



School Nurse Diabetes Resource Guide



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Introduction

The school-age child with diabetes spends a significant portion of their day in the school environment; therefore, it is important for school personnel, especially the school nurse, to be current with information regarding diabetes therapies.

In recent years, there has been a marked increase in the number of children wearing insulin pumps. Compared to standard insulin dosing or MDI (multiple daily injections), pump therapy may facilitate improved lifestyle, flexibility, and the potential for better glycemic control. Current models of care for children with diabetes encourage healthy eating habits that are in harmony with those of the child's family. Since carbohydrate as a food component has the greatest impact on blood glucose, dosing of insulin is usually based on the child's carbohydrate intake at mealtimes and snacks. Many of the features of current insulin pumps are designed to support and enhance appropriate mealtime insulin dosing.

This packet of information has been compiled for your use by Animas Corporation to assist in caring for the student with diabetes who wears an insulin pump. Diabetes is a very individualized disease, and each child requires a specific medical care plan. The content within is designed to help guide and support school personnel as they care for their students who live with diabetes.

Included within is basic information about insulin pump therapy, including explanations of common terms, and a list of helpful references about diabetes and insulin pump therapy.

We have also included templates for several medical management forms that may be used to define the child's medical plan at school. These may be used as needed, although most medical practices will have their own specific forms and orders. These documents may also be included in the student's Section 504 Plan or Individual Education Plan (IEP), suggested for every student with special needs, including those with diabetes.

Parents/guardians should provide the school with basic instruction regarding programming and use of the pump. They should also provide a copy of the Owner's Booklet for their student's Animas pump. Additional copies of the Owner's Booklet may be requested from Animas by calling the customer support number which is printed on the back of the pump or by downloading a PDF copy at www.animas.com. More information about many aspects of diabetes and insulin pump therapy is available online at www.animas.com.

Please Note: Only specific, signed orders from the child's medical care provider should be used when administering treatment.

Insulin Pump Basics

An insulin pump is a small, computerized device that continuously delivers rapid-acting insulin into subcutaneous tissue. It replaces the need for multiple daily injections of insulin.

Most current pump systems are comprised of the pump itself, and a cartridge of insulin that is attached to an infusion set. The infusion set terminates in a small needle or cannula which is inserted beneath the skin into subcutaneous tissue. Cartridges and infusion sets are replaced every two to three days. Insulin pumps have many built-in safety features and alarms, as well as a built-in dose calculator and other helpful features.

Insulin delivery is provided and described in two ways, basal and bolus:

Basal insulin delivery:

- A continuous flow of insulin that is pre-programmed and automatic.
- Basal insulin replaces the need for injections of long-acting insulin.
- The specific dose of basal insulin is expressed as an hourly rate; for example, "0.525 units/hour."
- Several automatic changes to the hourly basal rate may be programmed to occur throughout the day.
- The basal insulin dose supports the body's basic metabolic requirement, and is not strictly dependent upon food intake.

Bolus insulin delivery:

- Delivered on-demand, as needed throughout the day. Boluses provide additional insulin required for food or to correct a high blood glucose.
- Bolus doses for food are based upon an individualized insulin: carbohydrate ratio that works for the individual.
 - For example, 1:10 refers to needing 1 unit of insulin per every 10 grams of carbohydrate being consumed. The I:C ratio may vary by time of day, and the ratio is pre-programmed into the pump for use as needed.
- Bolus doses for correcting high blood glucose are based on the individual's specific "insulin sensitivity factor" (ISF). The "ISF" refers to how an individual's blood glucose level would respond to 1 unit of insulin.
 - For example, if the insulin sensitivity factor is 50, it means that 1 unit of rapid acting insulin could be expected to reduce the blood glucose by 50 mg/dL. The ISF is pre-programmed into the pump for use as needed.

Other important points about diabetes and insulin pump therapy:

- Rapid-acting U100 insulin is currently used in insulin pumps; the duration of rapid-acting insulin once it has been delivered is about 3 – 5 hours.
- If deprived of insulin due to a mechanical problem or other problem related to insulin delivery through the pump, the pumper may quickly develop high blood glucose (hyperglycemia). Assessing the seriousness of a child's hyperglycemia includes Blood Glucose checks as well as checking for the presence of ketones in either a blood or urine sample.
- A serious acidotic state (diabetic ketoacidosis, or "DKA") may ensue if replacement insulin is not provided in a timely manner. A backup plan and supplies for delivering insulin via injection, rather than the pump, must be in place. The student's diabetes care plan should include specific treatment guidelines to address hyperglycemia with ketones and to avoid onset of DKA due to lack of insulin.

Hyperglycemia with large ketones is an urgent medical problem and requires immediate attention!



Safe at School

School Personnel

Keeping a child with diabetes safe at school is a shared responsibility. Extreme high or low blood sugar levels can seriously disrupt the child's day, or interfere with school performance. Low blood glucose, (hypoglycemia), requires immediate treatment to prevent symptoms from worsening. In many instances, a child's Medical Management Plan allows for students to test blood glucose and treat hypoglycemia in the classroom. However, if the student must go to the nurses's office for treatment of hypoglycemia, they should be accompanied by an adult.

The school nurse is primarily responsible for maintaining and understanding written medical orders from the child's physician. These orders form the basis of the child's Diabetes Medical Management Plan (DMMP) during school hours.

The school nurse is also responsible for ensuring that other school personnel are appropriately trained and educated regarding the child's medical needs and the section(s) of the DMMP that pertain to them.

Examples of school personnel that may need to know and understand their role in caring for a child with diabetes include:

- teachers
- bus drivers
- coaches
- lunchroom personnel
- substitute teachers
- office staff

In addition to the DMMP, other accommodations may be required and desired for a child with diabetes. The use of a 504 Plan to further ensure the safety and appropriate care of a child with diabetes is recommended, although not required.

Parental/Guardian Responsibilities

Parents/guardians should provide the school nurse with all required medical orders. After follow-up visits with their child's diabetes care team, updates to the child's dosing or other aspects of diabetes care should be communicated to the school nurse.

Medical orders should include a backup plan if the pump malfunctions, or runs out of insulin. Backup plans may include orders for administering insulin via an insulin pen or syringe, or replacing an infusion set that may have fallen out.

Parents/guardians should ensure that the child arrives at school with the insulin pump in working order, and with enough insulin to last through the school day. They are also the primary resource for teaching the school nurse basic pump operations and functions that will be used at school.

Parents/guardians should also provide all supplies that may be required by the child during the day. A list of supplies that may be needed is included in the enclosed documents.

Student Responsibilities

Older children who are responsible and skilled may be able to take care of their diabetes independently under many circumstances. However, it may be a good idea to ask even these skilled students to check in with the nurse at least once a day to verify that the blood glucose is in a safe range. Independent self-care activities should be specified in the Medical Management Plan.



Diabetes Care Plan: Blood Glucose Monitoring and Management - Page 1

Student: _____ School Year: _____	
Target blood glucose range at school: 90–180 mg/dL based on ADA recommendations or: _____	Test times are checked off below: <input type="checkbox"/> Before lunch <input type="checkbox"/> Before sports or PE class <input type="checkbox"/> Before boarding school bus or driving a car <input type="checkbox"/> As needed if symptoms of low or high blood glucose <input type="checkbox"/> As needed if symptoms of illness <input type="checkbox"/> _____ hours after giving a correction bolus <input type="checkbox"/> Other:
Treat mild hypoglycemia, 50–70 mg/dL or: _____	Give 15 grams of fast-acting carbohydrate by mouth immediately, such as: <ul style="list-style-type: none"> • 3–4 glucose tablets • 4 oz juice • 6 oz skim milk • 6 oz regular soda • Other snacks provided by parent/guardian: Recheck blood glucose (BG) every 15 minutes and repeat treatment as needed until BG > 70 mg/dL or _____ mg/dL. Do not leave child unattended.
Treat moderate hypoglycemia, <50 mg/dL or: _____	Give 30 grams of fast-acting carbohydrate by mouth immediately. Recheck BG and repeat treatment every 15 minutes until BG > 70 mg/dL or _____ mg/dL. Do not leave child unattended.
Treat severe hypoglycemia: unconscious or seizing, unable to swallow or cooperate	Authorized diabetes care provider: Immediately administer glucagon injection (1 mg/cc) according to instructions. Position child on side to prevent aspiration in case of nausea/vomiting. Call 9-1-1 or other local emergency service number, and then call parent/guardian. Give nothing by mouth until student is awake and able to cooperate/swallow. Do not leave child unless it is unavoidable in order to get help.
Treat hyperglycemia BG > 250 mg/dL or: _____	General guidelines for hyperglycemia on insulin pump: <ul style="list-style-type: none"> • Check ketones using blood or urine ketone strips provided by parent/guardian and follow guidelines below based on ketone results. • Encourage drinking of water or other calorie-free fluids, 8 oz every hour if ketones are present, until resolution of situation. • Allow free access to bathroom and water; do not withhold normal food/meals. • Inspect pump and tubing for signs of problems, such as disconnected infusion set or pump alarm or message on screen. Call parent as needed for guidance.
Treat hyperglycemia with negative ketones:	Administer correction bolus via pump and recheck BG and ketones in 1–2 hours. <ul style="list-style-type: none"> • If ketones remain negative, may give an additional bolus via pump if necessary. • If BG is still not improving after two correction doses, may require insulin by injection. Contact parent.
Treat hyperglycemia with trace ketones:	Follow guidelines for negative ketones, but only one correction dose may be given. <ul style="list-style-type: none"> • After initial correction, if no improvement after 1–2 hours, contact parent.
Treat hyperglycemia with small to large ketones:	Notify Parent. This is a medically urgent situation, do not delay treatment. <ul style="list-style-type: none"> • Do not give bolus by pump. Give correction dose of insulin via syringe or pen. • Change infusion set and cartridge if possible. • Child will need insulin throughout the day, so if new infusion set is not available, contact parent/guardian or HCP for specific orders regarding insulin replacement throughout the school day.

(Continued on next page)

6. This information is provided for educational purposes only and is not intended to replace your healthcare provider's diabetes treatment plan. Only specific, signed orders from the child's medical care provider should be used when administering treatment.

Diabetes Care Plan: Blood Glucose Monitoring and Management - Page 2

Student: _____		School Year: _____	
Hyperglycemia with small to large ketones: (continued from previous page)	<ul style="list-style-type: none"> • Student may return to class if no complaints/symptoms of nausea, vomiting, stomach pain or other physical or cognitive problem. • Student may not participate in gym class or sports until ketones are negative. • If student is ill, parent/guardian should pick up child from school. • If student stays in school, recheck BG and ketones prior to boarding school bus. • If ketones are small to large with elevated BG, parent must be notified and child should not board the bus. 		
Actions for sports/PE class participation:	<ul style="list-style-type: none"> • School nurse or other Authorized Diabetes Care Provider (ADCP) must be present on campus during PE class and after-school sports. • BG must be at least _____ before child participates in physical activities. • If BG is below target, treat with carbohydrate until BG is within range. • If BG is above 250 mg/dL or _____ without ketones, child may participate in sports/PE class. Give correction insulin bolus as indicated: <ul style="list-style-type: none"> <input type="checkbox"/> Give half the calculated correction bolus. OR <input type="checkbox"/> Do not give any correction bolus. • If BG is above 250 mg/dL or _____ with ketones, child may NOT participate in sports/PE class. Follow hyperglycemia guidelines. • Be sure student stays hydrated during sports activities: <ul style="list-style-type: none"> • _____ oz. of water or sugar-free fluids every hour 		
Actions for extracurricular activities off campus:	<ul style="list-style-type: none"> • School nurse or other Authorized Diabetes Care Provider (ADCP) must be present on bus and on-site during field trips. • Follow standard BG testing guidelines and insulin administration plan during field trips and other off-campus activities. • If field trip entails prolonged physical activity, such as hiking, recheck BG every 1–2 hours or if student has symptoms of hypoglycemia. 		
<p>If child exhibits symptoms of severe diabetic ketoacidosis (DKA), you must call 9-1-1 immediately, and notify parent/guardian. Symptoms of serious DKA that indicate the need for emergency services include:</p> <ul style="list-style-type: none"> • Loss of consciousness • Difficulty breathing, gasping for air 			
<p>For assistance troubleshooting technical issues with an Animas® insulin pump, you may contact Animas Customer Support toll-free at: 1-877-937-7867</p>			
Healthcare Provider Name: _____		Telephone: _____	
Healthcare Provider Signature: _____		Date: _____	

Diabetes Care Plan: Insulin and Glucagon Administration

DIABETES CARE PLAN: Authorization for Insulin and Glucagon Administration					
STUDENT: _____		School: _____		Year: _____	
Type of Insulin in Pump: _____			Type of Infusion Set: _____		
INSULIN BY INSULIN PUMP: Calculate and deliver dose using pump programs. Pump is programmed to calculate dose based on the following settings:					
Basal Rates		Insulin: Carbohydrate Ratio		Insulin Sensitivity Factor	
Time	Rate (Units/hour)	Time	Units: __ gms	Time	mg/dL
INSULIN BY INJECTION IN CASE OF PUMP MALFUNCTION:					
<p>Rapid acting insulin should be given by syringe or insulin pen at meals, snacks, and to correct high blood sugar. Use the following guidelines:</p> <ul style="list-style-type: none"> • For food/snacks, give 1 unit insulin per ____ grams of carbohydrate • For BG correction: <ul style="list-style-type: none"> — Give correction before lunch if BG is > _____ mg/dL — To calculate dose, use formula below: $\frac{\text{BG} - \text{Target BG}}{\text{ISF}} = \text{units of rapid acting insulin to be given in addition to insulin given for food}$ • Do not give BG correction dose more often than every 4 hours or _____ 					
GLUCAGON ADMINISTRATION INFORMATION:					
<p>Glucagon 1 mg intramuscular will be administered in case of severe hypoglycemia by authorized staff who have been appropriately trained:</p> <p>Name: _____ Location or phone extension: _____</p> <p>Name: _____ Location or phone extension: _____</p> <p>Name: _____ Location or phone extension: _____</p>					
Follow glucagon administration guidelines specified in Diabetes Care Plan: BG Testing and Management					
HEALTHCARE PROVIDER NAME: _____					
TELEPHONE: _____					
HEALTHCARE PROVIDER SIGNATURE: _____					
DATE: _____					

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Diabetes Care Plan: Skills Checklist and Supply List

Student: _____		School Year: _____	
Checklist of Activity/Skill to be Performed:	Student Is Independent	School Assistance or Supervision Needed	Parental Support Needed
Routine BG monitoring:	<input type="checkbox"/> Student still needs to see nurse at least once a day to verify glucose status, OR <input type="checkbox"/> Student does not need to check in with nurse		
Select snacks/meals			
Carbohydrate counting of meal/snacks			
Enter data into pump			
Deliver insulin after calculating dose on pump			
Change infusion set/cartridge if required			
Calculate insulin injection if pump not available			
Deliver insulin via pen or syringe if necessary			
Treat mild to moderate hypoglycemia			
Check ketones			
Treat hyperglycemia			
Disconnect infusion set from site			
Pump management for PE class or sports			
Other:			
Supplies Required at School	Student-held	Kept in Health Office	
Glucose meter, strips, and lancing device			
Skin prep supplies (alcohol/IV Prep, etc)			
Glucose tabs or other fast carbohydrate snack			
Glucagon emergency kit			
Ketone strips for urine OR meter/kit for checking blood ketones			
User manual for insulin pump			
Extra pump or meter supplies: <ul style="list-style-type: none"> • Batteries • Infusion sets • Pump insulin cartridge 			
Required for backup plan in case of pump malfunction: <ul style="list-style-type: none"> • Insulin syringes and vial of rapid-acting insulin OR • Insulin pen and pen needles 			
Other:			

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Diabetes Care Plan: Emergency Contacts

Include Healthcare Provider, Parents, Guardians, or Others

Student: _____ School Year: _____

Name	Relationship to Student	Telephone Numbers
		Cell: Home: Other:
		Cell: Home: Other:
		Cell: Home: Other:
		Cell: Home: Other:
		Cell: Home: Other:
		Cell: Home: Other:
		Cell: Home: Other:

References and Resources

Books

Diabetes Burnout: Preventing It, Surviving It, Finding Inner Peace by William H Polonsky

Lara Takes Charge (for very young children) by Rocky Lang and Sally Huss

Pumping Insulin: Everything You Need for Success with an Insulin Pump by John Walsh, Ruth Roberts M.A.

Smart Pumping: A Practical Approach to the Insulin Pump by Howard Wolpert

Medical Alert Jewelry

www.laurenshope.com

www.LIFETAG.com

www.medicalert.com

www.n-styleid.com

Clothes and Accessories for Kids who Pump

www.pumpwearinc.com

Children on Pumps

www.grandmasandy.com - Downloadable book for kids on pumps and games for kids with diabetes

www.kidsrpumping.com

Children with Diabetes

www.childrenwithdiabetes.com

www.jdrf.org - Juvenile Diabetes Research Foundation International (JDRF)

www.diabetesjuvenil.com

www.tudiabetes.org

References and Resources (cont.)

Insulin Pump Sites

www.animas.com

www.insulin-pumpers.org - Chat rooms, articles, lots of links to other sites

Exercise

www.insulindependence.org

General Diabetes Sites

www.calorieking.com

www.cdc.gov/diabetes - Fact sheets, stats, publications, and info about state diabetes prevention and control

www.diabetes.org - American Diabetes Association (ADA)

www.diabetesnet.com - "The Diabetes Mall" - books, food scales, information

www.diabetes.niddk.nih.gov - Diabetes information, education, and referral resource

www.diabetesaction.org - Publishes "Managing Your Diabetes: Basics and Beyond"

www.nasn.org - National Organization of School Nurses

www.ndep.nih.gov/media/youth_schoolguide.pdf - Helping the Student with Diabetes Succeed: A Guide for School Personnel

www.nicolejohnson.com

Animas does not control the content of the websites listed and is not responsible for information provided. Always consult your HCP for information specific to your or your child's needs.

Appendix: Tips for Troubleshooting Hyperglycemia on an Insulin Pump at School

Always disconnect the pump from the student before troubleshooting to avoid inadvertent insulin delivery!!!!

Check the site and tubing

- Is the end of the infusion set still adhering to body?
- Is the cannula obviously dislodged or kinked?
- Is there redness at the site?
- Is there discomfort at the site?
- Is there blood on/at the site?
- Is there air in the tubing?
- Is the tubing connected to the cartridge?

Check the cartridge

- Is the tubing connected tightly to the cartridge?
- Do you see insulin leaking at the connection site between tubing and cartridge?
- Is the cartridge empty?

Check the pump

- Is the time on the pump screen correct?
- Is there an alarm or warning message on the screen?
(Call parent or Pump Support for assistance as needed).
- In History: Bolus: check for date/time of last bolus.

Check the insulin:

- Is it cloudy or clumped?
- Was the insulin exposed to extreme temperatures (freezing or direct sunlight)?

Follow Medical Care Plan to administer correction bolus if no obvious mechanical issues are present:

- Adhere to child's medical and diabetes care plans.
- Contact parent/guardian/healthcare provider as needed to resolve issues or clarify care plan.

NOTE: Any combination of redness, pain, fever, discomfort or heat at the site may indicate local site infection. Call parent/guardian so child may receive medical attention.



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