**CARBGAME – DIABETIC KETO ACIDOSIS**

**CASES**

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| **CASE 1** |
| **A 45-year-old male with type 1 diabetes presents with abdominal pain, nausea, and rapid breathing. Laboratory findings reveal elevated blood glucose, ketonuria, and metabolic acidosis. What enzyme deficiency is primarily responsible for the accumulation of ketone bodies in this patient?**  **A) Glucose-6-phosphatase**  **B) Pyruvate carboxylase**  **C) Phosphoenolpyruvate carboxykinase**  **D) Beta-hydroxybutyrate dehydrogenase** |

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| **CASE 2** |
| **A 32-year-old female with type 2 diabetes is admitted with DKA. Which of the following biochemical pathways is predominantly inactivated in response to insulin deficiency, leading to increased gluconeogenesis and ketogenesis?**  **A) Glycolysis**  **B) Pentose Phosphate Pathway**  **C) TCA Cycle**  **D) Cori Cycle** |

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| **CASE 3** |
| **In a 50-year-old male with uncontrolled diabetes, a deficiency of insulin results in increased lipolysis. What is the primary source of acetyl-CoA, which contributes to the elevated ketone bodies observed in DKA?**  **A) Fatty acid oxidation**  **B) Amino acid breakdown**  **C) Glycolysis**  **D) Cholesterol synthesis** |

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| **CASE 4** |
| **A 28-year-old pregnant woman with gestational diabetes develops DKA. The impaired insulin action leads to the activation of hormone-sensitive lipase. Which hormone primarily stimulates this lipolytic enzyme?**  **A) Insulin**  **B) Glucagon**  **C) Epinephrine**  **D) Cortisol** |

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| **CASE 5** |
| **A 35-year-old male with diabetes presents with DKA and elevated serum ketone bodies. Which of the following represents the primary ketone body produced in the liver?**  **A) Acetoacetate**  **B) 3-Hydroxybutyrate**  **C) Acetone**  **D) Methylglyoxal** |

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| **CASE 6** |
| **A 60-year-old male with type 2 diabetes is found lethargic and confused. His blood glucose is 550 mg/dL, but there is no significant ketosis. What is the most likely diagnosis?**  **A) Diabetic Ketoacidosis (DKA)**  **B) Hyperosmolar Hyperglycemic State (HHS)**  **C) Starvation ketosis**  **D) Hypoglycemia** |

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| **CASE 7** |
| **A 40-year-old female with a history of type 1 diabetes presents with polyuria, polydipsia, and weight loss. Laboratory results show blood glucose of 300 mg/dL, elevated ketones, and low bicarbonate levels. What is the most likely diagnosis?**  **A) Hyperosmolar Hyperglycemic State (HHS)**  **B) Starvation ketosis**  **C) Diabetic Ketoacidosis (DKA)**  **D) Insulinoma** |

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| **CASE 8** |
| **A 25-year-old male with no history of diabetes presents with abdominal pain and vomiting. Laboratory findings reveal hyperglycemia, ketonuria, and an anion gap. What should be considered in the differential diagnosis?**  **A) Diabetic Ketoacidosis (DKA)**  **B) Alcoholic ketoacidosis**  **C) Hyperosmolar Hyperglycemic State (HHS)**  **D) Lactic acidosis** |

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| **CASE 9** |
| **A 55-year-old female with diabetes is admitted with altered mental status and severe dehydration. Laboratory results show hyperglycemia, hyperosmolality, and absence of significant ketones. What is the likely diagnosis?**  **A) Diabetic Ketoacidosis (DKA)**  **B) Hyperosmolar Hyperglycemic State (HHS)**  **C) Starvation ketosis**  **D) Lactic acidosis** |

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| **CASE 10** |
| **A 30-year-old male with diabetes presents with abdominal pain, nausea, and fruity breath odor. Laboratory findings include hyperglycemia, ketonuria, and metabolic acidosis. What is the primary cause of metabolic acidosis in this case?**  **A) Lactic acidosis**  **B) Ketoacidosis**  **C) Respiratory acidosis**  **D) Renal tubular acidosis** |

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| **CASE 11** |
| **A 22-year-old female is suspected of having DKA. Which laboratory parameter is most specific for confirming the presence of ketoacidosis in this patient?**  **A) Serum glucose**  **B) Serum bicarbonate**  **C) Serum anion gap**  **D) Urine glucose** |

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| **CASE 12** |
| **A 45-year-old male with diabetes presents with DKA. Which arterial blood gas finding is characteristic of metabolic acidosis in this patient?**  **A) Decreased pH**  **B) Increased pCO2**  **C) Increased HCO3-**  **D) Elevated base excess** |

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| **CASE 13** |
| **In a patient with suspected DKA, which ketone body can be detected in the urine using nitroprusside reagent strips?**  **A) Acetoacetate**  **B) 3-Hydroxybutyrate**  **C) Acetone**  **D) Methylglyoxal** |

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| **CASE 14** |
| **A 35-year-old female with diabetes is admitted with DKA. What imaging study may be useful to assess for complications such as cerebral edema in this patient?**  **A) CT scan brain**  **B) MRI brain**  **C) X-ray skull**  **D) Lumbar puncture** |

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| **CASE 15** |
| **A 28-year-old pregnant woman with gestational diabetes presents with DKA. Which laboratory finding distinguishes DKA from hyperosmolar hyperglycemic state (HHS)?**  **A) Serum glucose level**  **B) Serum bicarbonate level**  **C) Serum anion gap**  **D) Serum osmolality** |

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| **CASE 16** |
| **A 50-year-old male with type 1 diabetes is admitted with DKA. He reports a recent illness that led to decreased insulin intake. On examination, he appears severely dehydrated with tachycardia. Laboratory results show a blood glucose level of 600 mg/dL, ketonuria, and a low bicarbonate level. What is the initial step in managing this patient's acidosis?**  **A) Insulin infusion**  **B) Intravenous bicarbonate**  **C) Fluid resuscitation**  **D) Potassium supplementation** |

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| **CASE 17** |
| **A 35-year-old female with diabetes is admitted with DKA. She complains of abdominal pain, polyuria, and has a fruity breath odor. Laboratory findings confirm elevated blood glucose and ketones. Which insulin preparation is preferred for continuous intravenous infusion in the initial management of DKA?**  **A) Insulin lispro**  **B) Insulin glargine**  **C) Regular insulin**  **D) Insulin aspart** |

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| **CASE 18** |
| **In a patient with DKA, the goal for intravenous fluid replacement during the initial resuscitation phase is essential. Mr. X, a 40-year-old male with type 2 diabetes, presents with extreme thirst and fatigue. What is the goal for intravenous fluid replacement during the initial resuscitation phase in a patient with DKA?**  **A) Correct dehydration**  **B) Normalize blood glucose**  **C) Prevent hyperkalemia**  **D) Restore acid base balance** |

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| **CASE 19** |
| **A 40-year-old male with type 2 diabetes is admitted with DKA. Besides insulin therapy, electrolyte supplementation is crucial. He experiences vomiting and abdominal pain. In addition to insulin, what electrolyte supplementation is crucial in the management of this patient with DKA?**  **A) Sodium**  **B) Potassium**  **C) Calcium**  **D) Magnesium** |

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| **CASE 20** |
| **A 28-year-old female with diabetes presents with recurrent DKA episodes. Following stabilization, long-term therapy is indicated to prevent future episodes. What long-term therapy is indicated to prevent future episodes of DKA in this patient?**  **A) Metformin**  **B) Glucagon-like peptide-1 (GLP-1) agonist**  **C) Sodium-glucose cotransporter-2 (SGLT-2) inhibitor**  **D) Insulin pump therapy** |

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| **CASE 21** |
| **A 45-year-old male with diabetes develops DKA and is started on insulin therapy. He initiated on insulin, and needs careful monitoring for potential complications. What potential complication should be monitored for during insulin treatment in this patient?**  **A) Hypokalemia**  **B) Hyperphosphatemia**  **C) Hypernatremia**  **D) Hyperkalemia** |

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| **CASE 22** |
| **A 30-year-old pregnant woman with gestational diabetes presents with DKA. In addition to maternal concerns, there are potential fetal complications. What fetal complication is associated with maternal DKA during pregnancy?**  **A) Macrosomia**  **B) Intrauterine growth restriction (IUGR)**  **C) Neural tube defects**  **D) Preterm birth** |

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| **CASE 23** |
| **A 5-year-old child with diabetes develops severe DKA and is admitted to the ICU. What is the potential CNS complication that can occur in severe cases of DKA?**  **A) Cerebral edema**  **B) Meningitis**  **C) Ischemic stroke**  **D) Subarachnoid hemorrhage** |

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| **CASE 24** |
| **A 50-year-old male with diabetes is admitted with DKA. The individual presents with symptoms of polyuria, polydipsia, and fatigue. On examination, there is evidence of dehydration, tachycardia, and deep, labored breathing. Laboratory findings reveal hyperglycemia (blood glucose 500 mg/dL), ketonuria, and metabolic acidosis (pH 7.2). What renal complication may be observed due to the osmotic diuresis associated with hyperglycemia in this patient?**  **A) Acute tubular necrosis**  **B) Glomerulonephritis**  **C) Nephrotic syndrome**  **D) Renal papillary necrosis** |

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| **CASE 25** |
| **A 45-year-old female with type 2 diabetes presents with recurrent DKA episodes. The person reports symptoms of increased thirst, abdominal pain, and altered mental status. On examination, there is evidence of dehydration, ketosis, and fruity breath odor. Laboratory findings confirm hyperglycemia (blood glucose 450 mg/dL), ketonuria, and metabolic acidosis (pH 7.1). What psychosocial factor may contribute to the poor management of her diabetes?**  **A) Social support**  **B) Financial stability**  **C) Depression**  **D) Educational level** |