Canine Diabetic Ketoacidosis

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Physical Examination
- Polyuria
- Polydipsia
- Polyphagia
- Weight loss
- Vomiting
- Lethargy

Patient may have only 1 or more of these signs.

Laboratory Results
- Blood glucose (BG): Hyperglycemia (> 200 mg/dL)
- Blood gas (venous or arterial): Metabolic acidosis
- Urine dipstick: Glucosuria; ketonuria or ketonemia

Serum ketones can be measured if urine is unavailable.

Dx Diabetic Ketoacidosis

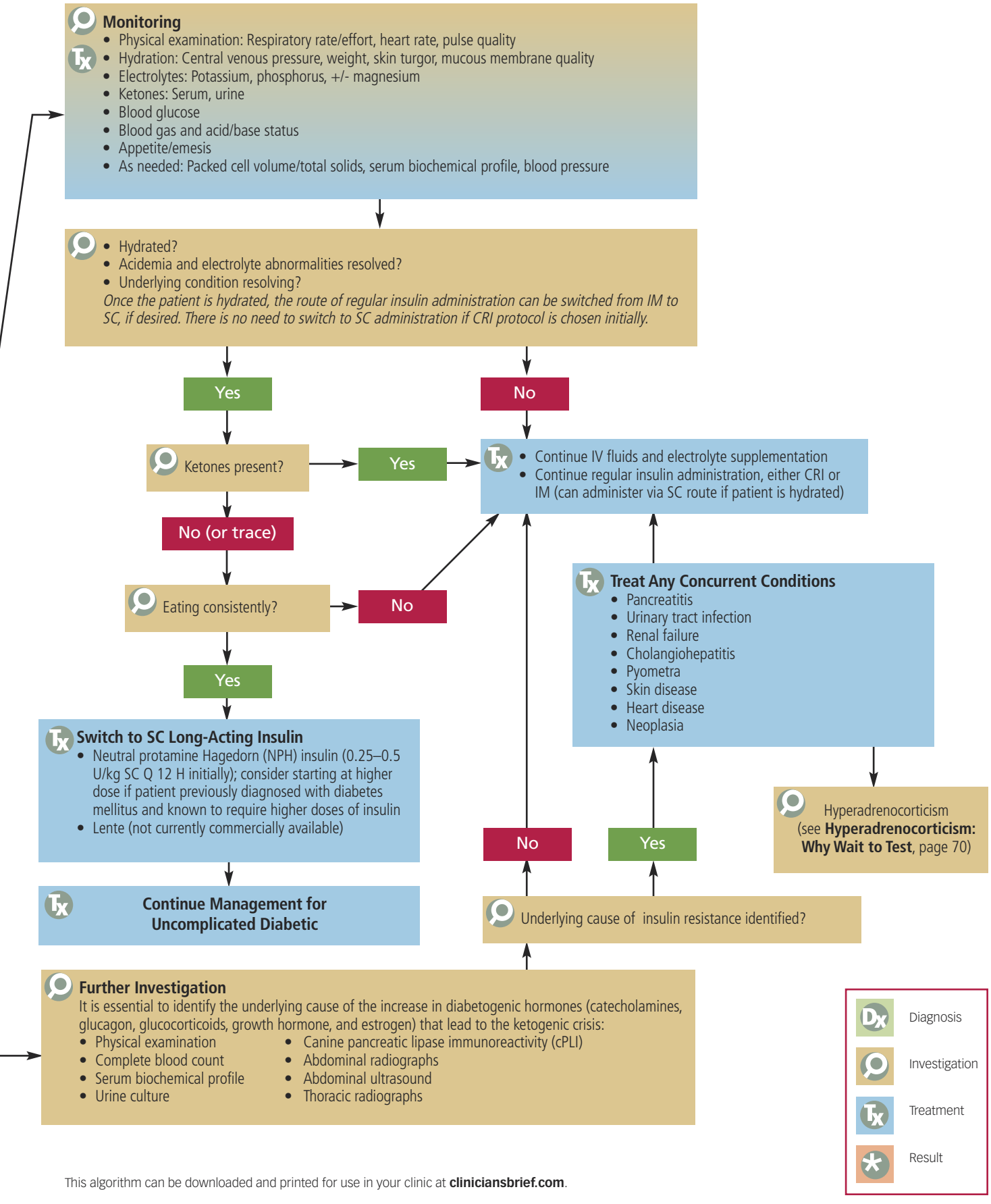
Tx Treatment

Tx 1. IV Isotonic Crystalloid Therapy
- Shock fluid therapy is warranted if cardiovascular instability is present: Full shock dose of fluids is 90 mL/kg; start with ¼ to ⅓ dose and reassess until stable
- Correct dehydration, provide maintenance needs, and replace ongoing losses over 6 to 24 hours:
  - % dehydration × body weight (kg) × 1000 **plus**
  - 20 mL/kg/day (insensible losses) **plus**
  - 20 to 40 mL/kg/day (maintenance sensible losses) **plus**
  - Account for vomiting, diarrhea, & polyuria (ongoing sensible losses)

Tx 2. Electrolyte Supplementation (see **Table 1**, page 70)
- Monitor serum potassium Q 4–6 H until within reference interval and stable; then Q 12–24 H
- Monitor serum phosphorus Q 4–6 H until > 1.5; then Q 6–24 H
- When supplementing potassium and phosphorus concurrently, take into account the amount of potassium contained in the potassium phosphate
- Consider magnesium supplementation in instances of refractory hypokalemia

Tx 3. Regular Insulin
- Continuous rate infusion (CRI) protocol:[1]
  - Add 2.2 U/kg of regular insulin to 250 mL of 0.9% saline
  - Allow 50 mL of insulin solution to run through administration set because insulin adheres to plastic
  - Administer solution as shown in **Table 2** (page 70)
- Intermittent low-dose IM protocol:
  - Administer 0.2 U/kg regular insulin IM initially; 1 hour later begin IM injections of 0.1 U/kg every hour
  - If BG < 250 mg/dL make 5% dextrose solution with hydration fluids and change dosing regimen to 0.1 to 0.4 U/kg SC insulin Q 4–6 H
- For either protocol:
  - Monitor BG Q 1–2 H
  - Goal for either protocol is to maintain BG between 200 and 300 mg/dL
  - Do not decrease BG faster than 70 to 100 mg/dL/H

BG = blood glucose; CRI = constant rate infusion; NPH = neutral protamine Hagedorn



This algorithm can be downloaded and printed for use in your clinic at **cliniciansbrief.com**.

Table 1. Electrolyte Supplementation

Serum Potassium Concentration (mEq/L)	Potasssium Chloride Dose
> 3.5 (maintenance)	0.05–0.1 mEq/kg/H
3–3.5	0.1–0.2 mEq/kg/H
2.5–3	0.2–0.3 mEq/kg/H
2–2.5	0.3–0.4 mEq/kg/H
< 2	0.4–0.5 mEq/kg/H
Serum Phosphorus Concentration (mg/dL)	**Potassium Phosphorus Dose**
2–2.5	0.03 mmol/kg/H
1.5–2	0.06 mmol/kg/H
1–1.5	0.09 mmol/kg/H
< 1	0.12 mmol/kg/H

Table 2. CRI Infusion of Insulin Solution

BG Concentration (mg/dL)	IV Hydration Fluids	Rate of Insulin Solution (mL/H)
> 250	0.9% saline	10
200–250	0.9% saline + 2.5% dextrose	7
150–200	0.9% saline + 2.5% dextrose	5
100–150	0.9% saline + 5% dextrose	5
< 100	0.9% saline + 5% dextrose	Discontinue

Hyperadrenocorticism: Why Wait to Test?

Although hyperadrenocorticism is one of the most frequent causes of insulin resistance, it is not appropriate to test for it during a diabetic ketoacidosis crisis because false positives would be expected. Diagnostic testing for hyperadrenocorticism should not be performed until the patient has been systemically healthy for at least 2 weeks. Appropriate regulation of diabetes mellitus may be difficult to achieve prior to diagnosis of concurrent hyperadrenocorticism.

See Aids & Resources, back page, for references & suggested reading.

BG = blood glucose