



Seirbhís Sláinte
Níos Fearr
á Forbairt

Building a
Better Health
Service

TYPE 1 DIABETES

HSE Paediatric Diabetes
Resource Pack





HSE Paediatric Diabetes Resource Pack

This family resource pack was developed jointly by Paediatric Clinical Nurse Specialists and Dietitians working in Irish Specialist services on behalf of the National Clinical Programme for Paediatric Diabetes. The aim is to give you clear, concise advice on common scenarios as you begin learning about diabetes. Not all issues are included in this introductory resource pack. Your diabetes team will advise you based on your individual needs.

We thank all those who prepared and proof read the material with special thanks to Nurse Specialists Norma O' Shaughnessy (Temple Street), Laura Andrews (Crumlin), Helen Fitzgerald (Tallaght) and Dietitians Shirley Beattie (Cork), Grainne Mallon (Tallaght) and Cathy Monaghan (Temple Street).

We also thank Siobhan Horkan, Programme Manager for Paediatrics, RCPI as well as Margaret Humphreys and the team of the National Clinical Advisor for the prevention and management of chronic disease who provided the project management and funding of this initiative.

We hope that you find this information useful.

Prof. Nuala Murphy

National Clinical Lead for Paediatric Diabetes
RCPI Clinical Programmes

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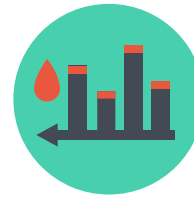
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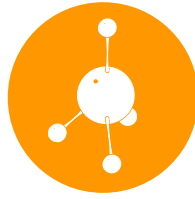
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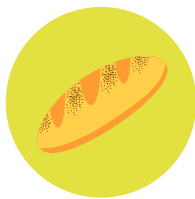
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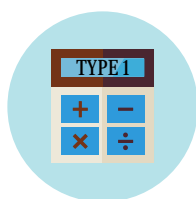
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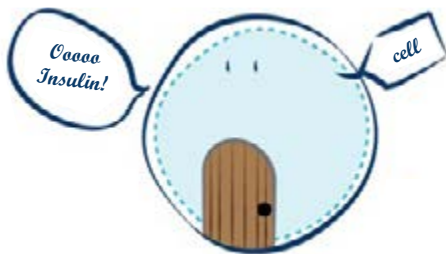
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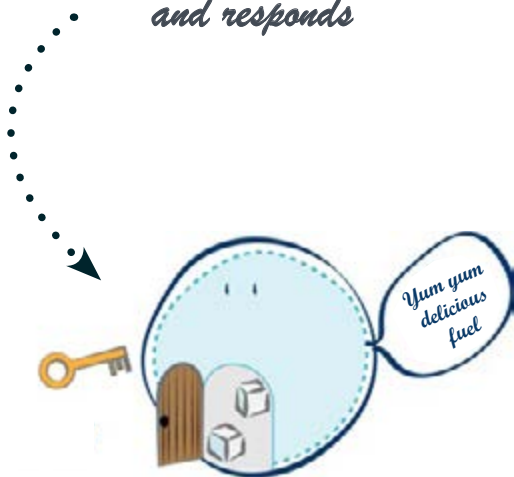
1. What is Diabetes?



Glucose "alerts" the pancreas to make insulin



Cell "notices" insulin and responds



"Door" of cell is opened so glucose can get in

What is Diabetes?

(Diabetes Mellitus)

Type 1 diabetes is an auto-immune condition where the body stops making enough insulin.

What is insulin?

- Insulin is a hormone that is made in our bodies in a gland called the pancreas.
- Insulin acts like a key, opening cell doors around the body so that glucose can get into the cells.
- Insulin is needed to allow glucose into cells where it can be used for energy.

What is glucose?

- Glucose is a sugar which comes from breaking down foods we eat - mostly from foods called carbohydrates.
- Glucose travels from the stomach into the blood stream and then all around the body.

What happens when you have diabetes?

When someone has diabetes, the pancreas stops making insulin, so there are no keys to open the cell doors. Glucose then builds up in the blood (high blood glucose).

Are there other types of diabetes?

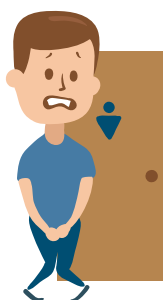
Yes, there are several other types of diabetes including type 2 diabetes, cystic-fibrosis-related diabetes, and MODY (Mature Onset Diabetes in the Young).

Difference between Type 1 & Type 2 Diabetes

	Type 1 Diabetes Mellitus (T1DM)	Type 2 Diabetes Mellitus (T2DM)
Common in:	Children, adolescents & adults.	Usually mostly adults.
Happens when:	The pancreas stops making insulin.	The pancreas is making some insulin but not enough.
Caused by:	An immune reaction - we do not fully understand why, but we do know that it is not caused by an unhealthy lifestyle.	T2DM is more likely in patients who are overweight and can have a genetic link (<i>family link</i>).
Treated by:	Insulin.	Lifestyle changes. Tablets. Sometimes insulin and other medications.

What are the signs (symptoms) of type 1 diabetes?

There are four main signs of type 1 diabetes.



1. Going to the toilet to pass urine a lot

The body tries to get rid of the extra glucose in the blood by passing it out in the pee (*urine*). Sometimes children can start to bed wet.



2. Being very thirsty

Passing lots of urine makes you very thirsty.



3. Losing weight

When the body cells cannot use the glucose from food, they break down fat and muscle for energy and you lose weight.



4. Feeling tired

Tiredness is a common symptom as the body cannot work properly without enough energy. There can also be other signs like mood changes, feeling hungry, thrush, tummy pain and breathing quickly.



2. Blood Glucose Monitoring

Guidelines for blood glucose monitoring

- Always wash and dry your hands carefully before testing your blood glucose.
- A new lancet should be used for each test.
- Children should check their blood glucose under the supervision of a parent or an adult who understands what the readings mean.

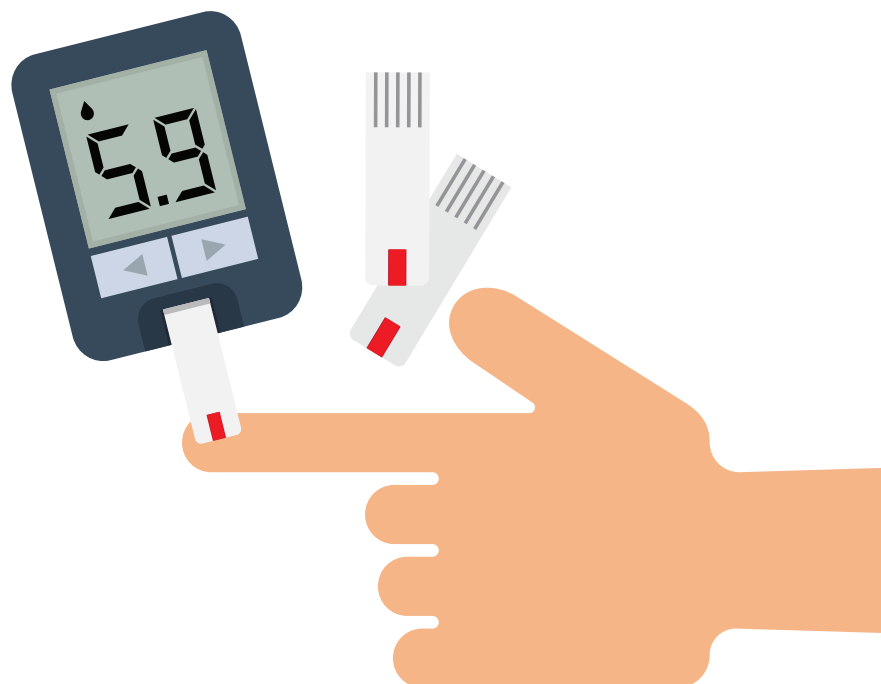
Blood glucose generally needs to be tested 5-7 times every day before meals (*breakfast, lunch and dinner*) and before bed. It may be necessary to test more frequently at times, including during the night or when sick.

Blood glucose monitoring – what is it and why do we do it?

Blood glucose monitoring means checking the blood glucose level to help keep it within the normal range (4-8 mmols/L). This is an essential part of looking after your child's diabetes. Blood glucose levels need to be monitored so that the insulin doses can be adjusted.

How do we do it and what other equipment is needed?

1. We use a glucose meter: this measures blood glucose. You will be shown how to use the meter before you leave hospital.
2. Finger-lancing device: this is needed to prick the finger for the blood glucose test (*it is essential to use a new lancet each time you test the blood glucose level*).
3. Test strips for the blood glucose and blood ketone meter: A drop of blood goes on the strip to measure blood glucose and/or blood ketone in the meter.





3. Using Insulin

Using insulin to treat type 1 diabetes

Insulin is the only way to manage type 1 diabetes. Insulin is injected into the subcutaneous layer of the skin to ensure steady absorption of the insulin.

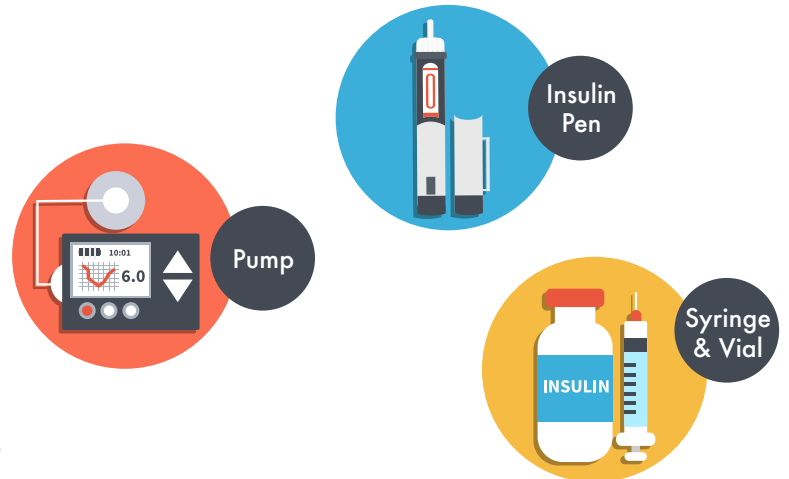
Everyone's lifestyle is different so we will work with you to find the best regimen for your child. Over time you will learn to adjust the doses for different situations.

Insulin pump therapy is another option for delivering insulin. It is rarely used at diagnosis but may be a suitable option as your child's diabetes journey progresses.

How is the insulin given?

There are three ways insulin can be given:

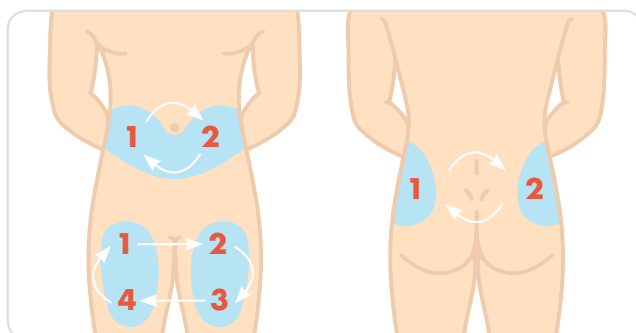
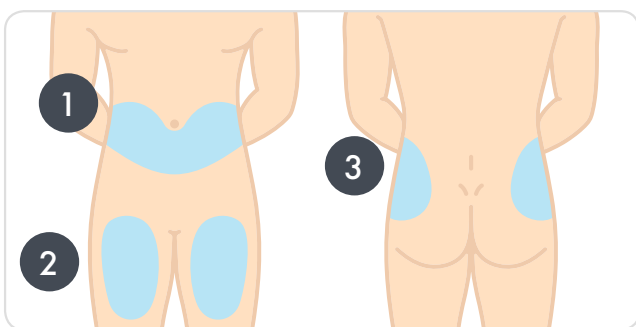
1. Insulin pen
2. A syringe and vial of insulin
3. A pump



Where do I inject the insulin?

There are three main areas where insulin can be injected:

1. Abdomen
2. Legs
3. Buttock



Rotation & care of injection sites

- Inspect and palpate (*touch*) injection site for lumps or bruising. If present, avoid injecting into that area until it has resolved.
- Rotate injection sites to prevent lumps from occurring. Correct rotation involves spacing insulin injections at least 1 cm apart (*approx. width of one adult finger*) in the same injection zone. Your health care professional will advise you on this.
- Injecting through clothes is not a good idea as this may cause an infection at the site and the insulin may not get delivered into the subcutaneous layer and therefore may not work.
- Use a new needle for each injection.



Safe storage of insulin

- Unopened insulin vials or cartridges should be stored in the fridge.
- When insulin vials or cartridges are opened, store at room temperature out of direct sunlight and heat, for a maximum of 4 weeks.
- Do not use after expiry date.

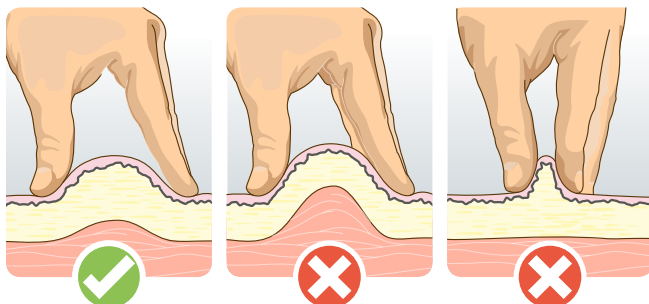
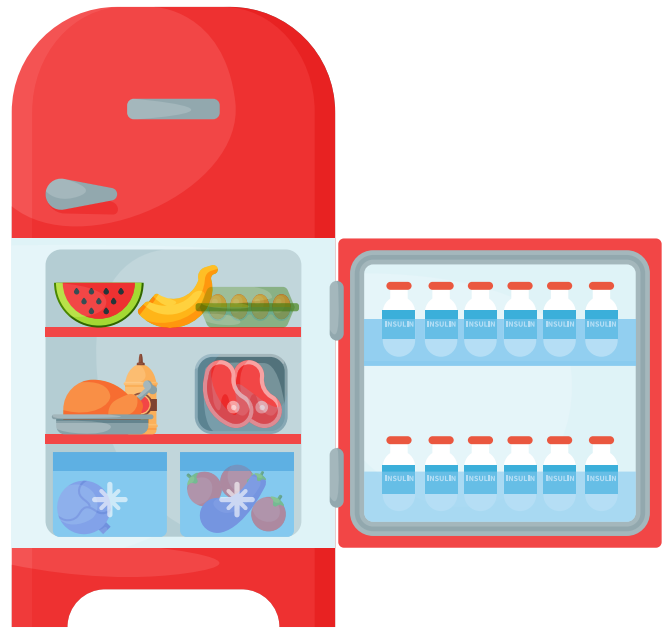


Figure 2:
Correct (left) and incorrect (middle/right) ways of performing the skin fold.

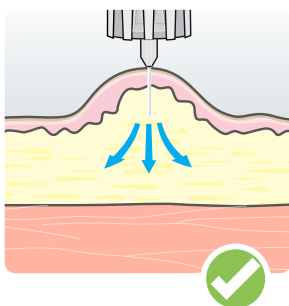


Figure 3:
The correct angle of injection when lifting a skin fold is 90°.

Correct injection technique

- Wash and dry hand before giving insulin.
- Select injection site avoiding areas with lumps or bruises.
- Make sure the injection site is clean and dry before injecting.
- Roll and tip the premixed or cloudy insulins before use.
- If using insulin pens do a test dose of two units to make sure the insulin pen is working properly.
- Fill the insulin to the correct dose.

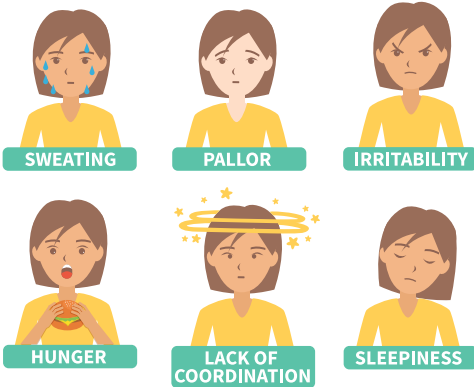
Make a lifted skin fold. The skin fold should not be lifted so tight to cause blanching (*paler than normal*) of the skin, or pain. Please see Figure 2.

- Insert needle at 90 degree angle - Figure 3.
- Release the skin lift.
- Administer insulin by pressing on the plunger.
- Leave the needle in the skin for at least 10 seconds.
- Remove needle at the same angle it was inserted.
- Dispose of sharps immediately.



4. HYPO GLYCAEMIA

POSSIBLE SYMPTOMS



Carbohydrate Table

Fast-acting Carbohydrates

10g
 3 Dextrose tabs
 100ml juice
 100ml sugary drink
 2 Jelly babies

15g
 5 Dextrose tabs
 150ml juice
 150ml sugary drink
 3 Jelly babies

Slow-acting Carbohydrates

10g
 2 Crackers
 1 Digestive

20g
 4 Crackers
 2 Digestives
 Small banana
 1 slice of bread

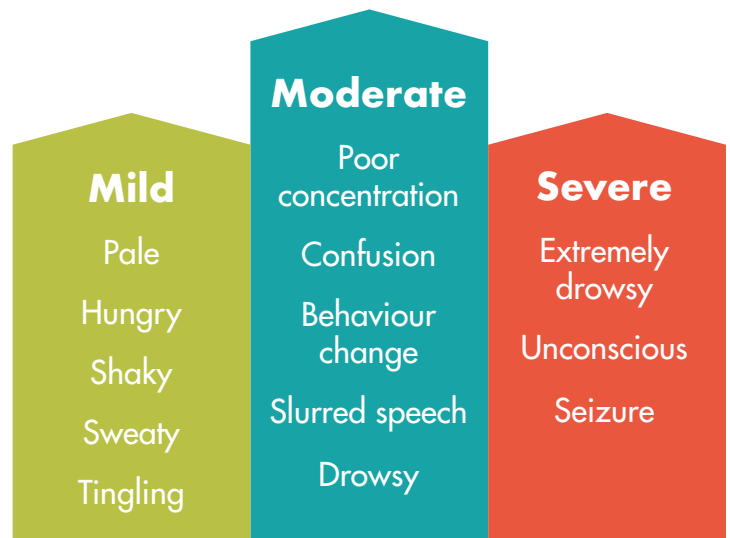
Note: many drinks manufacturers are reducing the sugar content of their products. It is important to check your hypo remedy regularly to ensure carb content is appropriate.

What is Hypoglycaemia?

Hypoglycaemia, also known as 'Hypo', is a low blood glucose reading less than 4mmols.

Symptoms

Hypos can be mild, moderate or severe.



Treating Mild/ Moderate Hypo

(Blood Glucose less than 4 mmols/L)

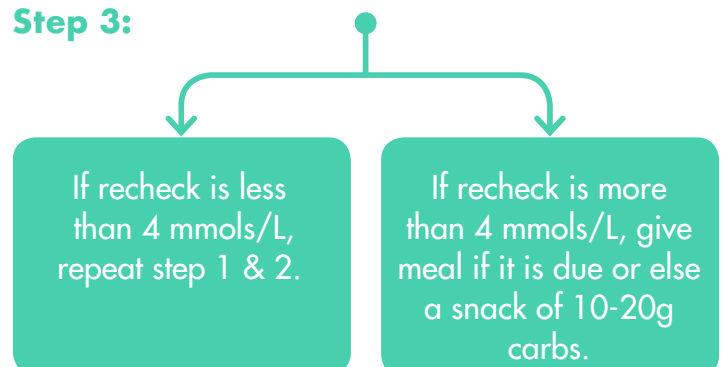
Step 1:

Give 10-15g of fast acting carbohydrate.

Step 2:

Wait 10-15 minutes and then recheck blood glucose.

Step 3:



Glucogel

Glucogel (10g per tube) is a dextrose gel that is absorbed through the mucosa of the mouth. It may also be useful for treating a mild/moderate hypo if a child is uncooperative and refuses to drink (toddler) or has nausea/vomiting.

Glucogel should not be used if a child is unconscious as it may accidentally go down the windpipe. (See severe hypo below).



Additional Information

- Never leave a child alone during a Hypo.
- Rest until blood glucose returns to normal.
- Record hypo and the possible cause, if known, in the diary.
- Get in touch with the diabetes team if hypos are recurring.

Treating Severe Hypo

If your child is very drowsy, very unco-operative or unconscious.

Step 1:

Put child in the recovery position.

Step 2:

Give glucagon injection.

- Children under 12 years - 0.5mg (half a vial) of glucagon.
- Children over 12 years - 1mg (a full vial) of glucagon.
- If you don't have glucagon or are not able to give it, phone for an ambulance immediately.

- **A severe low blood sugar is a medical emergency. If a child does not respond to the glucagon injection call an ambulance immediately.**

Step 3:

Give 10-15 grams of carbohydrate once child is conscious.

- Child may be nauseated for 20-30 mins following glucagon injection.

Step 4:

Contact the hospital diabetes team and go to the emergency department if your child has had a severe hypo. Call an ambulance if necessary.



HYPOGLYCAEMIA

Causes and Actions to prevent:

Causes

Vomiting,
Diarrhoea,
no appetite etc.



Illness

Actions

Monitor glucose levels more frequently.
Reduce insulin doses.
Follow sick day rules.

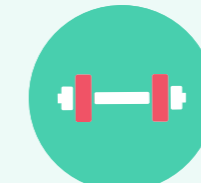
Possible error in insulin dose.
Unsuitable carb ratio.



Insulin

Adjust carb ratio/insulin dose if hypoglycaemia is reoccurring (e.g. 1:10 to 1:12).

Increase in level of activity.
Did not adjust insulin or increase carbs before or after exercise.



Exercise

Monitor blood glucose before and after exercise.
Adjust insulin doses/carb intake accordingly.

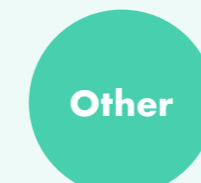
Over estimation in carb content of meal.
Did not finish a meal.



Food

Check you are counting the carbs in the meals correctly.
Use 'Carbs & Cals' app.
If unsure about carb counting contact your dietitian.

Change of routine.
Hot weather.
Stress.
Hot bath.
Alcohol.



Other

Monitor blood glucose more frequently.
For information regarding alcohol see:
www.askaboutalcohol.ie
or www.diabetes.ie



5. HYPERGLYCAEMIA

POSSIBLE SYMPTOMS



DRY MOUTH



HEADACHE



WEAKNESS



BLURRED VISION



INCREASED THIRST



FREQUENT URINATION

What is Hyperglycaemia?

Hyperglycaemia or high blood glucose is the term given to raised blood glucose levels. While target blood glucose is 4-8 mmol/L, when blood glucose is greater than 14 mmol/L additional steps are needed.

Hyperglycaemia

- Check blood ketones any time blood glucose is greater than 14 mmols/L.
- Drink plenty of water.
- Try to work out the cause of Hyperglycaemia and take action to correct or prevent (*see table below*).
- Record the reason for Hyperglycaemia in your diary.

Sometimes hyperglycaemia may not cause any of the listed symptoms.

If you see a pattern of high blood glucose readings, discuss this with your diabetes team. The dose of insulin may need to be adjusted.

HYPERGLYCAEMIA

Possible causes and actions to prevent:

Causes

Actions

Infection.
High temperatures.



Illness

See your GP to find out cause.
Give correction dose.
Follow sick day rules.

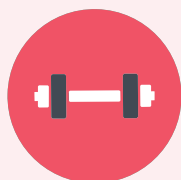
Missed or insufficient insulin doses.
Lumpy injection sites.
Faulty equipment.
Incorrect insulin storage.



Insulin

Adjust carb ratio if hyperglycaemia is recurring (e.g. 1:10 to 1:8).
Set reminders to avoid forgetting doses.
Re-calculate doses (carb ratio may need to be adjusted).
Rotate injection sites.
Check equipment.

Decrease in level of activity.
Did not adjust insulin or carbs to cover exercise.



Exercise

Monitor blood glucose before and after exercise.
Adjust insulin doses/carb intake accordingly.

Under-estimation of carb content of meal.
Reading labels incorrectly.
Eating meals or snacks without insulin.
Over-treating hypoglycaemia.



Food

Learn the carb content of your meals and snacks.
Use 'Carbs & Cals' app. If unsure about carb counting, contact your dietitian.
Take insulin for all meals and snacks (over 10g).

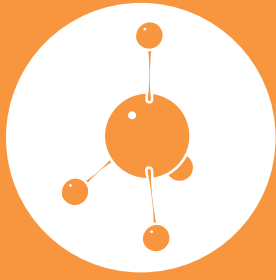
Change of routine.
Stress.



Other

Monitor blood glucose more frequently.

If you have a lot of unexplained high blood glucose readings, please discuss with your diabetes team as the insulin dose may need to be adjusted.



6. Ketones

DIABETIC KETOACIDOSIS SYMPTOMS



ABDOMINAL PAIN



HIGH KETONE LEVELS



FAST BREATHING



VOMITING

Ketones: what are they?

When there is not enough insulin in the body, glucose cannot get into the cells to be used for energy. The body compensates by breaking down body fat for energy. The breakdown of fat produces a by-product called ketones. Ketones can be detected in the urine and the blood. A build-up of ketones can cause the blood to become acidic. A low level of ketones may not have much of an effect, but as the levels rise your child may feel unwell with abdominal pain and vomiting.

When ketone levels get very high (*greater than 2.5 mmol/L*) your child may become very unwell with *vomiting* and fast breathing. The term for this is diabetic ketoacidosis and this requires emergency medical treatment. If left untreated, it can be fatal. Early detection and management of rising ketones is important to prevent Diabetic Ketoacidosis (*DKA*).

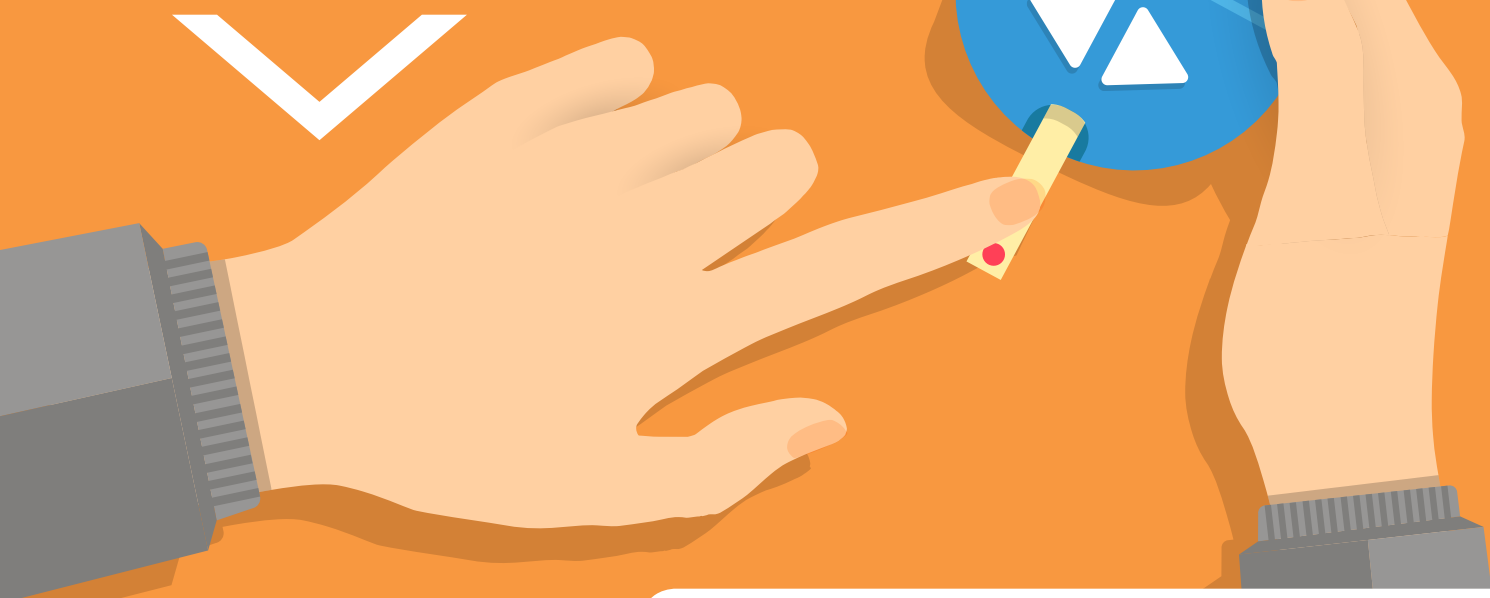
When to test for ketones:

- If your child is feeling sick, has tummy pain or is vomiting.
- If your child has a blood glucose level more than 14 mmol/L.
- If your child is breathing quickly.

What to do if ketones are present:

- Drink plenty of fluids to prevent dehydration.
- Give extra insulin as agreed with diabetes team - see sick day advice.
- Rest - do not exercise with high ketones.
- If ketone levels are very high or rising (*greater than 1.5 mmol/L*) you must call for medical advice immediately. Your child may need to come into the Emergency Department for assessment.

How to interpret blood ketone results



<0.6

(under 0.6 mmol/L):

May be normal; consider re-checking blood ketone levels in 1-2 hours if blood glucose remains elevated; above 13.9 mmol/L.

0.6-1.5

(between 0.6-1.5 mmol/L):

Indicates a need for extra insulin. It is important to telephone or follow the rules provided by your diabetes healthcare team and continue to check the blood glucose and blood ketone levels in 1-2 hours.

>1.5

(over 1.5 mmol/L):

Indicates risk of diabetic ketoacidosis. Call your child's health care team **WITHOUT DELAY** - It is likely that your child will need to be assessed in the emergency department.

Diabetic Ketoacidosis

DKA is a life-threatening condition which occurs when there is a build-up of ketones in the blood. DKA requires **urgent medical attention**.

Causes of DKA

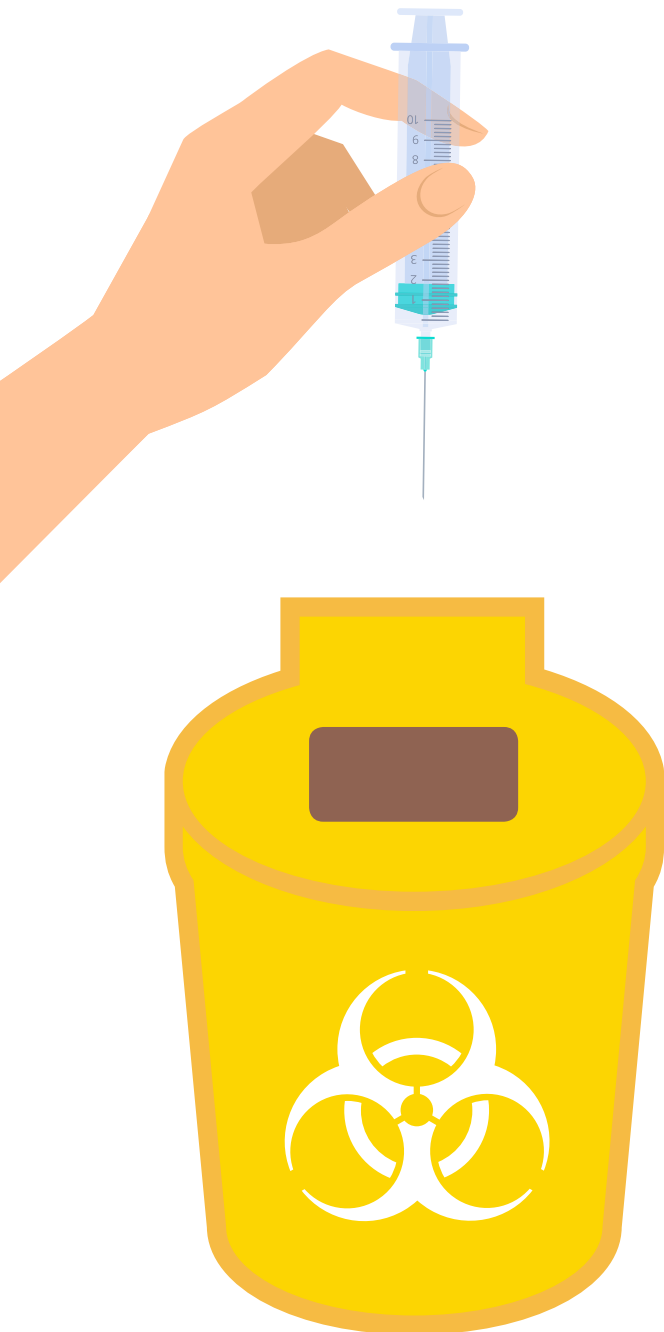
- Sometimes present at time of new diagnosis of type 1 diabetes.
- Insufficient insulin or missed insulin dose.
- Illness.
- Equipment problems (e.g. pen not delivering insulin, pump cannula blockage).

Signs and symptoms of DKA include:

- High blood glucose.
- High blood ketones (more than 2.5 mmol/L).
- Dehydration.
- Abdominal Pain/Vomiting.
- Laboured or fast breathing.
- Sweet smelling breath.
- Drowsiness leading to coma (late sign).



7. Sharps Disposal

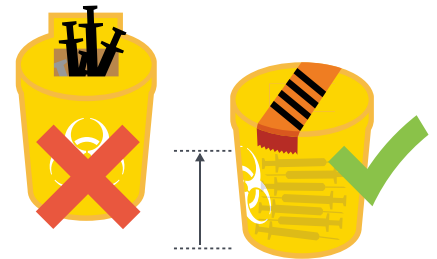
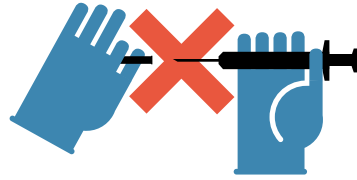


Reasons to use sharps bin

- Used syringes, needles and lancets can injure people.
- Used syringes, needles and lancets may carry infections such as hepatitis *(if a person is infected)*.

Please be responsible and dispose of sharps safely

- A sharps container will be provided by the Diabetes Nurse when leaving the hospital at diagnosis. The Diabetes Nurse will demonstrate how to use it safely. Advice on safe disposal and replacements will also be provided.
- Replacements may be sourced from your local health centre, pharmacy or the clinic.
- When full, the sharps bin is returned to where it was sourced.
- If there are any difficulties in getting a supply of sharps containers, or returning full containers, please contact the Diabetes Nurses who can advise.



DO'S & DON'TS

Be smart with your sharps

Do:

Don't:

Dispose of used syringes, needles and lancets.



Do use the temporary closure lid to avoid accidental injury.



Do keep the container out of reach from young children.



When the bin is full, close the lid until it clicks shut. Now it is locked and cannot be opened again.



Make sure a spare sharps container is available before the current one is full.



Do dispose of fully locked sharps container correctly by returning it with the outside clean, to where it was supplied.



Don't put used needles into any other containers, e.g. plastic food boxes.



Don't re-cap used needles, syringes or lancets.



Don't put any other waste in the sharps container. It should only have syringes needles and lancets.



Don't put the container into normal household rubbish as it could cause injury.



Don't try to remove a needle once placed in the sharps container.



Don't fill the container past the fill line because needles may begin to stick through the plastic wall and cause an injury to someone.





8. Sick Day Rules

SICK-DAY SUPPLIES TO KEEP AT HAND



Sick day management

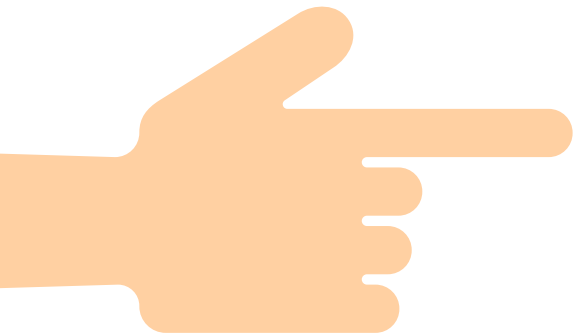
- During times of illness, your body may be more resistant to insulin. This means your blood glucose levels can rise and put you at more risk of developing ketones. Illnesses, especially those that cause a high temperature, can raise your blood glucose levels. Vomiting and diarrhoea can lower your blood glucose.

Sick-day supplies to keep at hand

- Extra supplies of blood glucose and ketones test strips.
- Fluids containing sugar for example; non-diet soft drinks.
- Glucogel or glucose tablets.
- Sugar-free medication such as paracetamol or ibuprofen.

Diabetes "Sick-day" rules

- Treat the underlying illness and see your GP in the usual way.
- Never stop taking insulin - doses may need to be adjusted.
- Monitor blood glucose levels more frequently; the frequency will depend on the levels and the seriousness of the illness. A general guide is 2 hourly and will include overnight monitoring. Aim to keep your blood glucose levels between 5-10 mmol/L when unwell.
- Check blood ketones; raised levels indicate the need for additional insulin and drinks.
- Drink plenty of fluids to keep hydrated and try to eat small amounts of food every 3-4 hours to keep blood glucose levels as normal as possible.
- Rest.
- Seek medical advice and seek help if your child is not improving.



Foods that are easier to digest during sick days.

Fast-acting Carbohydrates

Sugary drinks
(e.g. non diet 7-up)

Juice

Fromage frais

Ice-cream

Jelly

Slow-acting Carbohydrates

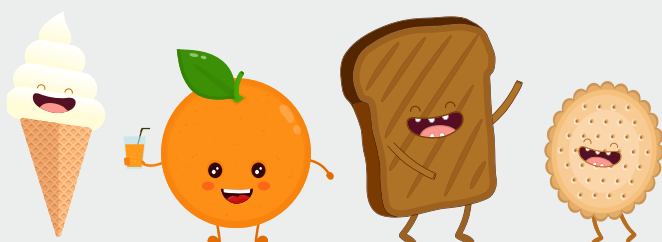
Plain biscuits

Toast

Pancakes

Custard

Crackers



Contact your doctor or diabetes team if:

- The cause of illness is unclear.
- Unable to eat or absorb carbohydrates.
- Persistent vomiting (*more than 2 vomits*).
- Unable to keep blood glucose above 4 mmol/L.
- The blood glucose continues to rise despite extra insulin doses.
- Blood ketones are above 1.5 mmol/L.
- If your child is under 5 years old (*they can get dehydrated and very sick very quickly*).
- If you are worried about your child.

Urgently attend the Emergency Department if your child is:

- Drowsy, confused.
- Breathing quickly or has labored breathing.
- Blood ketones are over 3 mmol/L.

What to eat on sick days

- Try to keep carb intake as near normal as possible.
- If appetite is poor, try to eat frequent small snacks - every 1-2 hours. (*Examples listed in table to the left*).
- If unable to eat, give sips of fluids containing sugar (*e.g. non diet 7-up*) and alternate with sips of sugar free fluids (*e.g. water, diet drinks*).






9. Healthy Eating

Diet and Type 1 Diabetes

The diet recommended for children with diabetes is based on the same healthy eating messages for all children and families. Healthy eating is important to help manage their diabetes, for optimal growth and for keeping the body healthy.

What is Healthy Eating?

Healthy eating means enjoying food and eating a variety of foods that give us the nutrients we need to be healthy, feel good and have energy. No foods are completely banned for someone with type 1 diabetes but healthier options are always the better choice. It will also help to limit certain foods for example:

	Limit:	Replace with:
 Carbohydrates (Carbs)	Chips, potato wedges, pizza, white bread, crisps, processed breakfast cereals.	Whole wheat pasta, brown rice, potato, wholegrain bread, quinoa, couscous, homemade potato wedges (<i>use spray oil</i>), wholegrain cereals.
 Protein	Processed meats – sausages, ham, chicken nuggets, fish fingers, burgers.	Plain meats – Whole chicken breast, fish (<i>no batter or bread crumbs</i>). Include more vegetable protein like beans, lentils, chickpeas, and tofu.
 Fat	Deep fried foods – chips, battered foods, butter, vegetable oils, fatty meats. skin on chicken, takeaways.	Cook with olive oil, rapeseed oil, or sunflower oil. Bake instead of deep frying. Choose whole cuts of meats
 Vegetables	No need to limit any vegetables.	All vegetables are good – aim for fresh vegetables but tinned or frozen vegetables are ok too.
 Fruits	Juices, smoothies, processed fruit pouches/winders.	Eat plenty of fresh fruit. Frozen or tinned in own juices are ok too.
 Occasional Food	Jellies, chocolate, crisps, juices.	Any of the above and see the snack list.



9. Healthy Eating

Diet and Type 1 Diabetes

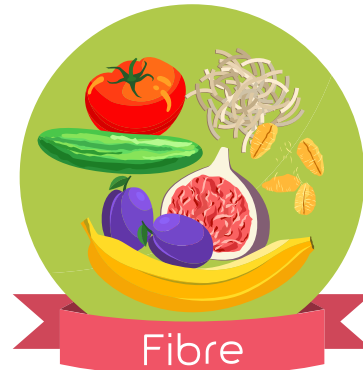
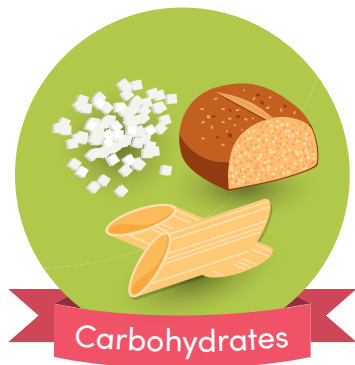
The diet recommended for children with diabetes is based on the same healthy eating messages for all children and families. Healthy eating is important to help manage their diabetes, for optimal growth and for keeping the body healthy.

What is Healthy Eating?

Healthy eating means enjoying food and eating a variety of foods that give us the nutrients we need to be healthy, feel good and have energy. No foods are completely banned for someone with type 1 diabetes but healthier options are always the better choice. It will also help to limit certain foods for example:

	Limit:	Replace with:
 Carbohydrates (Carbs)	Chips, potato wedges, pizza, white bread, crisps, processed breakfast cereals.	Whole wheat pasta, brown rice, potato, wholegrain bread, quinoa, couscous, homemade potato wedges (<i>use spray oil</i>), wholegrain cereals.
 Protein	Processed meats – sausages, ham, chicken nuggets, fish fingers, burgers.	Plain meats – Whole chicken breast, fish (<i>no batter or bread crumbs</i>). Include more vegetable protein like beans, lentils, chickpeas, and tofu.
 Fat	Deep fried foods – chips, battered foods, butter, vegetable oils, fatty meats. skin on chicken, takeaways.	Cook with olive oil, rapeseed oil, or sunflower oil. Bake instead of deep frying. Choose whole cuts of meats
 Vegetables	No need to limit any vegetables.	All vegetables are good – aim for fresh vegetables but tinned or frozen vegetables are ok too.
 Fruits	Juices, smoothies, processed fruit pouches/winders.	Eat plenty of fresh fruit. Frozen or tinned in own juices are ok too.
 Occasional Food	Jellies, chocolate, crisps, juices.	Any of the above and see the snack list.

What do these different nutrients do?



Carbohydrates (for the purpose of this booklet carbohydrates may be known as 'carbs') are an important source of energy – energy to grow and energy to do every day things as well as providing fuel for exercise.

Healthy sources of carbohydrate foods such as wholegrain bread and cereals, legumes (*peas, beans and lentils*), fruit, vegetables and low fat dairy products (*full fat in children under 2 years*) are advised.

When digested (*broken down in the body*) carbohydrates are broken down into glucose (*sugar*). They directly affect blood glucose levels, therefore you will need to measure the amount of carbohydrates that your child eats so we can match with the correct amount of insulin.

Low Carbohydrate Diets

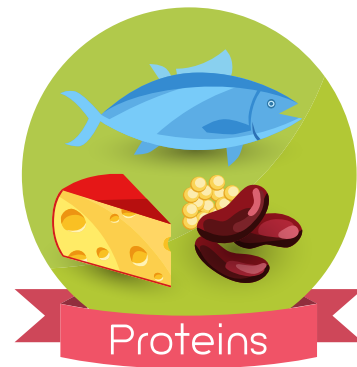
Carbohydrate should not be restricted in children and adolescents with type 1 diabetes as it may result in deleterious effects on growth whilst increasing cardiovascular risk. Unbalanced high fat, high protein diets are not recommended for growing children and may be nutritionally inadequate.

Increasing your child's fibre intake can help in improving their diabetes control. Processed foods tend to be lower in fibre, therefore, unprocessed, fresh whole foods should be eaten where possible.

Increase your child's intake of different fibre containing foods such as legumes, fruit, vegetables and wholegrain cereals. The soluble fibre in vegetables, legumes and fruit are especially useful in keeping a healthy heart. Eating insoluble fibre in wholegrain foods helps the heart and digestive system (bowels) also.

Your dietitian will discuss the different types of carbohydrates with you in more detail. The table below shows how much fibre your child or young person should eat.

Age	Fibre Recommendations
Children over 2 years old	Age in years + 5 = grams of fibre each day
Example: an 8 year old needs 8+5 = 13g fibre	



Fats are a source of energy and provide fat soluble vitamins (A, D, E & K). Examples of fats are: butter, oil, margarine. Aim to reduce the amount of saturated fat. This includes full fat dairy products, fatty meats and high fat snacks. Replace these with unsaturated fats such as lean meats, fish and low fat dairy products You can also try changing to mono-unsaturated and polyunsaturated cooking oils and margarines, as explained below.

Mono-unsaturated fatty acids (MUFA)

MUFA are found in olive, sesame and rapeseed oils. They are also found in nuts and peanut butter. They can help protect against heart disease.

Polyunsaturated fatty acids (PUFA)

PUFA are found in corn, sunflower, safflower, and soyabean or from oily marine fish. They also help with a healthy heart.

Oily fish which is rich in n-3 fatty acids is advised. Children and young people should eat oily fish once or twice a week such as salmon, mackerel, fresh tuna, sardines. A portion is about 80-120g weight of fish.

Protein is needed for growth and repair of cells in the body. High protein diets, high protein drinks and food supplements are not advised. Increase your sources of vegetable protein such as legumes. The sources of animal proteins advised to choose are: fish, lean cuts of meat and low fat dairy products.

Limit your salt intake to keep your small blood vessels healthy.

Age	Maximum amount of salt
1-3 years	2.5g per day
4-8 years	3g per day
9+ years	3.8g per day

Reducing processed foods will reduce your intake of salt in the diet e.g. waffles, chicken nuggets, sausages, salami, rashers etc.

Food refusal

Food refusal is a normal part of your child's development and can occur at any age. It is often your child's way of showing their independence. It is a stage in most young children and will usually pass. Continue to be firm in your parenting practices. If your child is going through a stage of food refusal, speak with your diabetes team. They may give you some guidance on your insulin timing to get over this tricky phase. This will allow you to continue to count your carbohydrates.

USEFUL TIPS FOR MEALTIMES

Have a routine at meal times where possible. Make the meal time a relaxed and positive environment, free of family conflict and tension with no distractions like TV, tablets or phones.

Positive parental roles and early participation in family meals may promote improved cooperation regarding food and healthy food choices.

Try to have all the family eat the same meal.

Aim to keep mealtimes no longer than 30 minutes.

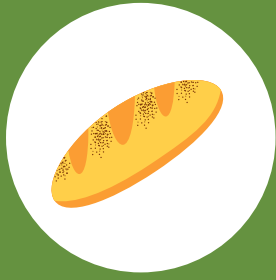
Do not offer a sweet alternative, treat food or cereal to your child instead of their meal. This can encourage them to continue refusing food in the longer term

Spend time in the kitchen with your children. Involve your child in food shopping and preparation. Try asking them to grate the cheese, pick out vegetables, set the table and so on.

Insulin: Discuss with your team the possibility of adjusting insulin doses while your child is going through a fussy phase.

Snacks: Think about what your child is eating as a snack between meals. If snacks are too large, they may not be hungry for their main meals. If this is the case, you need to reduce how much they eat at snack times.

Fluids: Make a house rule of no drinks for 30 minutes before meals. Limit drinks to a half cup of water (120mls) and ensure half the meal is eaten before allowing the drink.



10. Counting Carbs

Why count carbs?

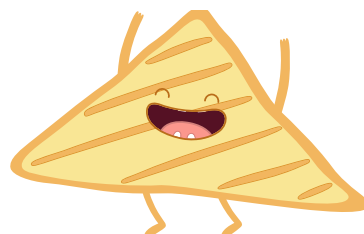
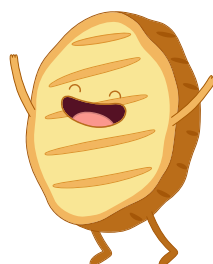
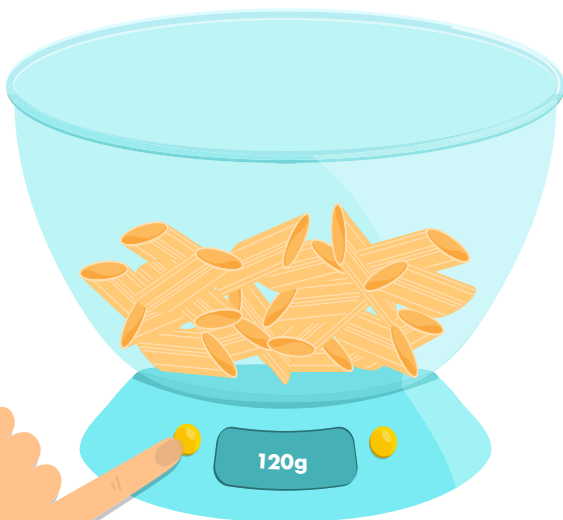
Insulin is needed to bring glucose to the cells. The amount of insulin needed depends on the amount of carbs eaten and it is important to start learning about carbs and counting them from diagnosis. Counting carbs allows for more flexibility with what you eat and allows you to manage your diabetes well.

It is a good idea to keep a diary of the carb content of the foods eaten. This way you can look back on foods/meals which you have counted already.

Tips to help with counting carbs

To make counting carbs as easy as possible we recommend:

- Keep it simple.
- Look at food labels.
- Make a carb awareness list of the foods your child usually eat using the 'Carbs and Cals' book or app and food labels.
- Use a digital weighing scales.
- Talk to your team about suitable websites and apps.



Cooked versus uncooked

- Be careful which figures you look at on label, the cooked or uncooked carbs can be confusing.
- For pasta or rice it is easier to use the cooked values from the 'Carbs and Cals' app rather than the values on the packet, or use the 1g list of cooked foods as follows:

How to read food labels

When working out the carbohydrate in a food you must look at the total carb content on the label – NOT just the sugar content! The label may give you the carb content per 100g and/or per serving size.

Example of a typical food label on a breakfast cereal

Typical values	per 100g	per 30g serving
Energy	1513KJ/359 kcal	454KJ/108 kcal
Fat of which saturates	3.0g 0.5g	1.0g 0.2g
Carbohydrate of which sugars	63.0g 14.0g	19.0g 4.2g
Fibre	15.0g	4.5
Protein	12.0g	3.6

**Total carb!
NOT sugars!!**

Quick Guide

Amount of carbs = $\frac{\text{Carb content per 100g} \times \text{quantity eaten (g)}}{100}$

Step-by-step Guide

Step 1

Ensure scales are set to zero, weigh your food portion:
For this example, your portion of cereal weighs 40g.

Step 2

Work out the carbohydrate in 1 gram of the food:
From the label there is 63g of carbohydrate for every 100g of food.
 $63\text{g}/100 = 0.63\text{g}$ in every 1g of this cereal

Step 3

Work out the carbohydrate content of your portion:
 $40\text{g} \times 0.63\text{g} = 25\text{g}$ of carbohydrate in your portion of cereal.

Carbs per 1g of cooked foods typically eaten in Ireland (check the label)

COOKED FOOD	CARBS PER 1G WEIGHT OF FOOD
Boiled potato	0.15
Mashed potato	0.15
Roast potatoes	0.26
Potato wedges	0.23
Baked potato with skin	0.21
Chips (oven)	0.33

Tagliatelle	0.3
Spaghetti	0.3
Noodles (egg)	0.34
Cous cous	0.22
Pasta	0.33
Rice	0.31
Tinned spaghetti	0.12
Macaroni (boiled)	0.18
Macaroni & cheese	0.12
Lasagne	0.15

Carb Awareness List

Food	Carbohydrate(g)
1 slice of brown sliced pan	15g
100mls milk	5g

Low carb/carb free snacks:

Snacking near main meals can affect appetite and is best avoided. The foods listed here are easy snacks and should not have a big effect on blood sugars.

Useful snacks

Avocado	A very satisfying snack that you can mash up with a bit of salt and pepper, or mix with garlic and chopped tomato to make guacamole.
Beetroot	Fresh, frozen or tinned.
Eggs	Handy snack any time of the day.
Cheese	Mini-cheese portions (30-60g – 1-2oz).
Cherry tomatoes	Bite-sized tomatoes (<i>they go really well with cheese</i>).
Cold meats	Sliced whole meats such as ham or turkey breast (<i>better than processed meat you buy in pre-packed slices</i>). Don't have every day.
Corn	Fresh, frozen or tinned. Corn is an indigestible fibre and so does not need to be counted.
Homemade vegetable soup	A great snack to fill you up. Make sure to add lots of vegetables and legumes such as beans, lentils and chickpeas.
Hummus	Hummus is a healthy dip made from chickpeas. You can buy it in all supermarkets or make your own in different flavours (<i>such as red pepper, or lemon and coriander flavoured and so on</i>). Try hummus with carrots sticks, chopped peppers or celery. Check there is no added sugar.
Nut butters	This is a tasty snack on its own, or as a spread or to eat with vegetable sticks.
Nuts	A handful of plain nuts are a good source of protein, minerals and fibre and considered free. However, larger portions may need to be counted. Check with your dietitian.
Sugar-free jelly	This has no carbs.
Sugar-free squash	This is a drink you dilute with water. You could make your own ice lollies by pouring it into ice pop moulds and freezing.

Healthy snacks containing 10g - 12g of Carbohydrate:

Examples of snacks between meals

Bread	A thin slice of wholegrain bread or toast – combine with an option from the low carb/carb free list for a more substantial snack such as scrambled eggs/omelettes or cheese.
Crackers	Choose wholegrain crackers where possible. To make crackers a more substantial snack, combine with foods from the low carb/carb free snack list such as cheese/vegetable sticks or peanut butter.
Fresh milk	A glass of cow's milk is a quick, handy, healthy snack. 200mls milk = 10g carbs.
Fruit: fresh or tinned (in own juices)	Fresh fruit provides fibre, vitamins and minerals. Fibre slows down the digestion of fresh fruit unlike smoothies and juices.
Popcorn	A bag of popcorn, from a multi-pack contains between 6 and 10g carbs depending on the size - check the label.
Rice cakes	2 large rice cakes are approximately 10g of carbs.
Yoghurt	A natural yoghurt is a great option. Try adding it to raspberries or blueberries. Check labels on all yoghurts for their carb content.



Counting Carbs

part 2

Changes to the Insulin to Carbohydrate Ratio (ICR) should always be discussed with your diabetes team.

Insulin to Carbohydrate Ratio:

Insulin to Carbohydrate Ratio (ICR) is the grams of carbohydrate that 1 unit of insulin covers.

ICR of 1:10 = 1 unit of insulin for every 10g of carbs.

ICR of 1:15 = 1 unit of insulin for every 15g of carbs.

ICR of 1:20 = 1 unit of insulin for every 20g of carbs.

Your diabetes team will calculate your child's ICR for you. It is usual to have a different ICR for different times of the day and this can change regularly.

How do I use the ICR to work out the bolus of insulin needed?

1. How many grams of carbohydrate are going to be eaten?
2. Divide the grams of carbohydrate by the ICR.
3. This is the number of units of insulin needed for this food (also called a 'bolus').

Breakfast



Your ICR at breakfast is 1:10.

(For every 10g of carbohydrate you eat, you need 1 unit of insulin.)

Example

If you eat 50g carbs, you take 5 units of bolus insulin because:
 $50 \div 10 = 5$ units of insulin

Lunch

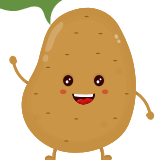


Your ICR at lunch is 1:15.

(For every 15g of carbohydrate you eat, you need 1 unit of insulin.)

If you eat 45g carbs, you take 3 units of bolus insulin because:
 $45 \div 15 = 3$ units of insulin

Dinner



Your ICR at dinner is 1:17g.

(For every 17g of carbohydrate you eat, you need 1 unit of insulin.)

If you eat 60g carbs, you take 3.5 units of bolus insulin because:
 $60 \div 17 = 3.5$ units of insulin.

Changing an Insulin Carbohydrate Ratio (ICR)

Remember the Rule of 2's:

Check glucose 2 hours after meal. If its unchanged or within 2mmol/L, your ratio is correct.



Your insulin to carbohydrate ratio is correct if your blood glucose check two hours after your meal is unchanged or no more than 2 mmols/L higher.

EXAMPLE:

Ratio is 1:15 (1 unit of insulin per 15g carbs)

Blood glucose	Pre-meal	2 hours after meal
Day 1	6.2	8.0
Day 2	7.0	8.7
Day 3	8.1	8.8

1:15 is fine
60g carbs therefore $60/15 = 4$ units insulin

If your blood glucose level is rising by more than 2 mmols/l after your meal then you need to decrease your ratio.

Blood glucose level starts going up 2 hours after meal. Ratio is 1:15

Blood glucose	Pre-meal	2 hours after meal
Day 4	6.2	15.6
Day 5	7.0	14.6
Day 6	8.1	13.7

Change ratio to 1:13 (1 unit insulin per 13g carbs)
60g carbs therefore $60/13 = 4.6$ units insulin = 4.5 units

If all 2 hour post meal blood glucose levels have decreased or you are experiencing hypoglycaemia, you need to increase your ratio.

Blood glucose level starts going down 2 hours after meal. Ratio is 1:15

Blood glucose	Pre-meal	2 hours after meal
Day 7	6.2	4.0
Day 8	7.0	3.4
Day 9	8.1	3.9

Change ratio 1:17 (1 unit of insulin for 17g carbs)
60g carbs therefore $60/17 = 3.5$ units insulin

Special diabetic foods

You do not need to buy special foods to manage diabetes.

Foods labelled 'diabetic products' or 'suitable for diabetics' are not recommended. They are expensive, often high in fat and may contain sweeteners that can cause diarrhoea.

Sucrose is another word for table sugar. When 'sugar free' is shown on a label, it will usually be free of sucrose. However, there may be other sugars present instead and they can cause your blood glucose levels to rise.



Remember 'sugar free' does not mean carbohydrate free.

Examples of sweeteners used in 'diabetic' products:

All of these sweeteners contain carbohydrates and will raise your blood sugar.

Dextrose	Fructose	Glucose	Glucose syrup	Honey
Lactose	Maltodextrose	Maltose	Molasses	Treacle

Artificial sweeteners

Artificial sweeteners are different to the sugars listed above. They add sweetness to a food without affecting blood glucose. Examples include candener and hermesetas. They contribute to a sweet tooth and so are not encouraged every day. They are used in 'Diet' or 'Zero' fizzy drinks and sugar free jelly.



These sweeteners are also commonly found in 'diabetic' products. They contain some carbohydrate and can cause stomach upset while affecting blood sugars.

Isomalt	Lactitol	Maltitol	Polyols	Sorbitol
Xylitol				

You can discuss this further with your dietitian.



11. Food Diary

Using a food diary

A food diary helps you count carbohydrate along with blood glucose and insulin. This will help control the child's blood glucose levels and insulin doses.

1. Try to complete over 3-5 days to help see any patterns with blood glucose levels.
2. Write down all meals, snacks and drinks taken.
3. Write down your child's blood glucose levels before and 2 hours after each meal, along with how much insulin was given.
4. Try to fill in this food diary as you go along, as you might not remember everything later in the day.
5. Bring the completed food diary to your next appointment with the dietitian. This can really help with fine tuning your child's insulin to carb ratios.

Your dietitian will have their own food diary to give and discuss with you.

A sample food diary is shown below:

Day & Date	Time	Blood Glucose	Insulin	Carbs (g)	Food & Fluids	Activity
Mon 16th Jan	8.00am	7.8	4 Novorapid	44g	2x slices Brown bread, (2x 17g carbs) with butter 1 egg (0) carbs 1x 200ml milk (10g carbs)	
	8.45					Walk to school: 15mins
	10:30am	10.9	-	15g	1 medium apple	Yard: 10min

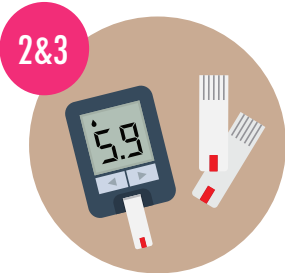


Notes Page





12. Exercise



Exercise

Exercise is a crucial part of managing diabetes. Children and young adults should take at least 60 minutes per day.

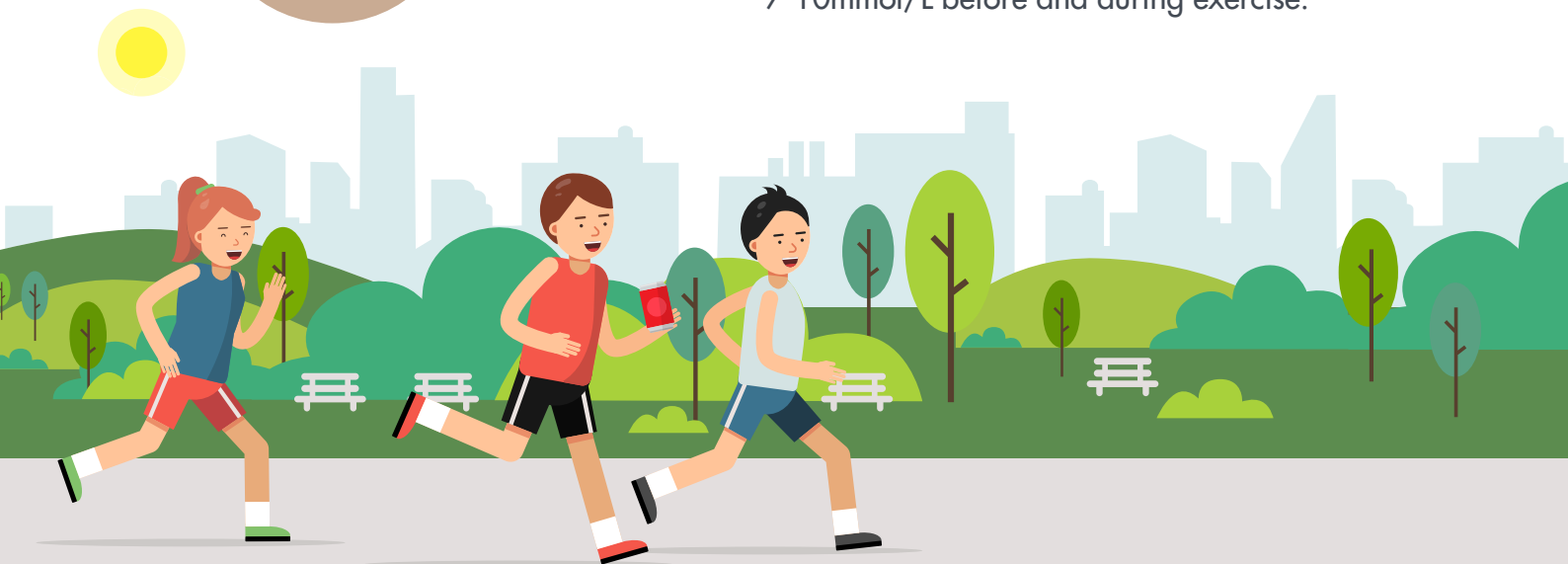
Exercise can lower your child's blood glucose levels and a reduction in insulin and/or extra carbs are often needed. Some activities may increase their blood glucose levels and the team can discuss this with you at a later stage. The diabetes team can discuss how and why exercise affects your child's blood glucose levels and can make individual tailored recommendations.

Important: your child should...

- 1 Always carry fast-acting carbohydrate when doing exercise, for example; dextrose/ glucose tablets/ glucogel/ full sugar drink/ juice.
- 2 Carry their glucose meter and strips with them to all training sessions, matches and other activities.
- 3 Check their blood glucose level before, during and for several hours after exercise. This will show how exercise affects their levels.
- 4 Ensure someone in charge knows they have type 1 diabetes and what to do in case of a hypo.

Aim:

Aim to keep blood glucose levels between 7-10mmol/L before and during exercise.





Planned activity

This can include swimming lessons, dance class or football training. If the exercise is within 2 hours of taking their insulin and food they may need to reduce the dose of insulin taken. Depending on the activity this may be between 25-75% reduction. Extra carbs may also be necessary. Discuss this in detail with your diabetes team.

Unplanned activity:

Your child may decide to go outside and play on a trampoline or kick a ball around. They should take an extra 10-12g snack before they go out. If the child's blood glucose is less than 5.5mmol/L they will need 10-20g carbs before starting exercise. They should take 10-12g carbs extra for every 30 minutes of play.

Take one of the following before doing exercise:

10g- 12g carbohydrate

1 regular yoghurt drink or yoghurt

1 small banana/other 10-12g carb fruit portion

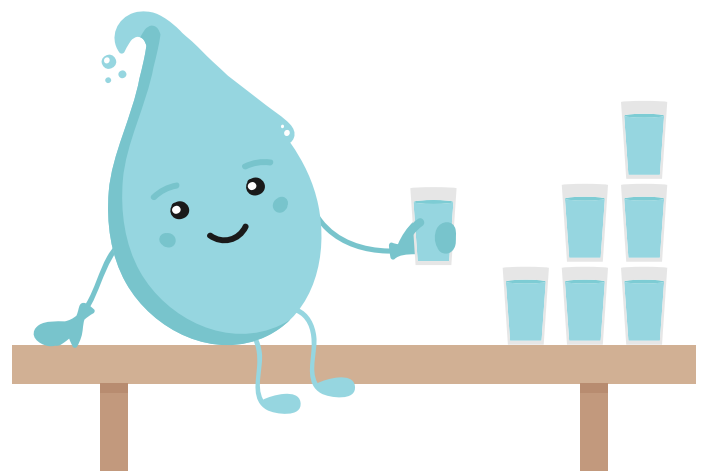
Cereal bar (1 stick of cereal bar)

1 thin slice of bread/toast

Handful of dried fruit/small box of raisins

Glass of milk

Hydration and fluids:



Make sure they drink plenty of fluids before, during and after exercise. If blood glucose levels are high when exercising they will need extra water to stay hydrated.

- Water is the best drink for hydration during sport.
- If they are exercising for longer than 60-90 minutes then a sports drink can be useful to help them get the fluid they need and the extra carbohydrate (*discuss with your diabetes team*).

NOTE: It is not a good idea to do intense exercise if your child's blood glucose is greater than 14mmol/L and ketones are present. The diabetes team will talk to you about this.



13. Parties, Sleepovers & Eating Out

Parties, sleepovers & eating out

Parties are fun for all and the most important thing is to have a good time. Forward planning can help manage blood glucose levels better.

Insulin and party food

Your child can have the party food like everyone else. They might need to reduce the insulin with their meal depending on the level of activity. They should take additional 10-12g carb snacks for the additional exercise (*see exercise sheet*).

Blood glucose levels

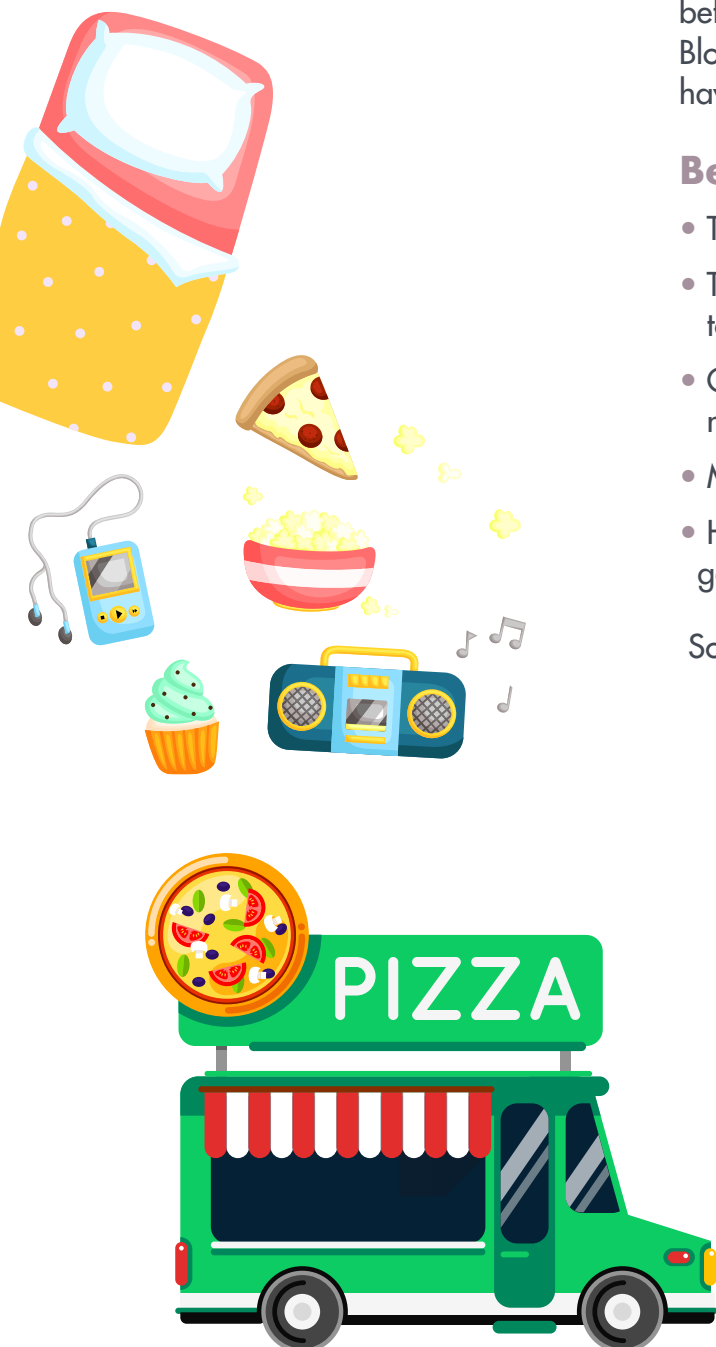
Your child's blood glucose levels will need to be checked before, during and after the party to understand their needs. Blood glucose may drop due to exercise even when they have eaten some birthday cake.

Before the party

- Talk with your nurse/dietitian about a plan for the party
- Talk to the party organisers about diabetes and how to recognise and treat a hypo.
- Give insulin as needed – some adjustments might be necessary.
- Make sure hypo treatments are available at all times
- Have a plan regarding meals and snacks at the party, generally a mix of savoury and sweet foods.

Some foods your child might have at the party...

- *small sandwiches, filled wraps or pitta breads*
- *chopped fresh fruit*
- *popcorn*
- *crisps*
- *nuts*
(whole nuts are a possible choking hazard in children under 5 years)
- *mini sausages*
- *cocktail sausages*
- *pizza slices*



Ideas if you are having the party

For sweet foods, try serving:

- fruit slices and grapes
- sugar-free jelly
- small slices of birthday cake
- madeira buns
- fun-size chocolate bars
- ice-cream

For party bag ideas, you might like to include:

- stickers
- pencils and rubbers
- hair clips or accessories
- colouring books
- crisp packet (*corn snacks from multipack*)

Eating out

When eating out, some people tend to guesstimate the carb content of their meal. Others bring their 'handbag size' scales with them to weigh and calculate the carbs. This is very individual.

Using the 'Carbs and Cals' app is particularly useful when eating out. Enjoying your family meal out in a relaxed environment is the most important thing.

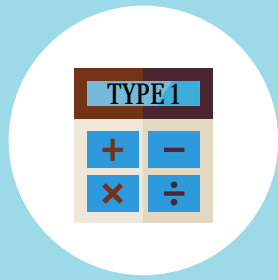
Check online to see if the venue provides nutritional information/carb content of their meals. You could have the carbs counted before you arrive!

Discuss the insulin timing for meals out with your diabetes team.

Annual Events

Have the same house rules for everyone, not just the child with diabetes.








14. Diabetes & School



**Diabetes does not mean
that your child:**

-  **Will miss school**
-  **Be left out from activity**
-  **Will not get on well at school**



Extra information

Managing diabetes at school can be found on the following web site link:

<http://www.into.ie/ROI/ManagingChronicHealthConditionsatSchool/>

PDF download

You can also download this information as a PDF for yourself and the staff of the school. Diabetes Ireland has also developed the following resource:

<https://www.diabetes.ie/living-with-diabetes/child-diabetes/school/>

School Information

It is very important that the child's teacher, school principal and other staff members are informed about diabetes and how to manage it in school.

The school must be provided with the following information:

- Information about the child's daily routine.
- Parents contact details and the details of someone to contact in an emergency.
- The contact details of the diabetes team.
- Glucogel, fast-acting carbs (*glucose tablets or sweet drink*) snack and emergency glucagon kit.

Some guidelines

Parents should arrange a meeting with the teacher, principle and SNA (*if applicable*) to ensure the staff know how to check blood glucose and ketone levels and how to recognise and treat a low blood glucose level. It is important to agree a plan on supervision for blood glucose testing, snacks/lunch and if necessary, insulin administration.

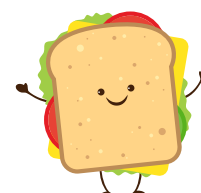
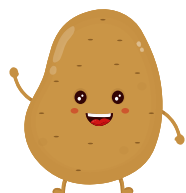
Make sure that the teacher has a clear plan in place for:

- Recognising a low blood glucose and how to treat it.
- Exercise: explain to teachers and staff that your child needs to eat their snacks or lunch and also they will likely need an extra snack before exercise or sport.
- Communication: ask that the teacher gives plenty of notice of sports days or trips away so a plan can be in place for insulin and snacks. Use your child's journal to communicate with the school and encourage the school to use it as well.
- Sick Days: if your child is sick at school, or has repeated low blood glucose levels, ask the teacher to contact you as your child will need to go home.

Ideas for school lunches

Include a wide variety of food types (*starchy foods, protein, dairy, fruit and vegetables*). It is useful to put labels on foods with the grams of carbohydrates written on it.

This will help your child learn about carb counting and also help anyone assisting your child at meal times. Drinks should be either water or milk.



Day	Option 1	Option 2
Monday	1 medium grain bread roll with chicken. A piece of cheese. Chopped carrot sticks.	1 wholegrain bagel with tuna, sweetcorn and mayonnaise. Raspberries or blueberries. A pot of yoghurt.
Tuesday	1 small pitta bread with chicken, peppers and mayonnaise. 6-8 strawberries or grapes. 200mls of milk.	Brown soda bread with cheese. Carrot or celery sticks with hummus.
Wednesday	Whole wheat pasta salad. An apple. 6 cherry tomatoes. 200mls of milk.	1 brown pitta with ham & salad. A banana. A pot of yoghurt.
Thursday	Vegetable soup. 2 slices of wholegrain bread. An apple. 200mls of milk.	1 tortilla wrap with chicken and salad. A satsuma.
Friday	1 wholegrain bap with ham, cheese or salad. A pot of yoghurt. A pear. 200mls of milk.	1 small soft brown roll. Sliced turkey. Blueberries. A pot of yoghurt.



15. Travel

**CONSULT WITH
YOUR NURSE
REGARDING...**

Food

Exercise

Travel
Letter

Insulin dose
adjustment



Travel

It pays to plan ahead - go over any travel plans well in advance of the travel date with your diabetes team to avoid last minute stress.

Before traveling abroad

Consult with your Diabetes Nurse Specialist who can advise on:

- Travel letter for airport staff and back-up prescription.
- Food
- Exercise - your child may be more active while on holiday so extra blood glucose monitoring may be necessary.
- Insulin dose adjustments when away as:
 1. Insulin may be absorbed faster in warm weather.
 2. Insulin doses may need to be adjusted when traveling across time zones.

Consider insurance

Apply for and bring a European Health Insurance Card if traveling in the EU. This is available from the HSE website.

If traveling outside of the EU, consider travel insurance as medical costs may be substantial.

Plan if traveling with an insulin pump

If your child is using an insulin pump, the company may provide a loan of a back up pump for the duration of the holiday. Contact the company early to check their policy.

- Do not put the pump through the conveyor belt x-ray or a body scanner as they have a magnet that may change the settings. The walk through metal detector is ok.
- Bring the contact details for the company in case there are any difficulties with the pump.

If the pump fails and you do not have a loan of a backup pump, your child will need to return to injections. Ensure you have supplies of short and long acting insulin and that you know your child's recent total daily doses and total basal doses. *(The long acting insulin dose is approximately the basal dose and then you use fast acting insulin pens to dose the usual insulin: carb ratio and correction dose when they are eating).* Remember to do extra blood glucose checks and to reduce the doses if they are very active.

Will the glucose meter work?

If you are traveling to a hot or cold environment or at high altitude, the blood glucose meter may be affected. Contact the manufacturer in advance for advice.

What should we bring with us when traveling?

We recommend bringing diabetes supplies in hand luggage, ideally divided in 2 bags (*glucose meter, strips, glucose and ketones, insulin, hypo remedy and glucagon-orange needle*). Store any insulin in a cool pack. Keep insulin out of direct sunlight and store it some place cool once at the destination. Do not put insulin in checked in luggage.

Insulin needs to be kept under 25 degrees. Divide holiday supplies between two people in case bag is mislaid or stolen *(Do not carry all the supplies in one bag.)*

Food for the journey

Carry plenty of snacks and sugar-containing food in case there are delays or food is unavailable on a flight. If starting out early in the day, bring additional snacks. Avoid 'diabetic' meals as they may contain very little carbohydrates.



Check List

- Travel Letter
- Prescription
- Travel Insurance
- European health insurance Card
- Cool Pack
- Extra supplies
- Spare equipment
- Glucogel/Glucagon
- ID (bracelet/necklace)
- Contact number for local clinic
- Contact number for clinic