



Tameside and Glossop
Integrated Care
NHS Foundation Trust

Safe administration of insulin

COMPETENCY BOOKLET

Trainee Name: _____

Date of training: _____

What is Diabetes?

What is diabetes?

Diabetes is a condition where the amount of glucose in the blood is too high because the body can't produce insulin, doesn't produce enough or where the insulin doesn't work properly.

Insulin is a hormone produced by the pancreas that helps the body to use glucose in the blood to give energy.

It acts as the 'key' that 'unlocks' the body's cells to let glucose in, which is then converted to energy.

Glucose comes from the digestion of starchy foods, fruit, some dairy products, sugar and other sweet foods, and from the liver, which produces glucose.



There are two main types of diabetes,
Type 1 and Type 2

	<i>Type 1 Diabetes</i>	<i>Type 2 diabetes</i>
<i>Insulin</i>	The body doesn't produce any insulin as the insulin producing cells have been destroyed	The body can still produce some insulin, but not enough and/or the insulin doesn't work properly (insulin resistant)
<i>Onset</i>	Symptoms develop quickly	Symptoms tend to develop slowly
<i>Age</i>	Develops at any age, but usually before the age of 40	Usually develops in people older than 40
<i>Prevalence</i>	Accounts for approximately 10% of all people with diabetes	Accounts for around 90% of all people with diabetes
<i>Treatment</i>	Treated with insulin (either by injection or pump) a healthy diet and regular physical activity	Treated with a healthy diet, regular physical activity, medication including insulin may be needed.

Risk Factors

Type 1 diabetes

No one is quite sure why insulin-producing cells in the pancreas of people with Type 1 diabetes become destroyed.

The most likely cause is due to an autoimmune response. This may be triggered by a viral or other infection.

Type 2 diabetes

There are certain risk factors that increase the chance of a person developing Type 2 diabetes.

Age

The risk of developing Type 2 diabetes increases with age.

This is particularly true for those over the age of 40. However, it can appear at an earlier age in people from a Black African, African Caribbean or South Asian background, generally 10 years earlier than people from White background.

Family history

A person is at increased risk of Type 2 diabetes if they have a close family member (parent or sibling) with diabetes.

Though the genetic aspects of Type 2 diabetes are complex, on average people with diabetes in the family are two to six times more likely to have diabetes than those without diabetes in the family.

Ethnicity

Research suggests that people from South Asian and Black communities are two to four times more likely to develop Type 2 diabetes than those from Caucasian backgrounds.

Weight

Not all people with diabetes are overweight, but being overweight or obese increases the risk of developing Type 2 diabetes. It is the most potent risk factor for Type 2 diabetes.

Waist circumference

An increased waist circumference is associated with an increased risk of Type 2 diabetes. Risk is increased in:

Women who have a waist measurement over 80cm (31.5 inches)

Men who have a waist measurement over 94cm (37 inches) or over 90cm (35 inches) for South Asian men

High blood pressure / history of heart attack or stroke

If a person has ever had high blood pressure, a heart attack or a stroke then they are at increased risk of Type 2 diabetes.

Symptoms

The common symptoms of diabetes are:

Feeling tired during the day, particularly after meals (fatigue)

Often feeling hungry, particularly if you feel hungry shortly after eating (polyphagia)

Urinating more often than normal, particular needing to do so during the night (polyuria)

Feeling abnormally thirsty (polydipsia)

Blurred vision

Itching of the skin, particularly itchiness around the genitals (genital itchiness)

Slow healing of cuts or wounds

Having regular yeast infections (thrush)

Having a skin disorder such as psoriasis or acanthosis nigricans

Sudden weight loss or loss of muscle mass.

Testing your blood glucose levels

You'll need these things to do the test:

- a blood testing monitor
- a finger prick device
- test strips
- a sharps bin, so you can throw the needles away safely
- a diary to record your blood glucose levels
- liquid control solution

Wash your hands with soap and warm water. Don't use wet wipes as the glycerine in them can affect the test result. Make sure your hands are warm so it's easier to get blood and won't hurt as much.

Take a test strip and slot it into the monitor to turn it on.

Remove the cap from your finger prick device. Choose which finger to prick but avoid your thumb or index finger. Don't prick the middle, or too close to a nail. Place the device against the side of your finger and press the clicker. Use a different finger each time and a different area.

Take your monitor with the test strip and hold it against the drop of blood. It'll tell you if the test strip is filled, usually by beeping.

Before you look at your reading, check your finger. Use a tissue to stop bleeding. By this time, your meter will probably show the result.

You can use the same tissue to take out the test strip and throw that away too. Taking out the strip will usually turn the monitor off.

Dispose of your test strip and finger prick device into your sharps bin

The optimal range for blood glucose is between 4 and 7 mmol/L some people may run higher; it is down to your Diabetic Nurse or GP to determine what is an acceptable range for you. Record your results in your diary. If your blood glucose is stable, it is recommended that you send a copy of the results to your Diabetic Nurse or GP once a month. You can send them more frequently if your levels are not stable.

It's crucial for people with diabetes to possess accurate information about their blood sugar levels. If there's something wrong with the monitor or the test strips, you will receive inaccurate blood glucose readings.

A control solution is necessary to gauge the accuracy of the test strip and monitor. The diabetic control solution is a chemical solution resembling sugar water, the solution contains glucose, when it's placed on a test strip, it will react to it and the monitor will take a reading.

Using the control solution is similar to how you use it to get your blood glucose level. Place the strip in the monitor, place a drop of control solution onto the test strip as you would apply a drop of blood, this will then give you a reading which should fall between a specified range. If it is outside this range then there is a problem with your monitor or test strips, further investigation is needed to determine the source of the problem.

You should carry out this test every time you open a new box of strips, if you drop your monitor, or if you get unusually high or low readings.

Hypoglycaemia

What is hypoglycaemia?

Hypoglycaemia occurs when the level of glucose present in the blood falls below a set point:

Below 4 mmol/L

Being aware of the early signs of hypoglycaemia will allow you to treat your low blood glucose levels quickly - in order to bring them back into the normal range.

What are the symptoms of hypoglycaemia?

The main symptoms associated with hypoglycaemia are:

- Sweating
- Fatigue
- Feeling dizzy

Symptoms of hypoglycaemia can also include:

- Being pale
- Feeling weak
- Feeling hungry
- A higher heart rate than usual
- Blurred vision
- Confusion
- Convulsions
- Loss of consciousness
- And in extreme cases, coma

Low blood glucose levels can happen to anyone, however dangerously low blood glucose levels can occur in people who take insulin. It is important to get your blood glucose level above 4 mmol/L before administering insulin.

How do I treat hypoglycaemia?

A mild case of hypoglycaemia can be treated through eating or drinking 15-20g of fast acting carbohydrate such as glucose tablets, sweets, sugary fizzy drinks or fruit juice.

Some people with diabetes may also need to take 15-20g of slower acting carbohydrate if the next meal is not due.

A blood test should be taken after 15-20 minutes to check whether blood glucose levels have recovered. Severe hypoglycaemia may require an ambulance, for example if loss of consciousness occurs or a seizure persists for more than 5 minutes.

Types of Insulin

Rapid-acting insulin:

This type starts to work just 15 minutes after you take it. It peaks within 30 to 90 minutes, and its effects last for three to five hours. Types of insulins include NovoRapid® & Humalog®

Short-acting insulin:

This type takes about 30 to 60 minutes to become active in your bloodstream. It peaks in two to four hours, and its effects can last for five to eight hours. It is sometimes called regular-acting insulin. Types of insulins include Humulin S, Actrapid, Velosulin®

Intermediate-acting insulin:

The intermediate type takes one to three hours to start working. It peaks in eight hours and works for 12 to 16 hours. Insulatard® is the most common Intermediate-acting insulin

Long-acting insulin:

This type takes the longest amount of time to start working. The insulin can take up to 4 hours to get into your bloodstream. Levemir® & Lantus® are commonly used.

Pre-mixed:

This is a combination of two different types of insulin: one that controls blood sugar at meals and another that controls blood sugar between meals. These types of insulin include NovoMix® 30, Mixtard 30, & Humalog Mix® 25/75

Storing your insulin

Keep any insulin you're not using in the fridge whatever the time of year. Don't put it in the freezer compartment as it may damage the insulin. If you leave it out of the fridge for 28 days or more, you'll need to throw it away as the insulin will have broken down.

Some insulins may need to be stored slightly differently so make sure you read the information leaflet that comes with yours.

Insulin needs to be kept at temperatures lower than 25°C (77°F). The ideal storage temperature is 2 to 6°C (36 to 43°F). Room temperatures can be below 25°C, but they can be higher if the heating is on or it is summer, if so keep your insulin in the fridge.

Safe administration of insulin

To inject insulin safely you will need:

An insulin pen – this can be one that already has insulin in which you throw away after it's empty, or a pen you can reuse by changing the insulin cartridge yourself.

A needle – this is small and thin, it only needs to go under the skin, not into a muscle or vein. These can only be used once.

A sharps bin – this is where you will safely throw away your needle.

Everything you need is available for free on prescription.

How to inject insulin

Wash and dry your hands.

Choose where you're going to inject – you're looking for fatty tissue, so the main injection sites are your stomach (in a semi-circle under your belly button), sides of your thighs and your bum. It's vital you choose a different spot each time – at least 1cm or half an inch from where you last injected. If not, hard lumps can appear that will stop your body absorbing and using the insulin properly.

Attach the needle to your pen by removing the paper from the bottom of the needle, screw this onto your insulin pen. Once secure remove the outer and inner caps (if using a safety needle there is only one cap to remove)

****Have you got the correct patient (If administering to someone other than yourself)? The correct insulin? The correct dose? The correct time? Is the blood glucose level 4mmol/L or above?****

Dial up two units of insulin. Point your pen upwards and press the plunger until insulin appears from the top of the needle. This is known as priming and helps regulate your dose by removing any air from the needle and cartridge.

Dial your dose and make sure the spot you're injecting is clean and dry. Always double check the insulin dose before administering

Insert the needle at a right angle (90° angle). You might want to gently pinch the skin before injecting. Press the plunger until the dial goes back to 0.

Count to 10 slowly to give the insulin time to enter your body before removing the needle.

Unscrew the needle, then place it into the sharps bin. Your chemist should dispose of your sharps bin safely once it is full.

Competency framework

	Yes	No	Trainee signature/date	Assessor signature/date	Comments
Explain the symptoms of diabetes					
Identify the difference between type 1 & type 2 diabetes					
Identify the risk factors for developing diabetes					
Know how to check a blood glucose level and what the results mean					
Know the symptoms of, and how to safely treat a hypoglycaemic episode					
Describe the different types of insulin and how each one works					
Identify how to safely store insulin					
How to safely administer insulin					
How to safely dispose of sharps					
How to record blood glucose results					
Know when to refer to the Diabetic Nurse or GP					

Practical assessment

SKILL	Date trained	Date assessed	Assessed by	Comments
Check and record blood glucose levels				
Check and record blood glucose levels				
Check and record blood glucose levels				
Check and record blood glucose levels				
Check and record blood glucose levels				
Check and record blood glucose levels				

Administer insulin and safe disposal of sharps				
Administer insulin and safe disposal of sharps				
Administer insulin and safe disposal of sharps				
Administer insulin and safe disposal of sharps				
Administer insulin and safe disposal of sharps				
Administer insulin and safe disposal of sharps				

Signed off by: _____

Date signed off: _____

There is a free RCN accredited course on Diabetes in Healthcare available at
<https://www.diabetesinhealthcare.co.uk>