plunger. Most are spring-



loaded and hide the needle from view.

Syringe alternatives. At present, this category includes insulin pens, infusers, and jet injectors.

Carrying around an **insulin pen** is like having an old-fashioned cartridge pen in your pocket—only instead of a writing point, there's a needle, and instead of an ink cartridge, there's an insulin cartridge. (See note on removing pen needles after use, page RG23, first column.) Disposable insulin pens are also available. These devices are convenient, accurate, and often used by people on a multidose regimen. Insulin cartridges can be prefilled with regular, NPH, insulin lispro, insulin aspart, insulin glulisine, or 70/30 or 75/25 premixed insulin. They are particularly useful for

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INSULIN PENS, PEN NEEDLES, AND OTHER DELIVERY SYSTEMS

Product Name (Manufacturer/Distributor)	Comments
INSULIN PENS	
Autopen (Owen Mumford, Inc.)	Automatic side injection for delivery from 1.5- or 3-ml insulin cartridge. Available in four models. The Autopen AN 3000 (1.5 ml) delivers 2–32 units in 2-unit increments. The Autopen AN 3100 (1.5 ml) administers 1–16 units in 1-unit increments. The AN 3800 (3 ml) delivers 2–42 units in 2-unit increments. The AN 3810 (3 ml) delivers 1–21 units in 1-unit increments; compatible with Eli Lilly 3-ml cartridge.
Humalog Mix 75/25 Pen (Eli Lilly and Company)	Same as Humalog Pen (see below).
Humalog Pen 50/50 Pen (Eli Lilly and Company)	Same as Humalog Pen (see below).
Humalog Pen (Eli Lilly and Company)	Prefilled, disposable insulin delivery device that holds 3 ml (300 units) of insulin. Knob can be dialed forward or backward in single-unit increments until the number of units appears in the magnifying dose window. No refrigeration needed after first use.
Humulin 70/30 Pen (Eli Lilly and Company)	Same as Humalog Pen.
Humulin N Pen (Eli Lilly and Company)	Same as Humalog Pen.
Levemir FlexPen (Novo Nordisk)	Prefilled disposable insulin pen that contains 3 ml (300 units) of Levemir. Dose steps are in 1-unit increments for up to 60 units. Large dialing window and audible clicks. Dose dial can be turned backward or forward for dose correction. Dose scale resets to “0” during injection. Designed for use with the NovoFine 30G or 31G disposable needles.
NovoLog FlexPen (Novo Nordisk)	Prefilled disposable insulin pen that contains 3 ml (300 units) of NovoLog. Dose steps are in 1-unit increments. Large dialing window and audible clicks. Dose dial can be turned backward or forward for dose correction. Dose scale resets to zero after injection. Designed for use with the NovoFine 30G or 31G disposable needles.
NovoLog Mix 70/30 FlexPen (Novo Nordisk)	Prefilled disposable insulin pen that contains 3 ml (300 units) of NovoLog Mix 70/30. Dose steps are in 1-unit increments. Has large dialing window and audible clicks. Dose dial can be turned backward or forward for dose correction. Dose scale resets to zero after injection. Designed for use with NovoFine disposable needles.
NovoPen Junior (Novo Nordisk)	Insulin delivery in ½-unit increments. Provides precision dosing. Color-coded options provide flexibility for various types of insulin regimens. Designed for use with all Novo Nordisk PenFill 3-ml (300-unit) cartridges and NovoFine 30G or 31G disposable needles.
NovoPen 3 (Novo Nordisk)	Durable insulin pen that delivers insulin in precise 1-unit increments from 2 to 70 units; large, easy-to-read dose indicator for dose setting; designed for use with all Novo Nordisk PenFill 3-ml (300-unit) insulin cartridges and NovoFine 30G or 31G disposable needles.
OptiClik (Sanofi-Aventis)	Reusable insulin delivery device (insulin pen) for use with 3-ml Lantus (insulin glargine [rDNA origin] injection) cartridge (U-100) system or 3-ml Apridra (insulin glulisine [rDNA origin] injection) Cartridge U-100 system.

Product Name (Manufacturer/Distributor)	Comments
PEN NEEDLES	
BD Ultra-Fine Original Pen Needles (BD)	BD's widest inner diameter insulin needle (29G, 12.7 mm [$\frac{1}{2}$ "]) makes it easier to press the push button and expel insulin. BD-engineered point geometry and patented, micro-bonded needle lubricant for maximum comfort during injection. Recommended for people who take large doses or those with limited manual dexterity. Paper tab and inner shield are color-coded pink for easy size/gauge recognition. Can be used with all makes of diabetes pens and dosers sold in the United States.
BD Ultra-Fine III Mini Pen Needles (BD)	Shortest, thinnest needle available (31G, 5 mm [$\frac{3}{16}$ "]); eliminates the need to "pinch up." Can be safely used by both children and adults. BD-engineered point geometry and patented, micro-bonded needle lubricant for maximum comfort during injection. Paper tab and inner shield are color-coded purple for easy size/gauge recognition. Can be used with all makes of diabetes pens and dosers sold in the United States.
BD Ultra-Fine III Short Pen Needles (BD)	BD's thinnest needle (31G, 8 mm [$\frac{5}{16}$ "]). "Short" offers the best size for most adults. BD-engineered point geometry and patented, micro-bonded needle lubricant for maximum comfort during injection. Paper tab and inner shield are color-coded blue for easy size/gauge recognition. Can be used with all makes of diabetes pens and dosers sold in the United States.
NovoFine 30 Disposable (Novo Nordisk)	30G, 8-mm disposable insulin needles. Thin-wall technology and ultra-sharp points designed to help increase injection comfort. For use with the Novo Nordisk line of insulin-delivery systems.
NovoFine 31 Disposable (Novo Nordisk)	31G, 6-mm disposable insulin needles. Thin-wall technology and ultra-sharp points designed to help increase injection comfort. For use with the Novo Nordisk line of insulin-delivery systems.
Pen Needles (Can Am Care, LLC)	Universal pen needles available in 50-count boxes in 29G/12-mm needles or 31G/8 mm. "Snap on" feature makes application to an insulin pen easier. Sold under various store brands.
UltiCare/Private Label Pen Needles (UltiMed, Inc.)	UltiCare and private label pen needles available in mini (6 mm, 31G), short (8 mm, 31G), and original (12 mm, 29G). Compatible with all brand name insulin delivery pens. Available in 100- and 50-count boxes.
Unifine Pentips Pen Needles (Owen Mumford, Inc.)	Ultra-thin lubricated pen needles compatible with all brand name reusable and disposable cartridge pens. 31G available in short (8-mm) and ultra-short (6-mm) lengths in boxes of 100. 29G available in original (12-mm) length. Available in 100-count box.
OTHER DELIVERY SYSTEMS	
InnoLet (Novo Nordisk)	A prefilled disposable insulin doser. Features include a large dial with easy-to-read numbers for dosage selection, dials forward and back to add and subtract units of insulin, support shoulder for consistent injection depth, and audible clicks for each unit of insulin set and delivered. Available in human insulin formulations Novolin 70/30, Novolin NPH, and Novolin R. Designed for use with NovoFine 30G or 31G disposable needles.
Innovo (Novo Nordisk)	Insulin-delivery system. Insulin can be dosed in 1-unit increments, from 1 to 70 units. Large display features a memory function, which indicates when the last insulin dose was taken and the number of units of the last dose. In addition, a 6-second countdown display indicates when the entire insulin dose has been delivered and the needle may be withdrawn. Designed for use with all Novo Nordisk PenFill 3-ml insulin cartridges (including NovoLog; NovoLog Mix 70/30; and Novolin R, N, and 70/30) and NovoFine disposable needles.

INSULIN PUMPS

Animas IR 1250	CozMore Insulin Technology System	DANA Diabecare II
Manufacturer: Animas Corporation	Manufacturer: Smiths Medical MD, Inc.	Manufacturer: Sooil Development
Size (inches): 2.9 × 2.0 × 0.76	Size (inches): 3.2 × 1.8 × 0.9	Size (inches): 2.95 × 1.77 × 0.74
Wt.: 3.13 oz. with battery and full cartridge	Wt.: 3.3 oz. with battery and insulin	Wt.: 1.8 oz.
Battery Type/Life: (1) AA lithium (1.5 volt) 6–8 weeks; can use AA alkaline (shorter life)	Battery Type/Life: (1) AAA	Battery Type/Life: (1) 3.6-volt DC (2- to 3-month life)
Infusion Set: All commercially available sets with standard Luer connection.	Infusion Set: All standard luer-lock infusion sets.	Infusion Set: Proprietary sets, including cannula and needle, straight and angled insertion available in 27" and 43" inch tubing.
Basal #: Up to 12 basal rates in four personalized programs, plus a temporary basal rate; the duration of temporary rates can be adjusted from 30 minutes to 24 hours in 30-minute intervals; 10 percent increments.	Basal #: Four programmable basal patterns. Temporary basal set in either percent or U/hr, for 30 minutes to 72 hours.	Basal #: 24 basal rates plus temporary basal in 10 percent increments +/- 100 percent in 60-minute durations up to 12 hours.
Basal Range: 0.025–25 U/hr	Basal Range: 0.05–35 U/hr	Basal Range: 0.00–16 U/hr in 0.1-unit increments
Smallest Bolus: 0.05 units	Smallest Bolus: 0.05 units	Smallest Bolus: 0.1 units
Occlusion Alarm: Patented sensor and algorithm to detect occlusions promptly.	Occlusion Alarm: Yes	Occlusion Alarm: Yes
Over-Delivery Alarm: Prevented by continuous self-tests, layers of redundancies, and other safeguards.	Over-Delivery Alarm: Yes	Over-Delivery Alarm: Yes; internal cross checks.
Near-Empty Alarm: Yes. User set: 10, 20, 30, 40, or 50 units.	Near-Empty Alarm: Yes	Near-Empty Alarm: Yes; audible alerts at 20 units.
Warranty: 4 years.	Warranty: 4 years.	Warranty: 4 years.
Features: CarbSmart stores up to 500 food items from CalorieKing database on the pump. Personalize food lists. Calculator features for carbohydrates, blood glucose corrections, and insulin on board; large 992-mm display screen; reminders for time of day and blood glucose check, waterproof tested to 12 feet/24 hours; ezBolus, audio bolus, combo bolus, PrimeSmart step-by-step priming for safety; history includes boluses, TDD, alarm, prime, suspend, basal; precise basal rate adjustment in 0.025-unit increments; interchangeable color covers; 24-hour, toll-free customer service; PC download and upload with ezManager Plus. Available in Spanish.	Features: All-in-one pump and blood glucose meter. Cozmonitor snaps onto the Cozmo pump and uses FreeStyle test strips. Blood glucose results are displayed on the Cozmo screen. Bolus calculation based on grams of carbohydrate eaten and personalized insulin to carb ratios. Continuously calculates insulin delivery from previous boluses to prevent overdosing. Special alerts (adjustable sound levels) for eight specific reminders can be set daily or for a one-time event. Up to 12 custom meal boluses. Waterproof. CoZmanager PC communications download programs to view all blood glucose, carbohydrate, bolus, and basal history. 24-hour toll-free help line; insurance reimbursement support; customer training plan; key pad lockout feature; screen backlight; personalized duration of insulin action.	Features: Light, watertight, 300-U capacity. Icon-driven programming with PIN access. Pre-setting of meal-specific, default, or extended boluses. Bolus frequency may be limited and a "lockout" feature can be enabled. Features selection of eight languages, 24-hour toll free technical support.

Medtronic MiniMed Paradigm 515/715	MiniMed Paradigm 522/722	OmniPod Insulin Management System
Manufacturer: Medtronic Diabetes	Manufacturer: Medtronic Diabetes	Manufacturer: Insulet Corporation
Size (inches): 3.0 × 2.0 × 0.8 (515 model); 3.6 × 2.0 × 0.8 (715 model)	Size (inches): 3.0 × 2.0 × 0.8 (522 model); 3.6 × 2.0 × 0.8 (722 model)	Size (inches): Omnipod: 1.6 × 2.4 × 0.7; Personal Diabetes Manager (PDM): 2.6 × 4.3 × 1.0
Wt.: 3.5 oz. (515 with battery and full reservoir); 3.8 oz. (715 with battery and full reservoir)	Wt.: 3.5 oz. (522 with battery; 176 unit reservoir); 3.8 oz. (722 with battery; 300 unit reservoir)	Wt.: 1.2 oz. OmniPod (with full reservoir); 4.0 oz. PDM (with batteries)
Battery Type/Life: 1 standard AAA battery	Battery Type/Life: (1) AAA	Battery Type/Life: OmniPod batteries are integrated into each pod; PDM (2) AAA (up to 4 weeks life)
Infusion Set: 23" and 43" lengths: Quick set (6 mm or 9 mm; at-site disconnect); Sof-set (6 mm or 9 mm away-from-body disconnect); Silhouette (at site disconnect). Serters available for each set.	Infusion Set: 23" and 43" lengths; serters available: Quick set (6 mm or 9 mm; at-site disconnect); Sof-set (6 mm or 9 mm; away-from-body disconnect); Silhouette (13 mm or 17 mm; at-site disconnect). Sure-T (6 mm; steel needle; away-from-body disconnect; 23; length only; no sserter available).	Infusion Set: Integrated infusion set with automated cannula insertion and no tubing.
Basal #: Three patterns; up to 48 basal rates per pattern; temporary basal rate (fixed rate or percent of basal pattern for 30 minutes to 24 hours in 30-minute increments).	Basal #: Three patterns; up to 48 basal rates per pattern; temporary basal rate (fixed rate or percent of basal pattern for 30 minutes to 24 hours in 30-minute increments).	Basal #: Seven basal programs with up to 24 rates per program; temporary basal rates can be set in either percentage or U/hr for 30 minutes to 12 hours in 30-minute increments.
Basal Range: 0.05–35.0 U/hr	Basal Range: 0.05–35.0 U/hr	Basal Range: 0.05–30.0 U/hr
Smallest Bolus: 0.1 units	Smallest Bolus: 0.1 units	Smallest Bolus: 0.05 units
Occlusion Alarm: Yes	Occlusion Alarm: Yes	Occlusion Alarm: Yes
Over-Delivery Alarm: Yes. Integrated safety check motor with Bio-Pulse helps ensure no over-delivery.	Over-Delivery Alarm: Yes. Integrated safety check motor with Bio-Pulse helps ensure no over-delivery.	Over-Delivery Alarm: Yes. Comprehensive safety systems monitor delivery.
Near-Empty Alarm: Yes; by time or volume remaining (user-settable). Alarm repeats with 50 percent of user-defined, set-point remaining.	Near-Empty Alarm: Yes; by time or volume (user-settable).	Near-Empty Alarm: Yes, with adjustable user settings.
Warranty: 4 years.	Warranty: 4 years.	Warranty: 4 years.
Features: In-warranty upgrade program available. Model 515 reservoir size is 176 units; model 715 reservoir size is 176 or 300 units. Bolus Wizard Calculator uses blood glucose readings and food entries to estimate food and correction boluses; monitor wirelessly beams test results to pump; multiple bolus options include normal, square wave, dual wave, Easy Bolus; self-test features; downloadable memory includes approximately 90-day delivery history; Web-based CareLink therapy management system charts A1C, blood glucose, carbohydrates, and other trends to optimize therapy; 24-hour toll-free help line; free video, educational materials, and insurance assistance.	Features: Displays readings every 5 minutes. Alarms alert user to low and high glucose levels. Bolus Wizard calculator suggests an appropriate bolus amount. Multiple bolus options include normal, square wave, and dual wave. The Web-based Carelink Therapy Management System transforms downloadable data (up to 90 days) into charts, graphs, and tables to help optimize therapy. Works with the Paradigm REAL-Time Continuous Glucose monitoring kit (purchased separately) or as a stand-alone pump. Paradigm Pathway in-warranty upgrade program available. Low-battery warning; keypad lockout; and remote control.	Features: OmniPod Insulin Management System consists of two components: OmniPod and PDM. Integrated infusion set; inserter and insulin reservoir; automated cannula insertion; no tubing. The PDM incorporates blood glucose monitoring technology; a food database with 1000+ common food items; setup wizard; suggested bolus calculator; and memory to store 90 days of data or 5,400 records. Other features include insulin on-board calculation; adjustable reverse corrections; adjustable duration of insulin action; programmable reminders and alerts; personalized ratios/factors/targets/presets; adjustable auto off; LCD backlight; and child lock-out feature.

INSULIN PUMP SUPPLIES

Product Name (Manufacturer/Distributor)	Type of Product	Features
Accu-Chek Rapid-D (Disetronic/Roche Diagnostics)	Infusion set	90° insertion angle, surgical stainless steel needle infusion set with 28-gauge needle. Works with all standard luer-lock pumps. 6-, 8-, and 10-mm needle lengths with 24", 31", or 43" tubing.
Accu-Chek Tender (Disetronic/Roche Diagnostics)	Infusion set	20° to 45° insertion set with a soft Teflon cannula. 13- and 17-mm cannula lengths. Works with all standard luer-lock pumps. Available with 24", 31", or 43" tubing.
Accu-Chek Tender Mini (Disetronic/Roche Diagnostics)	Infusion set	13-mm cannula version of the Tender infusion set. Works with all standard luer-lock pumps. Available with 24", 31", or 43" tubing.
Accu-Chek UltraFlex (Disetronic/Roche Diagnostics)	Infusion set	90° insertion angle with disconnect at site. Tapered teflon cannula for quick insertion. Works with all standard luer-lock pumps. 8- and 10-mm cannula lengths with 24", 31", or 43" tubing.
Cleo 90 (Smiths Medical)	Infusion set	Insertion needle automatically retracts into the insertion device, standard luer connection, transparent skin adhesive, Flex-Attach system for 360° site connection and rotation, straight in (90°) soft cannula in 6-mm and 9-mm lengths.
Quick Set with Quick-serter (Medtronic Diabetes)	Infusion set compatible with automatic insertion device	90° insertion angle with 6-mm or 9-mm soft, tapered cannula. No overtaping needed; built-in adhesive; at-site disconnect. Available with 23" and 43" tubing. Can be inserted manually or via the Quick-serter insertion device.
Silhouette with Sil-sertable (Medtronic Diabetes)	Infusion set compatible with automatic insertion device	Variable insertion angle with 13 mm and 17 mm soft, tapered cannula. It flexes to conform to the body's twists and bends. No overtaping needed; built-in adhesive; at-site disconnect. Available with 23" and 43" tubing. Optional Sil-serter insertion device.
SimpleChoice Easy (SpectRx, Inc.)	Infusion set	30° or "variable angled" infusion set for Medtronic MiniMed, Animas, and CozMore insulin pumps. Compatible with Sil-serter insertion device, 12-mm and 17-mm catheters, water-resistant tape, stable connect and release at insertion site, and small, portable packaging.
SimpleChoice Easy Pro (SpectRx, Inc.)	Infusion set	30° or "variable angled" infusion set for use with Medtronic MiniMed Paradigm pump. Compatible with Sil-serter insertion device, 12-mm and 17-mm catheters, water-resistant tape, stable connect and release at insertion site, and small, portable packaging.
SimpleChoice Reservoir (SpectRx, Inc.)	Insulin cartridge	Disposable, single-use insulin reservoir for use with Medtronic MiniMed 504, 507, 507c, and 508 insulin pumps.
SimpleChoice Reservoir Pro (SpectRx, Inc.)	Insulin cartridge	Disposable, single-use insulin reservoir for use with Medtronic MiniMed Paradigm insulin pumps. 1.8-ml and 3-ml capacity.
SimpleChoice Twist (SpectRx, Inc.)	Infusion set	90° insertion angle infusion set for use with Medtronic MiniMed, Animas, Roche, and CozMore insulin pumps. 360° rotation at the site, compatible with Quick-serter insertion device, 5-mm and 9-mm catheters, and small, portable packaging.
SimpleChoice Twist Pro (SpectRx, Inc.)	Infusion set	90° insertion angle infusion set for use with Medtronic MiniMed Paradigm insulin pumps. 360° rotation at the site, compatible with Quick-serter insertion device, 5-mm and 9-mm catheters, and small, portable packaging.
Soft-set with Sof-serter (Medtronic Diabetes)	Infusion set with automatic insertion device	Soft Teflon catheter remains in place after insertion. Disconnectable. Placement at optimal depth for insulin absorption.
Sure-T (Medtronic Diabetes)	Infusion set	90° insertion angle with 6-mm fine steel needle. Low profile design. No overtaping needed; built-in adhesive. Tubing disconnects 4 inches from insertion site for easy detachment from pump.

AIDS FOR PEOPLE WHO ARE VISUALLY OR PHYSICALLY IMPAIRED

Product Name (Manufacturer/Distributor)	Description/Use
SYRINGE MAGNIFIERS	
BD Magni-Guide (BD)	Syringe is slipped into curved channel of Magni-Guide. At opposite end, insulin vial is snapped into collar. Guide magnifies entire scale 1.7 times. Uses BD 1-cc, ½-cc, or ⅓-cc syringe. Available from BD; local pharmacies; Medicoool, Inc.; Gemco Medical.
Syringe Magnifier (Apothecary Products)	Clips firmly to syringe barrel. Easy calibration readings of ½-cc and 1-cc syringes. Uses any standard-size syringe. Available from local pharmacies.
Tru-Hand (Whittier Medical)	Insulin bottle holder/syringe guide/magnifier. Locks in syringes with direct guide into vial stopper. Magnifies entire scale. Insulin bottles can be changed without removing syringe from device. Uses BD, Terumo, and Monoject (all sizes). Available from local pharmacies.
NONVISUAL INSULIN MEASUREMENT	
Count-a-Dose (Medicoool, Inc.)	Syringe-filling device. Empty syringe secured in easy-to-locate platform; slide moves syringe plunger to control insulin intake. Click wheel activates slide to ensure accurate dosage in 1-unit increments. Click heard and felt as wheel is rotated. Holds one or two bottles of insulin for mixed doses. Use with BD U-100, ½-cc Lo-Dose syringe. Available from Medicoool, Inc., and Science Products.
NEEDLE GUIDES AND VIAL STABILIZERS	
Holdease (Meditec, Inc.)	Needle guide and syringe/vial holder. Unit holds syringe and insulin together in easy-to-handle unit while user fills syringe.
Inject Assist (Apothecary Products)	Holds syringe and insulin bottle steady as syringe is filled. Preset dosage guide for accuracy. Holds U-100, U-80, and U-40 syringes.
Injection Safety Guard (Apothecary Products)	Protects hands from accidental injection. Fits over the top of insulin vial, allowing user to place hands underneath safety guard and begin filling the syringe.
NeedleAid (NeedleAid, Ltd.)	Stabilizing guide for injection using an insulin pen or syringe. The broad base indicates where the injection will be made. Ensures injection at the proper angle and to proper depth. Shields the needle for increased safety. Suitable for use with one hand. Insulin is injected manually. Needle is hidden from view to reduce needle fear and pain perception.
VIAL SYRINGE GUIDES	
Bioject Vial Adapter (Bioject, Inc.)	Allows home-injection patients to reconstitute and/or draw up medication using any syringe with a standard luer-style tip. Does not contain sharps. Disposable in regular trash.
Vial Syringe Guide (Apothecary Products)	Eliminates blunted or broken needles by safely connecting syringe to insulin bottle.
VOICE MODULES AND SYNTHESIZERS	
Accu-Chek Voicemate (Roche Diagnostics)	Hand-held voice synthesizer incorporating an Accu-Chek Advantage blood glucose monitor and Accu-Chek Comfort Curve touchable test strips to integrate blood glucose monitoring and insulin identification. Talks user through blood glucose monitoring and reads bar-coded labels of Eli Lilly-brand insulin vials aloud. Also available with Spanish voice prompts. Special order through local pharmacies or durable medical equipment suppliers.
Digi-Voice Deluxe, Mini-DV (Captek/Science Products)	Speech module plugs into data jack on LifeScan Basic and SureStep monitors. Talks user through self-test procedure. Repeat feature. Earphone, cassette instructions. Mini-DV is a smaller version of the Digi-Voice. Other languages available.

JET INJECTORS

Product Name (Manufacturer/Distributor)	Size/Weight	Features
Advanta Jet (Activa Brand Products, Inc.)	Size: 6" x 1" Weight: 5.6 oz.	Standard model injector for the average skin type. Delivers from ½ to 50 units of all types and mixes of U-100 insulin; 14 comfort settings; 2-year warranty; tactile detents for visually impaired; lifetime benefit program available to all users; video included; toll-free help line; immediate service.
Advanta Jet ES (Activa Brand Products, Inc.)	Size: 6" x 1" Weight: 5.6 oz.	An extra strength Advanta Jet for those whose skin conditions require additional power from an injector; same features as Advanta Jet.
Gentle Jet (Activa Brand Products, Inc.)	Size: 6" x 1" Weight: 5.6 oz.	A lower-power model Activa Jet specifically designed for children and those with low levels of subcutaneous tissue; 2-year warranty; same features as Advanta Jet.
Medi-Jector Vision (Antares Pharma, Inc.)	Size: 6" x ½" Weight: 4.6 oz.	Compact, needle-free injector with needle-free syringes reusable for up to 21 injections. Delivers single or mixed doses from two to 50 units of all types of U-100 insulin; includes manual, video, carrying case, disposable adapters, and needle-free syringes. 30-day trial period; 2-year warranty.
Vitajet 3 (Bioject, Inc.)	Size: 6" x 1" Weight: 5.6 oz.	Personal insulin system lets you draw up and inject needle-free. Adjustable pressure for comfort level. Crystal Check nozzle lets patients see insulin dose prior to injection and to verify complete delivery. Delivers from two to 50 units of insulin per injection. Carrying pouch; disposable nozzles, vial adapter, and training video; 2-year warranty; 30-day money-back guarantee.

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people whose coordination or vision is impaired, or for people who are on the go.

If you are using a pen with NPH, 70/30, or 75/25, it is important to tip the pens back and forth at least 10 times to ensure the insulin is well mixed.

Infusers create “portals” into which you inject insulin. With an infuser, a needle or catheter is inserted into subcutaneous tissues and remains taped in place, usually on the abdomen, for 48–72 hours. The insulin is injected into it, rather than directly through the skin into the fatty tissue. Some people are prone to infections with this type of product, so be sure to discuss the necessary cleaning procedures with your health care team.

Jet injectors release a tiny jet stream of insulin, which is forced

through the skin with pressure, not a puncture. These devices have no needles. However, they can sometimes cause bruising.

You will need to work with your health care team to ensure good blood glucose control while you adjust to one of these devices.

You’ll want to ask manufacturers about training on the use of a jet injector, as well as how to clean it and how to troubleshoot. If jet injectors interest you, discuss their use with your health care team. Before buying, check to be sure your insurance covers jet injectors.

Aids For People With Visual Impairments

There are several products designed to make injections easier

for people who are visually impaired. Some products handle more than one task.

Nonvisual insulin measurement. Helps you measure an accurate dose of insulin. Some “click” at each 1- or 2-unit increment of insulin.

Needle guides and vial stabilizers. Help you insert the needle into the correct insulin vial for drawing up an injection.

Syringe magnifiers. Enlarge the measure marks on a syringe barrel.

It’s important to note that some of these aids fit only with specific brands of syringes, so check to be sure the product you want works with your syringe.

Information about blood glucose monitoring aids for people who are visually impaired is found on page RG34. ▲