

## Appendix 3 - Handouts

## Carbohydrate Counting and Correction Dosage Calculation Handout

### I. Overview

There are three types of nutrients: carbohydrates, fats and protein. Carbohydrate is the nutrient that has the most significant effect on blood glucose levels. Food with carbohydrate can be grouped into four categories: natural sugar (in fruit and milk), starches with fiber (raw vegetables, beans, whole grains), starches without fiber (white flour and refined grain products), and concentrated sugar (cake, candy and non-diet soft drinks).

When counting carbohydrates, include BOTH sugars and starches.

The student may perform this procedure independently if indicated on the INDIVIDUALIZED HEALTHCARE PLAN - DIABETES, and if the student has signed a STUDENT SELF-MANAGEMENT AGREEMENT.

### II. Supplies

#### A. Student's glucose meter and needed supplies.

B. IHP

C. School menu or other resource for counting carbohydrate from meal

D. Pencil/paper; calculator (optional)

E. Insulin, syringe and disposal equipment

### III. Preparation

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Review IHP	All specialized procedures conducted in the school setting require written licensed health care provider orders and parent/guardian consent. The IHP also contains specific information about the student's target blood glucose level and standard of care instructions based on the test results.
B. Review Universal Precautions	Refer to <u>Universal Precautions Handout</u>

### IV. Procedure

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
K. Gather supplies	
L. Observe or assist student in performing blood glucose test <ul style="list-style-type: none"> <li>• Document blood glucose result on student's individual treatment record – student goes to lunch.</li> </ul>	Refer to <u>Glucose Monitoring Handout</u>
M. Student returns from lunch with tray.	Nurse or trained staff may check with student in the lunchroom.

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
N. Count the amount of carbohydrate intake based upon school menu and/or other resource.	Use school menu and/or other resource to count amount of carbohydrates. When reading labels, determine count based on <u>total</u> carbohydrates and serving size.
O. Determine amount of insulin needed for carbohydrate intake based on student's insulin to carbohydrate ratio in IHP.	Example of insulin needed for carbohydrate eaten: The student's lunchtime insulin-to-carbohydrate ratio is 1:15, and the child ate 60 grams of carbohydrates. The calculation is: $60 \div 15 = 4$ units of insulin.
P. Determine amount of insulin needed for blood glucose level – recheck healthcare provider order in IHP to verify student's correction insulin dose calculation.	Examples for insulin correction dose: The student's pre-meal blood glucose is 300. The student's target blood glucose is 150. <ul style="list-style-type: none"> <li>• If DIABETES WITH INJECTION IHP and... <ul style="list-style-type: none"> <li>○ IHP uses <i>correction scale</i> example: use the insulin units indicated for the range.</li> <li>○ IHP uses <i>formula</i> example: Blood Glucose <math>(300) - \text{target } (150) \div 50 = 3</math> units of insulin.</li> </ul> </li> </ul>
Q. Determine the TOTAL amount of insulin dose	Example of total insulin dose: Insulin-to-carb dose plus correction dose = total units. The formula is: $4 + 3 = 7$ units of rapid-acting insulin.
R. Verify insulin dose with another staff	
S. Complete documenting procedure on student's individual treatment record.	<ol style="list-style-type: none"> <li>1. Date and time.</li> <li>2. (Blood glucose results recorded earlier)</li> <li>3. Carbohydrate intake.</li> <li>4. Insulin calculated.</li> <li>5. Action taken and student's response.</li> <li>6. Signature of personnel performing.</li> </ol>

V. Additional Resource

For carb counts when parties and other unexpected events arise:

<http://www.myfitnesspal.com/food/calorie-chart-nutrition-facts>

## Continuous Glucose Monitoring Device (CGM) Handout

### I. Overview:

A Continuous Glucose Monitor (CGM) uses a tiny sensor inserted under the skin to check glucose levels in the interstitial fluid (under the skin) in real time. Glucose levels are displayed in 5 minute or 1 minute intervals. The sensor stays in place for several days to a week then must be replaced. A CGM usually reads within 20% of a finger stick blood sugar value. It can be programmed to alert (vibrate or alarm) for high and low glucose levels. CGM is meant to provide additional glucose information. **It is not approved for use in making treatment decisions; a user must confirm glucose levels with a meter before making a change in treatment.**

CGM supplies include a sensor site, inserter, tegaderm, charger and battery, for turning it on. Since the CGM is not used in treatment, these supplies typically do not come to school. Also, if a CGM malfunctions while a student is at school, the absence of the information it provides does not change the execution of other diabetes management tasks.

### II. Supplies

- A. CGM Manufacturer's booklet, if available.
- B. IHP

### III. Preparation

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Review student's IHP	All specialized procedures conducted in the school setting require written licensed prescriber orders and parent/guardian consent. The IHP also contains specific information about the student's target blood glucose level and <u>standard of care instructions based on the test results.</u>
B. Review <i>Universal Precautions</i> .	These measures are designed to prevent spreading infectious disease. Refer to <u>Universal Precautions</u>

### IV. Procedures:

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Calibration reminder sounds	<ul style="list-style-type: none"> <li>• Check IHP</li> <li>• Use CGM manufacturer's booklet to help student calibrate the CGM.</li> </ul>

<p>B. CGM operation errors</p> <ol style="list-style-type: none"> <li>1. Dead battery</li> <li>2. Pump sensor becomes dislodged</li> </ol>	<ul style="list-style-type: none"> <li>• Check IHP.</li> <li>• If directed, follow CGM manufacturer instructions for replacing battery or to “find lost sensor.”</li> <li>• If CGM remains out of operation, continue finger stick blood glucose tests and take action based on the IHP.</li> <li>• IF CGM sensor is dislodged, send the transmitter home and dispose of catheter properly.</li> </ul>
<p>C. Alert Settings</p> <ol style="list-style-type: none"> <li>1. CGM will alert audibly if interstitial glucose is above or below set numbers.</li> <li>2. Arrows: Some continuous monitors show arrows on the screen to indicate the speed at which the glucose levels are changing. <ul style="list-style-type: none"> <li>• Arrows on the face of the monitor pointing straight downward indicate a rapidly falling glucose level.</li> <li>• Arrows pointing straight up indicate a rapidly increasing glucose level.</li> <li>• A horizontal or 45 degree arrow (or one arrow in contrast to two arrows) may mean that the glucose level is not changing as rapidly.</li> </ul> </li> </ol>	<p>Since this device should not be used for treatment purposes, <i>always</i> do a finger stick blood glucose test before taking action.</p>

**Glucagon Administration Handout**

I. Overview: Glucagon is a hormone made in the pancreas which frees sugar stored in the liver and raises the blood glucose level. Glucagon is used in an emergency situation to raise the blood glucose level in an unresponsive, hypoglycemic student.

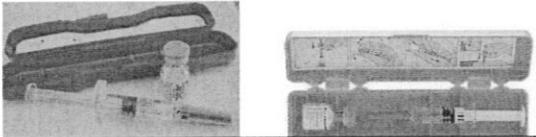
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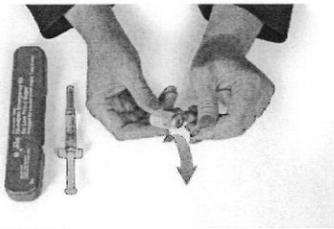
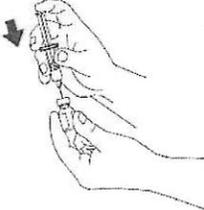
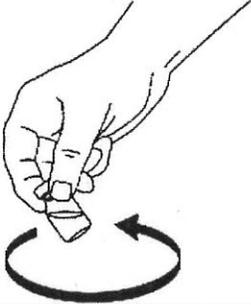
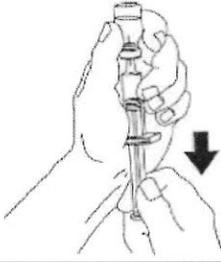
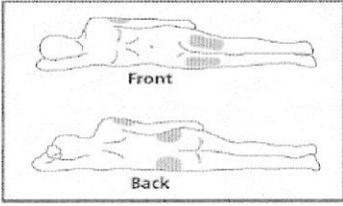
- A. Glucagon kit
- B. Alcohol wipe, cotton ball
- C. Sharps container
- D. Gloves
- E. IHP

III. Preparation

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Review Universal Precautions	These measures are designed to prevent spreading infectious disease. Refer to <u>Universal Precautions Handout</u> .
B. Review student’s IHP, particularly the ALGORITHM page.  Identify when procedure is indicated	All specialized procedures conducted in the school setting require written licensed prescriber orders and parent/guardian consent. The IHP also contains specific information about the student’s target blood glucose level and standard of care instructions based on the test results. Glucagon is needed if the student is unconscious, seizes, or is unable to swallow.
C. Obtain glucagon and ensure it has been stored appropriately and has not expired.	Store at room temperature (68-70 degrees). Avoid direct sunlight. Check expiration date.

IV. Procedure

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Send someone to call 911.	
B. Place student on his/her side.	To prevent aspiration. Nausea and vomiting is a common side effect after glucagon administration.
C. Gather supplies	
D. Wash hands, put on gloves.	Refer to <u>Universal Precautions Handout</u> .

<p>E. Remove cap from glucagon vial, pull needle cover off syringe.</p>	
<p>F. Insert needle through rubber stopper on vial of glucagon and inject entire contents of syringe into vial of glucagon powder.</p>	<p>Diluting solution may be in a vial or prepackaged in a syringe.</p> 
<p>G. Leaving syringe in place, swirl gently until dissolved (solution should be clear and colorless).</p>	
<p>H. Hold vial upside down and slowly withdraw the amount of solution from the vial into the syringe as specified in the student's IHP.</p>	
<p>I. Check for air bubbles in the syringe. Tap any visible air to the top of the syringe and gently push on the plunger until the</p>	
<p>J. Select appropriate injection site (buttock, arm, or thigh) and cleanse with alcohol wipe, if possible. Insert needle at 90 ° angle and inject into the tissue.</p>	

K. Withdraw needle, apply slight pressure to injection site with cotton ball.	
L. Keep student positioned on side in recovery position. If student is on an insulin pump, place pump on 'suspend' or disconnect.	
M. Dispose of sharps appropriately. Do NOT recap needle. <ul style="list-style-type: none"> <li>• Remove gloves and wash hands.</li> </ul>	Refer to <u>Universal Precautions Handout</u> .
N. Wait 15 minutes, monitor level of consciousness and breathing. Check blood glucose, if able. Stay with student until EMS arrives. <ol style="list-style-type: none"> <li>1. If no response and another dose is available, repeat glucagon procedure.</li> <li>2. If responsive and alert enough to swallow safely, offer juice. Wait 15 minutes and give protein and carbohydrate snack if the student is not nauseous or vomiting.</li> <li>3. Notify school nurse and parent.</li> </ol>	<p>After administering glucagon, student should be transported to hospital (in remote area, nearest medical facility). Continued monitoring is important.</p> <p>Student should regain consciousness in 15 minutes. You must be prepared to administer CPR. Do not be surprised if the blood glucose level is high (over 200), nausea or vomiting occurs, the student is incoherent or does not recall being unconscious, and/or if the student has a headache. The student needs to be fed additional simple and complex carbohydrates, as tolerated, to prevent another hypoglycemic episode.</p>
O. Document procedure in student's individual treatment record.	Record: <ol style="list-style-type: none"> <li>1. Date and time.</li> <li>2. Amount and type of glucagon given.</li> <li>3. Site of administration.</li> <li>4. Student's response and action taken.</li> <li>5. Signature of personnel performing.</li> </ol>

## Glucose Monitoring Handout

### I. Overview:

Successful diabetes management depends largely on blood glucose monitoring, which measures the effects of balancing food, exercise, and medication. All diabetes care centers on the blood glucose level. Blood glucose results are measured in milligrams per deciliter (mg/dL). The health care provider usually requests that the student self-check blood glucose levels at various times during the day, such as: before eating snacks or lunch, before physical activity, and when the students has symptoms of either high or low blood glucose levels.

### II. Supplies

- Meter (child's personal meter or meter provided by family)
  - Manufacturer's instruction booklet, if available
- Meter strips or cartridges
- Lancing device
- Disposable Gloves
- Tissue or cotton ball, adhesive bandage if needed
- Sharps container or disposal plan
- IHP

### III. Preparation:

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Review student's IHP.	All specialized procedures conducted in the school setting require written licensed health care provider orders and parent/guardian consent. The IHP also contains specific information about the student's target blood glucose level and standard of care instructions based on the test results.
B. Review <i>Universal Precautions</i>	These measures are designed to prevent spreading infectious disease. Refer to <u>Universal Precautions</u>

#### IV. Procedure

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Gather supplies	
B. Prepare work area.	Work area should be clean and well-lit. When possible, assure cleanliness by covering surface with a paper towel
C. Wash hands and put on gloves	Refer to <u>Universal Precautions Handout</u> .
D. Have student wash hands with warm soapy water and thoroughly dry them.	<ul style="list-style-type: none"> <li>• Washing with soap and water prevents infection and removes any substance that might alter the blood glucose results.</li> <li>• Washing in warm water will increase the blood flow to the finger.</li> </ul>
E. Turn meter on, insert strip and check codes (if applicable)	Follow manufacturer's instructions for specific machine.
F. Insert new lancet into the lancet device and "cock" or load it. (NOTE: student may choose to use a lancet more than once, but this is not recommended). Poke finger/alternative site with lancing device.	Follow directions for specific monitor and readying the cancelling device. Finger puncture should be lateral to fingertip (the pads of the fingertips may be more sensitive). Most inaccurate glucose readings are a result of insufficient blood samples. Hang the arm below the level of the heart for 30 seconds to increase blood flow. If hypoglycemia is suspected, only use the finger for testing, do not use alternate testing site.
G. Apply blood to strip.	Gently squeeze the finger in a downward motion to obtain a large enough drop of blood to cover the test pad on the test strip. Many test strips pull in the required amount of blood. Avoid squeezing the site excessively as this may contaminate the sample.
H. Place cotton ball or tissue over lanced area, applying slight pressure until	Prevent contamination of blood to other surfaces.
I. Read result displayed in monitor window (correctly).	Appropriate diabetes interventions are dependent on correctly reading the
J. Remove strip and lancet dispose of them properly	Dispose of lancet in sharps container and strip in appropriate container. Refer to <u>Universal Precautions Handout</u> .

K. Dispose of other supplies appropriately.	Testing supplies should be re-stored securely.
L. Inspect area for blood spills and follow district/program protocol for cleaning.	Refer to <u>Universal Precautions Handout</u> .
M. Follow IHP for action plan.	
N. Document procedure on student's individual treatment record.	Record: <ol style="list-style-type: none"> <li>1. Date and time.</li> <li>2. Blood glucose reading.</li> <li>3. Action taken and student's response.</li> <li>4. Signature of personnel performing</li> </ol>

## Insulin Administration by Pen Handout

### I. Overview

Insulin therapy involves the subcutaneous injection of insulin to reduce hyperglycemia and prevent diabetic ketoacidosis (DKA).

The student may perform this procedure independently if indicated on the INDIVIDUALIZED HEALTHCARE PLAN - DIABETES, and if the student has signed a STUDENT SELF-MANAGEMENT AGREEMENT.

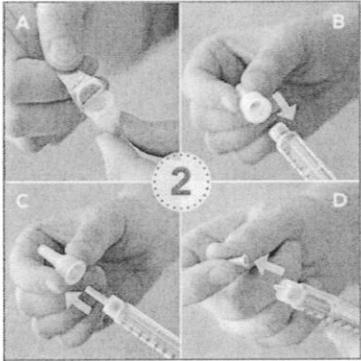
### II. Supplies

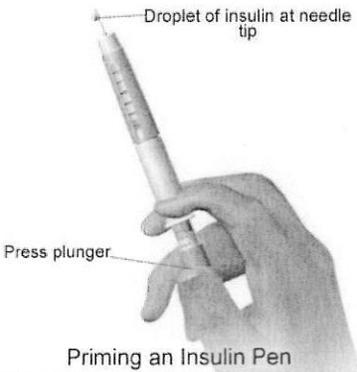
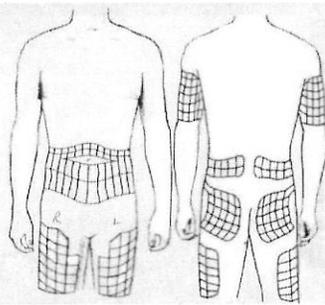
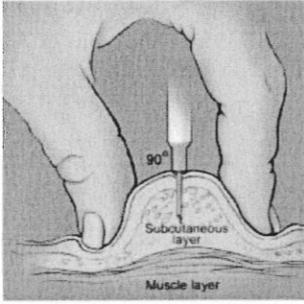
- A. Insulin cartridge as prescribed by healthcare provider
- B. Insulin pen, pen needles, and pen manufacturer’s operating instructions, if available
- C. Sharps disposal container
- D. Gloves, alcohol swabs, cotton balls
- E. Student’s IHP
  - o Carbohydrate coverage and correction scale and/or formula prescribed by health care provider.

### III. Preparation

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Review Universal Precautions	These measures are designed to prevent spreading infectious disease. Refer to <u>Universal Precautions</u>
B. Review student’s IHP. 1. Determine the insulin dose from the HEALTH CARE PROVIDER ORDERS	All specialized procedures conducted in the school setting require written licensed prescriber orders and parent/guardian consent. The IHP also contains specific information about the student’s target blood glucose level and standard of care instructions based on the test results. <ul style="list-style-type: none"> <li>• Review the dosage prescribed for covering carbohydrate intake and the insulin correction scale or formula to cover excess blood glucose.</li> <li>• Refer to <u>Carbohydrate Counting and Correction Dosage Calculation Handout</u>.</li> </ul>
C. Acquire blood glucose reading.	Refer to <u>Glucose Monitoring Handout</u> .

IV. Procedure

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
<p>A. Gather supplies</p>	<p>Insulin pens vary by manufacturer. Types of insulin pens include:</p> <ul style="list-style-type: none"> <li>• Pre-filled disposable pen (insulin cartridge is already in pen.)</li> <li>• Reusable (non-disposable) pen (insulin cartridge is loaded into the pen for use)</li> </ul> 
<p>B. Wash hands, put on gloves.</p>	<ul style="list-style-type: none"> <li>• Refer to <u>Universal Precautions Handout</u>.</li> </ul>
<p>C. Inspect insulin pen:</p> <ul style="list-style-type: none"> <li>• Check to be sure it has the student's name on the label. If the cartridge is new, add student's name to the label.</li> <li>• Check to be sure insulin is the correct type and that its expiration date has not passed</li> <li>• If the student uses prefilled disposable pens: cartridge is already in the pen.</li> <li>• If the student uses a reusable pen: the insulin cartridge will often be in the pen. If not, load pen cartridge into</li> </ul>	<p>Prevents medication errors.</p> <p>Insulin should be discarded after 30 days.</p>
<p>D. Remove insulin pen cap, clean rubber stopper with another alcohol swab.</p> <p>E. Take out new packaged needle, remove its protective tab. Do not touch where the needle will attach to the pen.</p> <p>F. Carefully screw on the needle onto the end of the insulin pen and remove protective cap.</p>	

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
<p>G. Prime the needle.</p> <ol style="list-style-type: none"> <li>1. Pulling out plunger on the end of the pen and dialing the pen to '2'.</li> </ol> <p>H. Point pen away from people and press the plunger until dose selector returns to zero. Liquid should come out of the needle; if it doesn't repeat priming process.</p>	 <p style="text-align: center;">Priming an Insulin Pen</p>
<p>I. Verify the dose</p> <ol style="list-style-type: none"> <li>A. Recheck IHP</li> <li>B. Check that the dose selector is set at zero, and then dial number of units needed.</li> <li>C. Check dialed dose on pen</li> </ol>	
<p>J. Verify dosage with another staff member.</p>	
<p>K. Use pen to inject insulin</p> <ol style="list-style-type: none"> <li>1. Assist the student in selecting the injection site. The area should be clean; alcohol wipe may be used.<sup>7</sup> Injection sites should be rotated.</li> </ol>	<p>Systematic rotation of sites will keep the skin supple and favor uniform absorption of insulin. Absorption is quicker from the abdomen and arms than the thighs or buttocks</p> 
<ol style="list-style-type: none"> <li>2. Pinch skin and insert insulin pen needle at 45-90° angle.</li> </ol>	<p>Thin people require pinching a skin fold and injecting at 45°. Injecting at 90° into taut skin is recommended for heavier people. Avoid pinching skin tightly to avoid trauma. Aspiration is not necessary.</p> 

3. Push the injection button down completely to deliver insulin and count 10 seconds with skin pinched and needle in place.	If the child is having trouble with leaking insulin, turn the pen (spin it around) before pulling it out
4. Remove insulin pen from skin. Apply slight pressure to the injection site with cotton ball, if needed.	
L. Do not replace the protective needle cap; carefully unscrew pen needle to remove from pen and dispose of needle in sharps container.	Refer to <u>Universal Precautions Handout</u> .
M. Put insulin pen cap back on pen for storage and return pen to storage area.	Some insulin may require refrigeration.
N. Document procedure in student's individual treatment record.	Record: 1. Date and time. 2. Blood glucose level. 3. Amount and type of insulin given. 4. Site of administration. 5. Student's response and action taken. 6. Signature of personnel performing.

Note: The practice of wiping an injection site with alcohol is not as automatic as it once was. Certainly, the area should be clean and alcohol can help.

## Insulin Administration by Pump Therapy Handout

### I. Overview

The insulin pump is a programmable microcomputer which delivers a continuous subcutaneous injection of rapid-acting insulin. The insulin pump is about the size of a pager, powered by a battery and capable of delivering exact amounts of insulin, in as small as 0.025 unit. Delivery occurs from the reservoir or cartridge contained in the pump through a specialized tubing (or infusion set) to the subcutaneous site which is usually in the abdomen (other sites may be used). An introducing needle is used initially to insert the infusion set into the selected site; the needle is usually removed after placement leaving a small plastic catheter in place. Some insertion sets leave the needle in after pump placement. Insulin is pumped through this tubing at a prescribed rate of infusion. This basal rate mimics the small amount of insulin that is continuously secreted by a healthy pancreas. When food is ingested, the grams of carbohydrates are calculated and a prescribed amount of insulin is given by bolus dose to maintain a prescribed blood glucose level. If the blood glucose level exceeds acceptable levels, a correction bolus may be prescribed.

The student may perform this procedure independently if indicated on the INDIVIDUALIZED HEALTHCARE PLAN - DIABETES, and if the student has signed a STUDENT SELF-MANAGEMENT AGREEMENT.

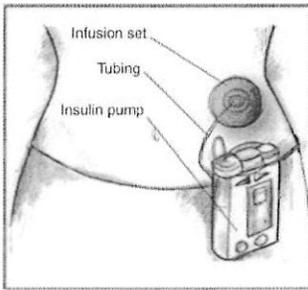
### II. Supplies:

- A. Insulin pump with rapid-acting insulin and manufacturer's instruction booklet.
- B. Extra batteries and other pump supplies (e.g., infusion set and inserter, reservoir and insulin) specific to student for pump maintenance.
- C. Injectable insulin supply and syringes or insulin pen in event of pump or site failure.
- D. Meter, lancets, strips, and alcohol wipes.
- E. Sharps container
- F. Disposable medical gloves
- G. Student's IHP
- H. Phone number of pump manufacturing company in case of pump malfunction.

### III. Preparation

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Review Universal Precautions	These measures are designed to prevent spreading infectious disease. Refer to <u>Universal Precautions Handout</u> .
B. Review student's IHP. 1. Determine the insulin dose from the HEALTH CARE PROVIDER ORDERS	All specialized procedures conducted in the school setting require written licensed prescriber orders and parent/guardian consent. The IHP also contains specific information about the student's target blood glucose level and standard of care instructions based on the test results. <ul style="list-style-type: none"> <li>Review the dosage prescribed for covering carbohydrate intake and the insulin correction scale or formula to cover excess</li> </ul>
C. Acquire blood glucose reading.	Document the newest blood glucose measurement. Refer to <u>Glucose Monitoring</u>

### IV. Procedure

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
V. Review and follow basic operating functions of the pump listed below based on the manufacturer's instructions: A. Identify insertion set, tubing, and cartridge components of pump. B. Check the status of the pump C. Suspend the pump D. Verify time of last bolus E. Verify the pump is not in 'no delivery' mode F. Change the batteries in the pump G. Check insulin reservoir and insertion site	 <p>Refer to manufacturer's instruction booklet</p>

<p>VI. Review and follow how to give a bolus per IHP following the manufacturer's instructions:</p> <ul style="list-style-type: none"> <li>• If using the insulin dose calculator (Bolus Wizard) function in the pump (if present), review how to look at pump dose calculations for dose of insulin, verify dose is within parameters and activate to administer dose.</li> <li>• Document procedure on individual student's treatment record.</li> </ul>	<p>Refer to manufacturer's instruction booklet and IHP.</p> <p>Record:</p> <ol style="list-style-type: none"> <li>1. Date and time.</li> <li>2. Blood glucose level.</li> <li>3. Amount and type of insulin given.</li> <li>4. Student's response and action taken.</li> <li>5. Signature of personnel performing.</li> </ol>
<p>VII. Troubleshoot pump malfunction</p> <ul style="list-style-type: none"> <li>• Review pump alarms/functioning. <ul style="list-style-type: none"> <li>• For hypoglycemia, <ul style="list-style-type: none"> <li>• Assess for pump malfunction.</li> <li>• Turn off or suspend pump if it is not functioning properly.</li> <li>• Notify parent/guardian and school nurse.</li> <li>• Refer to student's IHP for appropriate interventions.</li> </ul> </li> <li>• For hyperglycemia, <ul style="list-style-type: none"> <li>• Assess for clogged or kinked tubing</li> <li>• Assess for infusion site failure.</li> <li>• Follow IHP for appropriate interventions.</li> <li>• Notify parent/guardian and school nurse</li> <li>• Administer insulin by injection for hyperglycemia, according to health care provider order</li> </ul> </li> </ul> </li> </ul>	<p>Signs of pump malfunction may include pump alarms, clicking noise.</p> <ul style="list-style-type: none"> <li>• Check basal rate and last bolus dose given.</li> <li>• Refer to Manufacturer's instruction booklet.</li> </ul> <p>Signs may include: pump not infusing, leaks or kinks in infusion set tubing, empty insulin cartridge, redness and tenderness at site, or leakage around insertion site.</p> <p>Act as directed by the IHP HEALTHCARE PROVIDER ORDER.</p> <ul style="list-style-type: none"> <li>• Infusion set and/or insertion site should <i>only</i> be changed by school nurse, parent, or student (if student has signed a STUDENT SELF- MANAGEMENT AGREEMENT).</li> <li>• Check blood glucose. Refer to <u>Glucose Monitoring Handout</u>.</li> </ul> <p>Administer insulin by another means if needed. Refer to <u>Insulin Administration by Syringe Handout</u> or <u>Insulin Administration by Pen Handout</u> as appropriate.</p>

## V. Additional Resources

Medtronic: *A Reference Guide for School Nurses with the Medtronic Minimed Insulin Pump*

<http://www.professional.medtronicdiabetes.com/sfc/servlet.shepherd/version/download/068C0000000K6p8>

Animas User Guides (Animas webpage search results):

[http://www.animas.com/search/google\\_appliance/user%20guide](http://www.animas.com/search/google_appliance/user%20guide)

Omnipod User Guide webpage: <http://www.myomnipod.com/customer-care/guides-and-resources>

### **Insulin Administration by Syringe Handout**

#### I. Overview

Insulin therapy involves the subcutaneous injection of insulin to reduce hyperglycemia and prevent diabetic ketoacidosis (DKA).

The student may perform this procedure independently if indicated on the INDIVIDUALIZED HEALTHCARE PLAN - DIABETES, and if the student has signed a STUDENT SELF-MANAGEMENT AGREEMENT.

#### II. Supplies

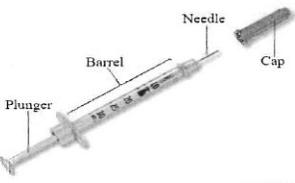
- A. Insulin supply as prescribed by healthcare provider.
- B. Insulin syringe with needle.
- C. Sharps disposal container
- D. Gloves, alcohol swabs, cotton balls
- E. Student's IHP
  - o Carbohydrate coverage and correction scale and/or formula prescribed by health care provider.

#### III. Preparation

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Review Universal Precautions	These measures are designed to prevent spreading infectious disease. See <u>Universal Precautions Handout</u> .
B. Acquire blood glucose reading.	Refer to <u>Glucose Monitoring Handout</u>

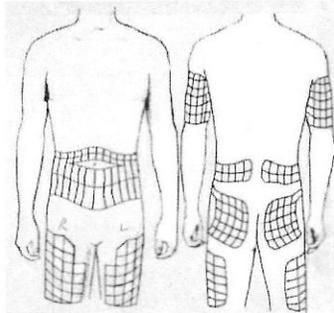
<p>C. Review student's IHP. Determine the insulin dose from the HEALTH CARE PROVIDER ORDERS</p>	<p>All specialized procedures conducted in the school setting require written licensed prescriber orders and parent/guardian consent. The IHP also contains specific information about the student's target blood glucose level and standard of care instructions based on the test results.</p> <ul style="list-style-type: none"> <li>Review the dosage prescribed for covering the carbohydrate intake and the correction scale or formula for covering excess glucose level.</li> </ul> <p>Refer to <u>Carbohydrate Counting and Correction Dosage Calculation Handout</u></p>
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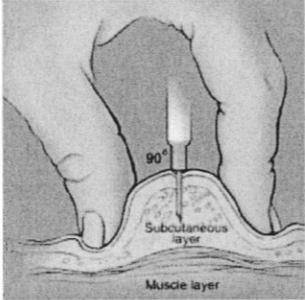
#### IV. Procedure

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Gather supplies.	
B. Wash hands and put on gloves.	Refer to <u>Universal Precautions Handout</u> .
<p>C. Prepare insulin</p> <ol style="list-style-type: none"> <li>Check to be sure you have the correct type and that the expiration date has not passed.<sup>5</sup></li> <li>Remove insulin bottle lid. Wipe rubber top of bottle with alcohol wipe and let dry for 5 seconds.</li> <li>Label insulin with student's name and date.</li> </ol>	<p>Insulin should be discarded after 30 days.</p> <p>Prevents medication errors.</p>
<p>D. Verify the dose</p> <ol style="list-style-type: none"> <li>Re-check IHP</li> <li>Pull air into the syringe by pulling back on the plunger until its black tip is even with the line showing the dose needed.</li> </ol>	 <p>The diagram shows an insulin syringe lying horizontally. Labels with leader lines point to the 'Plunger' at the back, the 'Barrel' in the middle, the 'Needle' at the front, and the 'Cap' which is shown separately to the right of the needle. The syringe has markings on the barrel and a black tip on the plunger.</p>
E. Place the vial of insulin flat on table, wipe rubber top of vial with alcohol swab, and push the needle through the center of the rubber top of the insulin.	

F. Push the plunger so that the air goes from the syringe into the bottle. Leave the syringe in the bottle.	
G. Turn the insulin bottle and syringe upside down.	
H. Pull insulin into the syringe by slowly pulling back on the plunger until the top of its black tip is even with the line showing required number of units.	
I. Look for air bubbles. If present, tap the syringe to raise air bubbles to the top, push the air bubbles back in the bottle and repeat steps 'G' 'H'.	
J. Check to make sure the correct number of units is in the syringe and remove the syringe from the bottle.	

<sup>5</sup> Students are rarely on NPH insulin, and those who are on NPH rarely administer it at school. If a student does have NPH, it may need to be mixed with another insulin. If mixing insulins, gently roll the bottle between the palms or turn the bottle over from end to end at least 20 times. Do not shake. If any clumps are visible, do not use. When using mixed insulins, withdraw clear insulin first and then withdraw cloudy insulin. This practice prevents dosage errors.

K. Verify dosage with another staff member.	
L. Use syringe to inject insulin 1. Assist the student in selecting the injection site. The area should be clean; alcohol wipe may be used. <sup>6</sup> Injection sites should be rotated.	<p>Systematic rotation of sites will keep the skin supple and favor uniform absorption of insulin. Absorption is quicker from the abdomen and arms than the thighs or buttocks.</p> 

<p>2. Pinch skin and insert insulin syringe needle at 45-90° angle.</p>	<p>Thin people require pinching a skin fold and injecting at 45°. Injecting at 90° into taut skin is recommended for heavier people. Avoid pinching skin tightly to avoid trauma. Aspiration is not necessary.</p>  <p>The diagram shows a cross-section of skin and muscle. A hand is pinching the skin to create a fold. An insulin syringe needle is shown inserted at a 90-degree angle into the subcutaneous layer, which is the layer of fat just below the skin. The muscle layer is shown below the subcutaneous layer. Labels include '90°', 'Subcutaneous layer', and 'Muscle layer'.</p>
<p>3. Push plunger in to deliver insulin and count 10 seconds with skin pinched and needle in place.</p> <p>4. Remove insulin syringe and needle from skin. Apply slight pressure to the injection site with cotton ball as needed.</p>	
<p>M. Dispose of syringe with needle intact into a sharps container. Do not recap needle.</p>	<p>Refer to <u>Universal Precautions Handout</u>.</p>
<p>N. Store remaining insulin according to manufacturer's recommendations.</p>	<p>Some insulin may require refrigeration.</p>
<p>O. Document procedure on student's individual treatment record.</p>	<p>Record:</p> <ol style="list-style-type: none"> <li>1. Date and time.</li> <li>2. Blood glucose level.</li> <li>3. Amount and type of insulin given.</li> <li>4. Student's response and action taken.</li> <li>5. Signature of personnel performing.</li> </ol>

The practice of wiping an injection site with alcohol is debated in the literature. Use of alcohol is optional depending on parent's preferred practice and environmental cleanliness. The site should be clean and not visibly soiled.

## Universal Precautions Handout

### I. Overview

Occupational Health and Safety Administration's (OSHA) *Universal Precautions* refers to a set of protocols for handling body fluids properly to protect against bloodborne pathogens. Bloodborne pathogens are infectious microorganisms in human blood that can cause disease in humans. These pathogens include but are not limited to hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV). Bloodborne pathogens can be found in blood, semen, vaginal secretions, and breast milk. Body fluids that do NOT pose a risk of bloodborne pathogen transmission unless visibly contaminated with blood include: urine, stool, saliva, emesis, nonpurulent respiratory secretions, tears, sweat or nasal discharge. Even though these other body fluids may not contain bloodborne pathogens, other infectious pathogens that cause other diseases may be present. Therefore, all blood, body fluids, secretions (including respiratory secretions), excretions (except sweat), non-intact skin and mucous membranes should be handled in a way that will prevent contamination with transmissible infectious agents (NOTE: this method is the Center for Disease Control and Prevention's *Standard Precautions* which evolved from Universal Precautions with additional protective standards).

These precautions include protocols to treat all body fluids as if they are contaminated.

Protocols include:

- Good hand washing technique
- Personal Protective Equipment (PPE)
- Cleaning and disposing of body fluids

### II. Supplies (for the purpose of medication administration):

- A. Warm, running water.
- B. Liquid soap.
- C. Paper towels.
- D. Plastic-lined and covered waste containers.
- E. Alcohol-based hand sanitizer, if running water not accessible
- F. Disposable gloves designed for medical use (latex or, because of the potential for allergy, non-latex [e.g., nitrile]).
- G. Brooms and dustpans.
- H. Approved germicidal solutions.

### III. Procedures

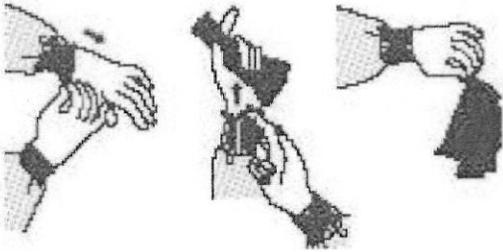
## Hand Washing

Hands must be washed with soap and water prior to beginning and after any planned procedure or when hands are visibly soiled. Good hand hygiene is the single-most effective procedure to prevent the spread of communicable disease in the school setting.

ESSENTIAL STEPS	KEY POINTS-PRECAUTIONS
A. Wet hands using warm, running water.	Warm water combined with soap makes better suds than cold water. Running water is necessary to carry away dirt and debris that contain microorganisms.
B. Apply liquid soap and lather well.	Bacteria can grow on bar soap and in soap dishes. Use plain non-antimicrobial liquid soap for most circumstances; use anti-microbial soap for specific circumstances, e.g., control of outbreaks or infections.
C. Rub hands together in a circular motion for 20 seconds.	Friction from rubbing hands together along with the effect of the soap loosening of the germs from the skin work together with the running water for good hand hygiene. Front and back of hands, between fingers and knuckles, under nails, and the entire wrist area are
D. Rinse hands well under running water.	Let water drain from wrists to fingertips.
E. Dry hands thoroughly with an air dryer or pat them dry with a fresh paper towel.	Use paper towels to turn off the water faucet, to open any exit door and to turn off bathroom lights. Dry skin may be cracked and potentially harbor microorganisms. Lotion is recommended after several hand washings.
<b>OR</b>	
A. Apply alcohol-based hand rub to the palm of one hand, then rub hands together covering all surfaces of hands and fingers until dry.	Hand sanitizers should never replace standard hand washing with soap and water but ethanol alcohol-based hand sanitizer can be used when hand washing facilities are not available. Hand sanitizers must have an alcohol base of at least 60% in order to be effective. Apply enough of the product (fragrance-free gel or foaming form preferred) to the palm of the hand that will wet the hands for at least 15 seconds (or longer according to the manufacturer).
B. Wash hands with soap and water as soon as possible.	Follow directions on the label to determine how many applications are recommended before washing hands with soap and water.

### A. Gloves – Use and Removal

Gloving prevents blood and body fluids that may contain disease-producing microorganisms, from coming in contact with the caregiver's skin and prevents the spread of microorganisms to others.

ESSENTIAL STEPS	KEY POINTS-PRECAUTIONS
A. Wash hands.	Refer to <i>Hand Washing</i> procedure.
B. Apply gloves to both hands.	Individuals with open skin lesions should cover lesions with waterproof bandage prior to applying the gloves. Ensure gloves are intact without tears.
C. Gloves must be worn during entire time when handling body fluids.	Gloves are most often worn during diapering, administering first aid and certain medications, and cleanup of body fluids.  Do not touch items with contaminated gloves that you or other people will be touching with your hands later. For example: water faucets, doorknobs, counter tops or other clothing.
D. To remove gloves after use:  1. Grasp outside of glove with opposite gloved hand; peel off;  2. Hold removed glove in gloved hand;  3. Slide ungloved fingers under the remaining glove at the wrist; peel off and discard	Do not touch skin with contaminated gloves.  
E. Repeat hand washing.	Refer to <i>Hand Washing</i> procedure in this handout.

### B. Cleaning and Disposing of Body Fluids

Items soiled with blood, body fluids, secretions, or excretions should be handled, transported, and processed in a manner that prevents skin and mucous membrane exposure and contamination of clothing.

ESSENTIAL STEPS	KEY POINTS-PRECAUTIONS
A. Wash hands.	Refer to <i>Hand Washing</i> procedure in this handout.

<p>B. Put on gloves when handling or touching body fluids, mucous membranes or non-intact skin of others in the school setting, or handling items or surfaces soiled with body fluids.</p>	<ul style="list-style-type: none"> <li>• Refer to <i>Gloves - Use and Removal</i> procedure in this handout.</li> <li>• Individuals with open skin lesions should cover lesions with a waterproof bandage prior to applying the gloves.</li> </ul>
<p>C. Sharp items (e.g., needles, lancets) must be handled with extreme care to avoid puncturing the skin.</p>	<p>Sharp items are regulated waste and should be disposed of in a sharps container labeled BIOHAZARD. Regulated waste should then be disposed of according to school district policy.</p>
<p>D. Blood and other body fluids can be flushed down the toilet or carefully poured down a drain connected to a</p>	
<p>E. Other items for disposal that are contaminated with blood or other body fluids that cannot be flushed down the toilet should be placed in a lined waste receptacle.</p> <ul style="list-style-type: none"> <li>✓ If saturated to the point of releasing blood or other body fluids if compressed (regulated waste), place in closable plastic container that is:</li> <li>✓ Constructed to contain all contents and prevent leakage during handling, storage, transport or shipping</li> <li>✓ Labeled with the standard fluorescent orange or orange-red BIOHAZARD</li> </ul>	<p>Immediately tie off the bag from the trash receptacle and dispose of it in appropriate general waste away from students.</p> <p>Bandages that are not saturated to the point of releasing blood or other potentially infectious materials if compressed would not be considered regulated waste. Regulated waste should then be disposed of according to school district policy.</p>
<ul style="list-style-type: none"> <li>✓ Closed before removal to prevent spillage or protrusion during handling, storage, transport or shipping.</li> <li>✓ Placed in a secondary container if leakage is possible.</li> </ul>	

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
<p>F. Body fluid spills should be cleaned up promptly, removing all visible debris first.</p>	<p>Wipe up as much of the visible matter as possible with disposable paper towels and carefully place them in a leak-proof plastic bag that has been securely tied or sealed. This prevents multiplying of microorganisms.</p>

<p>G. For hard surfaces, immediately use a detergent to clean the spill area and follow with a disinfectant.</p>	
<p>H. For soft, non-washable surfaces, such as rugs and upholstery, apply sanitary absorbing agent, let dry, and vacuum.</p>	<p>Cover spills with absorbent material, leave for a few minutes to absorb, gently sweep up and discard in a plastic bag or vacuum. Blot to remove body fluids from the fabric or carpet as quickly as possible; then disinfect by spot-cleaning with a combination detergent/ disinfectant, and shampooing, or steam-cleaning the contaminated surface.</p>
<p>I. Handle soiled, washable material (i.e. clothing and towels) as little as possible, at the location where it was used.</p>	<p>Send soiled clothing home with the student in a sealed, plastic bag.</p> <p>Wash and dry contaminated school-owned towels separately from non-contaminated laundry. Wash in soap and hot water (140- 160 degrees F) AND either liquid sodium hypochlorite bleach or dry bleach (which will not affect fabric colors). Dry on warm temperature setting.</p>
<p>J. Rinse non-disposable cleaning equipment (dustpans, buckets), clean with detergent followed by the</p>	<p>Non-disposable rags or mops should be treated as contaminated laundry.</p>
<p>K. Remove and discard gloves into covered, plastic-lined waste</p>	<p>Refer to <i>Gloves - Use and Removal</i> procedure in this handout.</p>
<p>L. Wash hands.</p>	<p>Refer to <i>Hand Washing</i> procedure in this handout.</p>

## Urine Ketone Testing Handout

### I. Overview

Ketones are acids that are produced by the body when it does not have enough insulin and uses fats for energy. Without sufficient insulin, ketones continue to build up in the blood and result in diabetic ketoacidosis (DKA), which is a medical emergency. DKA is the primary reason why children with type 1 diabetes are hospitalized, but it can be prevented with appropriate action.

Test for ketones when a student's blood glucose test result is above 300 for consecutive tests 3 hours apart, or when a student has abdominal pain, nausea, or vomiting.

The student may perform this procedure independently if indicated on the INDIVIDUALIZED HEALTHCARE PLAN - DIABETES, and if the student has signed a STUDENT SELF-MANAGEMENT AGREEMENT.

### II. Supplies

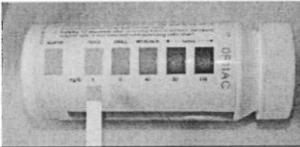
- A. Gloves
- B. Testing strips and comparison chart
- C. Cup for urine
- D. Protected testing area (waterproof disposable pad)
- E. Timing device (watch)
- F. IHP

### III. Preparation

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Review IHP	All specialized procedures conducted in the school setting require written licensed health care provider orders and parent/guardian consent. The IHP also contains specific information about the student's target blood glucose level and standard of care instructions based on the
B. Review Universal Precautions.	Refer to <u>Universal Precautions Handout</u> .

### IV. Procedure

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Gather supplies.	
B. Prepare work area.	
C. Wash hands, put on gloves	Refer to <u>Universal Precautions Handout</u> .
D. Student collects urine	

E. Place cup of urine on protected area (waterproof disposable pad)	Refer to <u>Universal Precautions Handout</u> .
F. Dip ketone testing strip in urine, tap off	
G. Time appropriately	Follow the specific instructions on the bottle, usually 15 seconds.
H. Compare strip to comparison chart, accurately read results	
I. Dispose of all supplies appropriately  Remove gloves, wash hands	Refer to <u>Universal Precautions Handout</u> .
J. Follow IHP for action plan.	Refer to health care provider orders and standard of care algorithm for
K. Document procedure on student's individual treatment record.	<ol style="list-style-type: none"> <li>1. Date and time.</li> <li>2. Blood glucose reading.</li> <li>3. Ketone results.</li> <li>4. Action taken and student's response.</li> <li>5. Signature of personnel performing.</li> </ol>

### Urine Ketone Testing Handout

#### V. Overview

Ketones are acids that are produced by the body when it does not have enough insulin and uses fats for energy. Without sufficient insulin, ketones continue to build up in the blood and result in diabetic ketoacidosis (DKA), which is a medical emergency. DKA is the primary reason why children with type 1 diabetes are hospitalized, but it can be prevented with appropriate action.

Test for ketones when a student's blood glucose test result is above 300 for consecutive tests 3 hours apart, or when a student has abdominal pain, nausea, or vomiting.

The student may perform this procedure independently if indicated on the INDIVIDUALIZED HEALTHCARE PLAN - DIABETES, and if the student has signed a STUDENT SELF-MANAGEMENT AGREEMENT.

#### VI. Supplies

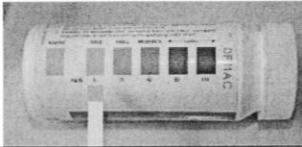
- A. Gloves
- B. Testing strips and comparison chart
- C. Cup for urine
- D. Protected testing area (waterproof disposable pad)
- E. Timing device (watch)

F. IHP

VII. Preparation

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Review IHP	All specialized procedures conducted in the school setting require written licensed health care provider orders and parent/guardian consent. The IHP also contains specific information about the student's target blood glucose level and standard of care instructions based on the
B. Review Universal Precautions.	Refer to <u>Universal Precautions Handout</u> .

VIII. Procedure

ESSENTIAL STEPS	KEY POINTS/PRECAUTIONS
A. Gather supplies.	
B. Prepare work area.	
C. Wash hands, put on gloves	Refer to <u>Universal Precautions Handout</u> .
D. Student collects urine	
E. Place cup of urine on protected area (waterproof disposable pad)	Refer to <u>Universal Precautions Handout</u> .
F. Dip ketone testing strip in urine, tap off	
G. Time appropriately	Follow the specific instructions on the bottle, usually 15 seconds.
H. Compare strip to comparison chart, accurately read results	
I. Dispose of all supplies appropriately  Remove gloves, wash hands	Refer to <u>Universal Precautions Handout</u> .
J. Follow IHP for action plan.	Refer to health care provider orders and standard of care algorithm for
K. Document procedure on student's individual treatment record.	6. Date and time. 7. Blood glucose reading. 8. Ketone results. 9. Action taken and student's response. 10. Signature of personnel performing.