

Hypoglycemia: A Deep Dive into Low Sugars

*Whitney Beaton, MSN, RN, ACCNS-P,
CDCES*

Anna Stawicki, BSN, RN

Objectives

- Discuss the pathophysiology of low blood sugar
- Define levels or severity of hypoglycemia
- Discuss management of hypoglycemia in the school setting

General Information about Glucose Levels in Individuals without Diabetes

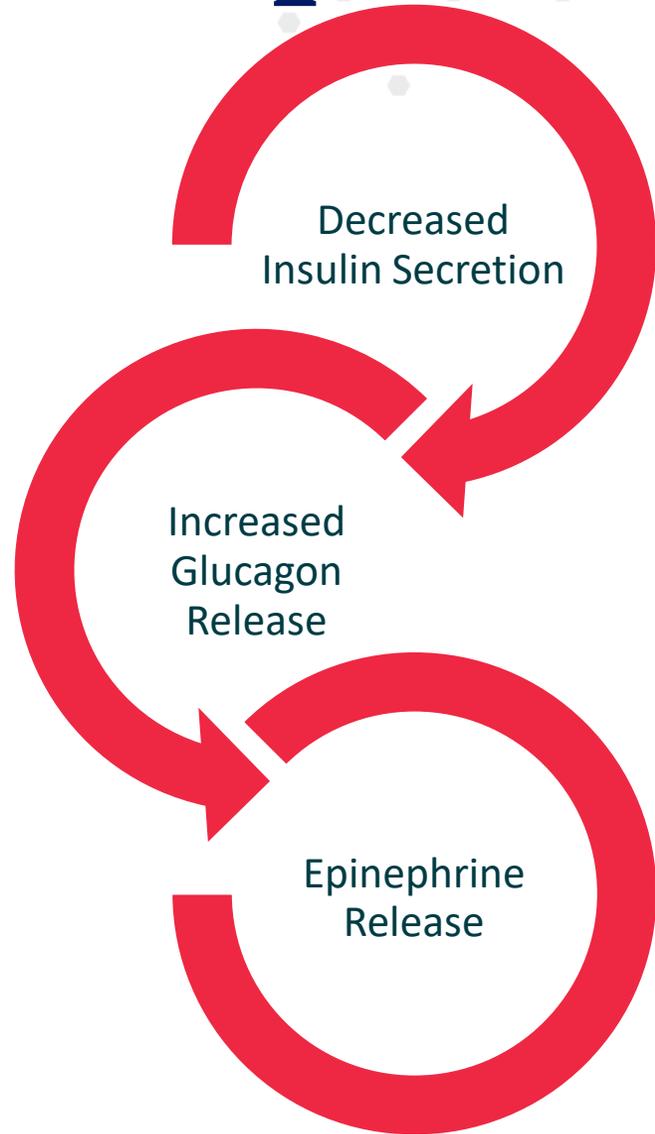
Glucose is a main fuel for our bodies, especially the brain

The body maintains near glucose levels within normal range even though intake and utilization of glucose vary significantly throughout the day

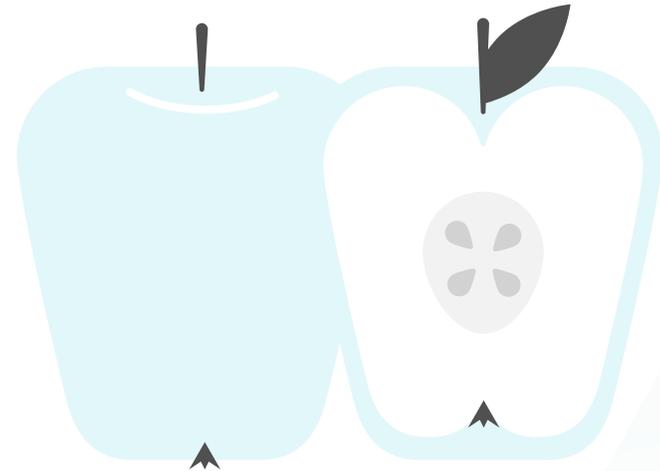
Hypoglycemia is an uncommon event in people without diabetes



Responses to Falling Blood Sugar Levels in People without Diabetes



+



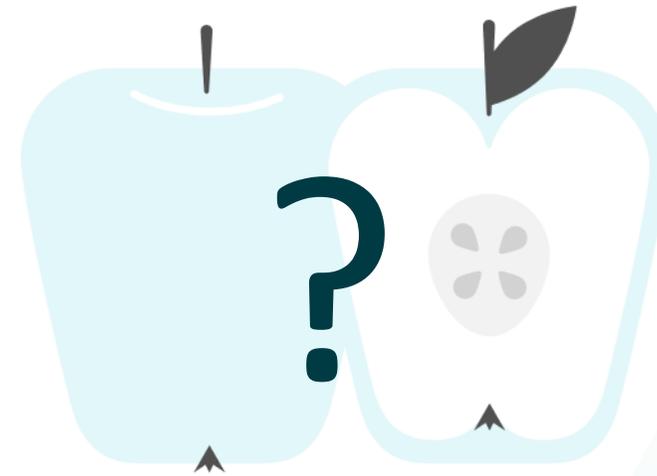
What is different in people with Diabetes?

Medications used impact blood glucose levels

Alterations in physiology reduce ability to compensate for hypoglycemia

Hypoglycemia is a limiting factor in achieving glycemic goals in people with diabetes

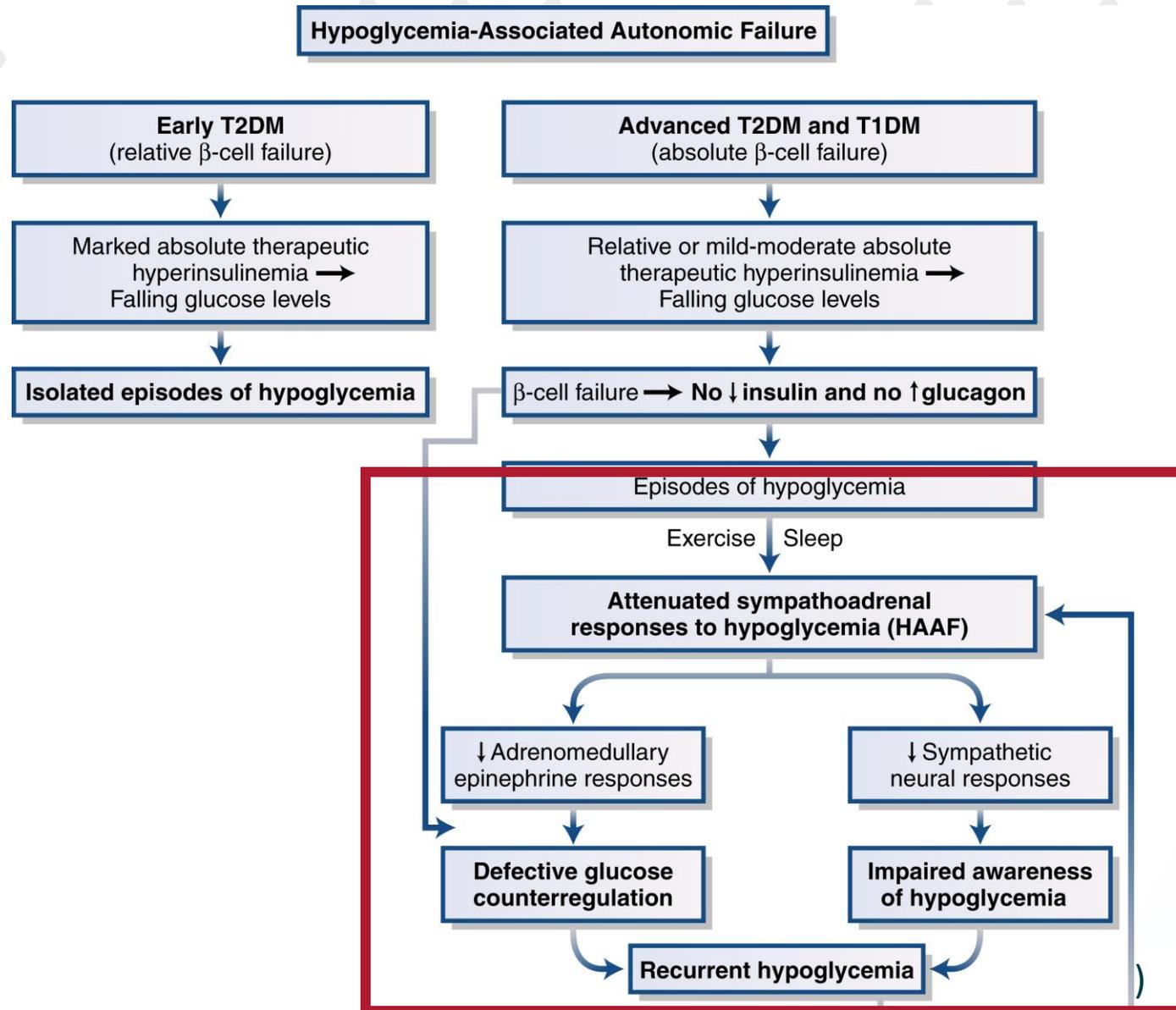
Physiologic Responses to Falling Blood Sugar Levels – T1D and Advanced T2D



Imagine driving only with gas...



Hypoglycemia Begets Hypoglycemia



What causes lead to low blood sugar in someone with diabetes?

- Missing a meal
- Taking more insulin than is needed
- More activity than usual without lowering insulin dose or increasing carbohydrate intake
- Increasing physical activity or intense physical activity
- Alcohol
- Illness
- Early pregnancy

Levels of Hypoglycemia

Level 1

- Blood glucose of 70 mg/dL or less

Level 2

- Blood glucose of 54 mg/dL
- Serious, clinically significant

Level 3

- Requires External Assistance for Recovery

Hypoglycemia Signs and Symptoms

Autonomic

(symptoms due to Activation of the Nervous System)

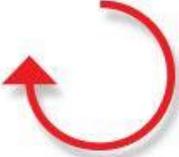
- Shakiness
- Sweatiness
- Trembling
- Palpitations
- Pallor

Neuroglycopenic

(symptoms due to inadequate glucose supply at brain)

- Poor Concentration
- Blurred or Double Vision
- Difficulty Hearing
- Slurred Speech
- Poor Judgment and Confusion
- Problems with Short-term Memory
- Dizziness and Unsteady Gait
- Loss of Consciousness
- Seizure

How to Treat Low Blood Sugar (Hypoglycemia)

1.  **Eat/Drink 15 g Carbs**
2.  **Wait 15 Minutes**
3.  **Check Blood**
4.  **Less than 70 mg/dl?
Repeat Steps 1-4**

Low blood sugar treatment (use a source of glucose or simple sugar)

- Juice (4 oz)
- Glucose tabs (3-4 tabs)
- Honey (1 Tbsp)
- Applesauce
- Airheads, skittles, etc.

For low treatment, avoid food that contains fiber, protein, or fat. This slows down the rise in blood sugar.

Glucagon

- Medication to be used for severe low blood sugar when the child cannot safely treat low blood sugar by mouth
- Caregivers should be comfortable with when and how to administer glucagon



Scan here to watch our [DiSH A La Carte Session on Glucagon](#)

**Glucagon
Emergency Kit**



**Gvoke™ Premixed
Injectible**



**Zegalogue®
(dasiglucagon)**



**Baqsimi™ Nasal
Glucagon Powder**



Severe Hypoglycemia

- Administration of Glucagon
- Call 911
- Protect airway

Hypoglycemia Unawareness/Reduced Hypoglycemia Awareness

- Difficulty or inability to feel symptoms of hypoglycemia
- May improve with a period of avoiding hypoglycemia (usually at least 2-3 weeks)
- Difficult to achieve, may be aided by CGM and newer technologies



Image: Tandem Diabetes



Image: Dexcom

Resources

- [UW Health Low Blood Sugar Health Fact](#)
- [Glucagon Health Fact](#)

Cryer, P.E. (2013). Mechanisms of hypoglycemia-associated autonomic failure in diabetes. *The New England Journal of Medicine*, 369: 362-372.

Cryer, P.E. & Arbelaez, A.M. (2020). Chapter 38: Hypoglycemia. In *Williams Textbook of Endocrinology* (14th Edition) (pp. 1525-1551). Elsevier.

Abraham, et al. (2018). ISPAD clinical practice consensus guidelines 2018: Assessment and management of hypoglycemia in children and adolescents with diabetes. *Pediatric Diabetes*, 27:178-192.

Urakami, T. (2020). Severe hypoglycemia: Is it still a threat for children and adolescents with Type 1 Diabetes? *Frontiers in Endocrinology*, 11. Retrieved from [Frontiers | Severe Hypoglycemia: Is It Still a Threat for Children and Adolescents With Type 1 Diabetes? | Endocrinology \(frontiersin.org\)](https://www.frontiersin.org/articles/10.3389/fendo.2020.00000/full)