

Case #2: Jonah Helmer, Hypoglycemia and hyperglycemia (see full case below)

Answer the discussion prompts below with explanation and detail, providing complete references for all citations. Use at least one peer-reviewed scholarly source from the last 5 years with a working DOI. Provide in-text citations for all information and include a full reference at the end.

- I. **Application of Course Knowledge:** Compare and contrast the assigned diagnoses in your initial discussion post. Answer all questions/criteria with explanations and details.
 - a. Compare and contrast your assigned client's presentation for each assigned diagnosis. Consider factors such as demographics, onset of symptoms, history of present illness, and associated risk factors.
 - I. Jonah Helmer is a 6-year-old child with Down syndrome and type 1 diabetes mellitus (T1DM) managed with an insulin pump who developed dizziness, headache, pallor, irritability, and fatigue after participating in a soccer tournament. Children with T1DM are at increased risk for hypoglycemia during and after exercise because physical activity increases glucose uptake by skeletal muscle and enhances insulin sensitivity, particularly when carbohydrate intake is inadequate or insulin dosing is not adjusted (Adolfsson et al., 2022). Jonah consumed only a small snack prior to activity, did not ingest additional carbohydrates during play, and received an insulin bolus before the game, which creates a physiologic environment consistent with exercise-associated hypoglycemia (Adolfsson et al., 2022). His symptoms of irritability, fatigue, dizziness, pallor, and mild gait instability are consistent with neuroglycopenic and adrenergic manifestations of hypoglycemia described in pediatric diabetes guidelines (American Diabetes Association [ADA] Professional Practice Committee, 2026).

In contrast, hyperglycemia in pediatric T1DM more commonly results from insufficient insulin delivery, pump malfunction, infection, or stress and typically presents with osmotic symptoms such as polyuria and polydipsia

(Glaser et al., 2022). As hyperglycemia worsens, particularly in diabetic ketoacidosis (DKA), children may develop nausea, vomiting, abdominal pain, dehydration, and compensatory hyperventilation (Glaser et al., 2022). Jonah's review of systems did not include excessive thirst, frequent urination, vomiting, abdominal pain, or respiratory distress, which decreases the likelihood of symptomatic hyperglycemia or evolving DKA. Additionally, his symptoms occurred acutely after physical exertion, which more strongly supports hypoglycemia as the precipitating event (Adolfsson et al., 2022).

- b. Compare and contrast the diagnostic criteria (assessment findings and diagnostic tests) for your assigned client and diagnoses. Support your response with the most current clinical practice guidelines (CPG) for each diagnosis.

- I. Hypoglycemia in individuals with diabetes is defined as a blood glucose level below 70 mg/dL, and clinically significant hypoglycemia is defined as a glucose value below 54 mg/dL (ADA Professional Practice Committee, 2026). Jonah's point-of-care glucose reading of 46 mg/dL meets criteria for clinically significant hypoglycemia and warrants immediate treatment and reassessment. The ADA emphasizes that confirmed low glucose values in the presence of compatible symptoms establish the diagnosis and require prompt carbohydrate administration (ADA Professional Practice Committee, 2026).

Hyperglycemia is defined as elevated blood glucose levels, typically greater than 180 mg/dL, and further evaluation is required when DKA is suspected (Glaser et al., 2022).

Diagnostic criteria for DKA include hyperglycemia, ketonemia or ketonuria, and metabolic acidosis, which requires laboratory confirmation of bicarbonate levels and blood pH (Glaser et al., 2022). In contrast to hypoglycemia, which can be rapidly confirmed with home glucose monitoring, the evaluation of hyperglycemic crises often requires laboratory testing and in-person assessment (Glaser et al., 2022). In Jonah's case, the objective glucose value definitively confirmed