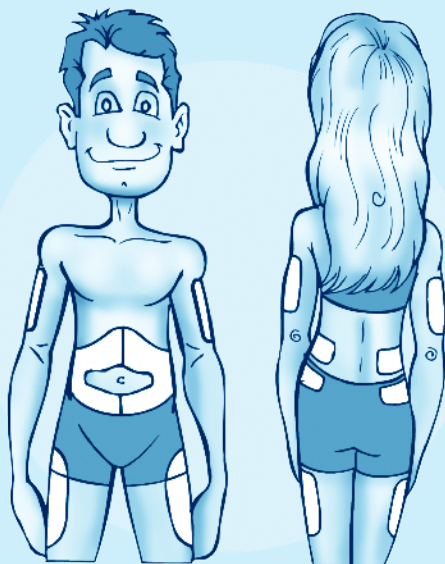


Insulin Injection Sites



NOTE: It is really important to change (rotate) where you give yourself insulin to prevent fatty lumps from forming since these can affect how your body absorbs insulin. For example, you can move from one side of your abdomen to the other side, and you can also move your injection site to a different location within each side of your abdomen.

Avoid a 2-inch area around the belly button as well as scar tissue.

Insulin Pens:

Your pen comes with an instruction book. Please review it to understand how your pen works, how to load the cartridge, and how to prepare your pen for an insulin injection. There are different sizes and lengths of needle tips available. Most often the shortest needle is recommended. Talk with your health care professional about which needle tip would be best for you.

Mixing Insulin:

Insulin that is cloudy (NPH, premixed) needs to be mixed before using. The pen should be rolled ten times, tipped ten times, and checked for a milky-white consistency.

Check Insulin Flow (Prime):

Attach pen needle. Dial up 2 or 3 units (whichever the manufacturers recommends) and, with pen tip facing upwards, push the dosing button. If no stream of insulin appears, repeat this step again.

Giving Your Injection:

After you have checked the insulin flow, dial up the dose of insulin to be taken. Insert pen tip into skin at a 90° angle. Push the dosing button until you see '0'. Count 10 seconds before removing the needle from your skin to ensure you receive the full dose. With longer needles ($\geq 8\text{mm}$), you may need to gently lift the skin before injection or inject on an angle.

Site	Things to think about
Abdomen (tummy) Stay 2 inches (5 cm) away from your belly button	Easy to reach. Insulin absorbs fast and consistently.
Buttock and thigh	Slower absorption rate than from abdomen and arm sites.
Outer arm	After abdomen, arm provides the next fastest absorption rate. This area is hard to reach when injecting yourself, so it is often not recommended.

Insulin Types:

Type	Onset (How quickly it starts working)	Peak (When it is most effective)	Duration (How long it works)	Timing of injection (When should it be given)
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Bolus insulins

Rapid acting analogues • Apidra / Fiasp / Humalog / NovoRapid / Humalog U200	10 – 15 min	1 – 2 hours	3 – 5 hours	Given with one or more meals per day. Should be injected 0 – 15 minutes before or after meals. Fiasp is to be given two minutes before the start of your meal or within 20 minutes after.
Short-acting • Humulin-R / Toronto	30 min	2 – 3 hours	6.5 hours	Given with one or more meals per day. Should be injected 30 – 45 minutes before the start of the meal.

Basal insulins

Intermediate-acting • Humulin-N / NPH	1 – 3 hours	5 – 8 hours	up to 18 hours	Often started once daily at bedtime. May be given once or twice daily. Not given at any time specific to meals.
Long-acting analogues • Basaglar / Lantus • Levemir • Toujeo	90 min 90 min up to 6 hours	not applicable	up to 24 hours 16 – 24 hours up to 24 hours	Often started once daily at bedtime. Insulin detemir (Levemir) may be given once or twice daily. Not given at any time specific to meals.

Premixed insulins

Premixed regular insulin • Humulin 30/70 / Novolin ge 30/70, 40/60, 50/50	Varies according to types of insulin	contains a fixed ratio of insulin (% of rapid-acting or short-acting insulin to % of intermediate-acting insulin); see above for information about peak actions based on insulin contained		Given with one or more meals per day. Should be injected 30 – 45 minutes before the start of the meal.
Premixed insulin analogues • NovoMix 30 / Humalog Mix 25, Mix 50	Varies according to types of insulin			Given with one or more meals per day. Should be injected 0 – 15 minutes before or after meals.

Insulin Care and Storage:

Unopened insulin should be stored in the fridge between 2°C and 8°C. The insulin you are using can be stored at room temperature for up to 1 month. Both Levemir and Toujeo are the exception; they are safe at room temperature for 42 days. Discard insulin that has been frozen or exposed to temperatures greater than 30°C. Do not use insulin after its expiry date.

Diabetes Identification:

You should always wear identification, such as a bracelet or necklace, to identify that you have diabetes. Identification bracelets, such as MedicAlert®, can be purchased at pharmacies and jewellery stores. Always carry identification in your wallet or purse that provides information about your diabetes.

Low Blood Sugars (Hypoglycemia):

Treatment of Low Blood Glucose (Hypoglycemia)

What is low blood glucose?

When the amount of blood glucose (sugar in your blood) has dropped below your target range (i.e. is generally less than 4.0 mmol/L), a condition called low blood glucose or hypoglycemia occurs.

When this happens, you may feel:

- Shaky, light-headed, nauseated
- Nervous, irritable, anxious
- Confused, unable to concentrate
- Hungry
- A faster heart rate
- Sweaty, headachy
- Weak, drowsy
- A numbness or tingling in your tongue or lips

How do I treat low blood glucose?

If you are experiencing the signs of a low blood glucose level, check your blood glucose immediately. If you do not have your meter with you, treat the symptoms anyway. It is better to be safe.

Eat or drink a fast-acting carbohydrate source (containing 15 grams). For example:

- 15 g of glucose in the form of glucose tablets (preferred choice)
- 15 mL (1 tablespoon) or 3 packets of table sugar dissolved in water
- 175 mL (¾ cup) of juice or regular soft drink
- 6 LifeSavers® (1 = 2.5 g of carbohydrate)
- 15 mL (1 tablespoon) of honey (do not use for children less than 1 year)

Low blood glucose can happen quickly, so it is important to treat it right away. If your blood glucose drops very low, you may need help from another person.

Causes of hypoglycemia:

- More physical activity than usual
- Not eating on time
- Eating less than usual
- Taking too much medication
- Drinking alcohol

Checking Blood Sugars and Adjustment of Insulin:

Insulin: _____ Starting Dose: _____ units at _____

Blood glucose goals: _____

Contact for help with insulin adjustments: _____

What to do with your diabetes pills: _____

Please check blood sugars using the following schedule.

	Breakfast		Lunch		Supper		Bedtime	Night
	before	after	before	after	before	after		
Insulin								
SMBG pattern*								

* SMBG = self-monitoring of blood glucose

For more information about checking your blood glucose, visit the [Self-monitoring of Blood Glucose tool](#) on [guidelines.diabetes.ca](#), under Patient Resources.

Proper Use of Pen Tips (needles):

Use pen tips only once; they are thin and can become bent or broken if re-used. Reusing pen tips can make the injection more painful. Leaving pen tips on the cartridge may cause leaking or allow air into the cartridge which may affect the concentration of the insulin.

Safe Sharps Disposal:

Pen tips and lancets should be disposed of in a sharps container. Check with your local pharmacy. Many pharmacies supply safe, puncture-proof containers. When the container is full, it is returned to the pharmacy in exchange for a new container. Sharps otherwise should be disposed of in accordance with local regulations.

Diabetes Driving Guidelines

Prevention of hypoglycemia for all insulin-treated drivers

- Measure your blood glucose level immediately before and at least every 4 hours during long drives.
- Always carry blood glucose monitoring equipment and treatment for hypoglycemia (e.g. source of fast-acting carbohydrate) within easy reach (e.g. attached to the visor).
- You should not drive when your blood glucose level is less than 4.0 mmol/L. If your blood glucose level is less than 4.0 mmol/L, you should have some carbohydrate-containing food and not begin to drive until your blood glucose level is at least 5.0 mmol/L.
- Stop and treat yourself as soon as hypoglycemia and/or impaired driving is suspected. You should not drive for at least 45 minutes after effective treatment of mild to moderate hypoglycemia (i.e. blood glucose level 2.5 – 4.0 mmol/L).

Professional Drivers

- You should follow the above recommendations as well as perform any diabetes self care as required by your licensing province.

Each province has its own rules regarding glucose control and being able to drive.

I want to apply for a commercial licence.

Can I drive in Canada? In the United States?

Canadians with diabetes who are using insulin can apply for a commercial licence. Motor vehicle licensing authorities require a greater level of medical fitness for drivers operating passenger vehicles (buses/commercial vans), trucks, and emergency vehicles. Commercial drivers spend more time driving and are often under more adverse conditions than private drivers.

Canadians with diabetes who are using insulin can be licensed to drive a commercial vehicle in Canada. The Canada/US Medical Reciprocity Agreement (effective March 1999) recognizes the similarity between Canadian and American medical standards and provides for reciprocal arrangements on medical fitness requirements for Canadian and American drivers of commercial vehicles.

However, Canadian commercial drivers who have diabetes requiring insulin, are not permitted to drive in the United States.

What is Diabetes Canada's position on diabetes and driving and licensing?

Diabetes Canada believes people with diabetes should be assessed for a driver's licence on an individual basis.

Adapted from Diabetes and Driving: 2015 Canadian Diabetes Association Updated Recommendations for Private and Commercial Drivers. Canadian Journal of Diabetes. 2015; 39:347-535.

Related articles: *Lows and highs: blood glucose Levels, Thinking of starting insulin, Managing your blood glucose*

**DIABETES
CANADA**

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Diabetes Canada is making the invisible epidemic of diabetes visible and urgent. Eleven million Canadians have diabetes or prediabetes. Now is the time to End Diabetes - its health impacts as well as the blame, shame and misinformation associated with it. Diabetes Canada partners with Canadians to End Diabetes through education and support services, resources for health-care professionals, advocacy to governments, schools and workplaces, and, funding research to improve treatments and find a cure.

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