Diabetes

# Caring for Children with Diabetes in a Community Program

**Unified Referral and Intake System (URIS)**
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**Manitoba Health ° Manitoba Family Services and Labour ° Manitoba Education**

**This manual was developed in consultation with health care professionals in the areas of endocrinology and community health. The Unified Referral and Intake System (URIS) wishes to acknowledge the contribution of the following individuals.**

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# INTRODUCTION

The Unified Referral and Intake System (URIS) is a joint initiative of the provincial Departments of Health, Families and Education. URIS supports community programs in the care of children with specific health care needs. Community programs that are eligible for URIS support include schools, licensed child care facilities, agencies providing respite services and selected accredited recreation programs.

URIS provides a standard means of classifying the complexity of health care needs and establishes the level of qualification required by personnel to support children with these health care needs. Health care needs that are classified as 'Group B' can be delegated to non-health care personnel who receive training and monitoring by a registered nurse. For children with 'Group B' health needs (e.g. diabetes), the nurse provides the following support:

- develops and maintains a written health care plan;
- provides training to community program personnel that are responsible for the child; and
- monitors community program personnel that receive training.

## URIS Group B Support for Children with Diabetes

A child with diabetes is eligible for URIS Group B support if he/she is diagnosed with type 1 diabetes or type 2 diabetes requiring insulin, due to risk of hypoglycemia.

This document provides standard clinical information that is relevant to the care of children with diabetes in community program settings. Supplemental resources are also provided to assist the nurse in the development of health care plans and training and monitoring of community program personnel.

# CLINICAL INFORMATION

The following information is considered 'best practice' in community program settings for the care of children with type 1 diabetes and type 2 diabetes requiring insulin. This information is the basis for all diabetes information contained in this document and its supplements.

## Diabetes

Diabetes is a disease resulting from a lack of insulin action. Insulin is a hormone produced in the pancreas that the body needs to use food for energy.

The body breaks down food into nutrients that are used to produce energy, build and repair tissue and regulate body functions. Glucose, which is the basic fuel for the cells in the body, comes from foods. Once the body has changed food into glucose, it travels in the bloodstream to the cells. Insulin is needed to transport glucose from the blood into the cells.

## Types

There are two major types of diabetes - type 1 and type 2.

Type 1 diabetes occurs when the pancreas is unable to produce insulin. Therefore, glucose cannot enter the cells and be used for energy. Multiple daily insulin injections are required to enable the body's cells to use glucose. Type 1 diabetes is usually diagnosed in children and young adults. Approximately 10% of people with diabetes have type 1.

Type 2 diabetes occurs when the pancreas does not produce enough insulin or when the body does not effectively use insulin that is produced. It is the most common form of diabetes and usually develops in adulthood, although increasing numbers of children in high-risk populations are being diagnosed with type 2 diabetes.

## Management of Diabetes

Maintaining a proper balance of food, insulin and exercise is essential to the management of diabetes. The timing of insulin injections, blood glucose monitoring, meals/snacks and exercise is important to maintain balance in blood glucose levels. Food increases the amount of glucose in the blood while insulin and exercise decrease the amount of glucose in the blood by allowing the glucose to be used by the body's cells. For children with type 1 and type 2 diabetes, healthy eating, physical activity, blood glucose monitoring and taking medication is important.

## Food

Food (carbohydrate) intake is balanced with the child's insulin regimen. For some children, their management plan mandates a fixed amount of carbohydrates while other children may vary their carbohydrate intake. In most situations, children with diabetes

can eat their snacks/meals at typical break times (e.g. recess, lunchtime). It is easier to remember to eat when others eat.

It is the responsibility of the parent/guardian to provide meals and snacks for their child. The community program does not need to know the details of the child's meal plan but it is important to understand the following principles:

- Eating the same amount of food (carbohydrate content) each day;
- Eating meals and snacks at the same time each day; and
- No trading or disposing of food.

Young children may require supervision to ensure that they eat the food that has been provided for them. Missing a meal/snack or eating less than planned may result in hypoglycemia which requires immediate treatment. If a child will not eat or finish the food provided for them, the community program personnel should attempt to understand the reason. The child may not like or want the food, the child may be ill, or the child may be experiencing hypoglycemia. Community program personnel should also advise the parent/guardian if the child is giving food away or accepting food from others. Eating too much or too little carbohydrates or eating at the wrong times can affect their blood glucose.

Children with diabetes can eat many of the foods that most children love, including sweets and candy. However, it is important to notify the parent/guardian prior to events that involve food so they can plan accordingly.

## Exercise

Regular exercise is important and can help the body in lowering blood glucose.
For children who participate in vigorous physical activity, good planning is essential to ensure their blood glucose does not go too low. Some children may have a pre-planned snack that is eaten before exercise to prevent hypoglycemia. It is the responsibility of the parent/guardian to provide required snack(s) and indicate when they need to be eaten. It is critical that community program personnel, especially physical education teachers and coaches, are familiar with the symptoms, treatment and prevention of hypoglycemia.

A child with diabetes should not participate in physical activity if their blood glucose is less than 4 mmol/L (hypoglycemic range).

## Special Events

The major risk of unplanned vigorous activity is hypoglycemia. The parent/guardian should receive adequate notice about events such as track and field days or field trips that may involve extra physical activity so they can plan accordingly (e.g. provide extra snacks, adjust timing of meals/snacks, adjust insulin dose). There should be a supply of fast acting sugars available on excursions outside the facility and sports events to treat hypoglycemia.

## Insulin

Children with type 1 diabetes require insulin injections multiple times a day. Children with type 2 diabetes may require insulin to manage blood glucose or oral medication (antihyperglycemics) that enhances insulin sensitivity in the liver and tissues, lowers glucose produced by the liver or assists the body in making or using insulin more effectively.

Most insulin injections are administered at home. Diabetes Education Resource for Children and Adolescents (DER-CA) works with families to facilitate the scheduling of insulin injections when the child is at home with their family. If a child requires insulin injections during attendance at the community program, it is the responsibility of the child and/or parent/guardian. Community program personnel are not responsible for giving insulin.

An insulin pump, insulin pen or needle and syringe are methods in which insulin can be administered. With each of these mechanisms, insulin is injected into the fatty tissue underneath the skin so that it can be absorbed and used by the body.

- An insulin syringe is small and has a fine needle with special coating so the injection is as painless as possible.
- An insulin pen looks similar to a slightly oversized writing pen. A cartridge inside the pen holds insulin and a short needle is attached to the end of the pen to inject the insulin.
- An insulin pump is about the size of a small cellphone and is connected to a thin tube inserted under the skin that delivers insulin continuously.

It is recommended to use a sharps container for disposal of used needles and lancets. Sharps containers can be obtained, free of charge, from pharmacies. Used sharps containers can be returned to the pharmacy for safe disposal.

## Blood Glucose Monitoring

Children with diabetes need their blood glucose monitored on a daily basis. Blood glucose monitoring is recommended at routine times including before meals and before bedtime. It may also be done before exercise, boarding the bus and /or when the child is experiencing symptoms of hypoglycemia or hyperglycemia.

A blood glucose meter is used to test blood glucose levels. The finger is pricked with a spring-loaded device and a drop of blood is applied to the test strip. The meter analyzes the drop of blood and reports the blood glucose level, usually in less than one minute. Adjustments to insulin and diet are made to keep blood glucose levels within the desired range. The optimal pre-meal range for blood glucose levels for children with diabetes is 4-8 mmol/L. For children and adolescents that have had severe or excessive hypoglycemia or have hypoglycemia unawareness, 6.0–10.0 mmol/L can be considered.

Most older children and adolescents perform blood glucose monitoring independently. Younger children and children with special needs may require supervision or assistance when performing blood glucose monitoring.

A child's blood glucose monitor and lancing device should never be used on another person. Blood-borne infections can be transmitted on the lancing device's end cap. It is recommended that lancets are used once and then discarded safely in a sharps disposal container.

Procedure for Blood Glucose Monitoring

1. Wash your hands.
2. Ensure that child washes their hands or clean child's finger with an alcohol wipe.
3. Insert a test strip into the blood glucose monitor's test port. Most monitors will turn on automatically when this function is performed.
4. Prepare the lancing device by inserting a new, sterile lancet into the lancing device firmly until it is in place and removing the protective cap from the lancet's end.
5. Adjust the lancing device's puncture depth setting for a shallower or deeper puncture setting as indicated in the child's health care plan.
6. Hold the lancing device firmly against the child's finger and press the release button, ejecting the lancet from the device and allowing it to puncture the fingertip.
7. Squeeze the sides of the child's fingertip just gently enough to bring a round drop of blood to the surface.
8. Touch the drop of blood to the test strip.
9. Record the blood glucose test result.
10. Discard the used lancet and test strip safely.

Responding to Blood Glucose Test Results

If blood glucose is less than 4 mmol/L prior to meal (e.g. lunch)

1. Have the child eat a fast acting sugar (15 grams of carbohydrates)
2. Have the child eat meal.
3. Wait 15 minutes and check blood glucose again. If blood glucose is less than 4 mmol/L, implement procedure for hypoglycemia (see page 9).

If the child's blood glucose is less than 4 mmol/L prior to exercise

1. Have the child eat a fast acting sugar (15 grams of carbohydrates).
2. Wait 15 minutes and check blood glucose again.
    - If blood glucose is less than 4 mmol/L, implement procedure for hypoglycemia (see page 9).

- If blood glucose is 4 mmol/L or higher, child can participate in physical activity.

The child should NOT participate in physical activity when blood glucose is less than 4 mmol/L.

## Interstitial Glucose Monitoring

Interstitial glucose monitors use a sensor that is inserted under the skin to continuously evaluate the amount of glucose in the interstitial fluid.

### Continuous Glucose Monitoring (CGM)

Continuous glucose monitors (e.g. ExCom) transmit the glucose value to an electronic receiver that is worn by the individual. The CGM has alarms that sound when glucose levels are trending high or low. The CGM is useful in interpreting trends in glucose levels and offering insight on the direction that the blood glucose may be moving (i.e. increasing or decreasing) without having to continuously perform blood glucose monitoring via finger pokes.

### Flash Glucose Monitors

Flash Glucose Monitors (e.g. Freestyle Libre) use a scanning device to get a glucose value from the sensor worn by the individual. Flash Glucose Monitors do NOT have alarms to alert if the glucose is trending high or low. Flash monitors have a graph that shows the last 8 hours of data. The current glucose reading with trend arrow appears on the monitor once a scan is done**.**

DER-CA supports the family's choice to use interstitial glucose monitors as a tool to assist them in managing their child's diabetes. Interstitial glucose monitors should not be used as the sole method of monitoring glucose levels and/or for making treatment decisions.

### Recommendations regarding the use of interstitial glucose monitors in community program settings

1. In general, interstitial glucose monitor readings should be used to monitor glucose levels ONLY when blood glucose monitoring is not expected. If a child has an interstitial glucose monitor, blood glucose monitoring via finger poke is still recommended in the following situations.
    - As indicated in the child's health care plan (e.g. before meal). It is safe and acceptable for the child to use their interstitial glucose monitor to check glucose levels before a meal.
    - If the interstitial glucose monitor is stating a glucose level in the "low" range, a blood glucose reading is necessary to confirm the blood glucose level. However, it is safe and acceptable to give the child a fast acting sugar if the interstitial glucose monitor shows a glucose reading that is <4 mmol/L . It is

recommended to perform a blood glucose reading before giving the child a 2nd or 3rd fast acting sugar.
    - To calibrate the interstitial glucose monitor and enhance its accuracy.
    - When the child has signs and symptoms that do not match the glucose reading on the interstitial glucose monitor.
2. Pre-planned snacks should always be consumed by the child regardless of the interstitial glucose monitor reading.
3. Community program staff is not expected to respond to CGM alarms and/or observe for trends in glucose levels (e.g. increasing or decreasing) throughout the child's attendance at the community program. Community program staff will continue to respond to signs and symptoms of hypoglycemia and hyperglycemia as outlined in this document.
4. When the child is able to respond independently and appropriately to interstitial glucose monitor readings, it may be used to observe trends in glucose levels and assist the child in proactively managing their diabetes. The use of interstitial glucose readings is at the discretion of the parent/guardian but should be done only when they are confident in its accuracy. When the child is independent, the health care plan should include a statement that the child has an interstitial glucose monitor and is independent in managing it. Details on how to respond to interstitial glucose monitor readings is not required as community program staff will not be assisting child to respond to such readings.
5. When the child is <u>not</u> able to independently monitor and comprehend interstitial glucose monitor readings, community program staff may observe and respond to interstitial glucose monitor readings in three situations including before lunch, before physical exercise and before getting on the school bus. The use of interstitial glucose values in these situations <u>may</u> be included in the child's health care plan if agreed upon by the parent/guardian and community program. When the interstitial glucose reading is observed (e.g. before gym, before recess, before getting on the bus), the interventions should be specified in the health care plan. The *Interstitial Glucose Monitoring* template has been developed for this purpose and is included as a supplement to this document. When completing the *Interstitial Glucose Monitoring* template, the following points should be considered:
    - Interstitial glucose monitor readings and related interventions prior to gym/recess and getting on the school bus should be addressed separately as they may vary depending on child specific factors (e.g. amount of exercise, length of bus trip).
    - It is acceptable to include a range (e.g. 6-10 mmol/L) or a specific number (e.g. 8 mmol/L) for interstitial glucose monitor readings in the child's health care plan

- The interstitial glucose monitor readings provided below are recommended guidelines that may be adjusted based on child specific needs.

| **Interstitial glucose reading** | **Intervention** |
|---|---|
| ≥ 6 mmol/L and rising (arrow is pointing upward) | None |
| ≥ 6 mmol/L and stable (arrow is NOT point upward or downward) | None |
| 6-10 mmol/L and falling (arrow is pointing downward) | Give child a preventative fast acting sugar (except lunch) |
| 4-6 mmol/L regardless of where arrow is pointing | Give child a preventative fast acting sugar. Child can participate in physical activity. |

6. The use of the interstitial glucose monitors should cause little or no interference in the community program setting (e.g. classroom learning) for the child with diabetes as well as other children. When a child is independent, the use of the CGM's vibrate feature is recommended to prevent disruption to other children. When the child is not independent, it is recommended to silence the alarms or use the vibrate feature. Even if the interstitial glucose readings are not closely monitored throughout the day, it can still provide valuable retrospective information about glucose patterns for the parent/guardian.

## Illness

Children with diabetes are no more susceptible to infection or illness than other children. However, when a child with diabetes becomes ill with normal childhood illness (e.g. viral cold, flu), their blood glucose may be affected. Vomiting and the inability to retain food and fluids are serious as they may result in hypoglycemia. The parent/guardian should be notified when the child becomes ill. Management of the child's illness and its effect on the child's blood glucose is not the responsibility of the community program.

Responding to illness

1. Contact the child's parent/guardian.
2. Check blood glucose, if monitor is available.
3. If blood glucose is less than 4 mmol/L, follow procedures for responding for responding to hypoglycemia (see page 9).
4. If child is vomiting AND parent/guardian or alternate emergency contact cannot be reached, call 911/EMS.

## Hypoglycemia

Hypoglycemia occurs when the blood glucose is less than 4 mmol/L. It can happen within minutes of a child appearing healthy and normal. Most school-age children can tell when their blood glucose is low. Very young children may not be aware of the symptoms of hypoglycemia or cannot communicate that they are feeling "low". It cannot be assumed that any child will inform community program personnel when they are experiencing hypoglycemia. Therefore it is important for community program personnel to be able to recognize the symptoms of hypoglycemia and respond appropriately.

Hypoglycemia can be caused by:

- not eating enough food or not eating on time;
- missing or delaying a meal;
- more physical activity than usual; and
- taking too much insulin.

Symptoms of hypoglycemia

- Cold, clammy or sweaty skin
- Shakiness, lack of coordination
- Irritable, hostile, poor behavior
- Tired
- Sudden moodiness or behavior change
- Difficulty concentrating, confusion
- Staggering gait
- Child may complain of
  - nervousness
  - excessive hunger
  - headache
  - blurred vision
  - dizziness
  - abdominal pain or nausea
- Fainting, unconsciousness

Responding to Hypoglycemia

1. Check interstitial or blood glucose, if monitor is available and time permits.
2. If blood glucose is less than 4 mmol/L and/or child is showing signs of hypoglycemia, have the child eat a fast acting sugar (e.g. 15 grams of carbohydrates).
3. Wait 15 minutes and check blood glucose, if monitor is available. If blood glucose is less than 4 mmol/L and/or the child is still showing signs of hypoglycemia, have them eat a second fast acting sugar.

4. Wait 15 minutes and check blood glucose, if monitor is available. If blood glucose is less than 4 mmol/L and/or the child is still showing signs of hypoglycemia, have them eat a third fast acting sugar and call the parent/guardian.
5. If unable to contact the parent/guardian or alternate emergency contact, call 911/EMS. The child may have a fast acting sugar every 15 minutes until EMS arrive if the child's blood glucose is less than 4 mmol/L and/or the child is still showing signs of hypoglycemia.
6. When the blood glucose is over 4 mmol/L but the next meal or snack is one hour or more away, the child should eat an extra carbohydrate snack with protein. The amount of carbohydrates will depend on the child's age and weight. It is the responsibility of the parent/guardian to provide these snacks.

- IF IN DOUBT, TREAT! If you suspect the child is experiencing hypoglycemia, give them a fast acting sugar. The temporary excess of sugar will not harm the child but hypoglycemia is potentially serious.
- It is recommended that the child's supply of fast acting sugars is readily accessible.
- It is the responsibility of the parent/guardian to provide fast acting sugars for their child. However, if the child's supply of fast-acting sugars is not available, the child should be given 15 grams of carbohydrates. Examples of 15 grams of carbohydrates include:
    - ½ cup of juice or regular soft drink;
    - 3 teaspoons or 3 packets of table sugar dissolved in water;
    - 1 tablespoon of honey;
    - 2 rolls of Rockets; and
    - 15 Skittles.
- Fifteen grams of carbohydrates is a safe and acceptable treatment for mild to moderate hypoglycemia in all children regardless of the child's weight. However, 5 or 10 grams of carbohydrate may be used as an option to treat mild to moderate hypoglycemia in smaller children (e.g. 10 grams if child is less than 30 kg or 5 grams if child is less than 15 kg). These weights are guidelines and may be adjusted to address the needs of a specific child. If the child's fast acting sugar is less than 15 grams and their supply is depleted or not available at the community program, the child may be given 15 grams of carbohydrates when treating hypoglycemia.
- The child should not be left alone when hypoglycemia is suspected.
- Do not leave the child alone for at least 30 minutes after the treatment of hypoglycemia. Once the child has fully recovered, they can resume regular activity. Parent/guardian should be notified of all incidents of hypoglycemia. Repeated low blood glucose levels are undesirable and unnecessary and should be drawn to the attention of the parent/guardian so they can make necessary adjustments to insulin doses and/or discuss it with their doctor.

- If a child has been treated for hypoglycemia just prior to a meal or snack, they should still eat all the food provided for the meal/snack.
- It is recommended that children with diabetes wear medical identification.

Severe Hypoglycemia

If the child's blood glucose drops very low, the child can progress to a more severe state including seizures and/or unconsciousness which is an emergency situation.

Glucagon is used for the treatment of severe hypoglycemia when the child's blood glucose is less than 4 mmol/L and the child is unconscious, having a seizure or unable/unwilling to swallow when told. Glucagon is a hormone that activates the liver to increase the blood glucose level. Glucagon can be administered by injection (intramuscular) or in the nose (intranasal).

Community program personnel cannot administer glucagon by injection. The parent/guardian may request the community program to store intramuscular glucagon on-site so it is readily available for themselves or a delegated person to administer. Community program personnel should be aware of its location.

Community program staff can administer glucagon in the nose. Baqsimi™ Glucagon Nasal Powder is a dry nasal spray that is absorbed through the nose. It does not need to be inhaled. Baqsimi™ contains 1 dose (3 mg) of glucagon and is for nasal use only. It can be administered into one nostril. It is stored in a shrink wrapped tube and should not be opened until you are ready to use it. If the tube has been opened, Baqsimi™ could be exposed to moisture which can cause it to not work as expected. It can be stored at temperatures up to 30 degrees Celsius. Baqsimi™ has an expiration date on the outside of the tube and should be replaced when expired. It is safe to use an expired Baqsimi™ but it may not be effective. Baqsimi™ will work even if you have a cold or are taking cold medication. It should be stored in a secure and accessible location so it can be available when needed. Community program personnel should be aware of its location.

Common side effects of Baqsimi™ includes nausea, vomiting, headache, runny nose, discomfort in the nose, stuffy nose, redness or watering in the eyes and itchy nose, throat and eyes.

How to use Baqsimi™

1. Remove the shrink wrap by pulling on the red stripe.
2. Open the lid and remove the device from the tube.
3. Hold the device between fingers and thumb. Do not push the plunger yet.
4. Insert the tip gently into one nostril until your fingers touch the outside of the nose.
5. Push the plunger firmly all the way in. The dose is complete when the green line disappears.

6. Discard the device and tube or give to EMS personnel.

Go to https://www.baqsimi.com/how-to-use-baqsimi to watch a video on how to use BAQSIMI™

The *Intranasal Glucagon* template is included as a supplement to this document and should be included in the child's health care plan if the child has Baqsimi™ available at the community program.

Responding to severe hypoglycemia

1. Place the child on the floor in a side-lying position.
2. Administer BAQSIMI™ if available
3. Call 911/EMS.
4. Notify the child's parent/guardian.
5. If the child is still experiencing signs of severe hypoglycemia after 15 minutes, a second dose of BAQSIMI™ may be given, if available.
6. Stay with the child until EMS personnel arrive.

- Do not give food/fluids if the child is unconscious, having a seizure or is unable to swallow. The use of Cake Mate® icing gel when a child is having a seizure or is unconscious is not recommended in the community program setting.
- Do NOT leave the child alone.
- When a child is experiencing severe hypoglycemia, calling 911/EMS and notifying parent/guardian is safe and acceptable regardless of the response time of emergency personnel.

**Hyperglycemia**

Hyperglycemia occurs when blood glucose is higher than the child's target range. Hyperglycemia is usually not an emergency situation and does not require immediate treatment.

Repeated high blood glucose is undesirable and should be drawn to the attention of the parent/guardian so they can make necessary adjustments and/or discuss it with their doctor. If left untreated or improperly managed, high blood glucose associated with diabetes can result in a variety of long-term complications including heart disease, blindness, kidney disease, impotence and amputation.

Hyperglycemia often develops as a result of one or more the following:

- too little insulin;
- too much food;
- less than the usual amount of activity;
- illness; and

- stress.

Symptoms of hyperglycemia
- increased thirst
- tiredness
- urinating more often

Responding to Hyperglycemia
1. Check blood glucose, if monitor is available.
2. Contact the child's parent/guardian if blood glucose is above the level (mmol/L) indicated in the child's health care plan.

It is recommended to contact the parent/guardian if the blood glucose is above 14.0 mmol/L, the child is showing symptoms of hyperglycemia and/or is feeling unwell. However, an acceptable range for contacting the parent/guardian is 12-20 mmol/L. The child and/or parent/guardian may make changes to the child's routine to correct hyperglycemia, including drinking water, checking for ketones and taking additional insulin. Community program staff should not provide direction on how to reduce the child's blood glucose level (e.g. instruct child to engage in physical exercise to lower their blood glucose). These decisions are the responsibility of the parent/guardian and/or child.

A child with diabetes must be allowed free access to water and a restroom.

**Insulin Pump**

An insulin pump is a small, battery-powered microcomputer, about the size of a small cellphone. It is worn clipped to a belt or waistband, in a pouch or pocket, or attached directly to the body. It delivers insulin into the body via an infusion set or pod. Most infusion sets include a thin plastic tube ending in a small, flexible plastic cannula, which is inserted beneath the skin, usually in the abdomen. The infusion set or pod is changed every two to three days and inserted in a new location. The pump can be disconnected from the infusion set for short periods of time for swimming, bathing, showering or exercising. Some insulin pumps are waterproof.

Fast acting insulin is delivered through the infusion set in two ways.
- Basal: A small amount of insulin is delivered continuously to keep the blood g;ucose level in the target range between meals and during the night. The pump can be programmed to deliver different rates of basal insulin throughout a 24-hour period.
- Bolus: A burst of insulin delivered over a short period of time. A bolus dose is given with every meal and snack. A correction bolus dose may also be given for hyperglycemia.

The child and/or parent/guardian are responsible for the operation of the insulin pump. If any concerns arise regarding the pump during the child's attendance at the community program, the parent/guardian should be contacted. It is recommended that an extra infusion set, extra batteries, an alternate source of insulin (e.g. insulin pen, needle and syringe) are kept at the community program in the event the infusion set and/or pump malfunctions.

For children with an insulin pump, the daily management of diabetes (i.e. plans for meals/snacks, exercise, blood glucose monitoring, responding to hypoglycemia, hyperglycemia and illness) is the same as for children using other forms of insulin administration. However, a child with a pump is at higher risk of developing diabetic ketoacidosis (DKA) more quickly as they receive fast acting insulin only.

## Diabetic Ketoacidosis (DKA)

Diabetic ketoacidosis (DKA) involves a combination of hyperglycemia, acidosis and ketones in the blood. It usually takes many hours to days to develop, but can happen within hours in children using an insulin pump. When insulin is administered via an insulin pump, more frequent ketone testing is recommended.

### For children that do not have an insulin pump

Ketone testing may be included in the health care plan if requested by the parent/guardian for the following situations.

- Child appears or feels ill. A child may become ill as a result of diabetic ketoacidosis (DKA) or from common childhood illness, which can also affect blood glucose levels.
- Parent/guardian requests ketone testing because DKA may be suspected.

### For children with an insulin pump

Ketone testing is recommended and equipment/supplies for ketone testing should be available during attendance at the community program. Ketone testing is recommended in the following situations.

- Blood glucose is greater than 14.0 mmol/L prior to a meal (e.g. lunch)
- Infusion set/pod becomes dislodged, pump malfunctions and/or pump is not available.
- Child appears or feels ill.
- Parent/guardian requests ketone testing because DKA may be suspected.

### Procedure for Urine Ketone Test

1. Dip the test end of the strip into fresh urine.
2. Remove the strip from the urine and wait 15 seconds.
3. Compare the color on the strip with the color chart on the bottle.
4. Record ketone test result.

5. Discard test strip safely.

- Keep test strips in a cool, dry place. Do not store in the refrigerator.
- Do not touch the test area of the strip or allow it to touch the table.
- Do not remove desiccant (white packet in bottle). Replace the bottle cap promptly and tightly.
- Check the expiration date on your test strips. Do not use if the test strips are expired. Use the strips within 6 months after first opening the bottle.
- Do not use test strips that have discolored.

Procedure for Blood Ketone Test

1. Wash your hands.
2. Ensure that child washes their hands or clean child's finger with an alcohol wipe.
3. Insert a ketone test strip into the monitor's test port. Most monitors will turn on automatically when this function is performed.
4. Prepare the lancing device by inserting a new lancet into the lancing device firmly until it is in place and removing the protective cap from the lancet's end.
5. Adjust the lancing device's puncture depth setting for a shallower or deeper puncture setting as indicated in the child's health care plan.
6. Hold the lancing device firmly against the child's finger and press the release button, ejecting the lancet from the device and allowing it to puncture the fingertip.
7. Squeeze the sides of the child's fingertip just gently enough to bring a round drop of blood to the surface.
8. Touch the drop of blood to the narrow channel at the top of the test strip.
9. Record ketone test result.
10. Discard test strip safely.

When child feels or appears ill

1. Contact parent/guardian.
2. Check blood glucose level.
3. **If blood glucose is greater than 14.0 mmol/L.**
    a) Perform test for ketones.
    b) Contact parent/guardian if the child has small, medium or high ketone levels (i.e. urine strip is any shade of purple, blood test result is more than 0.6 mmol/L).

c) If unable to contact parent/guardian or emergency contact and the child is vomiting, call 911/EMS. If the child is not vomiting but you are unable to contact the parent/guardian within 2 hours, call 911/EMS.

**If blood glucose is less than 4.0 mmol/L,** treat for hypoglycemia.

When blood glucose is greater than 14.0 mmol/L prior to eating meal (for child with pump only)

1. Perform test for ketones (e.g. urine, blood).
2. Call parent/guardian if child has small, medium or high ketone levels (i.e., urine strip is any shade of pink/purple, blood test result is more than 0.6 mmol/L).
3. If unable to contact parent/guardian or alternate emergency contact within 2 hours, call 911/EMS.

When infusion set/pod becomes dislodged, pump malfunctions and/or pump is not available

It is recommended that the child re-establish the infusion set/pod and administer insulin by injection, if they are able.

1. Check blood glucose.
2. If blood glucose is **greater than 14.0 mmol/L**:
   a) Perform test for ketones
   b) Contact parent/guardian if the child has small, medium or high ketone levels (i.e. urine strip is any shade of pink/purple, blood test result is more than 0.6 mmol/L).
   c) If unable to contact parent/guardian or alternate emergency contact and the child is vomiting, call 911/EMS. If the child is not vomiting but you are unable to contact the parent/guardian within 2 hours, call 911/EMS.

If blood glucose is **14.0 mmol/l or less:**

a) Call parent/guardian.
b) If unable to contact parent/guardian or alternate emergency contact within two hours, call 911/EMS.

# HEALTH CARE PLAN

When a community program receives URIS Group B support for children with URIS 'Group B' health care needs, a written health care plan is developed and maintained by a registered nurse on an annual basis, minimally. The development and implementation of the health care plan should reflect the principles of inclusion and independence. From a practical standpoint, these principles mean:

- A child with diabetes is foremost a child within a family, child-care facility, classroom or other community program.
- The environment should be changed to support the child, not the child changed to suit the environment.
- Interventions should be as non-intrusive as possible and be delivered in a manner that respects the child's dignity and privacy as well as the normal routines and patterns of the community program.
- The parent/guardian and child have rights and obligations and should be actively encouraged to participate in decisions affecting themselves and their children.

The diabetes health care plan incorporates standard responses for the management of diabetes (e.g. hypoglycemia, hyperglycemia, illness) and child specific information. It is developed in consultation with the parent/guardian and community program. For some children, the management of their diabetes within the community program may be complex and require consultation with health care professionals that are involved in the management of the child's diabetes.

The health care plan should be kept in a location that is secure and accessible at the community program. All community program personnel that may be responsible for a child with diabetes should be aware of the location of child's health care plan. It should also accompany the child on excursions outside the facility.

**Content**

When a child with diabetes attends the community program, the health care plan includes the following information. The *Diabetes Health Care Plan* template contains this information and is included as a supplement to this document.

Demographic information

- Child name
- Birth date
- Community program name
- Parent/guardian name and phone number(s)
- Alternate emergency contact name and phone number(s)
- Physicians
    - Endocrinologist name and phone number
    - Family physician/pediatrician name and phone number

Medical information

- Medical diagnoses and other relevant conditions
- Known allergies
- Availability of medical identification
- Prescribed medications

Diabetes information

- When diagnosed
- History
- Ability to self-manage

Hypoglycemia

- Symptoms of hypoglycemia
- Symptoms of hypoglycemia typically experienced by child
- Responding to hypoglycemia
- Type and location of fast acting sugars

Severe hypoglycemia

- Symptoms of severe hypoglycemia
- Responding to severe hypoglycemia

Hyperglycemia

- Symptoms of hyperglycemia
- Symptoms of hyperglycemia typically experienced by child
- Responding to hyperglycemia
- Responding to diabetic ketoacidosis

Daily management of diabetes at community program

- Plan for meals and snacks (e.g. schedule)
- Plan for blood and/or interstitial glucose monitoring (e.g. schedule, location)
    - If child requires assistance with blood/interstitial glucose monitoring, additional information is required. See *Blood Glucose Monitoring* (page 19)
- Plan for physical activity (e.g. blood glucose monitoring, snack prior to exercise)
- Responding to illness
- Plan for special events (e.g. track & field day, parties with food)

Documentation

- Template for recording interventions and actions performed by community program personnel (e.g. communication, actions taken)
- Signatures & dates
    - Nurse signature & date(s) of health care plan development/review
    - Parent/guardian signature & date

**Blood glucose monitoring**

When a child requires assistance with blood glucose monitoring at the community program, the health care plan includes the following information. The *Blood Glucose Monitoring* template contains this information and is included as a supplement to this document.

- Name and location of blood glucose monitor
- Schedule for checking glucose readings
- Target glucose range
- Lancing device setting (puncture depth)
- Storage and disposal of lancets & test strips
- Interventions based on test results
- Steps in performing blood glucose monitoring
- Written record
    - Date and time
    - Glucose reading
    - Interventions performed, if required
    - Signature of community program personnel

**Interstitial glucose monitoring**

When a child requires assistance with interstitial glucose monitoring at the community program, the health care plan health care plan includes the following information. The *Interstitial Glucose Monitoring* template contains this information and is included as a supplement to this document.

- Name and location of interstitial glucose monitor
- Schedule for checking glucose readings
- Intervention based on test results
- Written record
    - Date and time
    - Glucose reading

- Interventions performed, if required
- Signature of community program personnel

**Intranasal glucagon**

When a child has intranasal glucagon available at the community program, the health care plan includes the following information. The *Intranasal Glucagon* template contains this information and is included as a supplement to this document.

- Name and location of intranasal glucagon
- Steps in administering intranasal glucagon

**Ketone testing**

When a child requires assistance and parent/guardian requests ketone testing to be performed at the community program, the health care plan contains the following information. The *Ketone Testing* template contains this information and is included as a supplement to this document.

- Testing method (i.e. blood, urine)
- Location of supplies
- Lancing device setting, if applicable
- Steps in performing ketone test
- Storage of used lancets and test strips
- When to check ketones and intervention based on test results
- Written record
  - Date and time
  - Ketone reading
  - Interventions performed, if required
  - Signature of community program personnel

**Insulin Pump Health Care Plan**

When a child has an insulin pump, the health care plan includes the following information, in addition to the information included in the Diabetes Health Care Plan (see page 17). The *Diabetes Health Care Plan – Insulin Pump* contains this information and is included as a supplement to this document.

- Location of supplies
  - Extra infusion set, alternate source of insulin, extra batteries
- Situations when DKA may occur & how to respond
  - Blood glucose is greater than 14.0 mmol/L (prior to eating)

    - Infusion set/pod becomes dislodged
    - Pump malfunctions
    - Pump is not available
    - Child feels or appears ill
- Ketone testing
    - Testing method (e.g. urine, blood)
    - Location of supplies
    - Lancing device setting, if applicable
    - Steps in performing ketone test
    - Storage and disposal of supplies
    - Written record
        - Date and time
        - Test results
        - Interventions performed, if required
        - Signature of community program personnel

## TRAINING

When a community program receives URIS Group B support, training is provided to community program personnel by a registered nurse. Training is provided on an annual basis minimally. The training of community program personnel should reflect the principles of adult learning. From a practical standpoint, these principles mean:

- Identifying and integrating the learning needs of participants into the training session.
- Information should be applicable to the participants' responsibilities and focus on what is most useful to them.
- Adults have accumulated a foundation of life experiences and knowledge and need to connect learning to this knowledge/experience base.
- An organized training session with clearly defined elements assists participants in identifying and attaining learning goals.

It is recommended that all community program personnel that may be responsible for a child with diabetes attend the training session. Community program personnel that may be responsible for a child with diabetes may include:

- in schools - teachers, educational assistants, school administrators, office staff, substitute teachers, bus drivers, lunch room supervisors;
- in licensed child care facilities - child care providers, child care directors; and
- in recreational programs – staff members, administrators, volunteers.

The community program is responsible to ensure relevant personnel attend the training session. It is recommended to keep a written record that indicates community program personnel in attendance and date that training occurred.

Adequate time should be scheduled for training to ensure community program personnel obtain the knowledge and skill necessary to safely respond to the needs of children with diabetes in their facility. The amount of time required to train community program personnel will vary depending on several factors such as the existing knowledge of community program personnel, number of personnel attending the session and format of training resources used.

Whenever possible, training should be scheduled when all community program personnel can attend to ensure service is provided in an efficient manner. If the training session is poorly attended (i.e. there is not an adequate number of community program personnel to safely address the child's needs), additional training should be scheduled. If subsequent training sessions are also poorly attended, alternate strategies should be discussed with the community program to ensure training is provided in an efficient manner.

When the community program has not received training in the past, a child with diabetes may still attend the community program prior to the training session. In such

situations, the community program's policy for emergency situations (e.g. call 911/EMS) is implemented, if required.

**Content**

The following standard clinical information and child specific information is included in the training session.

Standard clinical information

- Definition of diabetes
- Types of diabetes
- Daily management of diabetes
  - Meals/snacks
  - Physical activity
  - Insulin
  - Glucose monitoring
  - Illness
  - Hypoglycemia symptoms and how to respond
  - Hyperglycemia symptoms and how to respond
  - Diabetic ketoacidosis

Child specific information

- Symptoms for hypoglycemia and hyperglycemia typically experienced by child
- Ability to self-manage
- Type and location of fast acting sugars
- Daily management of diabetes at community program specific to child
  - Meals and snacks
  - Physical activity
  - Schedule for glucose monitoring (e.g. time, location)

**When child requires assistance with blood and/or interstitial glucose monitoring**

When a child requires assistance with blood and/or interstitial glucose monitoring, it is recommended that 2-3 community program personnel receive training.

The following information is included in the training session

- Schedule
- Type of monitor
- Location of equipment/supplies
- Target range

- Step-by step procedure (demonstration and return demonstration)
- Interventions based on results
- Disposal of equipment/supplies
- Documentation

To avoid the transmission of blood-borne infections, it is recommended that each nurse is assigned a blood glucose monitor and that all demonstrations are performed on the nurse. It is also recommended that disposable lancets are used for demonstration purposes.

**When child requires assistance with ketone testing**

When a child requires assistance with ketone testing, it is recommended that 2-3 community program personnel receive training.

If ketone testing is done using a blood ketone meter, demonstration and return demonstration is required. If ketone testing is done using urine strips, it is expected that the child is able to perform the test independently. In such situations, community program personnel may need to assist the child in implementing intervention(s) based on the test results.

The following information is included in the training session

- Testing method
- Location of equipment and supplies
- Step-by step procedure (demonstration and return demonstration if blood ketone meter used)
- Interventions based on results
- Disposal of supplies
- Documentation

**Training Resources**

The following resources are included as supplements to this document. If alternate resources are used for training purposes, it is the responsibility of the nurse to ensure its content is consistent with this document.

- *Diabetes Handout*
- *Diabetes PowerPoint*
- *Diabetes Worksheet*. The Diabetes Worksheet is recommended for community program personnel that have previously attended a training session.

On-site training by a registered nurse is required to delegate the knowledge and skill to community program personnel in the management of diabetes. Other teaching strategies may be used as supplements to on-site training at the discretion of the nurse.

**The following on-line resource(s) may be useful for training purposes.**

Guidelines for the Care of Students Living with Diabetes at School
http://diabetes.ca/DiabetesCanadawebsite/media/Learn-About-Diabetes/Your%20R

Diabetes@School website www.diabetesatschool.ca

Diabetes Canada website www.diabetes.ca

## MONITORING

Monitoring of trained community program personnel by a nurse is required to ensure that the knowledge and skill necessary to safely care for children with diabetes has been acquired and/or retained. Monitoring is required on an annual basis, minimally.

The frequency and timing of monitoring is based on the professional judgment of the nurse as well as the complexity of information taught, maturational issues and the skill demonstrated by community program personnel. The following strategies may be used for monitoring purposes.

- Completion of an evaluation form by community program personnel that attend the training session. The *Diabetes Training Session Evaluation Form* is included as a supplement to this document and may be used for this purpose.
- Asking community program personnel questions during the training session. The *Diabetes Worksheet* is included as a supplement to this document and may be used for this purpose.
- Observation of community program personnel performing a return demonstration (i.e. blood glucose monitoring) at the training session.

## RESOURCES

**Diabètes Canada**
www.diabetes.ca

**American Diabetes Association**
www.diabetes.org

**British Columbia Children's Hospital**
www.bcchildrens.ca

**Children with Diabetes Inc.**
www.childrenwithdiabetes.org

**International Diabetes Federation**
www.idf.org

**Juvenile Diabetes Research Foundation**
www.jdrf.ca

# REFERENCES

Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada

*Kids with Diabetes in School*, Diabetes Canada

Guidelines for the Care if Students Living with Diabetes at School, Diabetes Canada

Types of Insulin Appendix 6, Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada

Kids, Teens, & Diabetes, Diabetes Canada

Kids & Type 2 Diabetes, Diabetes Canada

Eli Lilly and Company, Baqsimi™-3 mg dose, “For low blood glucose emergencies Be Prepared with BAQSIMI”