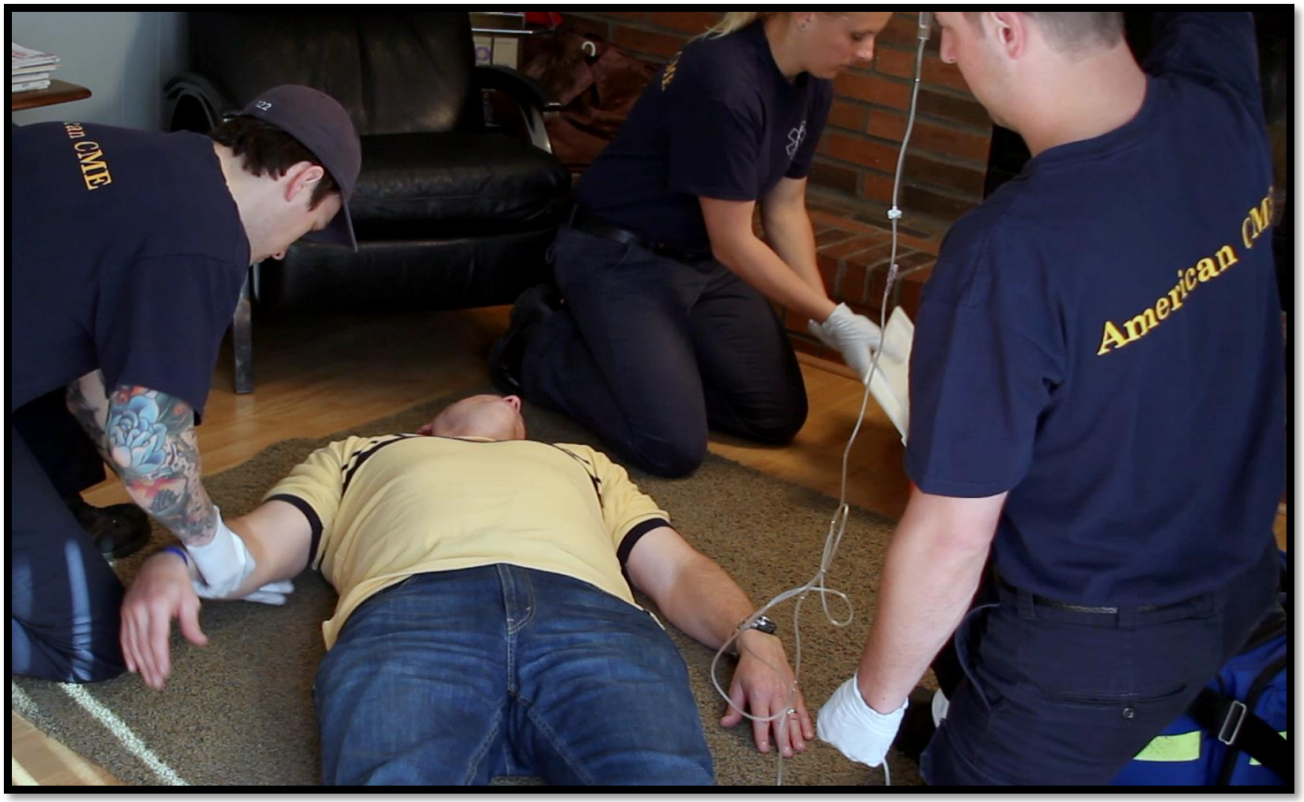
Diabetic Emergencies vs. Alcohol Intoxication

GFR Training

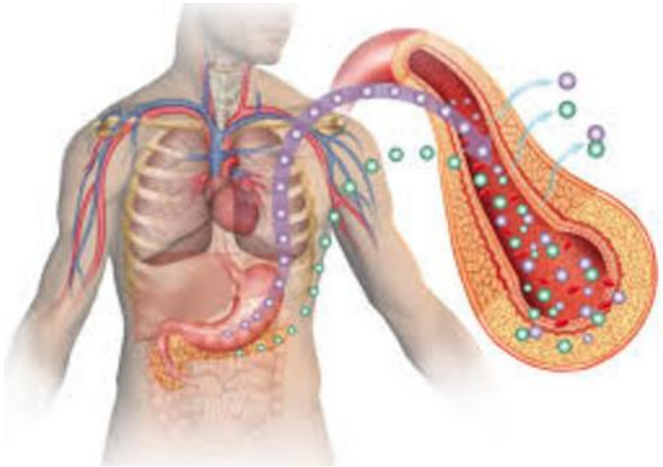
November 13, 2016



What is Diabetes?

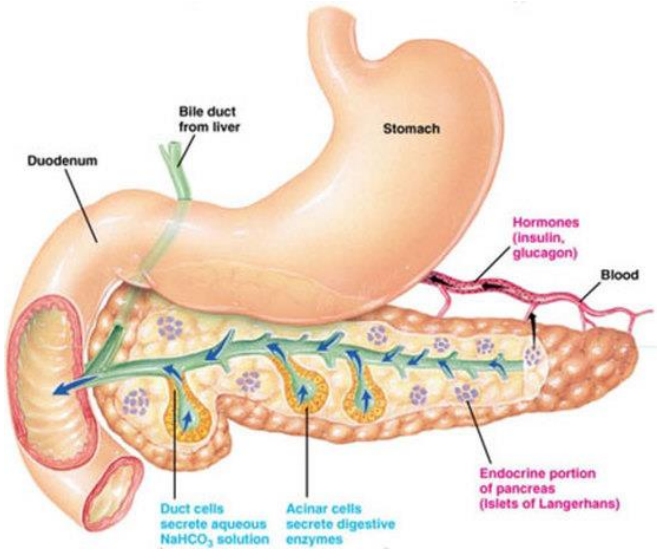
- **Diabetes** is a metabolic disease in which the body's inability to produce sufficient insulin or use insulin properly causes elevated levels of glucose in the blood

  Insulin: hormone that helps glucose move out of the bloodstream, across cell membranes, and into the cell where it is used for metabolism



What is Diabetes?

- **<u>Type 1</u>** – Juvenile Diabetes
  - Pancreas is unable to produce sufficient insulin, if any at all.
  - Results in hyperglycemia
  - Most common in Caucasians



- **<u>Type 2</u>** – Adult-onset Diabetes
  - Body doesn't utilize insulin properly. Cells become resistant to the effects of insulin, decreasing the efficiency of glucose passing through the cell membrane (aka ***insulin resistance***).
  - At first, the body makes excess insulin to make up for it, but over time it can't keep up and eventually BG rises.
  - More common than type 1

Hyperglycemia

- If insulin is low, BG begins to rise, causing **hyperglycemia** (high BG). However, due to the lack of insulin, the body's cells will not receive enough glucose.
- In absence of glucose, the cells will begin to use stored fats and proteins for energy metabolism, which is not as efficient as using glucose
  - Glucose metabolism produces water and CO_2
  - Fat metabolism produces ketone bodies, such as acetone, which can increase the acidity of the blood

- ***This is called diabetic ketoacidosis (DKA)***

Diabetic Ketoacidosis (DKA)

- Life threatening complication
- More common in Type 1 Diabetes
- Signs and symptoms may manifest gradually over a period of days to weeks
  - The three 'polys'
    - Polyphagia: Excessive eating
    - Polyuria: Excessive urination
    - Polydipsia: Excessive drinking
  - Kussmaul Respirations
    - Increased rate and depth of respirations

Diabetic Ketoacidosis (DKA)

- In severe cases:
  - Patient may have AMS and may eventually become unresponsive
  - Skin will become warm, flushed and dry as dehydration worsens
  - Elevated heart rate
  - Hypotension

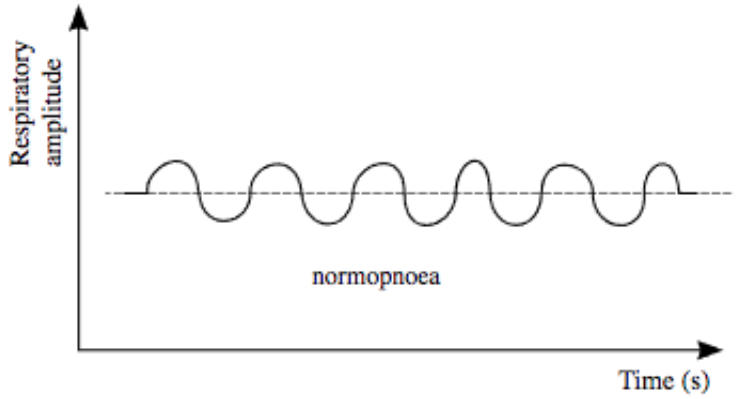
DKA Signs/Symptoms Explained

- Three 'Polys'
  - **Polyphagia** (hunger reflex) causes the patient to eat, increasing BG further. This often results in confusion (AMS)
    - Increased BG causes **polyuria** (excessive urination) as the kidneys remove excess glucose from the blood and draw more water to remove glucose from the body, thus increasing urination
      - This leads to dehydration, which triggers **polydipsia** (thirst reflex) which causes the patient to drink more water to replace what is drawn by the kidneys.

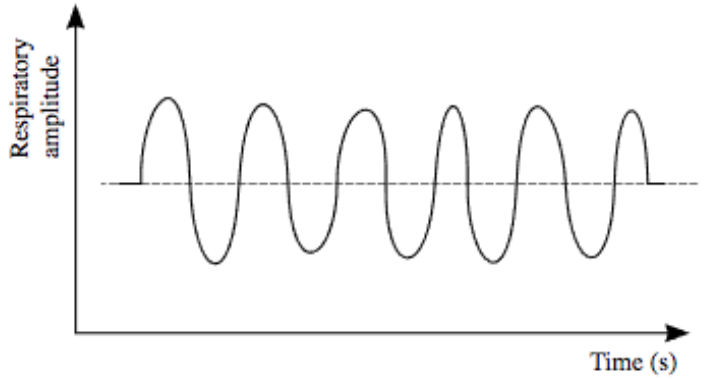
Hyperglycemia → Polyphagia → Polyuria → Polydipsia

DKA Signs/Symptoms Explained

- Kussmaul Respirations
  - The body tries to excrete the ketone bodies by breathing them out of the respiratory tract. This reduces the level of carbon dioxide in the bloodstream, which somewhat balances the acidosis temporarily. Breath often smells sweet, like acetone, and… like alcohol



Normal Respirations



Kussmaul Respirations

Hypoglycemia

- As blood glucose levels fall, the body reacts by releasing glycogen from the liver and large skeletal muscles.
  - Glycogen can be used by these organs to maintain metabolism. However, critical organs such as the brain and heart do not possess glycogen, and must depend on normal BG levels to function properly.
- As hypoglycemia worsens, the body enters a phase known as "insulin shock" (excess insulin in blood)
  - Common in Type 1 diabetics who take too much insulin

Blood Glucometry

- Non-diabetic BG level ranges:
  - Normal (fasting): 70 – 100 mg/dL
  - 2 hours post meal: < 140 mg/dL
- Diabetic BG level ranges:
  - Normal (fasting): 90 – 130 mg/dL
  - 2 hours post meal: < 180 mg/dL
  - Hyperglycemia: > 130 mg/dL
  - DKA: ≥ 250 mg/dL
  - Hypoglycemia: < 70 mg/dL

Alcohol Intoxication	Hypoglycemia	Hyperglycemia (DKA)
Dizziness	Lightheadedness or dizziness	
Blurred vision	Blurred vision	Blurred vision
Slurred speech	Slurred speech	
Confusion	Confusion, including delirium	Confusion
Weakness	Fatigue, weakness	Fatigue, weakness
Loss of coordination	Lack of coordination	
Irritability, combativeness	Irritability, combativeness	
Unconsciousness	Unconsciousness	Unconsciousness
Signs and symptoms develop within minutes to hours	Signs and symptoms develop within minutes to hours	Signs and symptoms develop within hours to days
		Frequent urination
Flushed, cool skin	Pale, chills, clamminess	Dry, hot, flushed skin
Hypotension	Hypertension	Hypotension
Breath smells like alcohol		Breath smells like alcohol
Decreased heart rate	Increased heart rate	Increased heart rate
	Hunger	Increased hunger
		Excessive thirst
Decreased respirations	Rapid Respirations	Kussmaul respirations
	Parasthesias	

Don’t always assume intoxication, even if the pt. denies drinking but they are acting drunk and/or their breath smells like alcohol!!

Differentiating the patient with "intoxicated" symptoms

- Can be difficult to distinguish between diabetes and intoxication
- The patient's combativeness may be the result of hypo- or hyperglycemia, so allow UPD to restrain the patient if necessary before performing a thorough assessment.
- Look for medical alert jewelry around the wrist and neck
- If a wallet or purse is available, check for any information that might point to a medical condition (prescriptions, medical card, small tuberculin syringes for insulin, etc.)
- Check for scarring on the anterior abdomen from repeated insulin injections, and the presence of an insulin pump strapped to a belt

Treatment for diabetics

- Scene safety
- ABCs
  - Assure airway patency and administer oxygen
- SAMPLE and vitals
- Assess blood glucose (BG)
  - If patient has BG < 60 mg/dL and appears hypoglycemic:
    - If patient is conscious with a patent airway, administer glucose gel
    - If unsure, call Med Control
- All patients who have been treated for potential hypoglycemia should be transported.
- Treatment should **not** be withheld from patients with a stroke-like presentation, as this is likely due to hypoglycemia.

Questions?

References

- http://www.ems1.com/medical-clinical/articles/1081443-Drunk-versus-diabetes-How-can-you-tell/
- http://www.ems1.com/columnists/art-hsieh/articles/3019584-4-endocrine-emergencies-EMS-providers-need-to-know/
- http://www.diabetes.org/diabetes-basics/?loc=db-slabnav