

**Centre intégré  
universitaire de santé  
et de services sociaux  
de l'Estrie – Centre  
hospitalier universitaire  
de Sherbrooke**

**Québec** 

**Educational  
program for people  
with diabetes**

**3**

**Insulin  
Special situations**

Inv.: 1-6-14730 (Hôtel-Dieu, Hôpital Fleurimont)

Version revised by members of the Specialized diabetes clinic team :

Josée Arbour, nutritionist, certified diabetes educator

Sarah Constantin, kinesiologist

Josée Desharnais, registered nurse

Catherine Goulet-Delorme, registered nurse, certified diabetes educator

Dre Chantal Godin, endocrinologist

Dre Marie-France Langlois, endocrinologist

Élisabeth Turgeon, kinesiologist

We also wish to acknowledge the contribution of all authors of previous editions.

September 2018 (revised) – Centre intégré universitaire de santé et de services sociaux de l'Estrie—Centre hospitalier universitaire de Sherbrooke

TABLE OF CONTENTS

INTRODUCTION.....4

GENERAL INFORMATION..... 5

TYPES OF INSULIN AND THEIR CHARACTERISTICS..... 6

    Conservation and use ..... 9

    Recommendations concerning pen-injectors..... 10

INJECTION ..... 11

    Injection sites ..... 11

    Rotation / monitoring of sites ..... 13

    Pen-injectors ..... 14

TREATMENT METHODS/ SPECIAL SITUATIONS ..... 16

    A) One injection per day (evening) ..... 17

    B) One injection per day (morning)..... 20

    C) One injection per day (supper)..... 24

    D) Two injections per day (morning and supper)..... 26

    E) Four injections per day ..... 29

GENERAL PRINCIPLES FOR ADJUSTING INSULIN ..... 34

INSULIN PUMP ..... 36

BIBLIOGRAPHY ..... 37

## INTRODUCTION

The main role of insulin is to allow glucose in the blood stream to enter the cells of the organism. This movement to the cells lowers the rate of glucose in the blood (blood sugar).

If your body does not produce enough insulin or is unable to use it properly, your doctor may prescribe insulin for you.

**Insulin is, therefore, a method of treatment. Do not worry, receiving insulin by injection does not mean that your disease is more serious or that your health is deteriorating.**

The goal of insulin treatment is to achieve good control of your diabetes. To do this it is necessary to :

- ◆ Follow your meal plan;
- ◆ Measure your blood glucose level 2 to 4 times per day (follow your doctor's recommendations as to how often);
- ◆ See your doctor or diabetes educator regularly to adjust your insulin dosage.

## BIBLIOGRAPHY

AWISSI, Don-Kéléna, et Patrick LEVASSEUR. *Québec pharmacie*, vol. 49, no<sup>0</sup> 5, mai 2002, p. 411-420

CENTRE DE JOUR DU DIABÈTE DE L'ESTRIE. *Mieux connaître le diabète*, Centre hospitalier universitaire de Sherbrooke, 2002, 121 p.

FIT FORUM FOR INJECTION TECHNIQUE CANADA, *Recommendations for Best Practice in Injection Technique*, Canadian Diabetes Association, 2011.

HUSBAND, A.. *Pour un meilleur contrôle de votre diabète*, Eli Lilly Inc, Canada, 2003.

LEBLANC, A., L. BILODEAU, N. TRÉPANIER et R. PARENT, *Équipement de survie: Programme d'enseignement aux personnes diabétiques*, Centre Hospitalier Universitaire de Québec, 1997.

MEDISENSE ABBOTT. *Les cétones et la gestion du diabète* (brochure), Medisense Abbott, 2000, 1 p.

NOVO NORDISK. *Bien vivre avec le diabète* (brochure), Novo Nordisk Canada Inc., 2001, 52 p.

PROGRAMME-CLIENTÈLE DIABÈTE. *Mieux connaître votre diabète*, Enseignement de base (clientèle adulte), Complexe hospitalier de la Sagamie, brochures # 321-1-7, 2002.

TEACHING PROGRAM FOR DIABETES. Centre hospitalier universitaire de sherbrooke, 2004.

UNITÉ D'ENSEIGNEMENT ET DE TRAITEMENT POUR DIABÉTIQUES, *Session éducative sur le diabète*, Centre universitaire de santé de l'Estrie, 1999, 57 p.

UNITÉ DE JOUR DU DIABÈTE DE L'HÔTEL-DIEU DU CHUM, *Understand your diabetes and live a healthy life*, 7<sup>e</sup> éd., Centre hospitalier de l'Université de Montréal, 2009, 270 p.

AMERICAN DIABETES ASSOCIATION Website : [www.diabetes.org](http://www.diabetes.org)

Centre intégré universitaire de santé et de services sociaux de l'Estrie—  
Centre hospitalier universitaire de Sherbrooke website : [www.santeestrie.qc.ca](http://www.santeestrie.qc.ca)

## INSULIN PUMP

For certain diabetics people, the choice may be made to administer insulin continuously, with a small portable pump (the size of a pager). The insulin pump liberates, in a constant and automatic way, a quantity of insulin predetermined by the user. To be able to enjoy the freedom offered by this method of administration, he/she must monitor closely his/her blood sugar levels. Your doctor can give you more information if you require it.



For more information, read the following information from the American Diabetes Association at :

[www.diabetes.org/living-with-diabetes/treatment-and-care/medication/insulin/insulin-pumps.html](http://www.diabetes.org/living-with-diabetes/treatment-and-care/medication/insulin/insulin-pumps.html)

## GENERAL INFORMATION

### Why is insulin taken by injection?

Insulin cannot be taken by mouth because the acid secreted by the stomach destroys it, making it ineffective.

### When is insulin used?

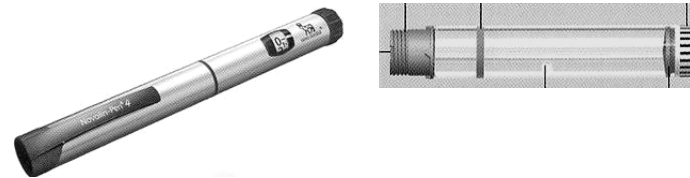
Insulin is used by the diabetic person:

- ◆ Who has type 1 diabetes (from diagnosis). The treatment by insulin is vital, since the body no longer produces its own insulin;
- ◆ Who has type 2 diabetes, when diet, physical activity, weight loss and medications do not control the blood sugar level;
- ◆ Who is pregnant (gestational diabetes), when treatment with diet and physical activity is not sufficient;
- ◆ When there is secondary diabetes (e.g.: cortisone, pancreatitis, etc.).

### Where does insulin come from?

Today, insulin is made in laboratories. Insulin is made from genetically programmed yeast bacteria.

Insulin available in Canada generally comes in a concentration of 100 units/ml and is available in vials, cartridges or as pre-filled pen-injectors (this option is not available everywhere in Canada). A cartridge or prefilled pen contains 300 units and cartridges are used with a pen-injector and disposables needles.



## TYPES OF INSULIN AND THEIR CHARACTERISTICS

There are 5 types of insulin that are distinguished by their onset and length of action. Note that peaks and duration of action varies in relation to the dose used for all insulins, and that the periods mentioned are approximate.

4. Correct the dose of insulin responsible for the hypoglycemias by starting with the first episode of the day;
5. When all the blood sugar results are elevated, start the day on the right foot by adjusting, the **morning glycemia**;
6. Then correct hyperglycemia for a given period of the day;
7. Wait at least 2 days after adjusting the dose before making any new changes. Changes can be made more quickly in the case of hypoglycemia;
8. In general, increase or decrease the insulin dose by 1-2 units at a time or by 0.1 to 0.2 units for 10 grams of carbohydrates;
9. You must not wait for more than a week in the case of recurrent hypoglycemia or hyperglycemia to adjust your insulin.

GENERAL PRINCIPLES FOR ADJUSTING INSULIN

When you measure your blood sugar, you assess the action of the insulin taken by injection in relation to your eating and physical activity. Every time you modify one of those three components, your blood sugar also changes. It is therefore very important to check whether there are any major changes in lifestyle habits before making an adjustment in your insulin dose .

On the other hand, if you must change your dose of insulin, it is important to know which **insulin corresponds to the blood sugar level to be corrected** and to have the necessary training from the care team. Please refer to the tables for treatment methods using insulin. (page 18 to 35)

Here are the main points to remember when you adjust your insulin:

- 1. Do not take into account any reading of less than 4 mmol/L or greater than 7 mmol/L associated with a one-time situation that is both exceptional and explainable, when making an adjustment;
- 2. Do not ever change the insulin dose based on a **single blood sugar test**;
- 3. Always adjust a single dose of insulin at a time, at one time of the day, unless you are advised otherwise;

TYPES OF INSULIN AND THEIR CHARACTERISTICS

Type of insulin (action)	Onset from time of injection	Peak effect after the injection	Duration of action after the injection	Time of injection
Ultrarapid Fiasp™	5 to 10 minutes	0.5 to 1.5 hour	3 to 5 heures	2 minutes before the meal, up to 20 minutes after starting the meal
Humalog™ Novo Rapid™ Apidra™	10 to 15 minutes	1 to 2 hours	3 to 5 hours	0-15 minutes before the meal
Rapid Humulin™ R Novolin™ge Toronto	30 minutes	2 to 3 hours	6 to 8 hours	15-30 minutes before the meal
Intermediate Humulin™ N Novolin™ ge NPH	1 to 3 hours	5 to 8 hours	Up to 18 hours	According to the doctor's prescription
Long acting Basaglar™ Lantus™ Levemir™ Toujeo™ Tresiba™	90 minutes	Not applicable	Up to 24 hours Up to 24 hours 16 to 24 hours Up to 30 hours Up to 42 hours	According to the doctor's prescription

# **TYPES OF INSULIN AND THEIR CHARACTERISTICS**

Type of insulin (action)	Action from time of injection	Peak action after the injection	Duration of action after the injection	Time of injection
<b><u>Premixed</u></b>	0 to 15 minutes	1 to 2 hours and 6 to 12 hours	18 to 24 hours	0-15 minutes before the meal
<b>Ultra rapid and intermediate action *</b>  Humalog <sup>MD</sup> Mix 25 Humalog <sup>MD</sup> Mix 50 Novo Mix 30*				
<b>Rapid and intermediate action **</b>  Humulin <sup>MD</sup> 30/70 Novolin <sup>MD</sup> ge 30/70 Novolin <sup>MD</sup> ge 40/60 Novolin <sup>MD</sup> ge 50/50	30 minutes	2 to 5 hours and 6 to 14 hours	18 to 24 hours	15-30 minutes before the meal
* Figure corresponding to the percentage of ultrarapid acting insulin in the mixture.				
** The first figure corresponds to the percentage of rapid acting insulin and the second figure to the percentage of intermediate action insulin in the mixture.				

## **E) FOUR INJECTIONS PER DAY (CONTINUED)**

### **Special situations**

- ♦ **Fasting blood test :**
  - Have your snack before 8:30 p.m.;
  - Decrease by 10 % your insulin dose in the evening if you have a tendency to hypoglycemia.
- On the morning of the blood test
  - Check your blood sugar level when you wake up;
  - Do not take your insulin in the morning;
  - Plan to have a source of sugar with you so you can immediately correct hypoglycemia;
  - Take your insulin when you have your breakfast.
- ♦ **Altered routine (Holiday period, vacation, etc.) :**
  - Monitor your blood sugar more frequently;
  - Take your intermediate or long-acting insulin at the usual time.



## **E) FOUR INJECTIONS PER DAY (CONTINUED)**

### **Special situations**

#### **◆ Forgetting a dose :**

##### **For ultrarapid- or rapid-acting insulin at a meal :**

- Inject the same dose of insulin if less than 1 hour after the meal;
- If not, wait for the next meal and correct the dose depending on your blood sugar test;

##### **For intermediate- or long-acting insulin in the evening :**

- Before midnight, inject the usual dose;
- After midnight, inject 50% of the planned dose;
- The next morning.
  - Do not inject the intermediate or long acting insulin from the evening before;
  - Take your blood sugar test 4 times a day;
  - Inject ultrarapid insulin as per your glycemic readings;
  - Return to the injection schedule the next day, in the evening, with the usual dose.

## **CONSERVATION AND USE**

For your insulin treatment to be effective, it is important to follow the following recommendations for proper storage :

- Insulin used every day is kept at room temperature; it will remain stable for **1 month**;
  - ⇒ Stability of Basaglar, Fiasp and Lantus : 28 days at room temperature;
  - ⇒ Stability of Levemir: 42 days at room temperature (6 weeks);
  - ⇒ Stability of Toujeo: 56 days at room temperature (8 weeks);
- **Unused** insulin should be kept in the **refrigerator** at a temperature of 2°C to 10°C (35°F to 50°F) until the expiration date;
- Insulin must be kept away from sunlight and sources of heat. It must never be frozen or heated (above 30°C); if this happens, it must be thrown away (this insulin will be less effective);
- Always check the **colour, appearance** and **expiration date** of the insulin before using it. **Do not use it** if there are clots, if the colour is uneven after mixing or if particles stick to the sides.

**RECOMMENDATIONS CONCERNING PEN-INJECTORS**

- Reusable pens (by changing the insulin cartridge) are available for all insulins. For some of them, it is also possible to get a prefilled pen, that you throw away when empty.
- The pen is available free of charge in pharmacies and diabetes teaching centres. You can always replace it if it is defective;
- Use a different pen for each type of insulin if you use more than one type of insulin in cartridges;
- Keep the pen in its case, **at room temperature** (not in the refrigerator). Never leave your pen in the car in times of extremes temperature (cold or hot);
- **Throw the used needle away after each injection** and insert a new one when it is time for the next injection;
- Dispose of needles or prefilled pens in an appropriate container supplied by the pharmacy; take your used containers back to the pharmacy;
- When you travel, carry an extra pen in case you need it.

**E) FOUR INJECTIONS PER DAY (CONTINUED)**

**2- Adjustment of insulin according to the blood sugar test, with the help of a scale**

The insulin dose at mealtime may vary according to the results of the blood sugar tests. You can therefore increase or decrease the ultra-rapid or rapid insulin dose using a scale prescribed by your doctor.

Example:

The ultrarapid or rapid insulin dose prescribed or calculated for a given meal is 6 units. You should add a dose of insulin according to a prescribed scale. That is, if the blood glucose is:

- ♦ Lower than 4, decrease by 2 units
- ♦ By 4 to 8, no addition
- ♦ From 8 to 10, add 1 unit
- ♦ From 10.1 to 12, add 2 units
- ♦ More than 12.1, add 3 units



to the dose already prescribed of 6 units.

This indicates that your insulin dose may vary from 4 to 9 units at mealtime.

## E) FOUR INJECTIONS PER DAY (CONTINUED)

### 1- Adjusting insulin according to the carbohydrate intake

One injection of ultrarapid-acting or rapid-acting insulin is given before each meal in relation to the carbohydrates that will be eaten during that meal. The nutritionist will teach you to assess the quantity of carbohydrates in foods. The insulin dose is usually calculated for each 10 grams of carbohydrates. It is equal to the quantity of ultra rapid or rapid insulin prescribed per 10 grams of carbohydrates multiplied by the quantity of carbohydrates calculated to be in your meal, then the result is divided by 10.

Example:

If the doctor prescribes 1.5 units of insulin per 10 grams of carbohydrates before breakfast, and your breakfast will consist of 55 grams of carbohydrates, the calculation of the insulin dose is as follows:

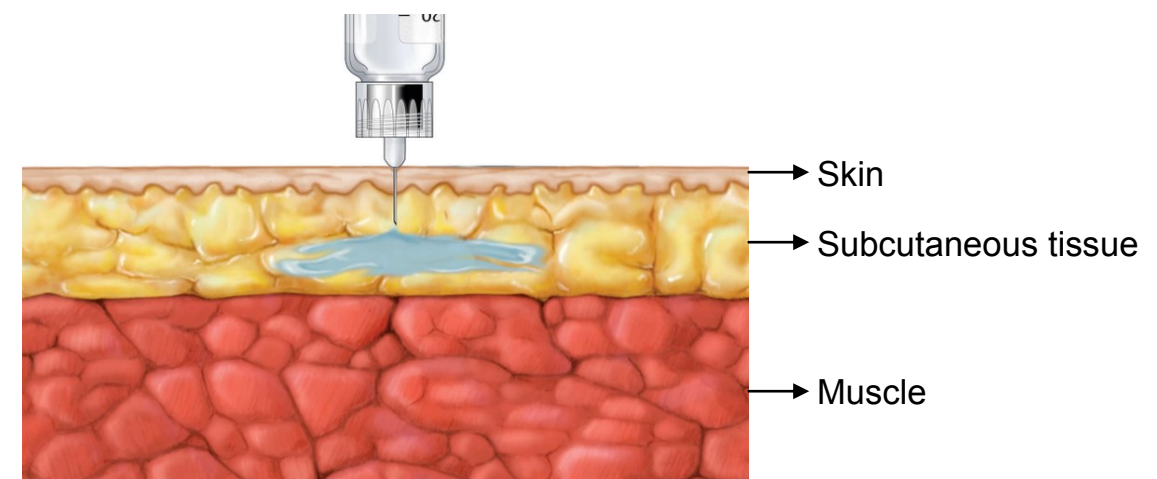
$$\text{Dose to take} = \left( \frac{1.5 \times 55}{10} = 8.2 \text{ units} \right) = 8.0 \text{ units}$$

Since it is difficult to take 0.2 units of insulin, the amount should be rounded. For a part of a unit less than 0.5, the rounding is done by using only the number of complete units calculated. For a part of a unit greater than 0.5, it is rounded up by adding 1 unit to the number of complete units calculated.

## INJECTION

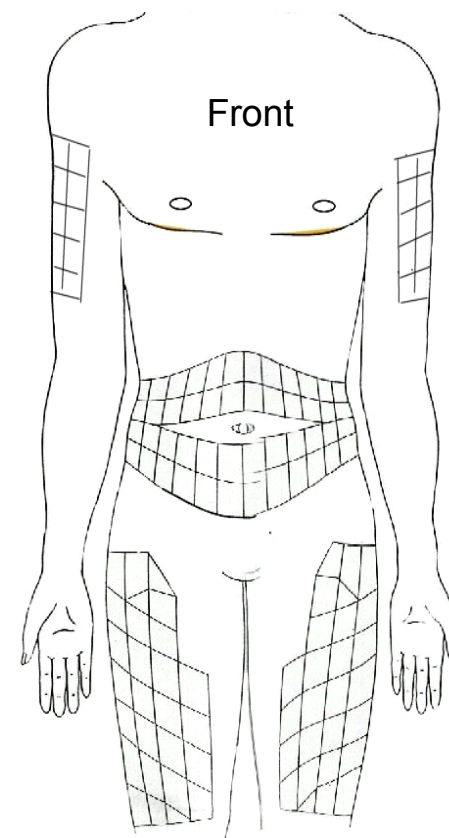
### INJECTION SITES

Insulin must be injected under the skin at a 90° angle into the fatty subcutaneous tissue. This is where the insulin is well absorbed and passes easily into the bloodstream.

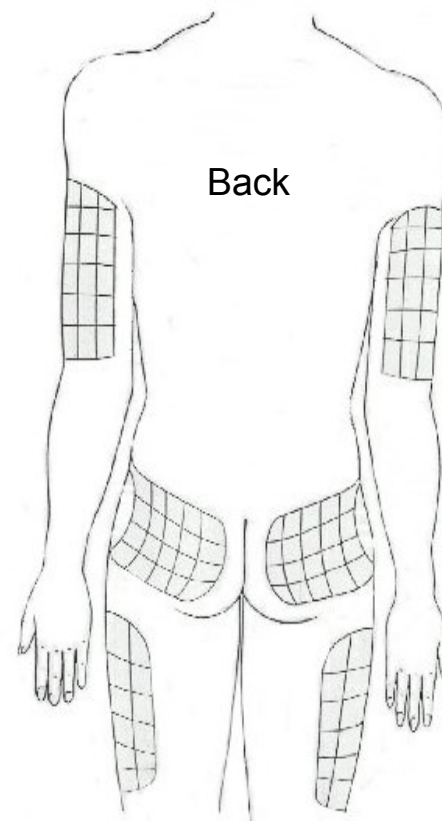


The most frequently used areas are :

- ◆ The side or back of the arms;
- ◆ The abdomen: **avoid injecting too near the navel**. Leave about 2.5 cm (1 inch) around the navel where you do not inject;
- ◆ The front and outside of the thighs;
- ◆ The buttocks.



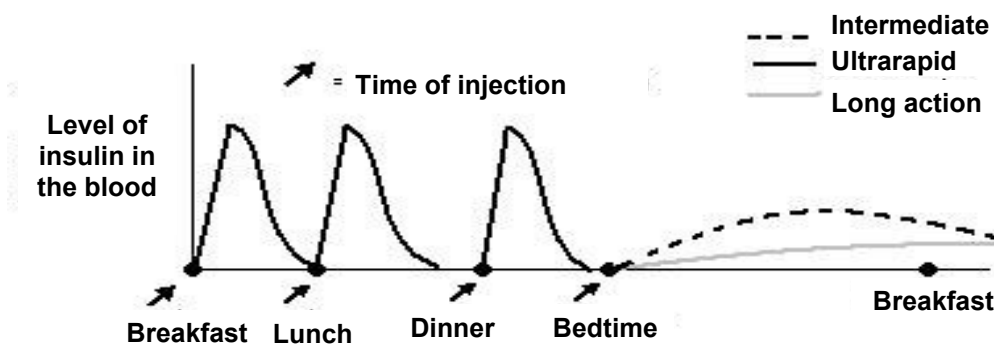
## INJECTION SITES



**NB:** The arm is not a preferred site for self injection due to difficulty accessing the correct zone and the lower thickness of subcutaneous fat resulting in a greater potential for intramuscular injection.

## E) FOUR INJECTIONS PER DAY

Below is the graph showing the action of four doses of insulin per day. Ultrarapid-acting insulin with meals and intermediate or long action in the evening.



Check the effect of the insulin in relation to the time of injection :

Time of injection	Type of insulin	Appropriate time to measure blood sugar
Before breakfast	Ultrarapid action	2 hours after breakfast and before lunch
Before lunch	Ultrarapid action	2 hours after dinner/lunch and before supper
Before supper	Ultrarapid action	2 hours after supper and in the evening
In the evening	Intermediate or long action	The following morning before breakfast

### Adjusting the insulin :

\* For information see : General principles for adjusting your insulin (page 34).

## **D) TWO INJECTIONS PER DAY (BREAKFAST AND SUPPER) (CONTINUED)**

### **Special situations**

#### **♦ Fasting blood test :**

The evening before :

- Decrease by 10 % your dose of insulin at supper if you have a tendency to hypoglycemia;
- Have your snack before 8:30 p.m..

On the morning of the blood test :

- Check your blood sugar when you wake up;
- **Do not take your insulin for the morning;**
- Bring your glucometer (it is advisable to take your blood sugar reading immediately after your blood test, to check the reliability of your meter);
- Plan to have some sugar in reserve to correct hypoglycemia immediately;
- Take your insulin before breakfast, after the blood test.

#### **♦ If you will be eating late :**

- Check your blood glucose 4 times a day;
- Have a snack at the usual mealtime (breakfast, dinner or supper);
- Take your insulin before the beginning of the postponed breakfast or supper.

## **ROTATION / MONITORING OF SITES**

- ♦ Inject insulin every day in the same part of the body, at the same time of the day (e.g.: the abdomen in the morning, thighs in the evening, etc.). This helps to decrease the fluctuations in blood sugar;
- ♦ For NPH and regular insulins, if the dose is larger than 50 units, is preferable to split into 2 separate injections. The larger the dose into one site, the more delayed the action of insulin.
- ♦ Vary the injection point within each site, to cover all the area available.

### **Space the injections from 1 to 2.5 cm (½ in. to 1 in.) apart.**

This helps to avoid lipodystrophy (the presence of bumps or hollows in the skin). These deformations interfere with the absorption of insulin;

- ♦ **At least once a week, check the injection points to look for :**
  - Any change of colour, redness or irritation;
  - The presence of lipodystrophie (lumps or dents);
  - A sensation of pain.

If you note the presence of one or the other of these anomalies, avoid using this injection site until the problem disappears, and speak to your doctor or diabetes educator if necessary.

### **Attention :**

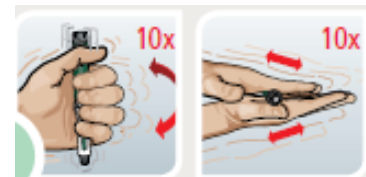
- ♦ Syringes and pen-injector needles used several times may also contribute to the above mentioned problems (pain, lipodystrophy).

## **USE A NEW NEEDLE FOR EACH INJECTION.**

## PEN-INJECTORS

This is the general information about use of pen-injectors. You can also take a look at the instruction manual that you will find in the box of your pen.

1. **If you are using cloudy insulin**, mix by rolling it 10 times and tipping it 10 times to ensure that it is a milky white consistency. Clear insulin does not need to be mixed;



2. **Attach your pen needle** and remove both the outer and inner caps.



3. **Prime your pen.** Dial up 2 units and depress the plunger while holding the pen needle pointing up. If drops come out, your pen needle is primed, if not, repeat the steps until drops come out of the top of the pen.



## D) TWO INJECTIONS PER DAY (BREAKFAST AND SUPPER) (CONTINUED)

### Adjusting the insulin :

We recommend that you adjust your insulin dose after receiving the necessary training from your care team. The team will guide you throughout the learning process.

\* For more information see: General principles for adjustment of insulin (page 34).

### Special situations

#### ♦ Forgetting a dose :

##### 1. Forgetting an injection at breakfast :

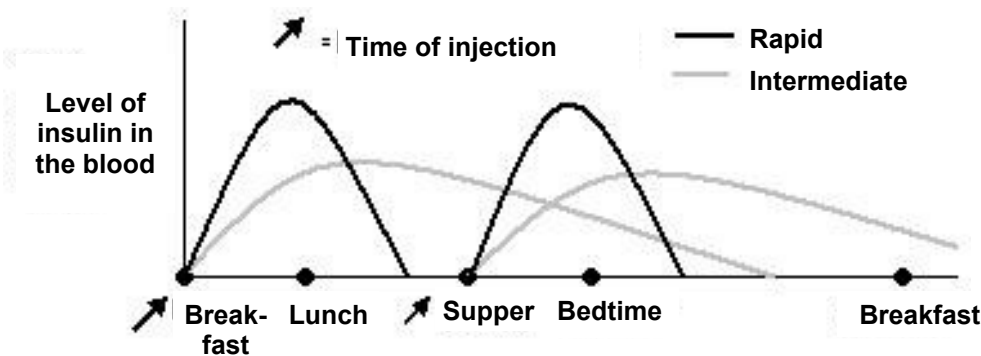
- If it is less than one hour after the meal: inject the usual dose;
- If it is before noon (e.g.: 10 a.m.): inject 2/3 of the usual morning dose of insulin;
- If it is around noon: inject 1/2 of the usual morning dose;

##### 2. Forgetting the injection at supper :

- If it is less than one hour after the meal: inject the usual dose;
- If it is more than one hour after supper but before midnight : inject 50 % of the dose of insulin that would have been taken at supper;
- After midnight : do not inject insulin.

Return to the usual injection schedule the next day.

**D) TWO INJECTIONS PER DAY (BREAKFAST AND SUPPER)**



This graph shows the way 2 doses of premixed insulin (rapid and intermediate action) act in relation to the meals of the day.

Check the effect of the insulin in relation to the time of injection :

Time of injection	Type of insulin	Appropriate time to measure blood sugar
Before breakfast	Rapid action	Before lunch
	Intermediate action	Before supper
Before supper	Rapid action	At bedtime
	Intermediate action	The next morning before breakfast

4. **Dial your dose; make sure** there is **enough** insulin left in the cartridge to administer the dose;



5. **Choose your injection site** insert pen needle into skin at a 90 degree angle;

6. **Push down** the thumb button completely. Count to 10, slowly.



7. **Remove pen needle and dispose of it in an approved sharps container.** Replace pen cap.

**Humapen Luxura, Luxura HD and Memoir**

N.B.: If there is not enough insulin in the cartridge for the dose chosen, it will be impossible to press on the push button any further : the figure on the selector is the dose that must be prepared with a new cartridge.

**AIISTAR, JuniorSTAR, Kwikpen, NovoPen 4, NovoPen 5, Novo-Pen Echo, FlexTouch, SoloSTAR, ClikSTAR and Savvio**

N.B.: If there is not enough insulin in the cartridge for the dose chosen, the dose selector will block the quantity of insulin available in the cartridge.

## TREATMENT METHODS / SPECIAL SITUATIONS

The method of insulin treatment varies with the needs of each individual. This is why the number of injections, the type of insulin used, the time of administration and the dose must be adapted to each person. There are several treatment methods using insulin.

In the next pages, find your type of treatment to learn about the effect of insulin and the appropriate time to measure your blood glucose.

### **Certain factors may influence the dose :**

- ♦ The quantity of insulin produced by your pancreas;
- ♦ Your weight, the proportion of body fat and muscle;
- ♦ The quantity of foods consumed, your physical activity, the other medications you take, your level of stress, your general state of health.

Your doctor will choose the treatment that will best suit your needs.

## **C) ONE INJECTION PER DAY (AT SUPPER) (CONTINUED)**

### **Special situations**

#### **♦ Forgetting a dose :**

- If it is less than one hour after supper: inject the usual dose;
- If it is more than one hour after supper but before midnight: inject 50 % of the usual dose;
- After midnight, do not inject insulin.

Return to the usual schedule the next day.

#### **♦ Fasting blood test :**

The evening before:

- Decrease by 10 % your dose of insulin at supper if you have a tendency to hypoglycemia;
- Take your snack before 8:30 p.m.;

The morning of the blood test:

- Follow the same recommendations as for example 1, page 19.

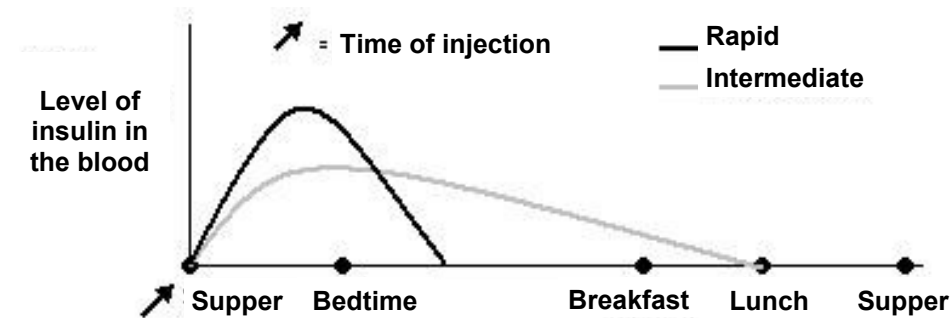
#### **♦ If you expect to eat late :**

- Check your blood sugar at your usual supper time;
- Have a snack at the usual supper time, if necessary;
- Take your insulin before beginning the postponed supper.



C) ONE INJECTION PER DAY (AT SUPPER)

Example 4: Premixed insulin at supper



Check the effect of the insulin in relation to the time of injection :

Time of injection	Type of insulin	Appropriate time to measure blood sugar
Before supper	Rapid action Intermediate action	In the evening The next morning before breakfast

Adjusting the insulin :

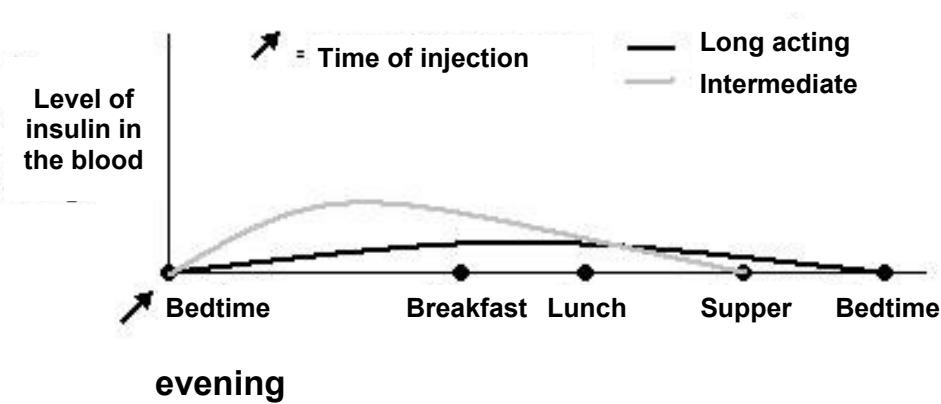
Depending on the results of the blood sugar test **in the evening** and the **next morning** before breakfast, **the dose is usually increased or decreased by 2 to 4 units.**

\* For more information see: General principles for adjusting insulin (page 34).

A) ONE INJECTION PER DAY (IN THE EVENING)

There are different possibilities for this treatment. Some people with type 2 diabetes may continue to take their oral medication (pills) during the day and have one insulin injection in the evening. In this case, the insulin used will be an insulin that is intermediate or long acting.

Example 1: Intermediate or long action insulin taken in the



Time of injection	Type of insulin	Appropriate time to measure blood sugar
In the evening	Intermediate or long action	The following morning before breakfast

### **A) ONE INJECTION PER DAY (IN THE EVENING) (CONTINUED)**

#### **Adjusting the insulin :**

Depending on the result of the blood glucose monitoring in the morning, **the dose is usually changed in increments or decreased of 1-2 units.**

\* For more information see: General principles for adjusting insulin (page 34).

#### **Special situations**

##### **♦ Forgetting a dose :**

- Before midnight : inject the usual dose;
- After midnight : inject 50 % of the usual dose.

Begin the usual schedule on the following day.

##### **♦ Fasting blood test :**

- Have your snack before 8:30 p.m.;
- Decrease by 10 % your insulin in the evening if you have a tendency to hypoglycemia in the morning.

### **B) ONE INJECTION PER DAY (IN THE MORNING) (CONTINUED)**

#### **Special situations**

##### **♦ Forgetting a dose :**

- If it is less than one hour after breakfast: inject the usual dose;
- If it is before noon (e.g. 10 a.m.): inject 2/3 of the usual dose of insulin;
- If it is around noon : inject 1/2 of the usual dose of insulin;
- Return to the usual schedule the next day.

##### **♦ Fasting blood test :**

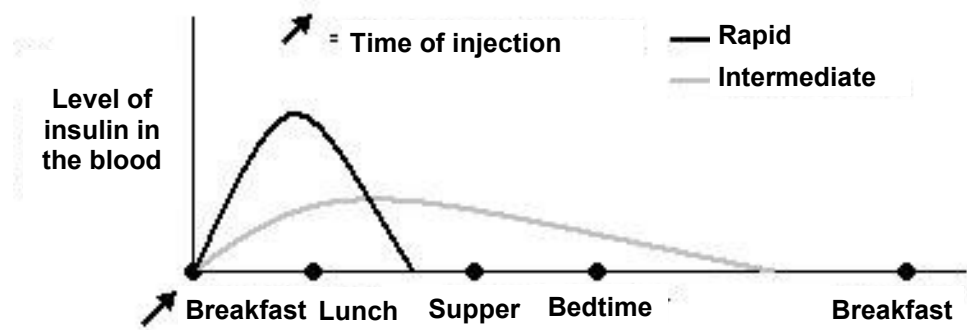
- Take your medications for diabetes when you have your late breakfast.

##### **♦ If you expect to eat lunch or supper late :**

- Take your insulin at the usual time (in the morning);
- Have a snack at the usual time of the mid-day meal;
- Check your blood sugar at the usual meal time;
- Take your medication for diabetes at postponed mealtime.

**B) ONE INJECTION PER DAY (IN THE MORNING) (CONTINUED)**

**Example 3: Premixed Insulin (morning)**



Check the effect of insulin related to the time of the injection :

Time of the injection	Type of insulin	Appropriate time to measure blood sugar
Before breakfast	Rapid action / intermediate action	Before lunch/dinner Before dinner/supper

**Adjusting of the insulin :**

Depending on the result of the blood sugar test at **lunch** or **supper**, **the dose is usually increased or decreased by 2 to 4 units.**

\* For more information see: General principles for adjusting insulin (page 34).

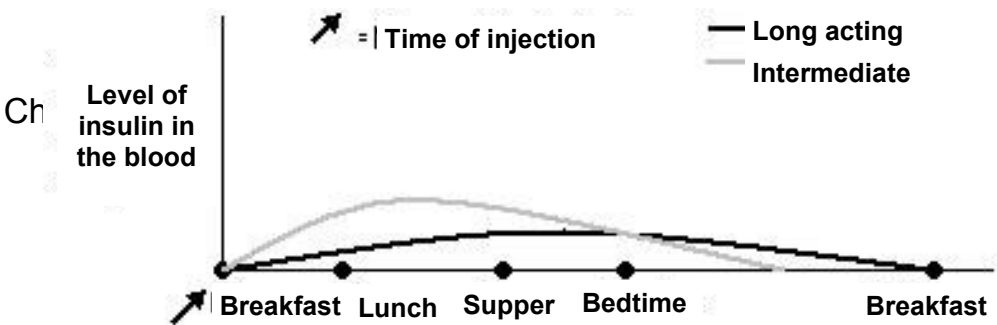
**A) ONE INJECTION PER DAY (IN THE EVENING) (CONTINUED)**

**The morning of the blood test :**

- Check your blood sugar when you get up;
- If you wish to check the accuracy of your blood sugar meter (glucometer) bring it along and take a reading within 5 minutes after your blood test;
- Always keep a supply of sugar to immediately correct hypoglycemia;
- Do not take your oral diabetes medication; take it at breakfast after the blood test.

**B) ONE INJECTION PER DAY (IN THE MORNING)**

**Example 2: Intermediate or long action insulin taken in the morning**



Check the effect of insulin in relation to the time of injection :

Time of injection	Type of insulin	Appropriate time to measure blood sugar
Morning	Intermediate or long action	Before supper

**Adjustment of insulin :**

Depending on the result of your blood sugar monitoring at supper time, **the dose is usually increased or decreased by 1-2 units.**

\* For more information see : General principles for adjusting insulin (page 34).

**B) ONE INJECTION PER DAY (IN THE MORNING) (CONTINUED)**

**Special situations**

**♦ Forgetting a dose :**

- Before dinner/lunch: inject the usual dose;
- In the afternoon: inject 50 % of the usual dose;

Return to the usual schedule the next day.

**♦ Fasting blood test :**

The morning of the blood test :

- Do not inject insulin, and do not take your oral medication for diabetes;
- Take your medications for diabetes and your insulin at breakfast after the blood test;
- For any other fasting test, ask your healthcare professional about the procedure and the necessity of adjusting your treatment regimen.