

diabetes

I N F O R M A T I O N

URGENT DIABETES HELP!

If the student is unconscious, call an ambulance and indicate to the operator that the student has diabetes.

Emergency phone number **111**



International Diabetes Federation

Acknowledgements

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Introduction

The aim of this resource is to answer questions about type 1 diabetes, make school staff and others more comfortable about having a child with this condition in their class. and ensure that the student with diabetes will be safe at school.

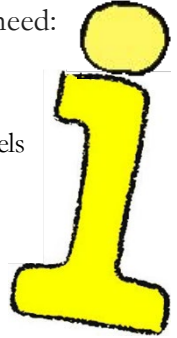
Students with diabetes can do everything their peers do, but, because of their diabetes, they will need:

- Special consideration
- Extra toilet privileges
- Extra consideration if unwell
- Extra supervision
- To eat at additional times, especially with sport
- Special provisions for privacy if testing blood glucose levels and injecting insulin at school is necessary

Duty of Care

Schools have a legal responsibility to provide:

- A safe environment
- Adequate supervision



Where the school knows or ought to know that certain students have type 1 diabetes, additional care must be taken. Staff (**including relief staff**) need to know enough about diabetes to ensure the safety of those students (especially in regard to hypoglycaemia and safety in sport). Parents/guardians have a responsibility to advise the school of their child's medical condition and particular requirements for the management of their child's diabetes. For children with special requirements a written Individual Management Plan incorporating medical recommendations should be developed with the school in association with the parents/guardians and medical practitioner. This should be attached to the student's records.

INTRODUCTION

What is Diabetes?

Diabetes exists when blood glucose builds up to high levels. There is no risk of contracting diabetes from affected individuals.

There are two main types of diabetes:

1. Type 1 diabetes:

This is the form of diabetes which occurs in childhood. Most secondary schools will have one student with diabetes for each 500, whilst primary schools will have one per 1200 (approximately). Type 1 diabetes is due to a severe deficiency of insulin and is fatal without life-long insulin injections. It is an auto-immune disease in which the body's own immune system attacks the pancreas and destroys the body's own insulin producing cells.

Features include:

- Lethargy
- Weight loss
- Increased urination
- Excessive thirst

Without insulin treatment the disease progresses to a life-threatening condition marked by dehydration and a build up of acids in the blood (ketoacidosis).



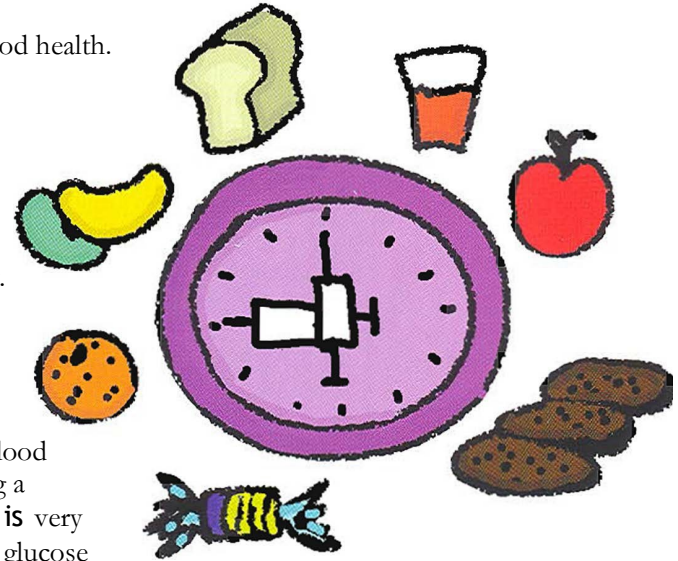
Treatment

Insulin lowers the blood glucose levels and allows a return to good health. Insulin is not a cure - insulin must **NEVER** be omitted

The treatment of diabetes depends on:

- 2 to 4 injections of insulin daily. The dose is adjusted according to blood glucose tests done several times a day.
- a regular pattern of snacks and meals.

The timing of injections and food intake is most important. Carbohydrate foods (bread, fruit, sugar) are essential and raise blood glucose levels while insulin and exercise lower them. Maintaining a balance so the level of glucose is neither too high nor too low **is** very important, but difficult to achieve. Exercising muscles use more glucose for energy and hence extra food needs to be eaten with exercise.



2. Type 2 diabetes

This form of diabetes mainly occurs in adults usually over 40 yrs. However, it is increasingly being seen in children and young people, particularly those who are overweight. It may be accelerated by lifestyle factors (weight, lack of exercise and family/genetic history) and is treated by weight control, sensible eating, exercise, tablets and occasionally insulin injections. However, unlike the childhood form of diabetes, omission of insulin injections will not prove fatal.

WHAT IS DIABETES?

Low Blood Glucose - Hypoglycaemia 'Hypo'

A blood glucose level below 4mmol/L is regarded as being low. The causes of a hypo include

- Too much insulin
- Exercise
- Not enough food (see Food and Diabetes)

Hypoglycaemia may occur at any time, but there is a greater chance of this happening with exercise or before the next meal is due (morning tea, lunch or afternoon tea).

Occasionally, children may develop illnesses which cause nausea and vomiting. Food may then not be absorbed and a low blood glucose will result. Urgent hospitalisation is required to prevent a severe hypo.

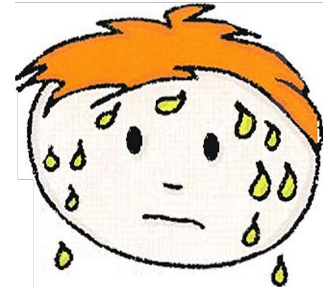
HYPOGLYCAEMIA MAY BE DANGEROUS

Signs of Hypoglycaemia

The signs may progress from mild to severe.

Features of a mild hypo include:

- Sweating, paleness, trembling, hunger, weakness
- Changes in mood and behaviour (e.g. crying, argumentative outbursts, aggressiveness)
- Inability to think straight, lack of coordination



In a moderately severe hypo additional signs develop, including:

- Inability to help oneself
- Glazed expression
- Being disoriented, unaware or seemingly intoxicated
- Inability to drink and swallow
- Headache, abdominal pains or nausea

In a severe hypo, the signs have progressed to include:

- Inability to stand
- Inability to respond to instructions
- Extreme disorientation (may be thrashing about)
- Inability to drink and swallow
- Unconsciousness or seizures (jerking or twitching of face, body or limbs)

Treatment is needed promptly to prevent a mild hypo from progressing to a severe hypo (see next page). If a hypo occurs, treat the hypo as per instructions for 'hypos'.

Blood Glucose Levels and Brain Function

The brain relies on glucose for its energy supply. Thinking, reactions, abstract thought, reflexes and other aspects of brain function deteriorate if the brain is not supplied with enough glucose. This occurs when the blood glucose level is low (see hypoglycaemia). Children who do not have diabetes maintain blood glucose levels between 4-8mmol/L (approx).

As blood glucose levels fall, a series of changes occur:

- Blood glucose 3-4mmol/L - reflexes and reaction times progressively slowdown. Signs of hypoglycaemia become increasingly evident by such changes as paleness, sweating, changes in mood and behaviour, and deteriorating performance generally. Cognitive abnormalities are detectable when blood glucose levels fall below 3.5mmol/L
- Blood glucose <3.0mmol/L - coma or seizures and other signs of severe hypoglycaemia can occur at any time

After an episode of hypoglycaemia, brain function may not return to normal for several hours and, even hours later, students with diabetes may not do as well as expected in school work. Moderately severe hypoglycaemia may cause a prolonged severe headache which will further affect performance.

LOW BLOOD GLUCOSE (Hypoglycaemia) May be dangerous

Treatment Of Mild To Moderate "Hypo"

Hypoglycaemia without symptoms

A blood glucose test may show a result less than 4mmol/L in the absence of hypo symptoms. Urgent treatment is still needed to prevent progression to a severe hypo. Hypos generally occur when the blood glucose falls below 4mmol/L. Mild to moderate hypos can be treated by giving **sugar containing drinks or foods** by mouth. Parents/guardians should provide classroom staff with their child's preferred hypo foods, or an emergency store of sugar containing drinks, or glucose tablets.

The essentials in the treatment of mild to moderate hypos are to:

1. Act swiftly

Sometimes a student will do a blood glucose test at school to confirm a hypo, however, it is important not to waste time. If in doubt, TREAT. Do not leave anyone having a hypo alone or send them away for treatment by themselves. An adult needs to stay with the student at all times to make sure the food or drink is actually consumed and the hypo is successfully treated.

2. Give easily absorbed carbohydrate, any ONE of the following:

- Glucose tablets or glucose gel equivalent to 10-15 grams
- Pre packed cordial drink of 125ml
- Sugar, honey, sweetened condensed milk or jam (2-3 teaspoons)

Repeat this treatment if there has been no response within 10 to 15 minutes.

Note: Often the student may be uncooperative during a hypo and two people may be required to help ensure the student takes the carbohydrate.



3. Follow up by giving extra carbohydrate

When recovery begins to occur (usually within 10 to 15 minutes) give extra carbohydrate foods (e.g. sandwich, biscuits - equivalent to 1 slice of bread or a piece of fruit). For very small children, half this amount is sufficient. These foods will provide a more sustained release of carbohydrates and maintain the blood glucose level in the normal range.

4. Supervision

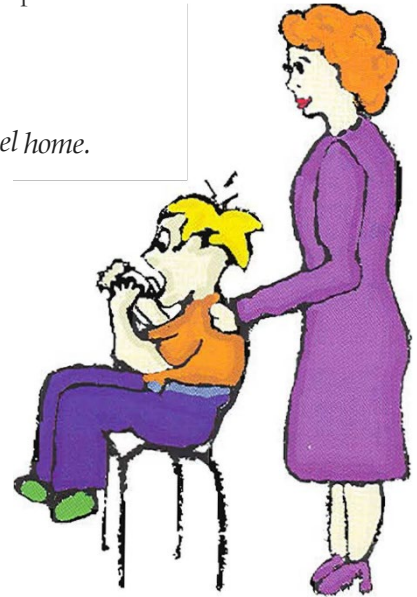
Adult supervision is needed until the student has recovered. If symptoms improve, the student may return to normal activity in approx. 15-30 minutes. If no improvement is apparent in this time, repeat the treatment. If symptoms remain, notify the parents/guardians or the school doctor or transfer to a hospital by ambulance.

5. Recovery

Some children take longer to recover and may not be able to concentrate for up to 30 minutes following the hypo. Headaches are common after hypoglycaemia.

6. Notify parents/guardians

Advise the parents/guardians about the hypo and do not allow unaccompanied travel home.



TREATMENT OF A MILD TO MODERATE 'HYPO'

Treatment Of A Severe 'Hypo'

Never put food or drink in the mouth of a person who is unconscious, convulsing or unable to swallow in case it is inhaled. The only treatment for a severe hypo is either an injection of glucose into the vein (this can only be given by a doctor or a trained paramedic) or an injection of Glucagon given by doctors, paramedics, a school nurse or the parents (see below).

In a severe hypo:

- Lie the student on one side and protect from injury if thrashing about
- If the student is unconscious or having a seizure, perform first aid, checking the **airway breathing and circulation**. (The "ABC" of first aid). Check the mouth is clear to allow unobstructed breathing. Skin colour should remain pale to normal if the student is breathing properly



**CALL AN AMBULANCE AND INFORM
THE OPERATOR THAT THERE IS A
DIABETIC EMERGENCY**



DIAL 111

Glucagon

Glucagon is a hormone which raises the blood glucose within 10 minutes. It needs to be given by injection and its effect lasts for about 1/2 an hour, then giving enough time for the student to take food/drink by mouth. Families will have Glucagon for such emergencies and will know how to give it. It is not essential that staff know how to give Glucagon but those wishing to learn can easily be taught by the parent/guardian of a child with diabetes.

Glucagon is dispensed as a hypo kit which contains a dry powder in an ampoule (1 unit or mg per vial) together with a prefilled syringe containing the liquid (1ml) needed to dissolve the powder. The Glucagon powder dissolves within seconds. It can then be drawn up in the same syringe and injected (preferred site is the middle of the thigh on the side of the leg). If the student is thrashing about two people may be needed to give the Glucagon.

The dose of Glucagon depends on the age of the student:

Under 5 years of age (or under 25kgs) : 1/2 mg (half the contents of the ampoule). Over 5 years of age (or over 25kgs) : 1 mg or a complete ampoule.

Sugar containing drinks or some easily absorbed carbohydrate need to be given slowly as the student recovers in order to prevent a recurrence of a severe hypo. Vomiting is a common side effect of giving Glucagon.



TREATMENT OF *SEVERE* 'HYPO'

High Blood Glucose (Hyperglycaemia)

High blood glucose levels can be caused by:

- Not enough insulin
- Too much food
- Common illness - e.g a cold
- Stress

If the levels are high, the following signs will occur:

- Frequent urination
- Excessive thirst
- Weight loss
- Lethargy
- Change in behaviour (usually irritability)

Staff often become aware of these signs when the student constantly asks for permission to go to the toilet. If this occurs, the parents/guardians should be notified.



Sick Days

If feeling unwell the child should sit quietly with an adult nearby. The parent/guardian should be notified.

- Students with diabetes should never be sent to sick-bay alone or left unattended when feeling unwell
- Vomiting is a danger signal
- Students with diabetes who are unwell, and especially when vomiting, need to be seen by a doctor urgently.
- If parents or guardians are not available, contact the school doctor or transfer by ambulance to hospital

During illness (e.g. influenza, tonsillitis) the body needs more insulin and diabetes control becomes less stable for a period of time. Unless more insulin is taken, not only will blood glucose levels rise, but a life-threatening condition called ketoacidosis can develop.

The signs indicating that ketoacidosis may be developing include:

- Rapid laboured breathing
- Flushed cheeks
- Abdominal pains
- Sweet acetone-smell to the breath
- Vomiting
- Severe dehydration

Hospitalisation is needed urgently. This is often the mode of presentation in a previously undiagnosed student with diabetes.



HIGH BLOOD GLUCOSE (Hyperglycaemia)

Food And Diabetes

The control of diabetes depends on balancing the effects on the blood glucose of:

- Carbohydrate food
- Exercise
- Insulin

Maintaining this balance, so the level of glucose in the blood is neither too high nor too low is very important but difficult to achieve.

A regular intake of food is vital to avoid hypoglycaemia. Permission should be sought from the bus company so that children may be allowed to eat snacks whilst travelling on buses.

Food and Diabetes

The foods recommended for diabetes are based on the same healthy eating practices recommended for all students. For younger children, parents/guardians should provide the school with the right type and amount of food and drink needed by their child.

If any difficulties are noted with meals or snacks, the parents/guardians should be notified.

Meals

Important considerations include:

- Type of food - Food containing carbohydrates must be eaten at each meal.
- Quantities - The amount of carbohydrate foods at each meal is also important and meals should never be skipped.
- Timing of meals - Most children with diabetes require 3 main meals (breakfast, lunch and evening meal) and 3 snacks (morning, afternoon tea and at bedtime). If the interval between meals and snacks is too long, an additional snack may have to be eaten to avoid hypoglycaemia.

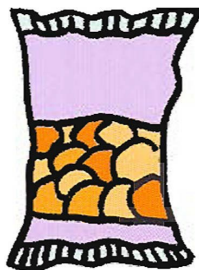
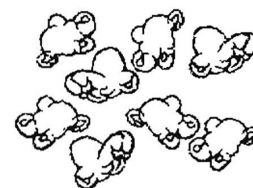
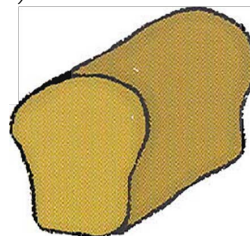
Very young children may require extra supervision at meal and snack times. Most students will have an eating pattern that fits in with regular school routines, avoiding the need to eat regularly in class or at odd times. Students with diabetes cannot delay meal times. If an activity is running overtime, they may need to eat during the activity.



Examples Of Carbohydrate Foods

The following foods are a good source of carbohydrate, which is important for managing blood glucose levels (see also section on carbohydrate under Hypoglycaemia).

- Bread, English muffins, fruit bread
- Pasta, noodles, rice
- Fruit (fresh, canned and dried)
- Baked beans
- Cereals
- Low fat ice-cream/yoghurt
- Biscuits and crackers, pretzels, microwave popcorn, potato crisps



Camps

School Camps

Camps enhance self-esteem, are fun, and promote confidence and independence. Students with diabetes can participate fully in a camp program. Usually students attend camp when they are reliably independent in the care of their diabetes. This includes the ability to:

- Inject insulin
- Do blood glucose tests
- Recognise and treat hypos early
- Understand their food plan
- Understand the need for meals to be on time
- Understand the need for extra food before, during and after physical activity



Parents/guardians need to meet with the organisers well beforehand to discuss any special needs. Occasionally a parent/guardian may be invited to attend the camp if the student with diabetes is not fully independent.

Staff need to know about:

- Food planning (especially the need for carbohydrates with all meals and snacks)
- Prevention of hypos
- Blood glucose testing and insulin treatment
- Recognising and treating hypos (including the availability of Glucagon)
- Sick-days
- When to call for help and any emergency medical evacuation details
- The importance of supper and the need for extra carbohydrate if the bedtime blood glucose level is less than 7mmol/L

In general, the student's friends and room mates should be aware of the diabetes, however, it is **essential** for all members of staff to be aware. The extra exercise at camp increases the risks of hypos. Insulin dosages are usually reduced by 20-30%, however, staff are not expected to be involved with adjusting doses. Carbohydrate foods (e.g. bread) should be served at every meal and snack-time. Meals need to be served at the regular times. Additional carbohydrate foods are needed for exercise and must be readily available where the exercise is taking place (dried fruit is excellent).

Supplies for Camping:

The student with diabetes needs two bottles of each type of insulin, insulin devices (eg. syringes, pens, pumps). Glucagon, blood glucose meter, test strips, urine test strips, hypo foods, contact details of doctor/hospital and a means to keep the insulin cool in hot weather if a refrigerator is not available.

Diabetes Camps

Diabetes Camps for children and teenagers are held annually. Details of times, venues, ages catered for, and costs may be obtained from Diabetes Youth New Zealand or Diabetes Centres. These camps are specifically designed for students with diabetes and are run by staff knowledgeable in diabetes.

School Excursions

Planning is the key to trouble-free school excursions. Details which need to be considered include:

- Timing of meals
- Timing of insulin injections and blood glucose tests
- The need to carry an adequate supply of food (e.g. sandwiches, crackers, biscuits, dried fruit) without relying on being able to purchase food when needed

Buses

Permission should be sought from the bus company so that children may be allowed to eat snacks whilst travelling on buses.

Special Occasions

Students with diabetes should be included in special school parties and celebrations. Foods like sandwiches, pizza, popcorn, fruit and ice-cream are all suitable. Low joule (diet) soft drinks can be provided or brought from home if desired.



Exercise and Diabetes

The student with diabetes should be encouraged to exercise because it:

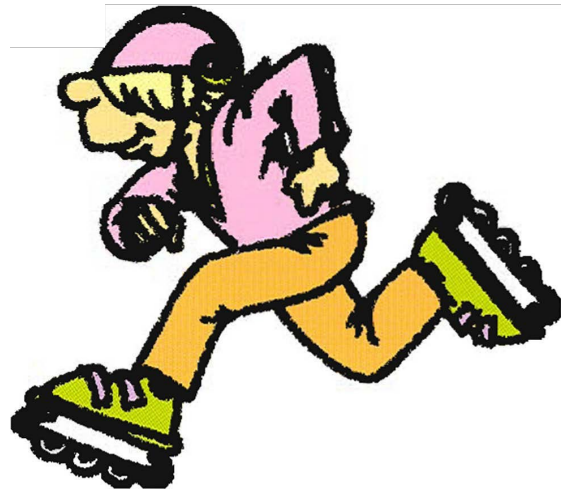
- Improves fitness and wellbeing
- Encourages a lifelong healthy lifestyle
- Builds self-esteem, confidence and teamwork
- Improves the action of insulin and enhances blood glucose control

Exercise and Hypoglycaemia

Exercising muscles use more glucose for energy. This may cause the blood glucose to fall during, immediately after, or, in the case of prolonged or intensive exercise, several hours afterwards. To prevent hypoglycaemia, extra carbohydrate may need to be eaten before exercise begins. If the physical activity is intensive and sustained, extra carbohydrate may be needed for each 1/2 hour of exercise. If the sport has been particularly vigorous or lengthy, extra food may be needed after the sport as well.

Good sources of carbohydrate for sport

- Bread
- Fruit bars/muesli bars
- Fruit
- Low fat milk/yoghurt
- Fruit juice
- Fruit sticks
- Plain biscuits
- Mini chocolate bar



Food for Continuing Exercise

If a student has had a very strenuous day of physical activity e.g. an all day walk or a tennis competition, extra carbohydrate food will also be required after the exercise. This may even be needed before bedtime to avoid a delayed hypo occurring during the night.

Insulin Adjustment and Exercise

Parents should be informed in advance of scheduled intensive exercise. This allows the parent to adjust insulin doses and provide extra food.

Exercise and High Blood Glucose Levels

Exercise is generally not recommended when blood glucose levels are high as it may cause the blood glucose levels to become even more elevated. Parents/guardians will advise the school if physical activity should not be undertaken. (See Hyperglycaemia)

Special Precautions for Exercise

- Food/drinks for the treatment of hypoglycaemia need to be available at the place of physical activity and sport and not at some distance.
- Students with diabetes need additional supervision during exercise. The younger student may also need to have meals supervised especially before physical activity.
- Sports uniforms/clothing should have a pocket to allow a student with diabetes to carry emergency hypo food (e.g. jelly beans).
- Any sport in which a hypo would cause a risk to either the student or someone called upon to help (e.g. abseiling, rock climbing), should be modified or only be considered after careful planning and always occur under strict supervision.
- Water sports need very careful planning and supervision because a hypo increases the risk of drowning and some features of hypoglycaemia may be masked by cooler body temperatures experienced during water-based activity.



Diabetes Treatment at School

Relief Staff

It is important for relief staff to be aware that they have a student with diabetes in their classroom or playground.

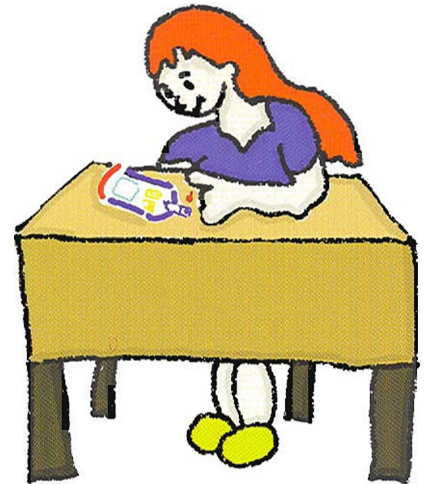
Insulin Injections

Most young students are on two injections per day (before breakfast and before the evening meal) and do not need to inject at school. Older students are frequently on three or four injections per day and may need to have an injection at school. Some children are on an insulin pump. Members of staff are not expected to give insulin or adjust pump settings but may need to help in arranging some privacy for students who need to have their injections at school. Where schools do agree to a request for staff to assist with insulin administration, appropriate training is required.

Blood Glucose Testing

Most students will know how to prick their finger and measure the blood glucose using their own blood glucose meter. Members of staff are not expected to do blood glucose tests, but, if they volunteer, should be properly trained to do the necessary blood glucose tests in line with infection control procedures.

Not all children require blood glucose testing while at school.



Examinations and School Performance

Students perform best at examinations when the blood glucose levels are maintained in target range.

When blood glucose levels are high, there is a need to urinate more frequently. Easy access to toilets needs to be granted.

High blood glucose levels may also affect brain function, but the effects are not as clear cut as with low levels. High levels may be accompanied by an inability to concentrate and mood changes (especially irritability).

High blood glucose levels may impact adversely on other areas of school performance e.g. sport.

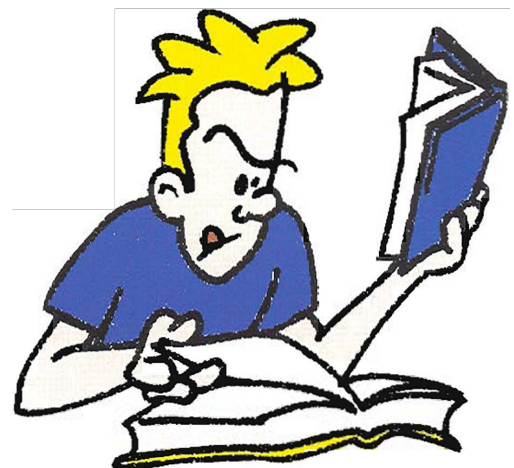
When blood glucose levels are low, the brain is deprived of glucose for energy causing cognitive and other changes - (see Hypoglycaemia).

Blood glucose levels should be measured immediately before important examinations.

Students with diabetes need to be allowed to bring food (not in noisy wrappers) in case of hypos during the test/examination. An allowance of an additional few minutes should be given if a mild hypo has occurred immediately before or during an examination. If a severe hypo occurs, then a claim for a special consideration should be filed straight after the examination.

Special provisions for senior examinations are available for students with diabetes throughout New Zealand. These provisions need to be applied for in writing well before the examination date. *Contact the NZQA Liaison Officer at their school or enquire through their Diabetes Clinic for more details or advice.*

It is advised that students should talk to their school well in advance of exams to ensure appropriate arrangements are made. Also, ensure schools are aware of appropriate NZQA policies should any problems occur.



Family and Type 1 Diabetes

Impact of diabetes on the student and family

Diabetes treatment is lifelong, continuous, painful and frequently frustrating for the individual and the family. The demands of diabetes are relentless and can cause enormous stress on students, their parents or guardians and the rest of the family.

Prior to coming to school, students with diabetes should have:

- Tested their blood glucose level
- Had an injection of insulin before their meal
- Eaten the usual quantity of carbohydrate containing foods

The possibility of developing long-term complications of diabetes (damage to the eyes, kidneys, nerves and arteries) adds to the stresses of the condition. This uncertainty can cause great anxiety and impacts on the day-to-day well-being and the psychological development of the student and family.

It is also important for members of staff to be aware of the emotional stresses faced by the siblings of students with diabetes. Siblings should not be expected to take the responsibility of supervising their brothers/sisters with diabetes at school.



School Attendance and Absenteeism

Students with diabetes are generally no more likely to become unwell with illness or infections than other students. School attendance is therefore largely unaffected apart from routine doctor or clinic visits every few months.

Occasionally, unstable diabetes will lead to hospital admission or more frequent visits to the doctor or clinic for a period of time. It is uncommon for diabetes to be the cause of significant absenteeism.

Diabetes control is commonly less stable during puberty. The changing hormonal patterns are partly responsible. The emotional turmoil of adolescence contributes by making it more difficult to adhere to diabetes routines, treatment and testing schedules.

Boarding Schools

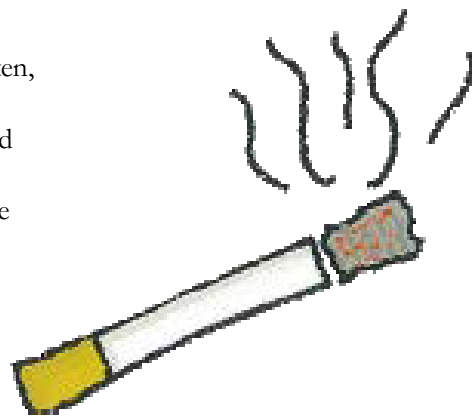
Students with diabetes can attend boarding schools. Parents or guardians need to inform the school administrators, nurse, catering officer and school doctor about the diabetes and any special information concerning the diabetes. An Individual Management Plan needs to be formulated with the staff.

Details of emergency contacts (e.g. diabetes centre, specialist, hospitals) and arrangements for sick days need to be provided before the initial attendance at school. Clear guidelines need to be available. The school nurse should be given Glucagon (and the authority to use it) for an emergency caused by a severe hypo, as well as urine testing materials for use on sick days or a meter which can test for blood ketones.

Alcohol and Diabetes

Adolescents with diabetes are neither more nor less likely to experiment with or use drugs. The most common drugs are tobacco and alcohol. Tobacco is discouraged because it increases risk of damage to the heart, eyes, and nerves. Alcohol predisposes to hypos. The combination of alcohol intoxication and a hypo is very dangerous.

Drugs alter perception, ability to reason, consciousness and sensation. They reduce interest in achieving diabetes control. Diabetes routines may be forgotten, and injection and meal schedules disrupted. Signs of hypoglycaemia may be ignored or misinterpreted. Most drugs reduce appetite and interest in food, and increase the risk of hypos. However, marijuana may stimulate appetite (the 'munchies') with a craving for carbohydrate foods causing a high blood glucose level. Regular drug use, which may be denied by the student, can affect overall blood glucose levels. Such drug use is generally part of other risk-taking behaviours, psychosocial distress, and peer group or family drug usage.



Eating Disorders

The combination of eating disorders (anorexia or bulimia) and diabetes is a dangerous one because of the increased risk of hypoglycaemia. Students with eating disorders are also more prone to omit their insulin injections.

Urgent Diabetes Help

Most diabetes emergencies can be prevented or handled at home, camp or school if help is sought early. If the student is unconscious, call an ambulance and indicate to the operator that the student has diabetes.

Extra information may be obtained from either Diabetes Youth New Zealand or your local hospital's Diabetes Clinics or the student doctor.