Blood Sugar Monitoring, Child

The best information to help manage a child's diabetes is obtained from blood sugar (*glucose*) monitoring at home. This information guides changes in insulin dosing, diet and activity levels. Monitoring is important to identify when high or low blood sugar levels show up and what causes them. Catching low or high sugar levels can allow fast treatment to avoid dangerous blood sugar levels - low (*hypoglycemia*) or high (*hyperglycemia*). Monitoring helps the child reach their diabetes treatment goals and maintain a normal lifestyle.

There are two types of home blood sugar monitoring:

- Home blood glucose meters.
- Continuous glucose monitoring.

BLOOD GLUCOSE METERS

- Insert a test strip into a slot on the meter.
- Prick the skin with either:
  - A sharp-pointed tool used by hand (*lancet*).
  - An automatic spring-loaded tool with small needles.
- Place a drop of blood on the strip.
- Take the blood sugar reading.
  - Look at reading to make a treatment decision.
  - Readings are stored on the meter for later analysis of trends and problem times of day.
  - Most meters can connect to a computer to download information for graphing and analysis.

CONTINUOUS GLUCOSE MONITORS (CGM'S)

- A blood sugar sensor is attached to a small needle that is inserted just beneath the skin.
- Blood sugar readings are taken frequently throughout the day and night.
- Readings are sent wirelessly to a small monitor attached to the belt or kept in a pocket.
- Monitor display shows blood sugar level and trends.
- Can be used continuously or periodically for a few days (to check trends not picked up by glucose meter use).
- Some devices can be used for children age 7 and above.
- It sounds an alarm if there is a dangerous reading.
- Needs at least two to three calibrations each day with a finger stick and glucose monitor.
- A finger stick using a standard blood glucose meter is required before making self-management or therapy decisions.
- Some systems send information to an insulin pump to tell them how much insulin to give.
- Readings are stored for later analysis of trends and problem times of the day.
- Can connect to a computer to download information.
- Need to be changed after 3 days.
- More expensive than standard blood glucose meters.

TIMES TO TEST (BLOOD GLUCOSE METER OR TEST STRIP)

- Follow your child's caregiver's instructions about when to test.
- When in doubt, test.
- How often to test may depend on how well your child's diabetes is controlled.
- It is usually best to test at least 3 to 4 times a day as part of the daily routine.
- Most indicated times to test:
  - Before breakfast, lunch and dinner.
  - Before bed.
- Other good times to check blood sugars:

- Before giving insulin.
- Before and after exercise.
- After correcting a low blood sugar.
- After meals.
- Occasionally during sleep.

- Sometimes testing is needed in between or after meals and in the middle of the night to improve treatment.
- Check blood sugar as soon as possible if your child shows signs of high or low blood sugar.
- Check your child's blood sugars more often during an illness.

HOME CARE INSTRUCTIONS

- Your child should have their meter with them all the time. You will know when they are old enough and want to check their blood sugar themselves.
- Praise your child whenever they check their blood sugars and report it accurately. It is good to encourage good diabetes self care.
- **Do not** reuse or share used lancets.
- Bring your child's blood sugar monitoring supplies and devices to their clinic visits:
  - Testing techniques can be checked and corrected if needed.
  - Meters can be checked for accuracy
- Glucose meters should be calibrated with a control solution every few boxes of strips.
- If your child's meter is out of range or if daily readings are not making sense, call the number on the meter for technical support. The meter can be brought in to the clinic to be checked.

NORMAL BLOOD SUGARS

Your caregivers will help advise you on how close to normal (*tight*) the control must be. However, normal blood sugar level ranges are 70-150. The higher end of the range is preferred for bedtime. Talk to your caregiver about goals. Tight control may lead to problems with low blood sugar (*hypoglycemia*).

HYPERGLYCEMIA (HIGH BLOOD SUGAR)

During times of illness or stress, the blood sugar should be checked more often. Stress (including illness) can make the blood sugar go up. Sometimes the sugar can down if the appetite is poor. This means that insulin dosages may have to be adjusted. More exercise can also use up the elevated blood sugar. The diet may have to be watched more closely if this is not already being done. If the blood sugar is above 250, check your child's urine for ketones. The ketones go up if your child is not getting enough insulin or enough fluids.

HYPOGLYCEMIA (LOW BLOOD SUGAR)

During times of poor food intake, your child's blood sugar may become too low. Exercise and too much insulin also cause low blood sugar. Usually a blood sugar below 60 is considered low. Signs of low blood sugar are:

- Hunger (which can also happen with high blood sugar when cells are hungry).
- Nervousness and shakiness.
- Sweating (*perspiration*).
- Dizziness or light-headedness.
- Sleepiness.
- Confusion.
- Difficulty speaking.
- Feeling anxious or weak.

When you detect hypoglycemia, correct it right away. Some juice with sugar, cake gel or sugar tablets usually help within a few minutes. **Do not** give liquids by mouth if your child is unconscious or unable to follow instructions to swallow. Your caregiver will have suggestions. Check sugar again in 15 minutes and keep correcting until it is above 70.

SUPPLIES NEEDED FOR CHECKING YOUR CHILD'S BLOOD SUGAR

- Lancets to prick the finger to obtain blood. The sides of the fingers are less sensitive than the fingertips.
- A meter to analyze the blood.
- Test strips. Most meters require these.
- You may want to see what meters use the least expensive test strips. Your caregiver can give you guidance on this.
- Get a book to write down your child's test results. Keep these handy and have them available to show your caregiver at your follow up appointments.
- Meters which keep track of results and the time and date are very useful.
- Follow the instructions with the meter for checking the accuracy. You may also want to check your child's blood sugar when you visit your caregiver, and match your meter's results with those from your caregiver. Your meter does have controls for you to make sure your results are accurate, but sometimes comparing to your caregiver's result gives reassurance.

HOW TO GET A BLOOD SAMPLE

- Wash hands well.
- Use the lancet to stick the side of the finger.
- Put a drop of blood on the test strip. Follow directions which came with the meter for use of the strips and meter.

HEMOGLOBIN A1C

Hemoglobin A1c level measure how well your child's blood sugar has been controlled during the past 1 to 3 months. It helps your caregiver see how effective your child's treatment is and decide if any changes are needed. Your caregiver will discuss your child's target glycohemoglobin with you. Children can compare results with scores on past tests and set goals for improvement. Normal is 4 to 6; children with diabetes do well with a score of 7 or 8 provided this does not represent a combination of very high and very low sugar levels.

IN GENERAL

- If you know your child's blood sugar level, it helps you treat low or high levels before they become emergencies. You will know in time how exercise and food affect your child's blood sugar and how much short-acting insulin to give (if your child takes insulin).
- Your diabetes team will tell you what range of numbers is safe for your child to aim for and how to adjust insulin or food intake if the numbers are too high or too low.

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