

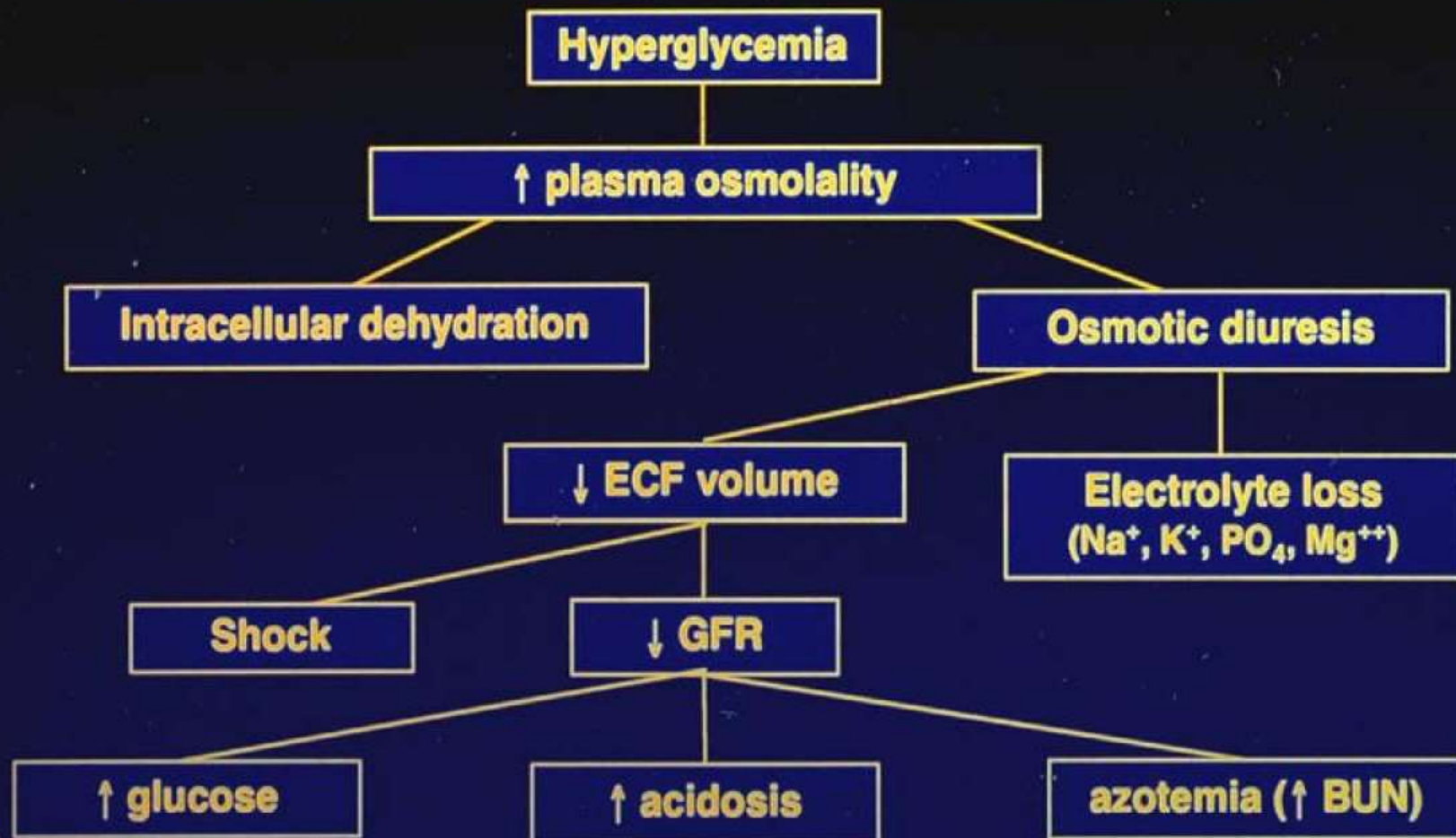
A person in a white lab coat is shown from the chest up, holding a clear plastic IV drip chamber. The drip chamber is suspended from a black stand. The background is a solid, bright blue color. The person's face is partially visible on the right side of the frame, looking towards the left.

Welcome

DKA and HHS

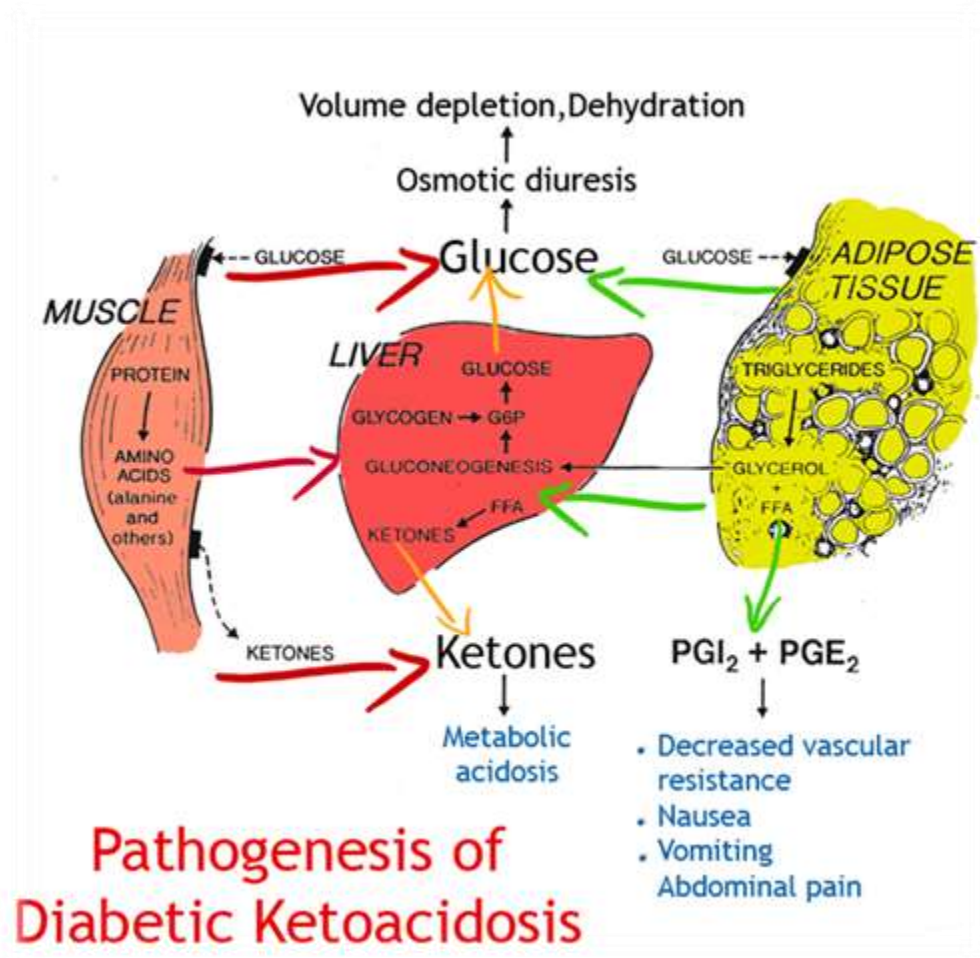
**CDE Exam Preparation
Presented by
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May 4, 2017**

Diabetic Ketoacidosis



Pathophysiology of diabetic ketoacidosis

DKA at organ level



Diabetic Ketoacidosis

Characteristics

- Ketones positive
- Anion Gap > 12 (High)
- Blood Sugar ≥ 14 (High)
- Bicarbonate ≤ 15 (Low)
- PH ≤ 7.3 (Low)
- Sodium Normal or Low
- Potassium Normal, Low , High

Monitor every hour until fluid and acidosis is corrected
(electrolytes, creatinine, osmolality, fluid balance)

Pregnant women in DKA present with lower glucose levels than non-pregnant women

Diabetic Ketoacidosis

Characteristics

- Quick Less 24 hours
- Polyuria, polyphagia, polydipsia
- Kussmaul respiration
- Nausea and Vomiting
- Tachycardia
- Hypotension
- Leg cramps
- Abdominal pain
- Decreased Extracellular volume (ECFV)
- Weakness, weight loss
- Physical symptoms of dehydration

Diabetic Ketoacidosis

Causes

- Newly Diagnosed Type 1
- Insulin Omission
- Infection
- MI
- Trauma
- Flu
- Eating Disorders (20% recurrent)
- Pump Failure
- Thyrotoxicosis
- Cocaine, atypical antipsychotics, interferon

Hyperosmolar Hyperglycemic State (HHS)

Characteristics

- Dehydration, Marked Decreased Extracellular volume
- Blood Sugar >33
- Osmolality > 350
- PH > 7.2
- Bicarb >20
- Ketones +/-

Can have neurologic presentation, seizures and stroke like symptoms

Symptoms

- Dry Mouth
- Poor Urine Output
- Sleepy coma
- Stupor
- Increased BUN, Cr

Causes

- Illness
- Decreased Fluid intake
- Drugs-glucocorticoids, thiazides, lithium and atypical antipsychotics
- Elderly, chronic care
- Following cardiac surgery

Tests

Glucose

Electrolytes and anion gap

Creatinine

Osmolality

Blood gases

Serum and urine ketone

- Beta-hydroxybutyric acid (78%)
- Acetoacetate (20 %)
- Acetone(2%)

Fluid balance

Monitor

Level of consciousness

Precipitating factors

	DKA	HHS
Blood Sugar	> 14	>34
Ketones	Positive	+ / -
Osmolality	Normal	> 350
PH	< 7.3	> 7.2 (normal)
Anion gap	increased	normal
Presentation	Rapid	Slower
Characteristics Common to Both	Weight Loss Vomiting Abdominal pain	Illness Dehydration Stupor
Treatment	Insulin (0.1u/kg/h) Hydration	Hydration Insulin
Mortality	< 1 % (age 20- 49) 16% (over 75)	12- 17 %
Incidence hospital admissions US	4-9 %	< 1 %

Treatment

DKA

Fluid resuscitation
Avoid Hypokalemia
Insulin
Avoid rapidly falling serum
osmolality
Causes

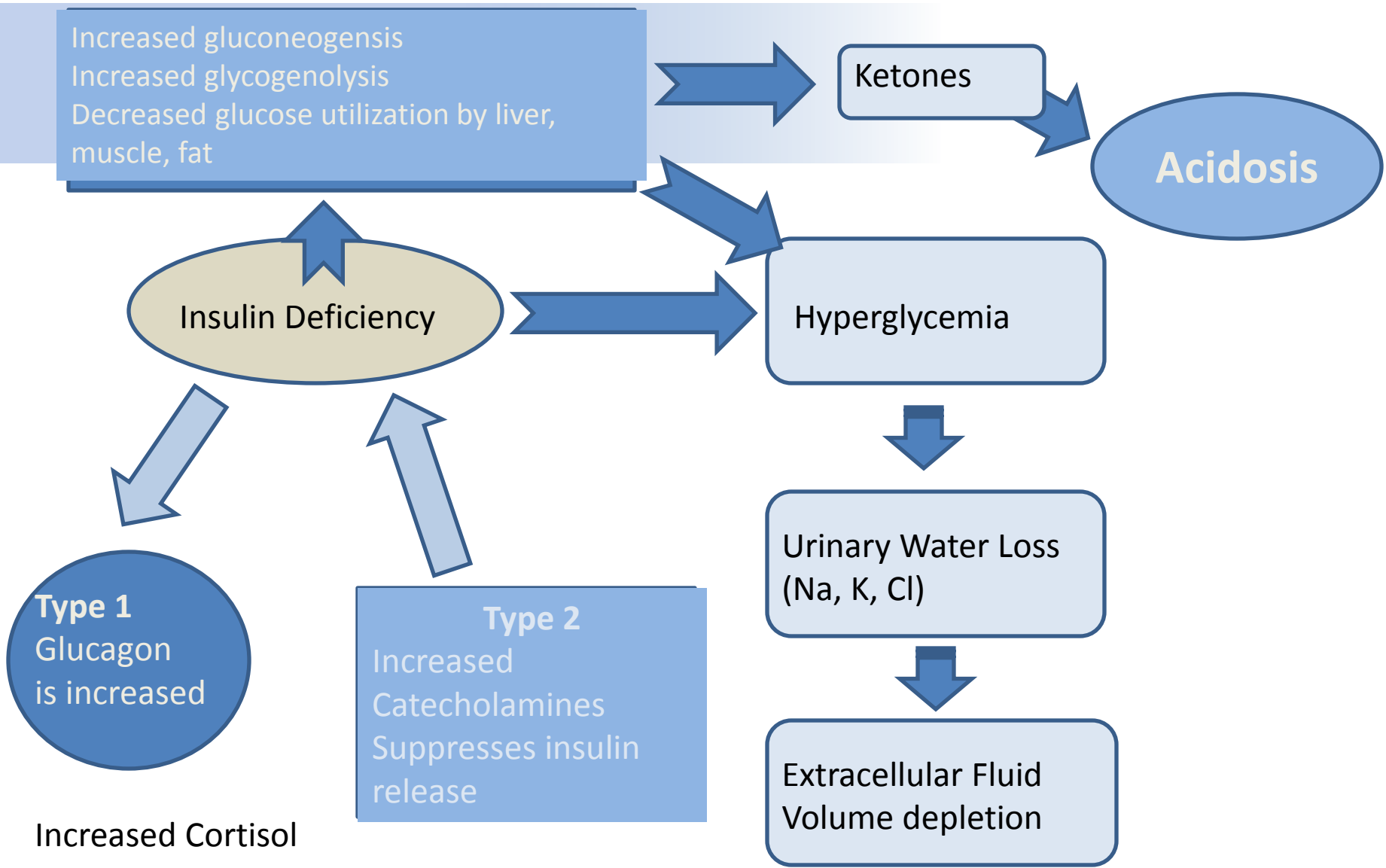
HHS

Fluid resuscitation

- K
- Bicarb
- Electrolytes

Avoid Hypokalemia
Avoid rapidly falling serum
osmolality
Causes
Insulin

Concerns: Cerebral Edema if hyperosmolality is reduced quickly(only 3 mmol/kg/hr)

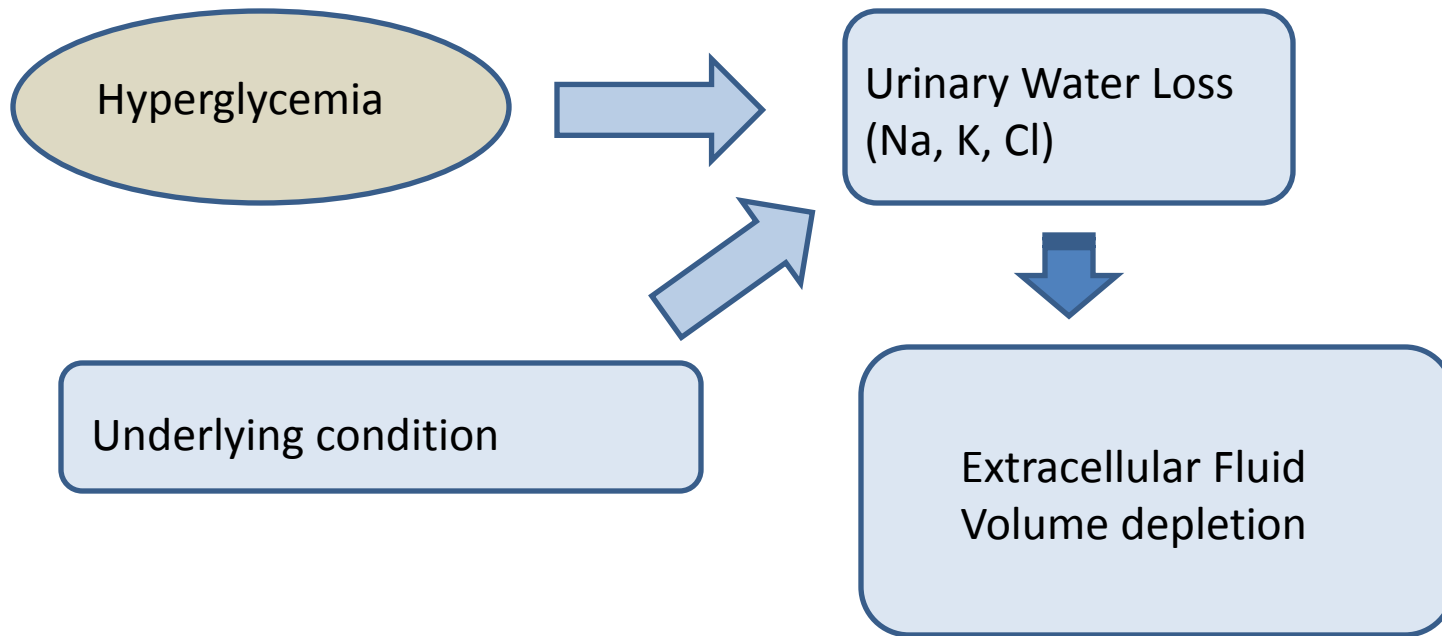


Wendy's attempt to simplify

Diabetic Ketoacidosis

Wendy's attempt to simplify

Hyperosmolar Coma



Insulin is still present but inadequate to control blood glucose, but adequate to prevent formation of ketones.

Case Study

Judy was brought to hospital by her husband. She has been weak and sleepy for the last 24 hours. She is now complaining of abdominal pain.

What blood tests would you look at to determine if this is DKA or HHS?

- a) Blood Glucose, anion gap, urine ketones, bicarbonate
- b) Ethanol, salicylate, acetaminophen
- c) Insulin levels, blood ketones
- d) Blood glucose, anion gap, blood ketones, pH, bicarbonate

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A close-up photograph of a stack of books. A bright red rectangular sticky note is attached to the side of the books. The words "good luck" are written on the note in a black, cursive-style font, with a small black heart symbol at the end. The background is blurred, showing a desk with a yellow highlighter and other items.

good luck ♥