Alternate Caregiver Training

Goals—Caregivers will learn:

- Basic understanding of what diabetes is
- Fundamentals of insulin and carbohydrates
- How to check blood sugar
- How to treat high or low blood sugar
- Basic carb counting
- How to give insulin via injection or pump
- What to do in case of emergency

What is diabetes?

- Autoimmune diabetes (commonly referred to as “Type 1” diabetes)
  - Beta cells—cells that make insulin are recognized as foreign
  - Beta cells attacked by body until T1D is unable to produce their own insulin
  - Insulin from the external source (i.e.: via injection or insulin pump) is the only treatment—is NOT a cure
What does that mean?

- Without insulin, the body cannot properly metabolize carbohydrates
- Carbohydrates are the body’s main source of fuel
- Insulin is the gatekeeper to the cells; if there is not enough insulin, carbohydrates will not get into the cells and will be left elsewhere in the body
- Causes blood sugar to rise above ideal levels

How do I know what the blood sugar is?

- You must CHECK it!

To test blood sugar:

- Be sure to change your lancet EVERY time you test
- Place strip into glucometer with the PIANO KEYS IN the machine
- Clean the finger (or toe) that you will be using thoroughly using either alcohol or hand washing with soap and water for 15 seconds.
- Use the sides of the finger or toe for sample.
- Make sure the finger or toe is warm before trying to lance it—otherwise it will be difficult to get a sample.
To test blood sugar (cont’d):

- Make sure your lancing device is ready before placing on sample area
  - On Accu-Chek lancing device, this is the top of the lancing device—you will press down to click and load
  - On One-Touch Delica lancing device, is the lower black button—you will pull back to load

Testing blood sugar (cont’d)

- You are now ready to place lancing device over the sample area
- Push button to activate the lancet
  - On Accu-Check device, this is the clear button at the bottom
  - On One Touch Delica, this is the blue button at the bottom

Testing blood sugar (cont’d)

- If having difficulty obtaining sample, you can “milk” the finger or toe, and hold downward to help blood flow to the area faster
- Bring glucometer to the blood sample, hold the strip to the blood sample, and let it “draw” the blood in
- Wait 5 seconds for the result or “number” to appear.
What does the number mean?

- Goals for blood sugar
  - Under age 6: 80-200 before meals and bedtime
  - Greater than age 6: 70-150 before meals and bedtime
- If blood sugars are above or below these target ranges, you must take action

Hyperglycemia

- High blood sugar
  - Symptoms
    - Feels hot
    - Thirsty
    - Urinating more often than usual
    - Hungry
    - Nauseated
    - Complains of headache
    - Mood swings
    - Drowsy

Hyperglycemia (cont’d)

- What do I do?
  - You must always test blood sugar first!
  - If blood sugar is above target goal before meal or bedtime, give correction factor as prescribed by the doctor
  - Insulin should never be given sooner than 2 hours apart. Therefore, you do not need to retest any sooner than 2 hours
  - Regardless of when tested, if blood sugar is over 300, you must test for ketones
Giving insulin

- If using a manual injection, corrections for high blood sugar should only be given before meals and bedtime to prevent low blood sugar.
- Correction factor is usually written like this:
  - 1:50 greater than 150
  - Every number in equation gets used
    - Example: Blood sugar is 300
      - Subtract 150 (the target blood sugar) from 300
      - 300-150=150
      - Then, divide 150 (your answer from previous problem) by 50
        - 150/50=3 units

Giving insulin (cont'd)

- For any food amount greater than 5 grams of carbohydrate, you must give insulin based on child's carbohydrate ratio.
  - Example: Child's carb ratio is 1 unit for every 10 grams (usually written as 1:10), and eats 50 grams at a meal
    - Divide 50 by 10 to know how much insulin to give for food
      - 50/10=5 units
  - If at mealtime, and child’s blood sugar is high, you will add the food dose to the correction dose for the total insulin dose

How do I give a shot?

- Wash your hands
- Wipe the rubber top of the insulin bottle with an alcohol swab (can reuse to wipe the skin later)
- Remove the syringe caps (bottom first, then top to keep from sticking yourself)
How do I give a shot (cont’d)?

- Pull amount of air equal to the dose into the syringe (ex. If the dose is 5 units, pull 5 units of air into the syringe)

How do I give a shot (cont’d)?

- Push the needle straight into the rubber top

How do I give a shot (cont’d)?

- Push the air into the vial (you are creating positive pressure to prevent getting air bubbles at the end)
How do I give a shot (cont’d)?

- Turn the syringe and vial upside down
- Pull slowly back on the plunger until the top of the black tip is even with the line of your dose

Why am I worried about air bubbles?

- Air bubbles can displace insulin and give you an inaccurate insulin dose
- What happens if you see air bubbles?
  - Two ways to rid of air bubbles
    - Take the syringe out of the vial, pull air into the syringe, "flick" the syringe to move the air bubbles to the top, then push the air out (may require you to draw more insulin in to equal the correct dose)
    - "Flick" the syringe to move air bubbles out (be sure to take the syringe out of the vial to do this, so as not to bend the needle)

Now what?

- Once you have made sure there are no air bubbles in your syringe, you are ready to inject
- Be sure to clean the shot site with alcohol
- You do not have to pinch the area where you will be injecting
- When you’re ready to inject, inject the needle straight into the shot site
- Slowly push the dose in until you cannot push anymore
- Wait 5 seconds, then remove the needle.
- Make sure you dispose of the needle in a sharps container!
Where can I inject a shot?

Anywhere you see here...

...Or anywhere you can do the Macarena...

How to “Bolus” From an Insulin Pump

- “Bolus” means to give insulin
- Three most common pumps currently in use
  - Medtronic
  - Animas
  - Omnipod
- Advantage: you do not have to do the math to calculate the insulin dose
  - Bolus Wizard
  - Insulin On Board feature
- Disadvantage: if site becomes dislodged from the child, you must give insulin via injection

How to “Bolus” With Medtronic Pump

1. Either press the “B” button, or press ACT, select “Bolus” and go to “Use Bolus Wizard”
2. Press “ACT”
   1. If you are entering a blood glucose level, use the up and down arrow keys to do so, then press ACT. If not, then press ACT to skip this step and move on to entering carb amounts
   2. If you are entering a carb amount, use the up and down arrow keys to enter the amount. If you’re only correcting the blood glucose, then press ACT to skip this step
3. The Estimate screen will appear with the suggested insulin dose. Be sure to review this to make sure you have entered all information correctly. If you need to make any changes, press the ESC button to return to the Enter BG screen and repeat steps 2 and 3.
4. If everything is correct, press ACT to advance to the Set Bolus screen. When you are ready to deliver the insulin, press ACT again.
How to Bolus With the Animas Pump

- If correcting blood sugar
  1. Press "OK" on the insulin pump
  2. Press OK again to go to the Main Menu
  3. Select Bolus and press OK
  4. Select "eBG"
  5. Enter the actual BG amount using the up and down arrow keys
  6. Select "Show Result". If you need to change anything, you will need to select Main Menu to start over
  7. The total will be the second-to-last number on the screen—above the flashing zeros. You must agree with that amount by using the up and down arrow keys to enter the total immediately above it
  8. Select "Go" and press OK to deliver the insulin

How to Bolus With the Animas Pump (cont’d)

- If covering carbs
  1. Press OK on the pump, and press OK again to go to the Main Menu
  2. Select Bolus and press OK
  3. Select "eCarb" by using the up and down arrow keys, and press OK
  4. Use the up and down arrow keys to enter the carb amount
  5. **Note** you will have the option to enter the blood sugar if you need to by selecting "Add BG" at the bottom of the screen—then follow the steps to input the BG
  6. Select "Show Result" using the arrow keys, and press OK to review the information
  7. If anything is incorrect, you will need to select Main Menu to start over
  8. If you agree with the total, shown immediately above the flashing zeros, use the up and down arrow keys to enter the Total Amount and Press OK
  9. Select GO using the up and down arrow keys, and press OK to deliver the insulin

How to Bolus using the Animas Remote

- You must be within 10 feet of the child to make sure the remote communicates with the pump
- To correct BG or cover carbs
  1. Turn the meter on using the arrow key on the left (if it is not on already)
  2. Select OK to go to the Main Menu
  3. Select Bolus and press OK
  4. From here, you will see the same options that you see on the pump. You will enter all information using the same process that you would on the pump
- To see in detail, videos are available at http://www.animas.com/support/onetouch-ping-insulin-pump/how-to-use
How to Bolus Using the Omnipod

- Must be done using remote
- Remote can also be the glucometer
  1. To check BG using remote, insert the Freestyle test strip—“Piano Keys” into the remote.
  2. Check to make sure the calibration code matches the vial of strips
  3. When the screen displays “Apply a Blood Sample to the Strip”, test blood sugar using technique described earlier
  4. When the result displays, select “Next” using the button immediately below Next
  5. The screen will display “Are you going to eat now?” If yes, select “Yes” using the button immediately below Yes.
  6. If you selected Yes, then you will need to enter the carb amount using the up and down arrow keys, then select “Enter”.
  7. The screen will display “Are you going to eat now?” If yes, select “Next” using the button immediately below Next
  8. If you selected Yes, then you will need to enter the carb amount using the up and down arrow keys, then select “Enter”.
  9. The next screen will ask if you want to “Start Bolus”. If you are ready, select “Confirm”.

**Note**: The child must be within two feet to start the bolus. However, once the bolus is being delivered, the child does not need to be within two feet.

How to Bolus using the Omnipod (cont’d)

- If not using the remote as glucometer
  1. You can enter the information from a different glucometer by pressing the “Home/Power” button
  2. The Status screen will appear. Press the Home/Power button again to go to the Main Menu
  3. Select Bolus. The screen will tell you to Enter BG, which you can do by using the up and down arrow keys
  4. You will be asked if you want to use this for “Bolus Cals”. Select Yes.
  5. The next screen will display “Are You Going to Eat Now?” If yes, then select Yes; if not, then select No.
  6. Repeat steps 6-9 from previous screen.

Caregiver Guide: [http://www.myomnipod.com](http://www.myomnipod.com)
- Select Customer Care, then Guides and Resources. The PDF file is under “UST200 Caregiver Guide”

What are ketones?

- When there is a lack of insulin to let carbohydrates into the cell, the body needs a fuel source
  - Burns through protein quickly, then burns through fat
- Ketones are by-products, or “poisons” that release into the body as a result of burning through fat.
### When and how are they tested?

- **Ketones should be tested**
  - Any time you have an unexplained high blood sugar greater than 300 (example of "unexplained": more than 2 hours after a meal or snack)
  - When ill—they should be tested every 4 hours regardless of the blood sugar
  - If nauseated or vomiting

- **How are they tested?**
  - Blood ketone meter
  - Urinating on a strip that changes color if ketones are present.
    - **Note**: if you have strips with two color pads, you are only concerned with the bottom color!
  - Wait 15 seconds after urine hits the strip, then look for one of the colors below:

### How are ketones treated?

- Ideally, ketones will be negative
- If trace or small, encourage at least 16-20 oz. of water every hour
  - If child is nauseated, allow them to drink only what they can handle without vomiting—vomiting can make ketones worse!
- If ketones are moderate or large, this is a “danger zone”
  - Encourage water by the same guidelines above
  - Restrict from activity—can make ketones worse
  - If vomiting, may need to go to emergency room for fluids to help clear ketones

### Hypoglycemia

- **Signs of low blood sugar**
  - Shaking
  - Sweating
  - Mood swings
  - Hungry
  - Anxious
  - Headache
  - Fatigue, or complains of feeling weak
  - Child may tell you he or she “feels funny”

- Always test first before treating! Some of the signs of low blood sugar are the same as those for high blood sugar!
Treatment for low blood sugar

- “Rule of 15”—treat with 15 grams of a **fast-acting** carbohydrate source, wait 15 minutes and retest
- Sources of 15 grams include:
  - 4 oz (1/2 cup) of juice
  - 6 oz (1/2 can) of regular soda
  - 8 oz (1 cup) of milk
  - 3-4 glucose tabs
  - 1 oz. cake icing gel
  - 15 Smarties candies
- If blood sugar is less than 70 (or 80 if child is under the age of 6) when you retest, repeat the Rule of 15
- If blood sugar is above 70 (or 80 if the child is under age 6) when you retest, no further action is needed

Glucagon

- Glucagon is used for extreme cases of low blood sugar when
  - Child is unconscious
  - Child is seizing
  - Child is unable to cooperate to take anything by mouth

Glucagon (cont’d)

- Always make sure child comes to you with their Glucagon kit and that you know where it is
- If you are by yourself
  - Give Glucagon
  - Call 911
  - Test blood sugar
- If someone is with you
  - Designate one person to test blood sugar
  - If 70 or below (below 80 if child is under age 6), give Glucagon
  - While you’re giving the Glucagon, have the other person call 911
How Glucagon is given

- Video:
- Rule of thumb to know how much to give:
  - If child is above the waist in height, give all of the Glucagon
  - If child is below the waist, give HALF of the Glucagon
- Can give anywhere you can give a shot, and can be given through the clothes
- Child may complain of headache or nausea, may vomit, or may not remember what happened. These are all normal after giving Glucagon

Counting Carbohydrates

- What are carbohydrates?
  - The body's main source of fuel
- Why do they have to be counted?
  - T1Ds must have insulin coverage to help metabolize carbohydrates correctly
- How do I do that?

Counting Carbohydrates (cont’d)

- Look at your serving size!
- Look at your total carbohydrate amount
- Divide the total carbohydrate amount by the child’s carb ratio. Example: the ratio is 1:10, 31 divided by 10 would equal 3 units.
Counting Carbohydrates (cont’d)

In this scenario, you will need to either weigh (most accurate) or estimate the amount of food. Remember: Any food that is 5 grams or less is considered FREE and does not need insulin coverage. However, do not subtract 5 grams from the carb count if it is over 5 grams.

What if We Are Eating Out?

- Ask restaurant for nutrition information
- Can use pocket-sized guides such as Calorie King or Life in the Fast Lane (Eli Lilly)
- Estimate
  - Example:

What if We Are Eating Out (cont’d)

- Smartphone Apps
  - Calorie King
  - Carbs Control
  - Lenny the Lion
  - GoMeals
- Can use a similar food to estimate
  - Example: If you eat sandwiches at home and you know that each piece of bread is 15 grams (for a total of 30 grams), then you could also know that if the child is eating a hamburger, that each piece of bread on the bun is 15 grams.
What if I’m Using a Recipe?

- Can weigh or use nutrition labels for each ingredient
- Can use websites to enter each ingredient, and it will calculate the nutrition information
  - Example: http://recipes.sparkpeople.com/recipe-calculator.asp

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Questions?