DIABETIC EMERGENCIES

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Fundamentals of First Aid and Emergency Care for Radiography

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Student Learning Outcomes (SLOs):

By the end of this lecture, students will be able to:

1. **Describe the pathophysiology of diabetes mellitus**, including impaired insulin production or insulin resistance leading to hyperglycemia.

2. **Differentiate between Type 1, Type 2, and gestational diabetes** based on their causes, onset, and management strategies.

3. **Identify the classic symptoms of diabetes and the clinical manifestations of acute complications** such as hypoglycemia, diabetic ketoacidosis (DKA), and hyperosmolar hyperglycemic nonketotic syndrome (HHNS).

4. **Demonstrate appropriate emergency responses** to acute diabetic complications by recognizing critical signs and outlining immediate actions required to ensure patient safety.

What Is Diabetes Mellitus DM?

- A **group of metabolic disorders** caused by problems with **insulin production or insulin use**.
- Insulin is produced by **beta cells in the islets of Langerhans (pancreas)**.
- In diabetes:
  - The pancreas **does not produce enough insulin**, **or**
  - Body cells **do not respond to insulin** (insulin resistance).
- Result: **Hyperglycemia** → leads to metabolic complications.

Classic Symptoms

Polyuria – frequent urination	**Polydipsia** – excessive thirst	**Polyphagia** – increased hunger

Impact & Statistics

- Diabetes is considered an **epidemic**.
- Millions affected, with rising prevalence and high healthcare cost.
- **1 in 3 Americans** born after 2000 may develop diabetes.
- **40%** of people with **prediabetes** may progress to type 2 within 5 years.

Types of Diabetes Mellitus

Type 1 Diabetes (Insulin Dependent)

- Onset: Usually **before age 30**; **sudden onset**.
- Cause: **Autoimmune destruction** of pancreatic beta cells.
- Body **cannot produce insulin** → requires **lifelong insulin therapy**.
- Risk of **diabetic ketoacidosis (DKA)** if untreated.

Type 2 Diabetes

- **Most common** type.
- Onset: Usually **after age 40**, **gradual** development.
- Cause: **Insulin resistance** and/or **reduced insulin production**.

- Management:
  - Weight loss, **diet**, exercise
  - May require **oral hypoglycemic drugs**

Gestational Diabetes

- Occurs in **late pregnancy**.
- Caused by **placental hormones** that block insulin.
- Usually managed with **diet**; sometimes **insulin**.
- **20–50%** later develop **type 2 diabetes**.

Acute Complications of Diabetes Mellitus

1. Hypoglycemia (Low Blood Glucose)

Cause:

- Too much insulin or oral hypoglycemic drugs
- Skipping meals or inadequate food intake
- Increased glucose use (exercise, stress)
- Common if the patient arrives **fasting** for imaging

Onset:

- **Rapid** — requires **immediate action**

Manifestations:

- Sweating, tremors
- Hunger
- Confusion, irritability
- Possible loss of consciousness (coma)

Technologist Response:

- Give **high-sugar foods or drinks** (candy, glucose gel, orange juice)
- Never leave the patient alone
- Notify medical staff if symptoms worsen

2. Diabetic Ketoacidosis (DKA)

Cause:

- **Insufficient insulin** → liver increases glucose production
- Kidneys excrete excess glucose → **dehydration + electrolyte loss**

Manifestations:

- Nausea, vomiting, abdominal pain
- Altered level of consciousness (LOC)
- Deep, rapid breathing
- **Sweet (fruity) breath odor**
- Signs of dehydration

2. Diabetic Ketoacidosis (DKA)

Technologist Response:

- Recognize emergency quickly
- Send patient to the **Emergency Department**
- Treatment: **IV fluids, electrolytes, insulin**

3. Hyperosmolar Hyperglycemic Nonketotic Syndrome (HHNS)

Cause:

- Severe **dehydration**
- Very high blood glucose without ketone production
- May occur even in people without known diabetes

Manifestations:

- Extreme thirst
- Mental confusion or coma
- Signs of severe dehydration

3. Hyperosmolar Hyperglycemic Nonketotic Syndrome (HHNS)

Technologist Response:

- **Immediate ED referral**
- Treatment: **IV fluids + potassium**, monitoring

General emergency Response

- Stop the procedure and notify the physician in charge of the procedure.
- Do not leave the patient unattended.
- Monitor the vital signs and prepare to administer intravenous fluids, medication, and oxygen as they may be needed and requested by an emergency team.