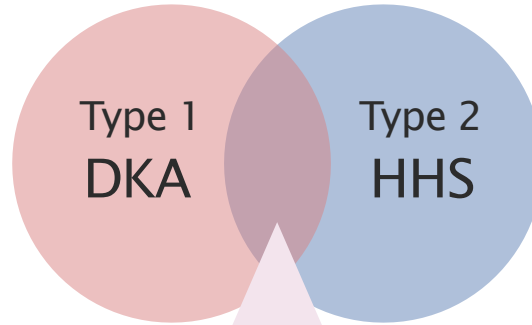


Diabetes and Severe Hyperglycemia



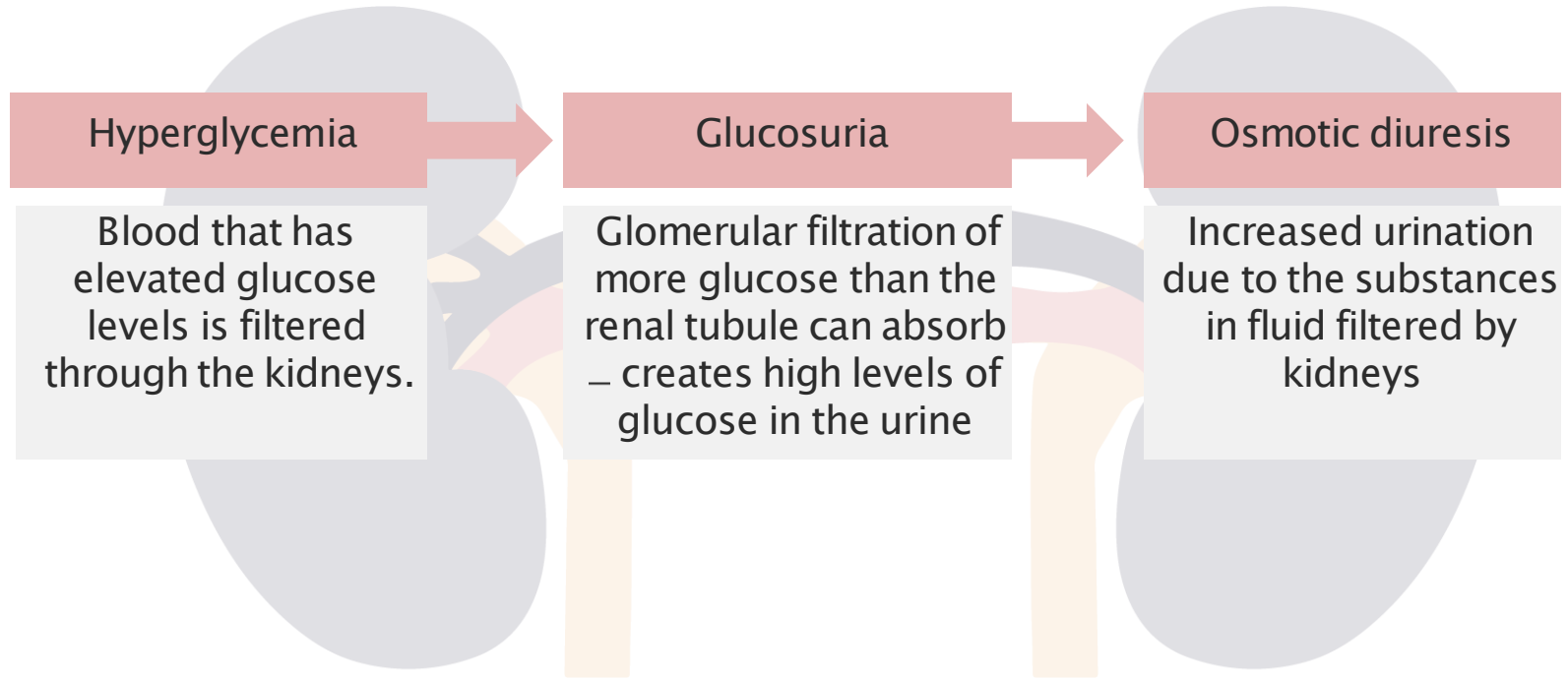
Introduction to Diabetic Ketoacidosis (DKA) and
Hyperosmolar Hyperglycemic Syndrome (HHS)

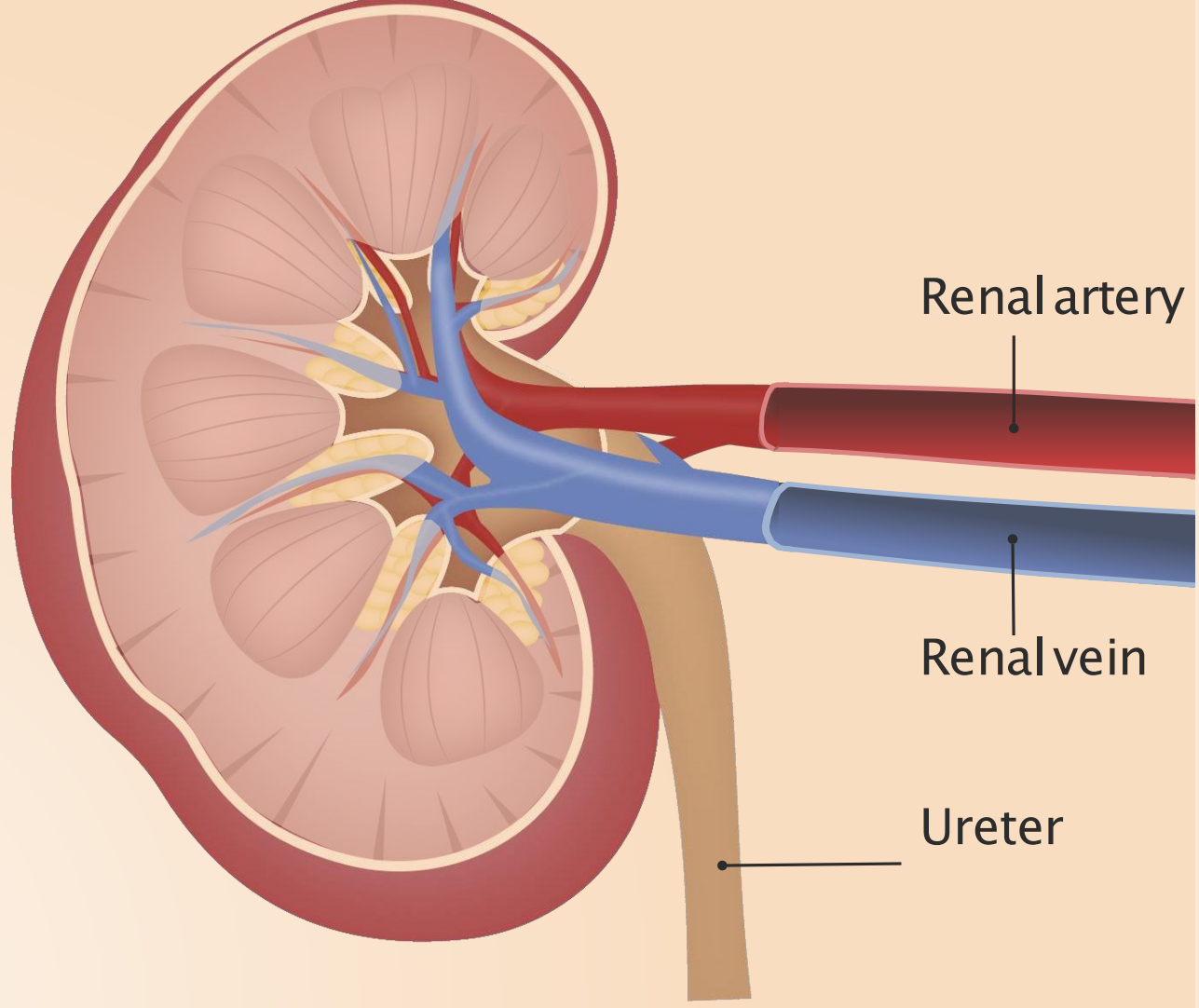
What DKA and HHS Have in Common



1. Both occur in clients with diabetes
2. Life-threatening/medical emergencies, elevated blood glucose
3. Increased serum plasma osmolarity (normal: 275-295 mOsm/L)
4. Extreme osmotic diuresis and dehydration

Osmotic Diuresis

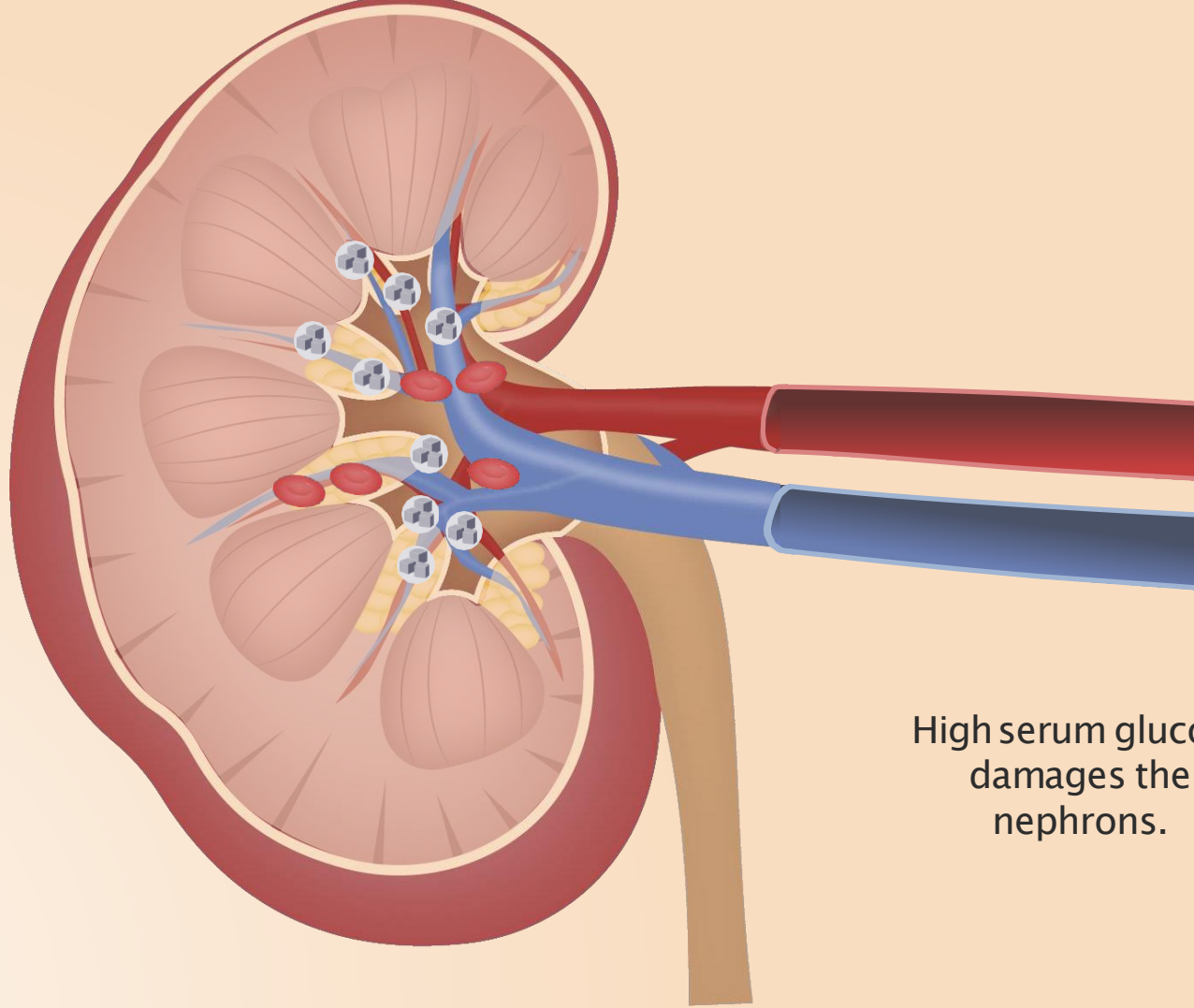




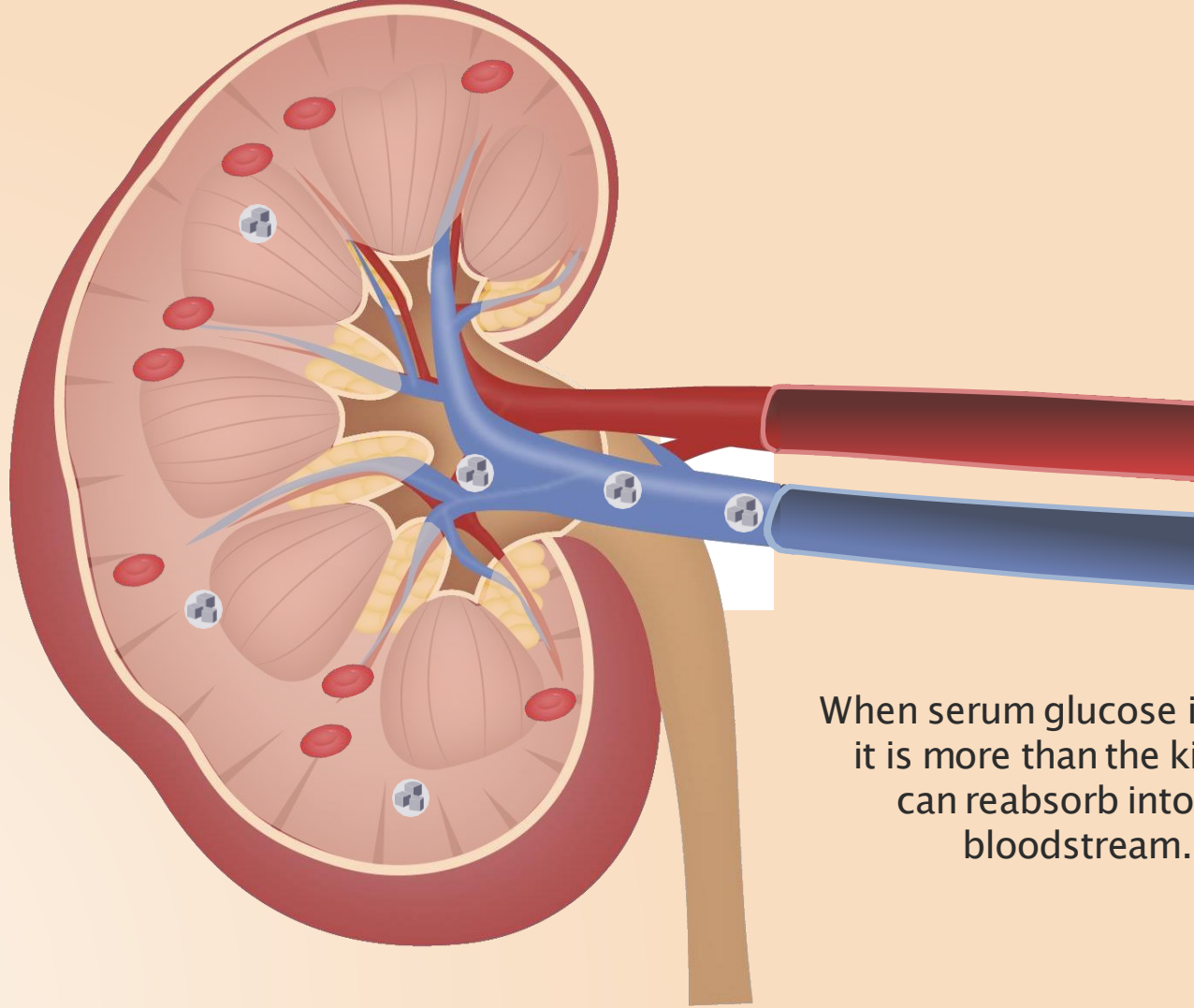
Renal artery

Renal vein

Ureter



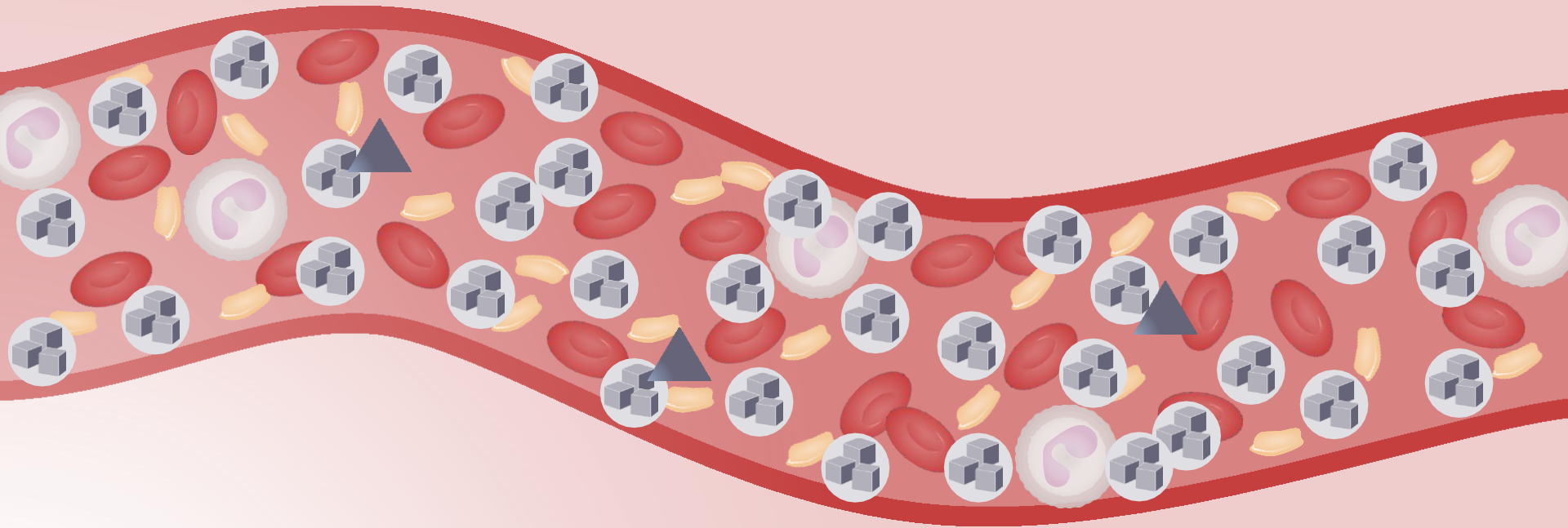
High serum glucose
damages the
nephrons.



When serum glucose is high, it is more than the kidneys can reabsorb into the bloodstream.

Characteristic Comparison

	Insulin	Blood glucose	Progression	Ketone bodies	Other labs	Osmotic diuresis
Diabetic ketoacidosis (most oftentype 1 diabetic client§)	Profound lack of insulin	> 250 mg/dL	Rapid	Present in urine and blood	ABG pH < 7.30, HCO ₃ < 16mEq/L, and ketones	Yes! And dehydration
Hyperosmolar hyperglycemic syndrome (Type 2 diabetic clients)	Minimal amount of insulin	> 600 mg/dL	Slower	Absent or minimal	Marked increase in serum osmolality	Yes! And dehydration



What is the main difference between DKA and HHS?

Ketosis and Ketoacidosis



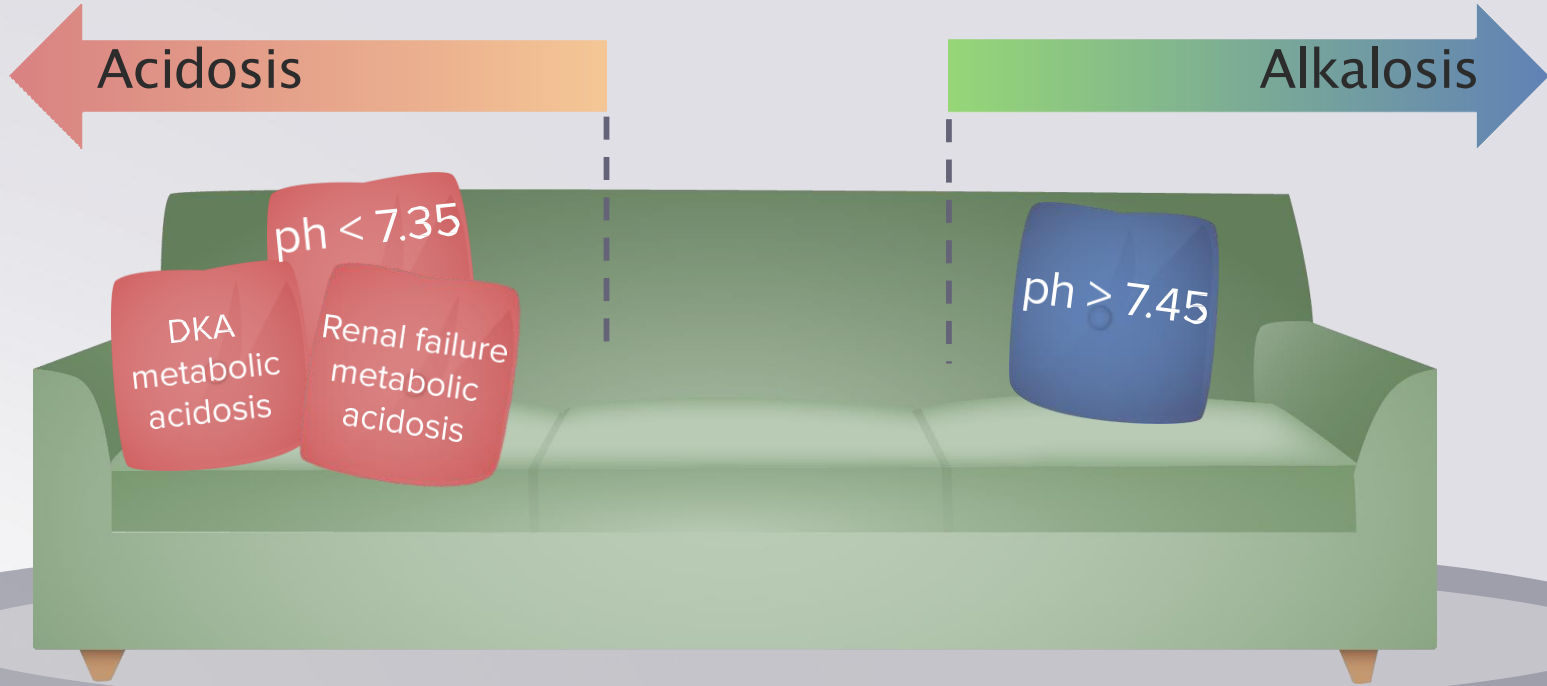
Ketosis

- Normal metabolic state
- 1 – 6 mmol/L ketones in blood
- Burning fat as energy



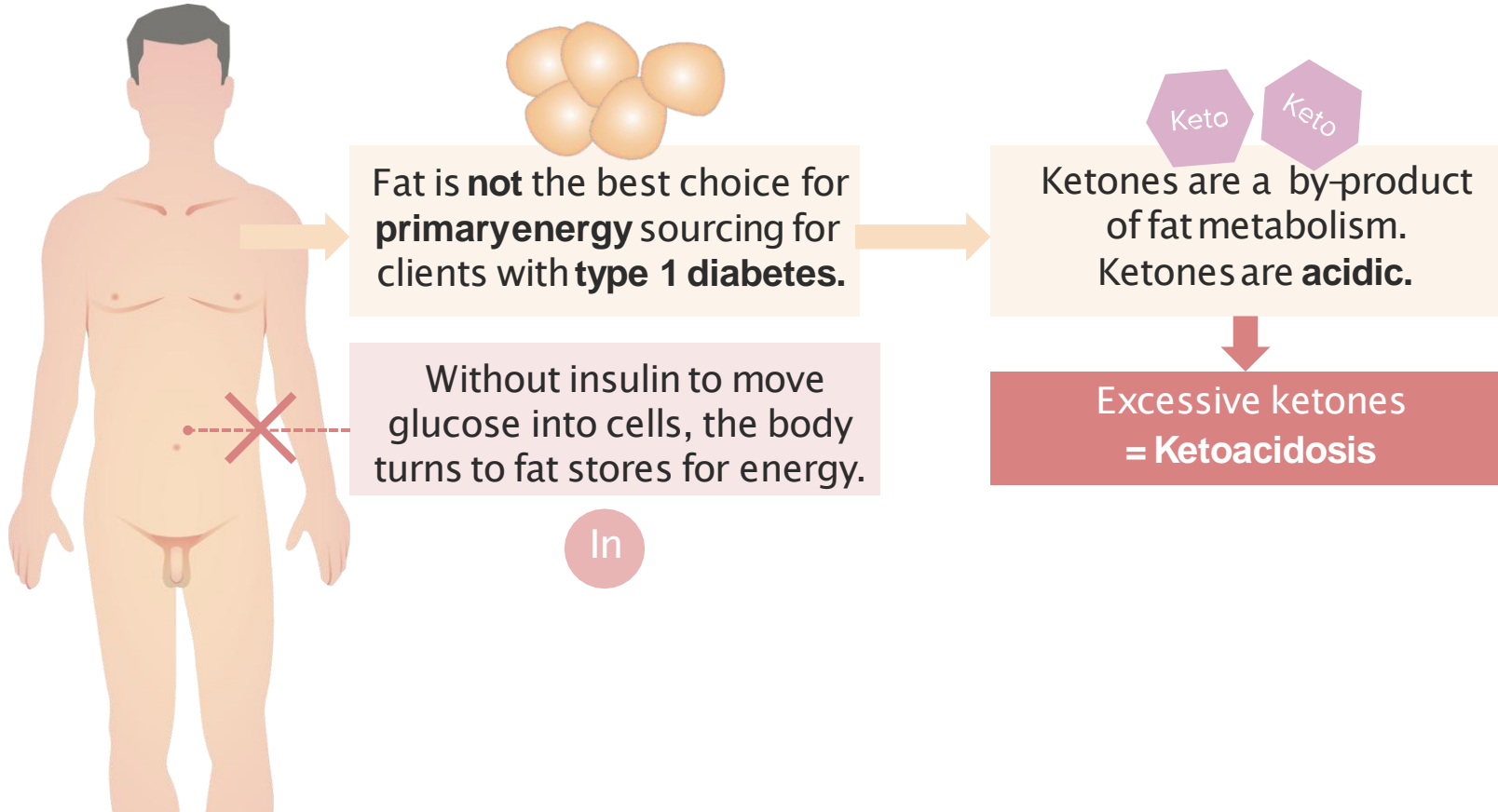
Ketoacidosis

- Dangerous metabolic state
- 15 – 30 mmol/L ketones in blood
- Affects clients with type 1 diabetes

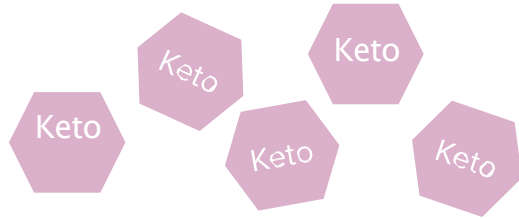


Metabolic acidosis is a dangerous imbalance for your client.

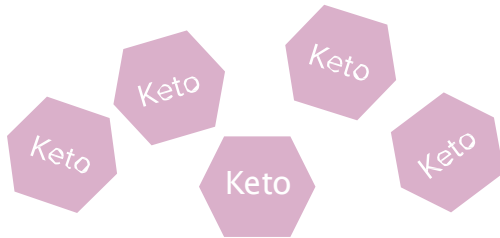
Burning Fat for Fuel Can Have a Price...



Excessive Ketones = Severe Dehydration



Blood pH is altered and becomes acidic, which puts the client in **metabolic acidosis**.



Electrolytes are severely depleted in an effort to restore balance from ketosis.



Imbalances in:

- Sodium
- Potassium
- Nitrogen
- Chloride
- Phosphate
- Bicarbonate
- Magnesium



A client with ketones in their urine and blood is most likely experiencing HHS or DKA? Why?

Nursing Care for HHS and DKA

Priorities	Interventions	Monitoring
1. Correct osmotic diuresis_ induced dehydration to sustain blood pressure.	<ul style="list-style-type: none">• Fluid volume replacement	<ul style="list-style-type: none">• Monitor vital signs.• Monitor lab work.
2. Correct hyperglycemia.	<ul style="list-style-type: none">• Controlled insulin administration_ to prevent cerebral edema	<ul style="list-style-type: none">• Monitor serum glucose.• Assess neuro status.
3. Correct electrolyte imbalance.	<ul style="list-style-type: none">• Give electrolytes based on client lab work.	<ul style="list-style-type: none">• Monitor lab work and signs of depleted electrolytes.

In a Nutshell

- ✓ The 4 major similarities of HHS and DKA are:
 1. Both occur in clients with diabetes
 2. Life-threatening/medical emergencies, elevated blood glucose
 3. Increased serum plasmæsmolarity
 4. Extreme osmotic diuresis and dehydration



In a Nutshell

- ✓ The 3 major priorities of care for a client with HHS or DKA are to safely:
 1. Correct severe dehydration from osmotic diuresis.
 2. Correct hyperglycemia.
 3. Correct electrolyte imbalance.

