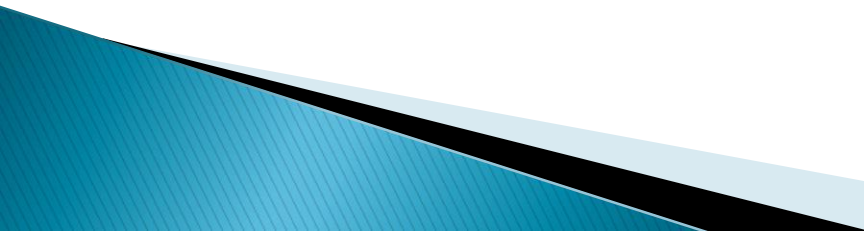


Strategies for Managing Diabetes in the School Setting for Optimal Glycemic Control

Cindy Lybarger, APRN, CDE
September 21, 2019



Introduction

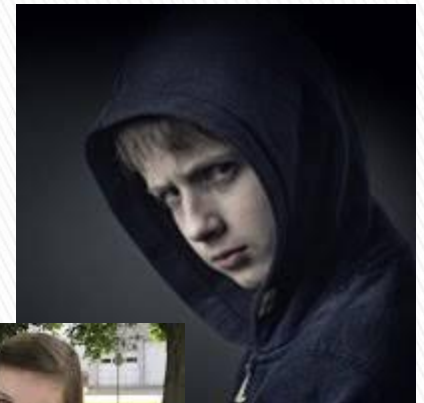
- ▶ List goals and targets for glycemic control
 - ▶ Describe strategies for improving outcomes in children and teens with diabetes, including use of new technology
 - ▶ Apply principles of management in interactive case scenarios with group discussion
- 

ISPAD Clinical Practice Consensus Guidelines 2018

- ▶ The ultimate goal in diabetes care delivery is to “provide care that results in normal growth and development, high quality of life, and lowest possible risk of acute and long-term complications.
- ▶ This goal is best accomplished by helping children and families become proficient in self-management, remain motivated throughout childhood and adolescence while mentoring children to develop into independent, healthy adults. “

Glycemic Targets– individualized, most should aim for <7.0%

- ▶ HbA1C reflects mean blood glucose over the prior 3 to 4 months and is the only long-term glycemic control measure with robust outcome data
- ▶ Multiple studies in diverse populations have shown elevated HbA1C values are associated with chronic complications of diabetes
- ▶ Chronic hyperglycemia has adverse effects on neurocognitive function and brain structure and development in children and adolescents.



2019 ADA Position Statement

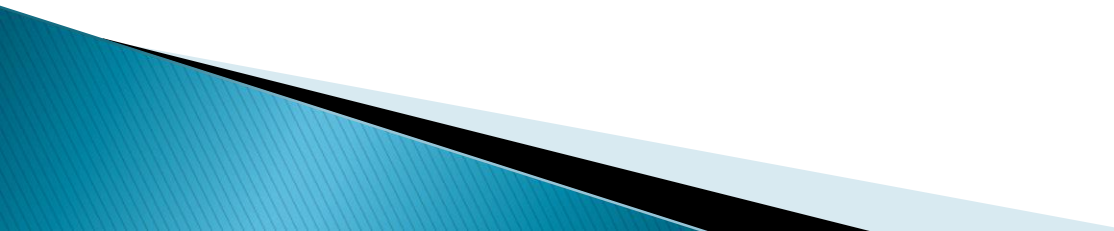
ADA position statement:

A1C Goal for youth with type 1 diabetes <7.5%
(Across all age groups)

The ADA emphasizes that glycemic targets should be individualized with the goal of achieving the best possible control while minimizing the risk of severe hyperglycemia and hypoglycemia.

Diabetes Care 2019.

A1C goal statement has not been revised, but lower A1Cs without increased risk of hypoglycemia may now be possible.



Goals for type 2 diabetes in teens

- ▶ Glycemic control important (A1C <6.5)
- ▶ Avoid hypoglycemia
- ▶ Weight loss– even modest will help
- ▶ Reducing insulin resistance – exercise/
activity goal: work up to 60 min/most days
- ▶ Avoid or treat comorbidities (HTN,
dyslipidemia, sleep apnea)
- ▶ Early onset T2DM has greater morbidity and
mortality than T1DM (Micro–and Macro–CV
disease)

Treatment of type 2 DM

- ▶ There are now 3 approved drugs for treatment of type 2 diabetes in youth age 10 & up: (ADA, June 2019).
 - Metformin only (max dose 2000 mg/day) unless A1C is 8.5% or higher, then need additional treatment needed
 - Insulin (basal only unless presenting in DKA)
 - Liraglutide (injectable GLP-1 receptor agonist)
 - Incretin mimetic
 - Increases insulin release from the pancreas – glucose sensitive–
 - Contraindicated if there is a FH of thyroid cancer
 - GI side effects, titrate dose slowly
 - Helps with weight loss

Measures of glycemic control: A1C

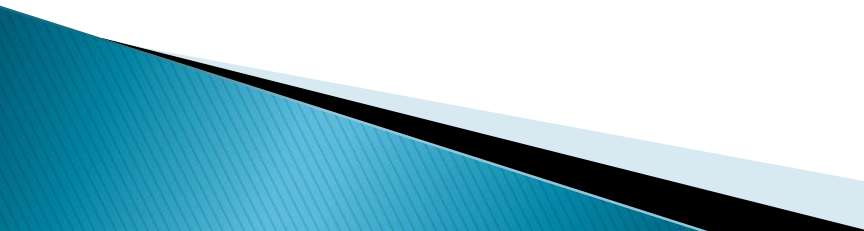
- ▶ A1C is an average of glucose levels – can have considerable variability in BG that is not reflected in A1C.

- ▶ A1C and estimated average glucose:


- ▶ NGSP.org
National Glycohemoglobin Standardization Program

HbA1C%	eAG (mg/dl)
5	97
6	126
7	154
8	183
9	212
10	240
11	269
12	298

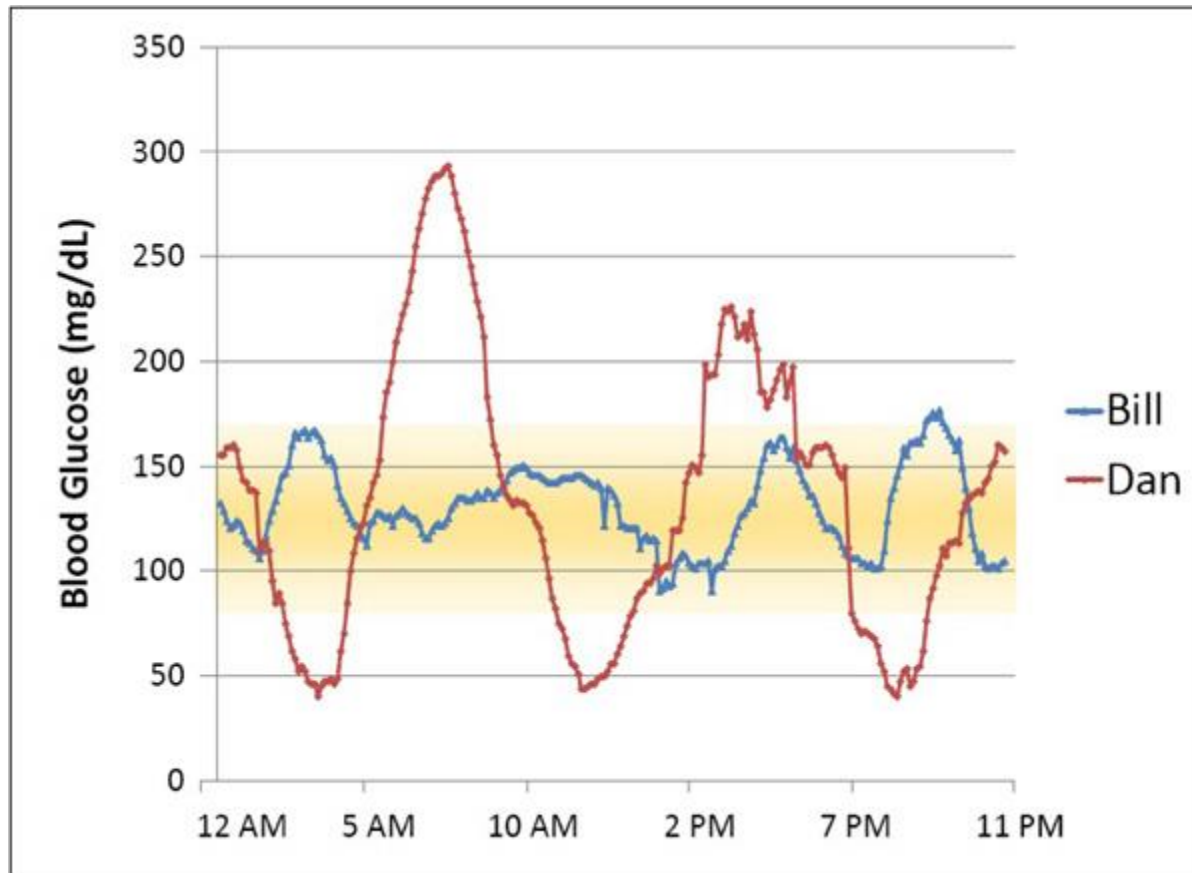
Is A1C still a good measure of glycemic control?

- ▶ YES!
 - ▶ It remains the gold standard for overall glycemic control and only measure that has robust outcome data.
 - ▶ Hemoglobin A is a minor component of hemoglobin to which glucose binds .
 - ▶ For tracking glycemic control over time, A1C gives us an idea of how much glucose that red blood cell has been exposed to over it's 3 month life span.
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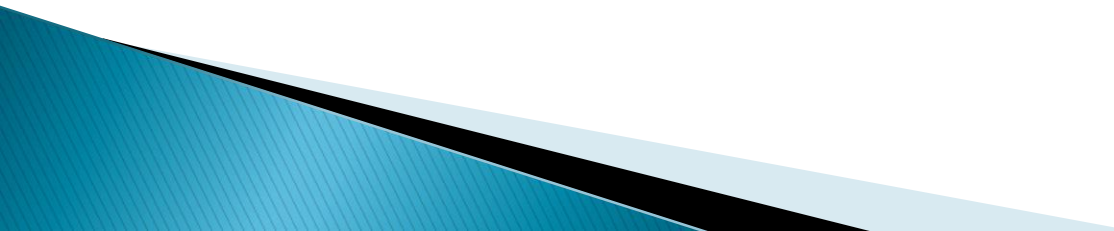
Is A1C still a good measure of glycemic control?

- ▶ And NO!
 - ▶ A1C is only one measure of glycemic control and does not take glucose variability into account *at all*.
 - ▶ Individuals can have extreme high and low BG and have the same A1C as someone who has stable BG in or near target range.
 - ▶ Time in target range can be calculated for individuals using CGM devices and give a much better picture of overall glycemic control.
- 

Not all A1Cs are created equal



Using Trend Arrows on CGM Devices to guide decision making

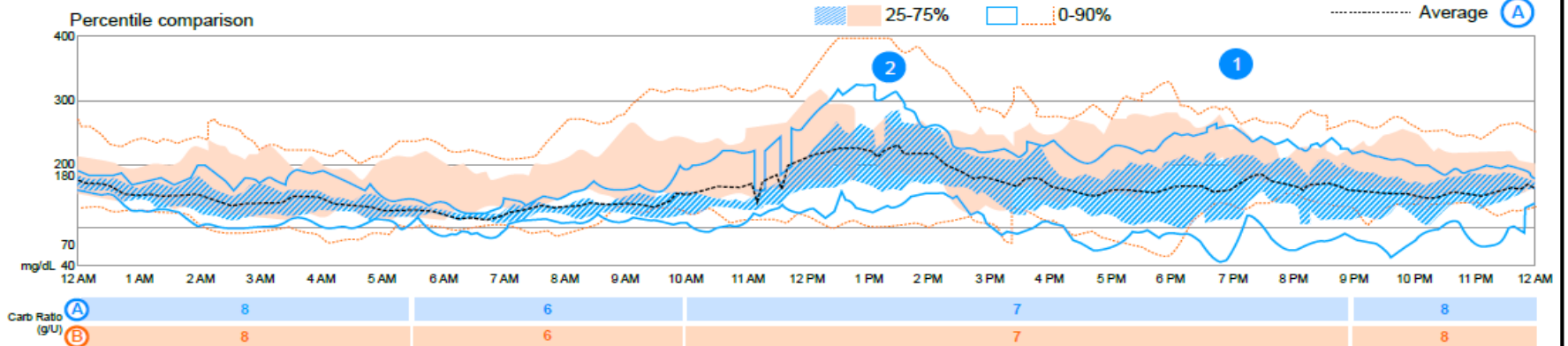
- ▶ Trend arrows indicate rates of glucose change
 - ▶ Concept of “point in time” BG vs. “anticipating future glucose levels” using interstitial fluid
 - ▶ Important: CGM lags behind fingerstick BG, both can be accurate, although numbers don't match precisely
- 

Time in target range

- ▶ Technology is improving and more individuals are going to be using automated insulin delivery systems now and in the future.
- ▶ “Time-in-range goals depend on the individual. One should try to achieve the highest time-in-range that can be reasonably achieved, but not at the expense of an increase in hypoglycemia.”
- ▶ For children and teens, most consider 70–180 mg/dl a reasonable target range.

(A) 4/12/2017 - 4/19/2017 (8 Days)

(B) 3/27/2017 - 4/4/2017 (9 Days)

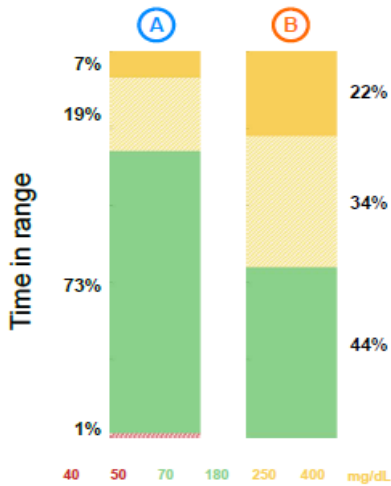


Hypoglycemic patterns(1)

Hyperglycemic patterns(1)

1 6:33 PM- 7:03 PM (1 occurrences)

2 11:50 AM- 2:55 PM



Auto Mode Exits

	(A)	(B)
No Calibration	0	0
High SG Auto Mode Exit	1	0
Auto Mode max delivery	0	0
Auto Mode min delivery	0	0
BG required for Auto Mode	1	0
Sensor Algorithm Underread	0	0
Sensor Updating	0	0
No SG values	0	0
Sensor Expired	0	0
Auto Mode disabled by user	0	0
Alarms	0	0
Pump Suspend by user	0	0
Large time/date change	0	0
Unidentified	1	1

Statistics

	(A)	(B)
Auto Mode (per week)	93% (6d 13hrs)	3% (6hrs)
Manual Mode (per week)	7% (11hrs)	97% (6d 18hrs)
Sensor Wear (per week)	97% (6d 19hrs)	93% (6d 13hrs)
Average SG ± SD	159 ± 54 mg/dL	198 ± 70 mg/dL
Estimated A1C	7.2%	8.5%
Average BG	189 ± 82 mg/dL	238 ± 108 mg/dL
BG / Calibration (per day)	4.8 / 3.4	6.0 / 3.6
Total daily dose (per day)	64 units	57 units
Bolus amount (per day)	28U (44%)	26U (46%)
Auto Basal / Basal amount (per day)	36U (56%)	31U (54%)
Set Change	2	3
Reservoir Change	2	4
Meal (per day)	4.5	4.1
Carbs entered (per day)	170 ± 79g	134 ± 40g
Active Insulin time	2:00 hrs	2:00 hrs

What are reasonable time in range goals?

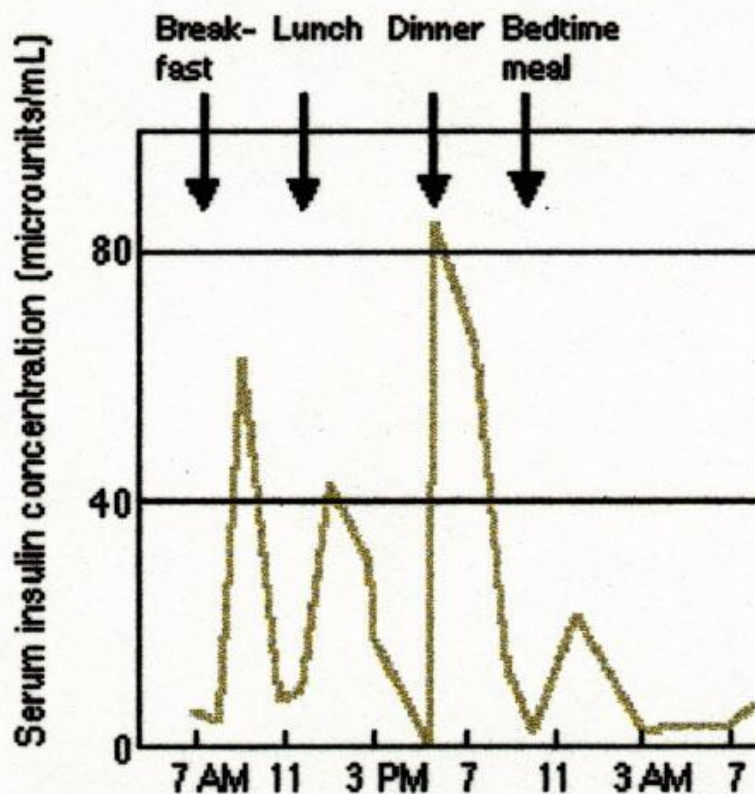
- ▶ Medtronic 670G hybrid closed loop pivotal study: showed 72% time in range. (and our patients –who upload data to Carelink– are achieving this, too!)
- ▶ Tandem Control IQ trial achieved 70% time in range. (T slim pump and Dexcom G6 software should be available soon)
- ▶ Dexcom study of injection users found time in range about 51% vs. 45% not using CGM.
- ▶ Abbott study using Freestyle Libre found time in range 66% vs. 61% with fingersticks. (people using pumps and injections with starting A1C 6.8%, actually reduced their hypoglycemia using Libre system).
- ▶ <https://diatribe.org/time-range-whats-achievable-goal-diabetes>

Diabetes Management

▶ Goals

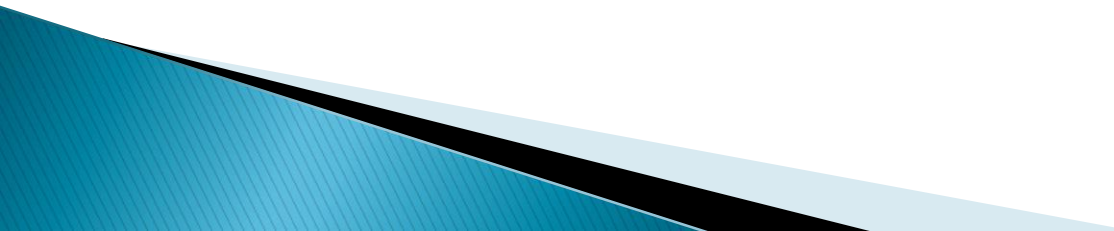
- Maintain blood glucose level as close to normal as possible– “think like a pancreas”
- Occasional (non–severe) low BG is acceptable, CGM can alert with trend arrow, intervene early
- Reduce risk of both short– and long–term complications
- Maintain acceptable quality of life– fit diabetes in to their lifestyle
- *Gradually* shift responsibility for diabetes tasks from parent/adult to child/ teen. (when child/ teen is ready)

How *Does* a Pancreas Think?



- ▶ Insulin secreted for ~2h with meals
- ▶ Insulin needs largely determined by carbohydrates
- ▶ Insulin secretion never completely stops
- ▶ Pre-meal dosing is more physiologic

Is pre-meal dosing that important?

- ▶ YES– It makes a difference, look at the CGM!
 - ▶ Avoiding significant post prandial hyperglycemia is crucial to improve time in range and A1C.
 - ▶ 2018 ISPAD guidelines: prandial insulin before each meal is superior to postprandial injection and should be preferred if possible
- 

Pre-meal dosing

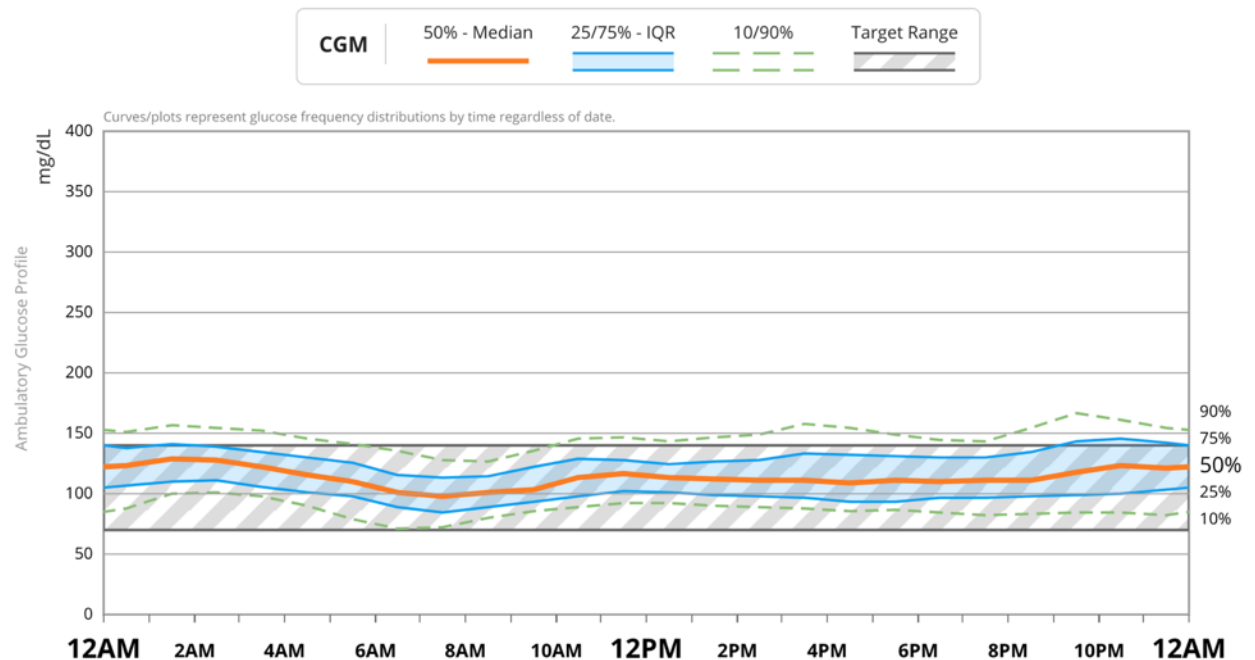
- ▶ Pumpers should always dose any needed correction and at least half of predicted carbs pre-meal. (All of carbs pre-meal is best). Unless the BG is low at the start of the meal.
- ▶ Those taking injections should aim to pre-meal dose. (the only exception is young child when it is not possible to predict their intake).

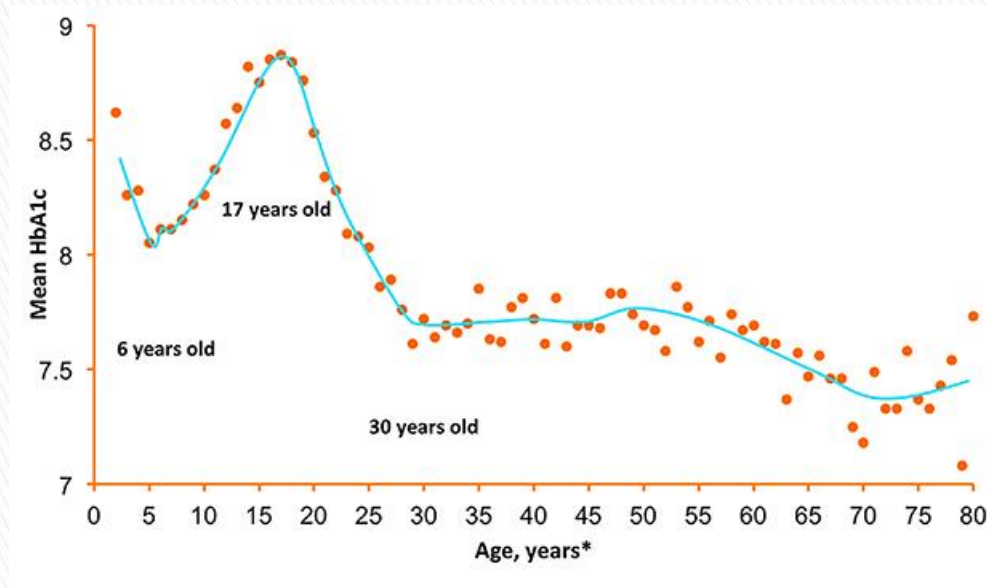
What about very low carbohydrate diets?

- ▶ Some* are advocating carb restriction (36g/day +/-15g) as a means to reduce variability and avoid post prandial hyperglycemia
 - * Lennerz, BS, Barton, A., Bernstein, RK, et al. Management of Type 1 Diabetes with a Very Low- Carbohydrate Diet. *Pediatrics* 2018, 141 (6) :e20173349.
- ▶ Generalizability of findings unknown/ acceptability of this level of restriction for growing/ active children and teens? Case reports of growth failure.
- ▶ Could carb restriction lead to resentment/ food sneaking/ disordered eating?
 - Probably makes sense to avoid high carb intake; aim for 150–200g/day .

Low carb diet, pre-meal bolus

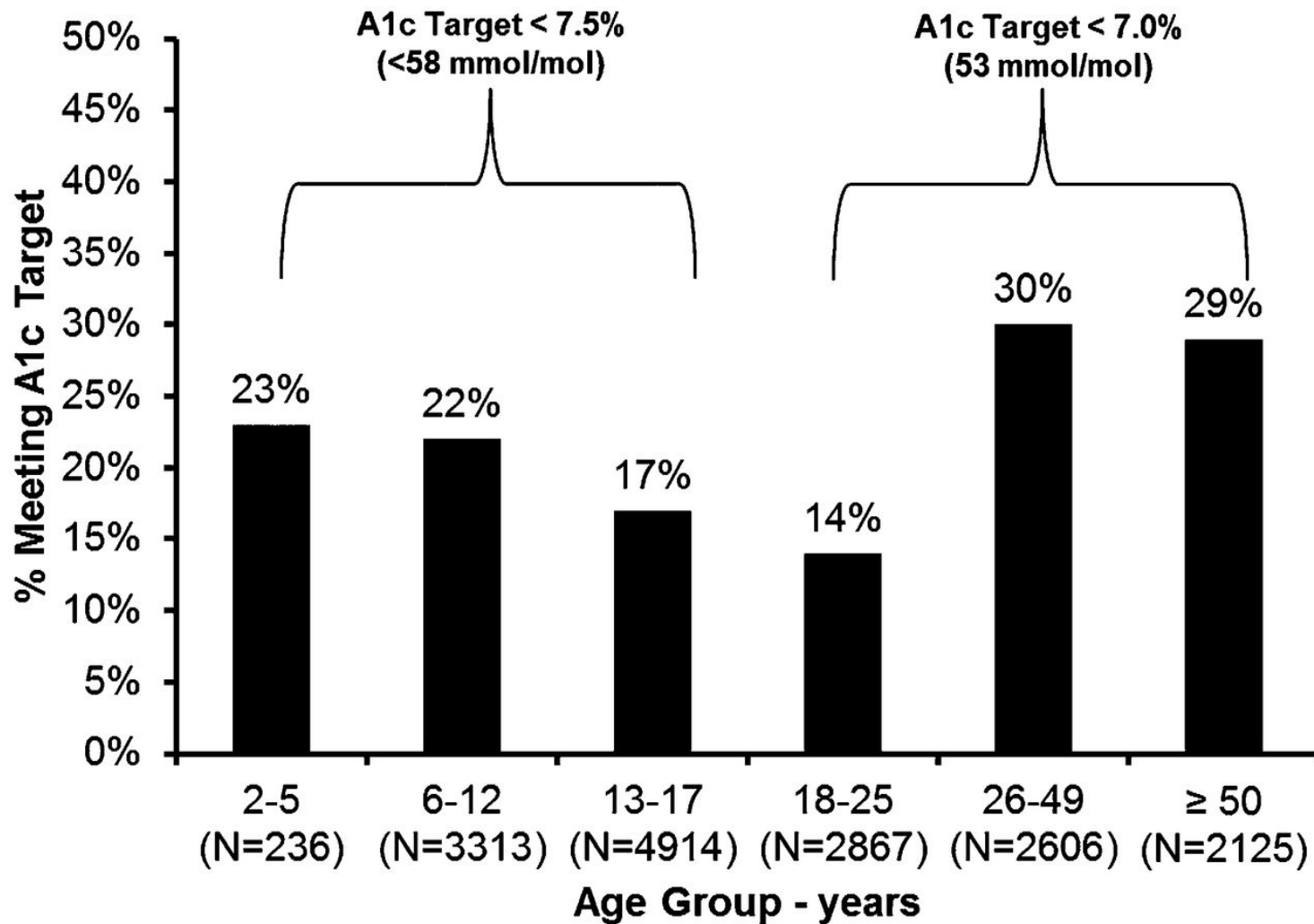
A professional... Adam Brown on Diatribe.org
Achieving excellent glycemic control!





So how are teens doing?

Current State of Type 1 Diabetes Treatment in the US.: Updated Data from the T1D Exchange Clinic Registry. (2015) Diabetes Care, 38(6): 971–978.



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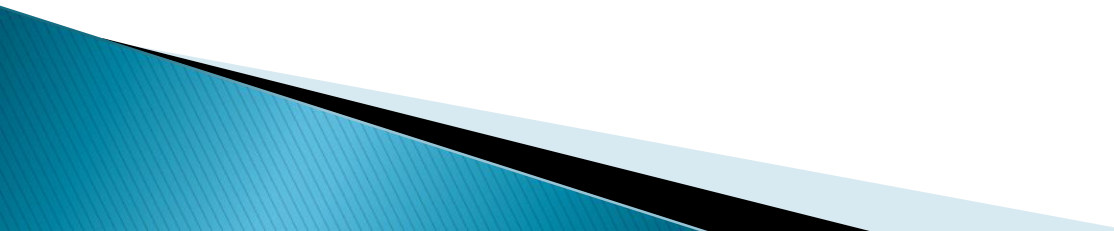
Case Scenario #1 Brad



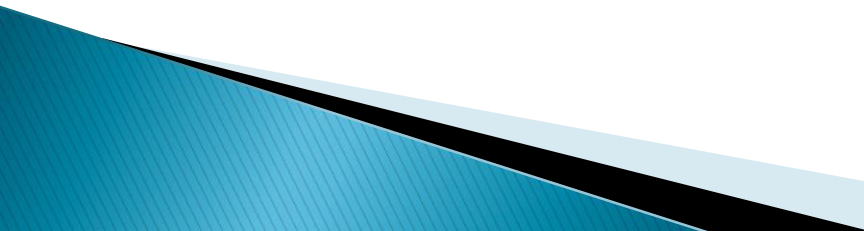
Case Scenario #1 Brad

- ▶ Brad is 13 years old, diagnosed 5 years ago with type 1 diabetes
- ▶ He started wearing a Medtronic 670G pump and sensor device about 6 months ago
- ▶ His last A1C was 8.0%, in auto mode 65% of the time.
- ▶ His time in target range at his last visit was about 55%, above target range 45%, and no low BG
- ▶ He says he does not want to bolus before eating because “I never know how much I’m gonna eat”.

Case Scenario #1 Brad

- ▶ You review his CGM history and note that he is having considerable post prandial hyperglycemia.
 - ▶ He is not having any problems with hypoglycemia.
 - ▶ He is of normal weight and height
 - ▶ What is the most appropriate course of action?
- 

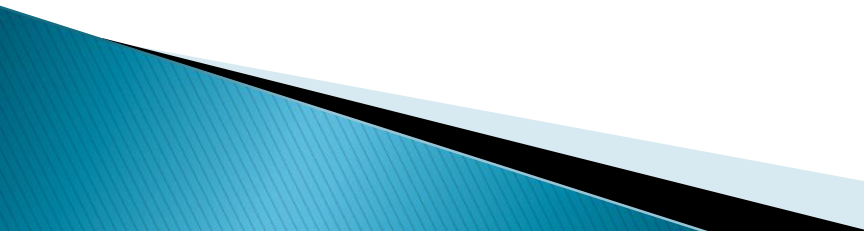
Case Scenario #1 Brad

- ▶ You call parents to discuss practice of premeal dosing.
 - ▶ Dad acknowledges that they “try” to get him to premeal dose and agree he should at least be doing correction dose and entering at least half of predicted carbs premeal.
 - ▶ You tell Brad if he will premeal dose for carbs, he doesn't have to come back to the office after lunch and he is in agreement.
- 

Case Scenario #1 Brad

- ▶ What is the most appropriate 1st course of action?
 - A. Call parents and discuss practice of premeal dosing– are they doing this at home?
 - B. Tell Brad that he has to premeal bolus or his BG will be too high after lunch.
 - C. Call diabetes clinic to reduce his ratio for lunch so his BG are not so high.
 - D. Don't do anything because his A1C is almost in target range.

Case Scenario #1 Brad

- ▶ A. Is the best answer.
 - ▶ You call parents to discuss practice of premeal dosing.
 - ▶ Dad acknowledges that they “try” to get him to premeal dose and agree he should at least be doing correction dose and entering at least half of predicted carbs premeal.
 - ▶ You tell Brad if he will premeal dose for carbs, he doesn't have to come back to the office after lunch and he is in agreement.
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Managing Hyperglycemia in the School Setting

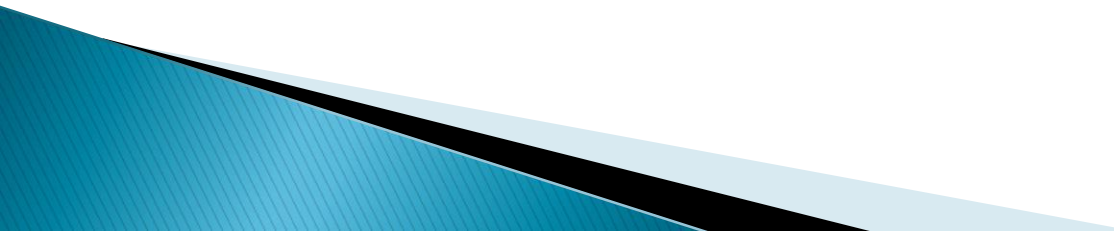
Recognition: chronic versus acute problem
Isolated high blood glucose is NOT a reason to send a student home from school.

More urgent problem if:
vomiting, abdominal pain
insulin pumper (no long acting insulin)
urine ketones moderate to large
blood ketones over 0.6 mmol/L

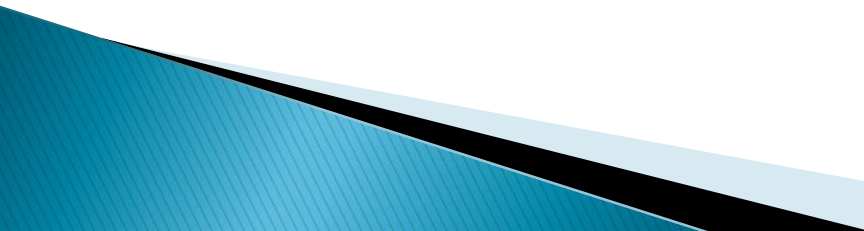
Causes of hyperglycemia

- ▶ Inaccurate carb counting/ poorly timed dose
- ▶ Missed insulin doses – accidental or intentional (eating without insulin coverage)
- ▶ Pump or site problem (catheter dislodged, kinked or poor absorption– “old site?”)
- ▶ “Forgetting” basal insulin dose the night before
- ▶ Inadequate evaluation for trends and need for dose adjustment. (coming out of honeymoon, puberty, “outgrowing dose”– back to school)
- ▶ Old/ outdated/ damaged insulin given?
- ▶ Illness and /or medications (steroids, decongestants)

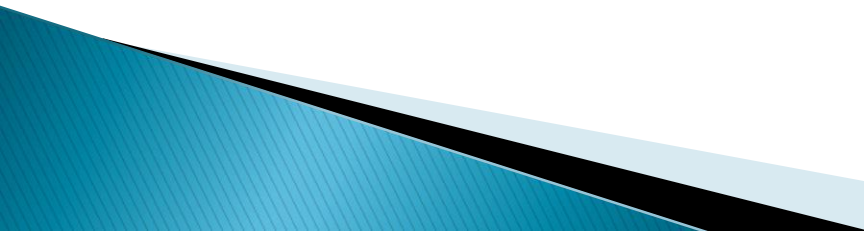
Mild Hyperglycemia Symptoms

- ▶ Excessive Thirst
 - ▶ Frequent urination
 - ▶ Sleepiness
 - ▶ Hunger
 - ▶ Blurred vision
 - ▶ Weight loss (chronic high BG)
 - ▶ Stomach ache
 - ▶ Flushing of the skin
 - ▶ Difficulty concentrating
 - ▶ Headache
- 

Moderate Hyperglycemia Symptoms

- ▶ Mild symptoms plus
 - ▶ Dry mouth
 - ▶ Nausea
 - ▶ Stomach cramps
 - ▶ Vomiting
 - ▶ Fruity smell to breath
 - ▶ Signs of dehydration– sunken eyes, poor skin turgor
 - ▶ Presence of ketones (in urine or blood)
- 

Severe Hyperglycemia Symptoms

- ▶ Mild and moderate symptoms plus:
 - ▶ Labored breathing (sign of acidosis)
 - ▶ Very weak
 - ▶ Confused
 - ▶ Unconscious
 - ▶ Tachycardia
-
- ▶ DKA develops over time (hours) of inadequate insulin
- 

Hyperglycemia Treatment

Address immediate concerns:

thirst; need 16 oz water per hour

restroom access

insulin needs– for pumpers– are they getting insulin? (site or pump malfunction– consider insulin via injection or change set)

Assess for abdominal pain, vomiting, ketones in blood or urine

Fix the Problem

Ask the student their opinion– what do you think caused this? (be nonjudgmental, problem solve– try not to accuse)

Do not shame or blame

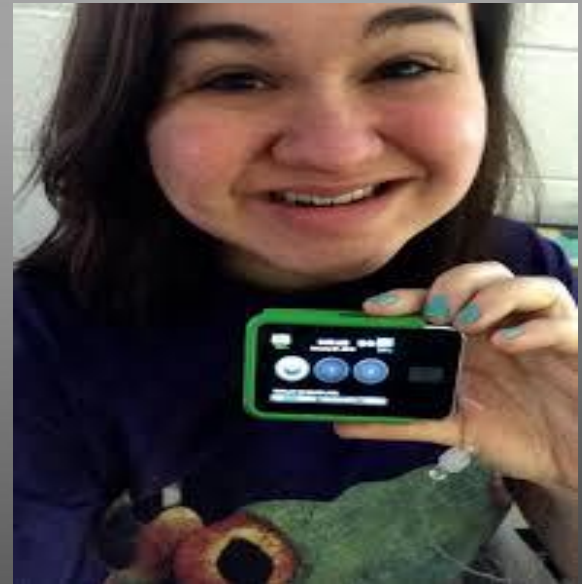
Evaluate blood glucose trends– acute or chronic problem?

Chronic hyperglycemia– increased risk of complications, higher risk for DKA.

Do *not* let fear of hypoglycemia at school be the driving force...

Communicate with parents and diabetes team– unite efforts.

Case Scenario #2 Jasmine



Case Scenario #2 Jasmine

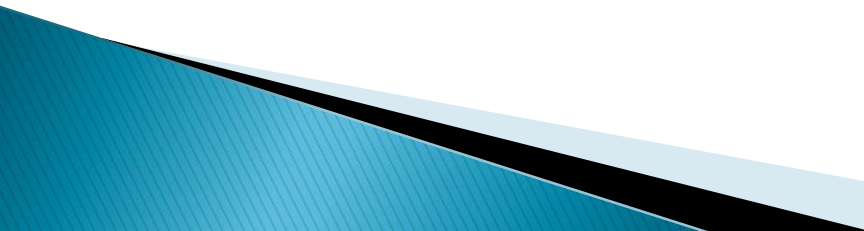
- ▶ Jasmine is a 15 year old girl with T1D, diagnosed at age 8 years, last A1C 7.7%.
- ▶ She has been wearing an insulin pump for the last three years. (no CGM as she doesn't want to wear 2 sites)
- ▶ She has been independent with her diabetes care at school
- ▶ She comes to you one morning at 10AM because her pump is alarming.
- ▶ The message on the pump says “pump failure– all deliveries stopped”
- ▶ She checked her BG: 95 mg/dl.

Case #2: Jasmine–

which answer is *not* correct??

- ▶ A. Since her BG is in normal range, she does not need insulin now, so take off the pump and have her ask her mother to call the pump company after school.
- ▶ B. At lunchtime, let her eat with her class and give Novolog injection using her ICR and correction factor.
- ▶ C. Take her pump off, call mother to bring a vial of Lantus to school and give her a dose asap. (the total of her 24 hour basal insulin)
- ▶ D. Have Jasmine or her mother call the pump company (# on the pump) immediately and arrange for a new pump to be sent. (usually will arrive within 24 hrs).

Case Scenario #2 Jasmine

- ▶ A is not correct. Yes, remove the pump but she needs basal insulin replaced asap.
 - ▶ Even though her BG is in range now, she needs basal insulin replacement with Lantus asap. (She says her back up Lantus dose is 24 units)
 - ▶ She can eat lunch as usual and take Novolog via injection using usual formula.
 - ▶ The sooner her pump company is called the better, as she will be using injections until it arrives.
 - ▶ Resume the basal rate on her new pump about the same time she took the Lantus dose.
- 

Managing hypoglycemia in the school setting

- ▶ Most frequent emergent condition among children with diabetes
- ▶ Use of CGM allows earlier detection– trends
- ▶ Severe episodes are usually avoidable
- ▶ Involves training for all school personnel
- ▶ Most episodes of low BG can be managed by the student with supervision by a responsible adult. (except very young students)
- ▶ In order to have good glycemic control, some low BG are inevitable. (may be less true with CGM and augmented insulin delivery systems)

Causes of Hypoglycemia

- ▶ Imbalance between carbohydrates and insulin or other medication
 - Too little food or too much insulin (inaccurate carb counting?)
 - Using an insulin to carb ratio will reduce risk of hypoglycemia by better matching of insulin to food
 - Giving too much or too frequent correction dose
 - Timing of dose is important – post meal dosing increases risk of hypoglycemia later



Activity guidelines for T1D

- ▶ Check BG (or use CGM) prior to exercise
- ▶ If BG is less than 90 mg/dl : 10 to 20g snack
- ▶ If BG is 90–124 mg/dl : give 10g snack
- ▶ If BG is 125 to 180 mg/dl: no snack needed
- ▶ If BG is 181 to 270 mg/dl: no snack needed
- ▶ If BG is over 271 mg/dl and no recent (2h) meal, check for ketones.
 - If neg ketones and feeling well, ok to do moderate aerobic exercise with close observation (hydrate)
 - Riddell, et al (2017). DOI:[https://doi.org/10.1016/S2213-8587\(17\)30014-1](https://doi.org/10.1016/S2213-8587(17)30014-1)

Activity guidelines

- ▶ If mild–mod ketones (or blood 0.6–1.4mmol/L)
 - ▶ only light exercise for 30 min or less is OK.
 - ▶ Consider BG correction dose prior to exercise.
 - ▶ Consider pump site change.

- ▶ If urine ketones are mod to large (or blood ketones over 1.5 mmol/L)
 - Exercise is contraindicated
 - Give correction dose and drink water
 - (change pump site)

Causes of Hypoglycemia

- ▶ Unusual amount of exercise
 - Can cause delayed hypoglycemia (up to 24 hours later)
 - Avoid this problem by reducing insulin *or* increasing food on active days (see guidelines)
 - Have access to testing supplies and glucose source during activity



**Okay okay.. So...
If my blood sugar is high..
and I eat 60 carbs..
And I'm going to go for a run..
And I feel a cold coming on..**



**How much
insulin
do I take
right now?**

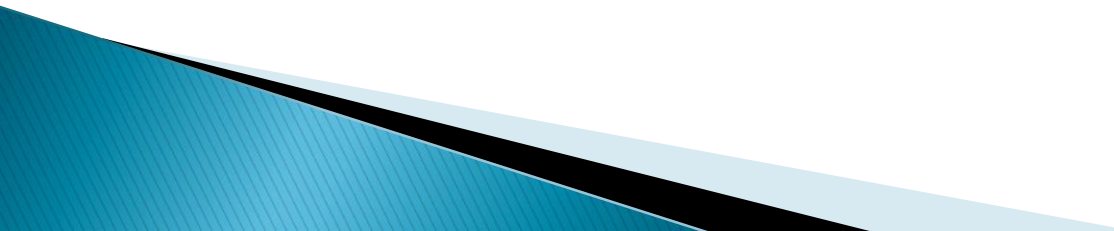
Hypoglycemia Recognition



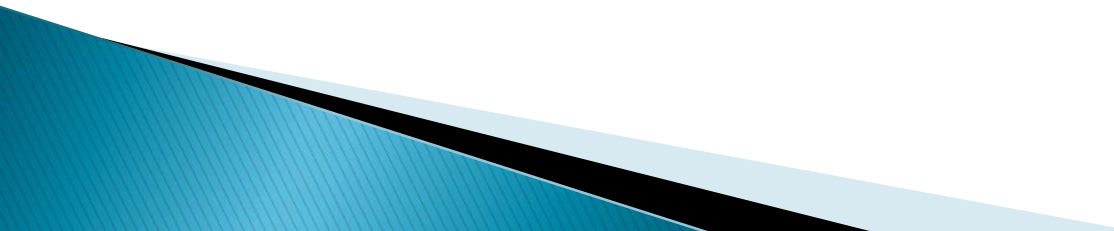
- ▶ **Symptoms**
 - early are adrenergic
 - later are neuroglycopenic
- ▶ **adrenergic**
 - shaky, sweaty, hungry, weak, fast heart beat, clammy skin
- ▶ **neuroglycopenic**
 - sleepy, confused, disoriented, can progress to seizures or loss of consciousness

Moderate Hypoglycemia Symptoms

Neuroglycopenic

- ▶ Headache
 - ▶ Behavior change– acting strangely
 - ▶ Poor coordination
 - ▶ Blurry vision
 - ▶ Weakness
 - ▶ Slurred speech
 - ▶ Confusion– combativeness
- 

Severe Hypoglycemic Symptoms

- ▶ Loss of consciousness
 - ▶ Seizure
 - ▶ Cannot swallow– risk of aspiration
 - ▶ Can administer glucagon before BG check if severe symptoms are present.
 - ▶ Check BG as soon as possible after administering glucagon
- 

Hypoglycemia treatment

- ▶ Treat if blood glucose is less than 70 mg/dl
- ▶ Don't over treat a low! (CGM lags behind) Use trend arrows
- ▶ 15 gm of glucose: glucose tabs or gel, 1/2 cup of soft drink, or juice
 - avoid chocolate to treat lows (fat slows carb absorption)
- ▶ Follow with 15 gm starch, or a meal.
- ▶ No insulin coverage for carbs used to treat low BG



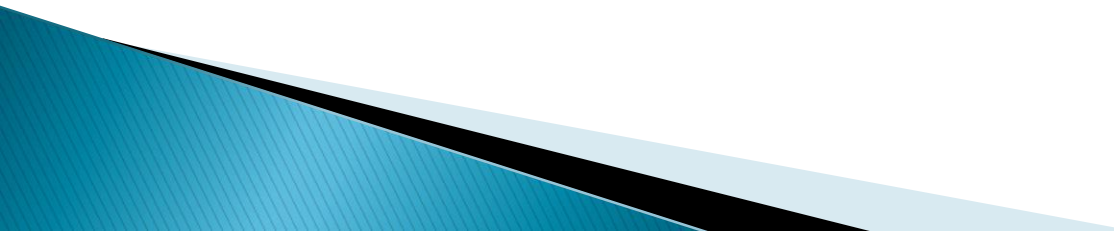
Case Scenario #3 Kayla



Case Scenario #3 Kayla

- ▶ 11 year old girl diagnosed about 2 months ago with type 2 diabetes. A1C was 8.8% at time of dx.
- ▶ She takes Lantus 20 units daily (at home) and metformin 1000 mg bid– with breakfast and dinner. Dose has been gradually increased to max dose. (no short acting insulin)
- ▶ She just started having PE 3 days per week at school, mid–morning.
- ▶ Every day after she has PE, she comes to the office to check her BG and c/o feeling hungry, weak and “needs a snack”.
- ▶ Her readings at this time are usually in the range of 80 mg/dl.
- ▶ What would you recommend?

Case Scenario #3 Kayla

- ▶ A. Tell her to eat a 30 g snack before PE from now on.
 - ▶ B. Tell her to eat more carbs at breakfast to avoid low BG after PE.
 - ▶ C. Tell her to skip PE to avoid her BG going low.
 - ▶ D. Communicate with parent and suggest she call diabetes team to adjust insulin dose.
- 

Case Scenario #3 Kayla

- ▶ Best answer is D:
- ▶ Ideally, she needs less insulin : suggest parent call diabetes team : reduce Lantus dose to avoid the need for extra snack.
- ▶ OK to give her a snack– 12–15 grams carb, although 80 is a normal BG. (not 30g)
- ▶ Look at trend and communicate with parent– suggest they call diabetes office for dose adjustment.
- ▶ She needs exercise, so do not allow hypoglycemia (or fear of low BG) to be an excuse to skip PE.
- ▶ Consider pre–PE BG check

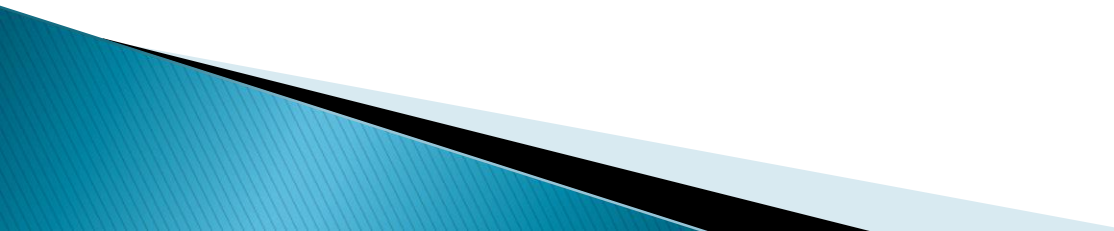
Use of glucagon

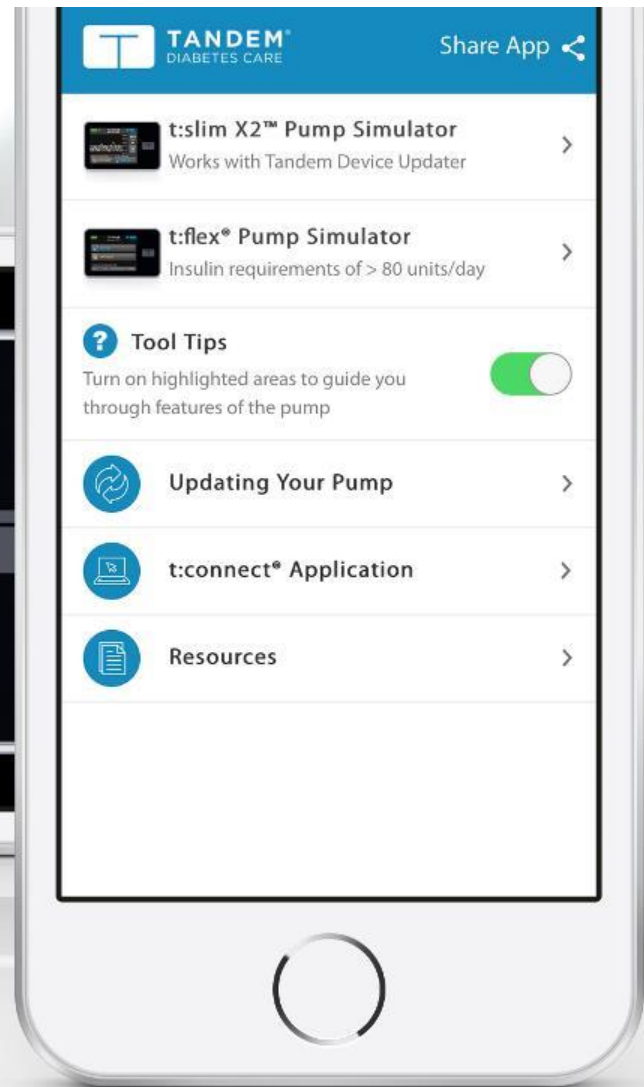
- ▶ If unconscious or having a seizure– unable to swallow– don't hesitate to give.
- ▶ Comparable absorption nasal and IM.
- ▶ Injectable: must first reconstitute– glucagon powder in the vial, syringe contains diluent. Always use the syringe in the kit.
- ▶ Dose: 45 lbs or less: 0.5 mg (1 / 2 the contents)
 - Weight more than 45 lbs: give 1 mg (the entire syringe)
- ▶ Common side effect is vomiting – roll to the side to avoid aspiration.
- ▶ Short ½ life of glucagon : Give oral glucose as soon as safely able to swallow.
- ▶ OK to be given by trained nonprofessional
- ▶ Check BG asap after giving glucagon

Case Scenario # 4 Luke

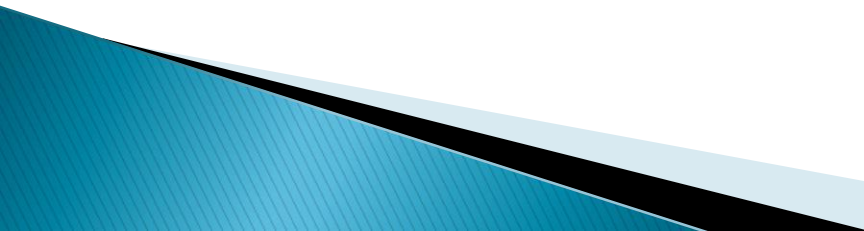


Case Scenario #4 Luke

- ▶ 14 year old male, diagnosed age 11 years
 - ▶ He is wearing a t slim pump and Dexcom G6 with Basal IQ technology (that suspends the pump to prevent hypoglycemia)
 - ▶ He is athletic, currently running cross country
 - ▶ He is not sure what to do regarding snacks before he goes to cross country practice?
- 



Case Scenario #4 Luke

- ▶ A. Rely on the Basal IQ technology to suspend his pump to avoid hypoglycemia while running
 - ▶ B. Use activity guidelines to guide his decision about having a snack before cross country practice
 - ▶ C. Have him eat a 30g snack and cover with usual ratio before practice
 - ▶ D. Tell him to sip on Gatorade to avoid hypoglycemia
- 

Case Scenario #4 Luke

- ▶ B is the best answer – use activity guidelines to help him decide if he should eat a snack
- ▶ Although the basal IQ technology should work to suspend his pump, there are some situations when it will not be able to avoid hypoglycemia
- ▶ It is best to use activity guidelines as a starting point to work with him to avoid hypoglycemia and help him exercise safely
- ▶ You do not want him to sip on gatorade, without regard to his BG, as this may result in hyperglycemia.
- ▶ He should not eat a 30g snack and bolus for it, as this would actually increase his risk of hypoglycemia, as the suspend feature cannot influence bolus insulin on board.
- ▶ Some trial and error will be involved, as people respond differently to exercise.

Two brands of glucagon kits



BAQSIMI

1



2



- ▶ 3 mg dose intranasal
- ▶ 4 years and older
- ▶ Insurance coverage?

Strategies to improve glycemic control

- ▶ Insulin works when you take the right dose at the right time. (no missed or late doses or boluses) .
- ▶ Site rotation helps insulin absorb better
- ▶ Pre-meal dosing *is* better. All pumpers can give correction dose and at least half of carbs pre-meal. Teens should predict how much they will eat. (even shot givers!)
- ▶ “Once you dose, you are committed to eat that amount of carbs”
- ▶ Check at least 4–6x per day , or use CGM. Download and review for trends.
- ▶ Don’t be complacent, don’t accept high BG as “normal” .

Improving glycemic control

- ▶ Exercise improves insulin sensitivity (at least 30 min/day will help)
- ▶ Even modest weight loss improves insulin sensitivity
- ▶ Positive feedback for efforts (thank you for checking your BG today)
- ▶ Eating lower carb content foods probably helps
- ▶ Role model problem solving and critical thinking
- ▶ Independence is *earned* by being responsible
- ▶ TREND MANAGEMENT
- ▶ Glycemic control IS an achievable goal “you can do this”
- ▶ Embrace diabetes, don't ignore or deny it. (no magic answer to accomplish this task)
- ▶ Depression is common, identify and get help

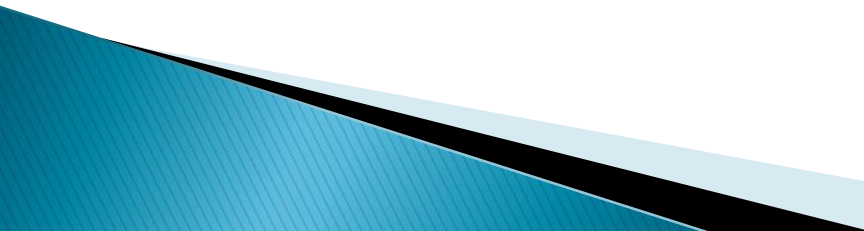
Case Scenario #4 Taylor



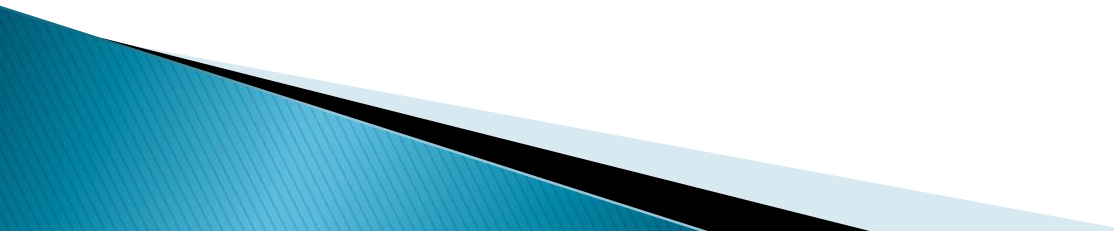
Case Scenario #4 Taylor

- ▶ Taylor is a 3rd grader at your school who has had type 1 diabetes for 2 years.
- ▶ She uses injections and does not have a CGM
- ▶ She eats school breakfast every day– often choosing Pop Tarts, chocolate milk, and sugary cereal.
- ▶ Her packed lunch from home consists of uncrustable PB and J sandwich, Cheetos, a fruit roll up, chocolate milk and bottled water.
- ▶ Today is the Valentines Day party and her parents have sent in cupcakes.


Case Scenario #4 Taylor

- ▶ She comes to your office to receive a shot for the party food she ate consisting of a cupcake without the icing, a chocolate chip cookie and Takis.
 - ▶ She tells you that she did not eat the icing on the cupcake as her parents told her to scrape it off because “it has too much sugar”.
 - ▶ What are the most effective ways to help Taylor?
- 

Case Scenario #4 Taylor

- ▶ A. Work with school cafeteria/ district dietitian to consider purchasing lower sugar cereals and breakfast items.
 - ▶ B. Discuss icing on the cupcake is allowed if she is given insulin to cover those carbs.
 - ▶ C. Ask a local dietitian to come to school for a few nutrition education days to help students and staff learn more about healthy, balanced meals.
 - ▶ D. All of the above
- 

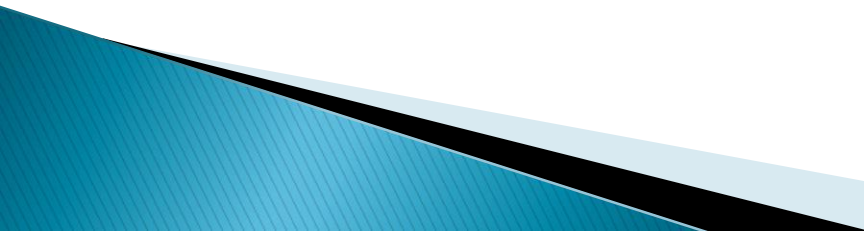
Case Scenario #4 Taylor

- ▶ All of the above!
 - ▶ Children with diabetes should be treated like other students whenever possible
 - ▶ Children with diabetes should not be left out of school parties or made to eat low carb food
 - ▶ Healthier food choices would be advisable for *all* students, not only those with diabetes
 - ▶ Is there a role for the school nurse in promoting behavior change for a healthier school ?
- 

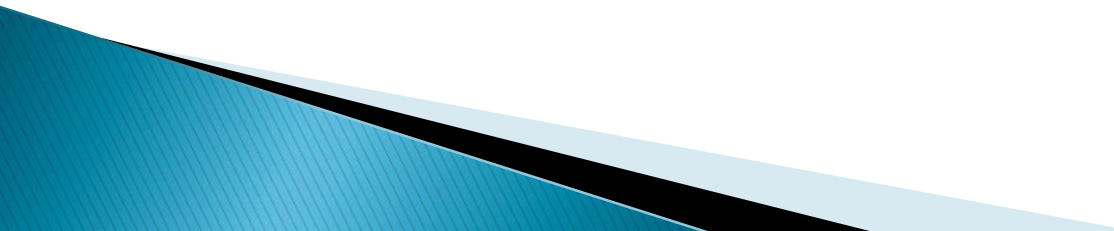
Case Scenario #5: Julie



Case Scenario #5 – Julie

- ▶ 17 year old girl, senior in high school
 - ▶ Has had type 1 diabetes for 5 years
 - ▶ Glycemic control is poor with A1C 9.2%
 - ▶ She is independent in administering her insulin at school
 - ▶ She has refused to check her BG, says she knows it is OK by how she feels
 - ▶ Her mother is supportive of her decision, saying “she is almost an adult”
 - ▶ What would you do?
- 

Case Scenario #5 – Julie

- ▶ A. Ask her mother to sign a waiver, releasing you from liability.
 - ▶ B. Require Julie to demonstrate to you that she is checking her BG by having her come to the office once/month.
 - ▶ C. Call the diabetes team to get an order that she does not have to check her BG .
 - ▶ D. Problem solve with Julie about barriers to checking her BG and possible solutions.
- 

Case Scenario #5 – Julie

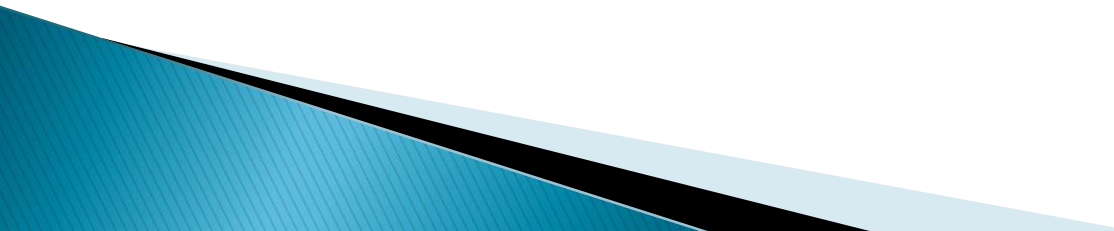
- ▶ Problem solve with Julie about barriers and try to find a workable solution.
 - Yes, she is *almost* an adult, but she is not making a good decision for her health
 - Is a CGM device an option for her? (Dexcom or Freestyle Libre do not require routine fingersticks)
 - What is getting in the way of BG checking?
 - Assess for needs/barriers
 - Help Julie identify specific goal for diabetes care that she is willing to work on
 - Continue to support, discuss possible solutions, and build rapport

Case Scenario #6 Alex

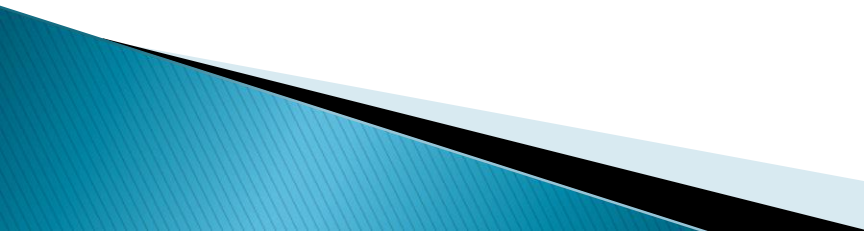


Case Scenario #6 Alex

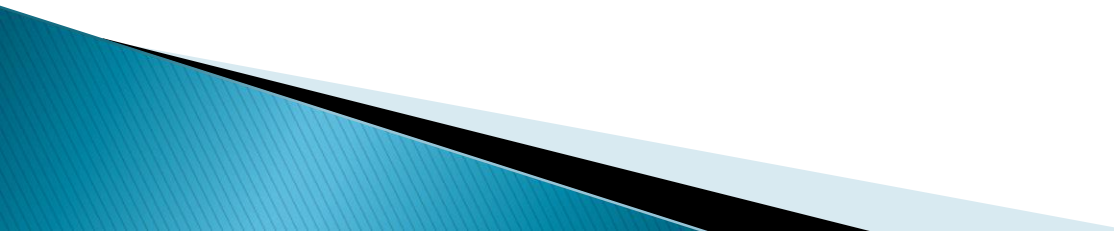
- ▶ Alex is a fifth grader with type 1 diabetes.
 - ▶ He comes in to your office every morning when he arrives to say “hi”.
 - ▶ You ask him to check his BG daily on arrival
 - ▶ You realize his readings are usually in the range of 240–280 mg/dl.
 - ▶ He does not eat breakfast at school

 - ▶ What would you do?
- 

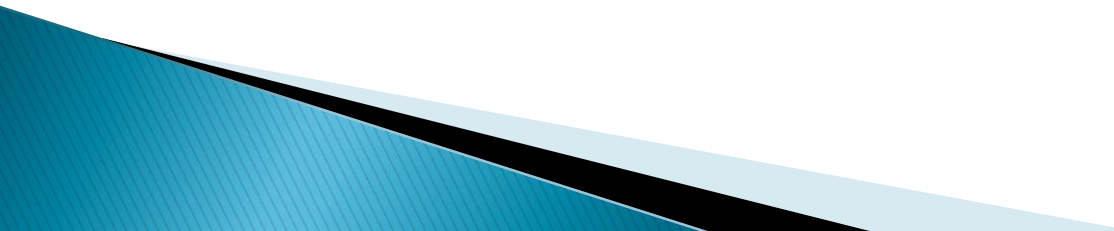
Case Scenario #6 Alex

- ▶ A. Give him a correction dose using his lunch scale because his BG is above target
 - ▶ B. Give him a correction dose but make sure he also eats something, since he is getting insulin
 - ▶ C. Call his mother to review his morning plan and review BG readings
 - ▶ D. Call the diabetes office to ask for a dose change, as these readings are too high.
- 

Case Scenario #6 Alex

- ▶ Best Answer is C.
 - ▶ Call his mother to ask about morning routine
 - Is he eating breakfast at home?
 - Does he check his BG before eating at home?
 - Is someone supervising his dose?
 - Is he dosing before or after eating?
- 

Case Scenario #6 Alex

- ▶ You learn that he eats breakfast on the way to school which they purchase on the way
 - ▶ He has a sausage and biscuit every day, but they give him his insulin as he arrives at school- after eating.
 - ▶ Mother says that he often “forgets” to check his BG in the morning
- 

Case Scenario #6 Alex

- You suggest to mother that since he eats the same thing every day, it would be ideal if he could dose 15 minutes premeal.
- He should be checking his BG at home, give correction dose if needed along with carb coverage
- If his BG is under 80 mg/dl, ok to delay his dose until right before he starts eating
- Should not give correction dose until at least 2 hours after previous dose of short-acting insulin (insulin on board concept)
- No need to check his BG when he arrives to school since he just ate breakfast

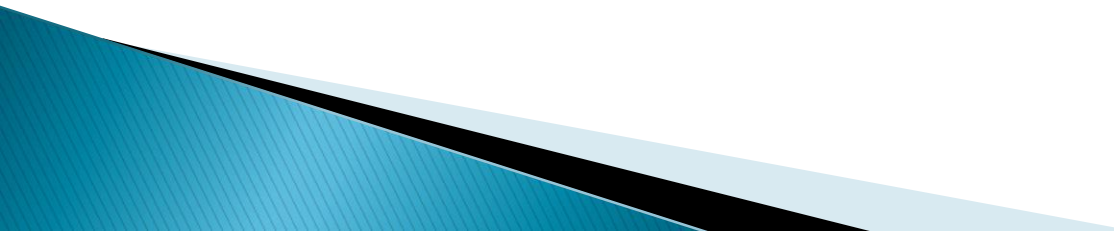
Case Scenario #7 Abby



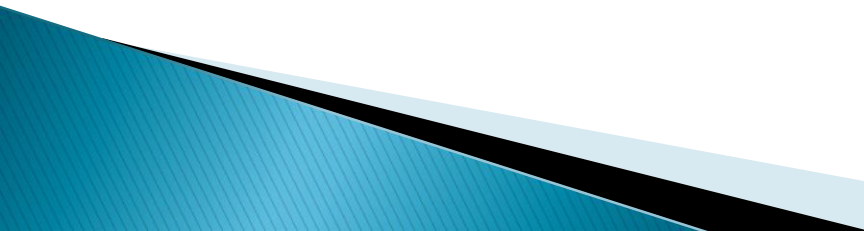
Case Scenario #7 Abby

- ▶ 7 year old girl with type 1 diabetes of 2 years' duration
- ▶ She has been wearing an insulin pump for about 3 weeks and has a DexcomG6 CGM device
- ▶ She has been playing outside at recess, now comes in for pre-lunch dose and Dexcom is reading 344 mg/dl with an up arrow.
- ▶ Her BG is not usually high, so you begin to investigate and find that her pump catheter has been pulled out.
- ▶ She has back up supplies in the office, including another catheter but Abby is not able to place her own site.

Case Scenario #7 Abby

- ▶ What should you do?
 - ▶ A. Have Abby eat lunch, call her mother and have her come to school to deal with it
 - ▶ B. Dose her insulin with a syringe (carbs and correction) and have her go eat lunch with her class
 - ▶ C. Call her parents to come replace the catheter and keep her in the office until one arrives
 - ▶ D. Replace the catheter yourself as this is a site and pump with which you are very familiar (after lunch)
- 

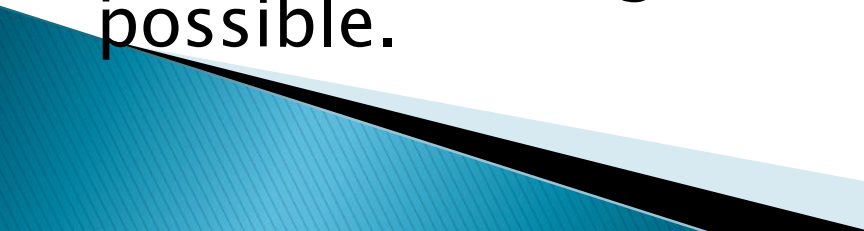
Case Scenario #7 Abby

- ▶ B, then D.
 - ▶ She likely is hungry and wants to eat lunch with her class, so give her an injection so she can do so. (including carbs and correction for high BG)
 - ▶ After lunch and you have spoken with her parent, change out the catheter if you are comfortable doing so.
 - ▶ If not, then a parent should come and put a new site in asap.
- 

FAQs

- ▶ When should we give a correction dose between meals? (injections vs. pumpers?)
- ▶ What about using CGM readings for correction doses or to treat low BG?
- ▶ What does it mean to check ketones after 2 consecutive readings over 240 mg/dl? (how long apart?)
- ▶ Why is pre-meal dosing preferred? What if they don't eat all of their lunch?
- ▶ Why won't you sign our district's special school form?

Summary and Goals

- ▶ Keep students with diabetes in school, in the classroom, and fully participating in all activities of their choosing.
 - ▶ Manage diabetes to prevent long and short term complications. New treatment options!
 - ▶ Advocate for students with diabetes – facilitate communication with all involved parties.
 - ▶ Educate teachers about needs of students with diabetes.
 - ▶ Support students and families in gradually assuming more responsibility for their own care.
 - ▶ Show respect for teens and involve them in problem-solving about their diabetes, when possible.
- 

The Children's Diabetes Program At Eskind / MCJCHV

▶ Innovative Team Care

- 15 Endocrinologists
- 4 Nurse Practitioners
- 1 Nurse Case Manager
- 6 Nurse Educators
- 4.5 FTE Dietitians
- Social Worker
- Child Life Specialist

▶ *ADA Recognized* Education Program

- since 1996 – through 2023

▶ Unique Relationships with Providers

BCBST and Tristar Center of Excellence



- 2700 Patients from 8 states
- 85% Type 1

Outreach Diabetes Clinics–

- ▶ Jackson, TN Oct 2015 (once/month)
- ▶ Cookeville , TN March 2016 (once or twice/month)
- ▶ Murfreesboro, TN Aug 2016 (twice/ month)
- ▶ Clarksville, TN Sept 2018 (once/ month)

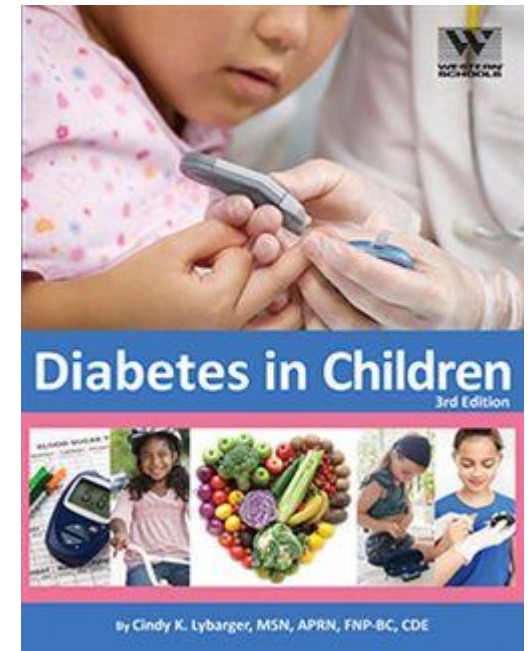
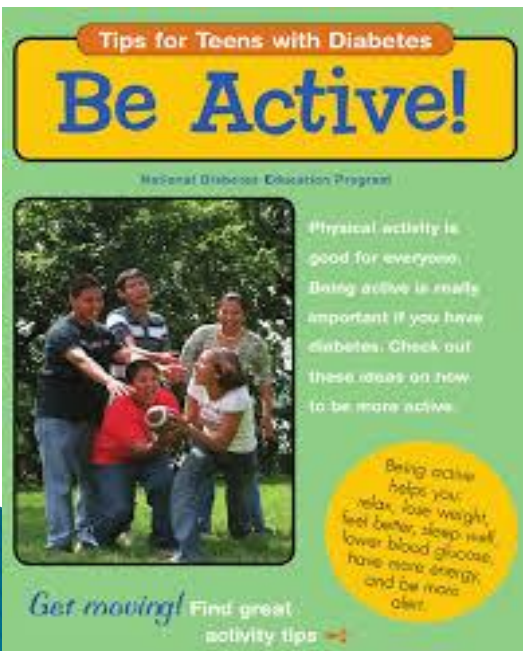


THANK YOU FOR BEING HERE

Thank you for attending today

We hope it has been helpful and you learned at least one thing!

Thank you for all you do for kids with diabetes!



[http:// www.yourdiabetesinfo.org](http://www.yourdiabetesinfo.org)

www.westernschools.com