



University of Missouri Pediatric Service Line

Pediatric Emergency • Clinical Practice Guidelines

Diabetic Ketoacidosis (DKA) Management

Patient < 18 years presenting with signs/symptoms of DKA^a

Obtain immediate POC glucose

Continuous cardiac and pulse oximetry monitoring

Place PIV x 2

Obtain CBC, RFP, VBG, UA, β -hydroxybutyrate, HgA1C (unless obtained in the last 30 days), urine pregnancy test as indicated¹

Initial Fluid Bolus (Phase I)²

LR (preferred) or NS 10-20 ml/kg (max 1L) given over 1 hour

Give initial bolus rapidly only if in decompensated shock

Only one bolus recommended if hemodynamically stable

Reassess perfusion after each bolus & avoid cumulative bolus > 40ml/kg unless persistent shock

Consider vasopressors after 3rd bolus if hemodynamically unstable

POC glucose > 600

No

Yes

Criteria for Insulin Infusion

Hyperglycemia ≥ 200 mg/dL

Venous pH < 7.25 and/or Bicarb < 15 mmol/L

β -hydroxybutyrate ≥ 3 or moderate/large ketones^b

No

Yes

Consider
alternative
diagnoses

Consult Peds
Endo as needed
(see risk
stratification for
known
diabetics)^c

New Onset Diabetes

Yes

No

Obtain new onset
diabetes labs^d

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Obtain serum osmolality

**Serum osmolality ≥ 320
mOsm/kg AND Bicarb
 ≥ 15 mmol/L**

No

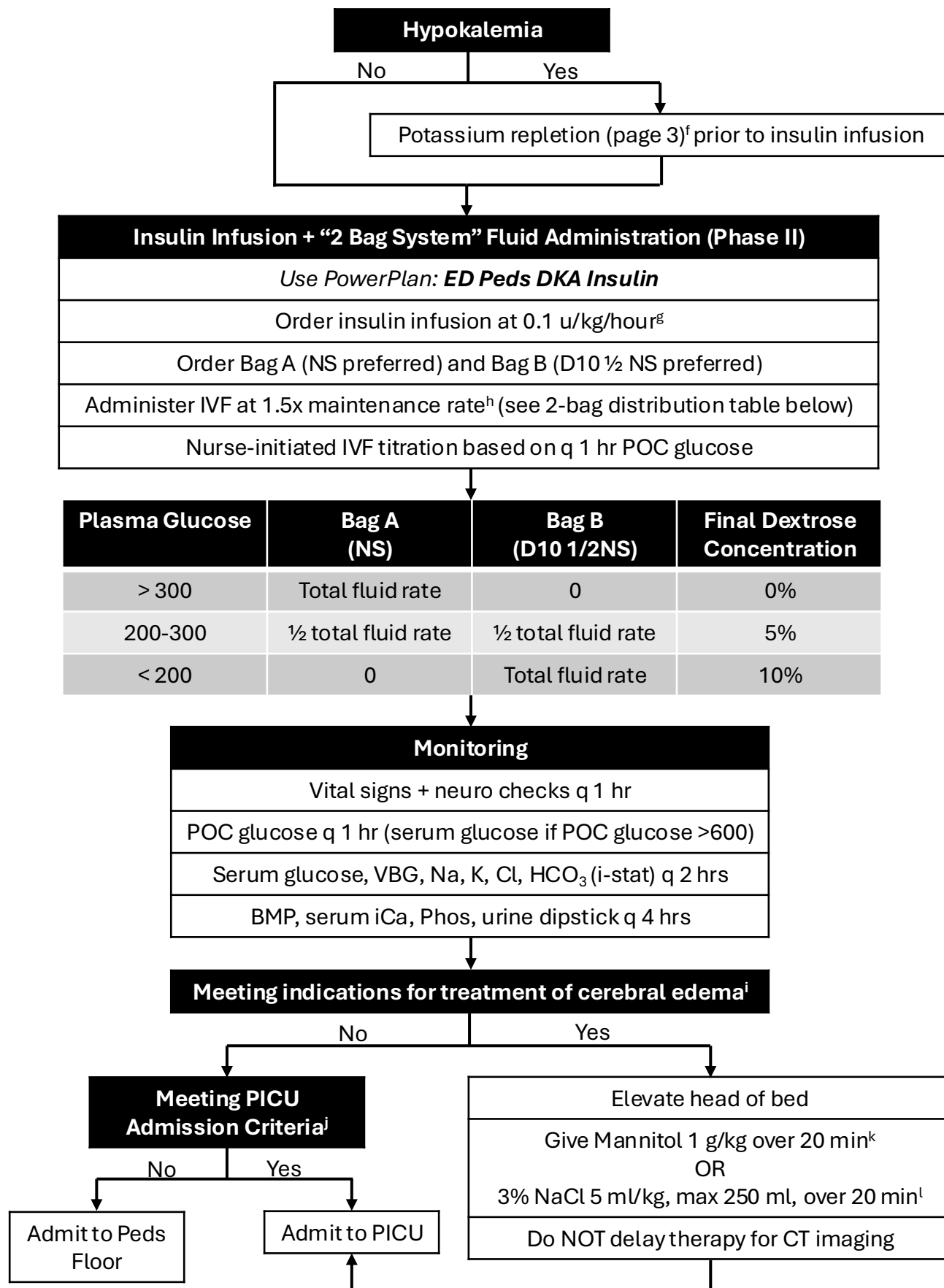
Yes

Contact PICU for
admission for
Hyperglycemic
Hyperosmolar
Syndrome (HHS)^e
management



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Footnotes:

- a. Presentations concerning for DKA: patient with or without known history of diabetes presenting with hyperglycemia, polyuria, polydipsia, nausea/vomiting, abdominal pain, deep and fast respirations (Kussmaul breathing), fruity/acetone-like odor on breath, fatigue, confusion, altered mental status
- b. If bicarb < 15 but pH ≥ 7.25 , consult pediatric endocrinology.
- c. Cerebral Edema Risk Stratification:
 - i. High Risk:
 - i. pH < 7.0 (≥ 3 years), pH < 7.1 (< 3 years), glucose > 1000 mg/dL, corrected sodium > 155 mEq/L, new neurologic deficit
 - ii. Dispo typically to PICU
 - ii. Medium Risk:
 - i. Does not meet low or high risk criteria, progressive ketonuria, inability to tolerate PO
 - ii. Dispo typically to inpatient pediatric floor with peds endo consult
 - iii. Low risk:
 - i. pH > 7.2 , bicarb > 15 , improving ketones, able to tolerate oral PO
 - ii. Dispo typically to pediatric floor vs structured outpatient management if appropriate per peds endo
- d. New Onset Diabetes Labs: HgbA1c, insulin antibodies, GAD antibodies, IA-2 antibodies, zinc transporter 8 antibodies, C-peptide, celiac panel, TSH
- e. Lab findings typical of Hyperosmolar Hyperglycemic State: glucose > 600 mg/dL, venous pH > 7.35 , bicarb ≥ 15 mEq/L, minimal or absent ketones, serum osmolality > 320 mOsm/kg
- f. Potassium Repletion:

Initial Potassium (mEq/L)	Insulin	Fluids (Bag A)	Additional Repletion	Repeat Potassium Level
≤ 3	Do not start until repeat potassium > 3	NS + KCl 20 mEq/L	PO (preferred): 1 mEq/kg (max 40 mEq) PO using oral liquid or powder packet - or - IV (alternative if not tolerating PO): 1 mEq/kg (max 40 mEq) IV infused over 4 hours Infusion rate: 0.25 mEq/kg/hr (max 10 mEq/hr)	1-2 hours after end of potassium administration
3.1-3.3	May start only if additional IV potassium repletion has been administered (PO) or if is being infused (IV)	NS + KCl 20 mEq/L	PO (preferred): 0.5 mEq/kg (max 20 mEq) PO using oral liquid or powder packet - or - IV (alternative if not tolerating PO): 0.5 mEq/kg (max 20 mEq) IV infused over 2 hours Infusion rate: 0.25 mEq/kg/hr (max 10 mEq/hr)	1-2 hours after end of potassium administration
> 3.3	Start immediately	LR (preferred) or NS	None	Standard lab frequency



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Footnotes:

- g. Insulin drip should be started after the initial fluid bolus is completed. Insulin drip is to be administered via a dedicated pump (i.e. Alaris pump), and never pushed/bloused IV.
- h. Do not exceed 4L/m²/day (including initial fluid bolus)
- i. Diagnosis of cerebral edema:³
 - g. Minor criteria:
 - g. Headache, especially if worsening or recurring during treatment
 - h. Vomiting, especially if developing or recurring during treatment
 - i. Irritability, lethargy, or not easily aroused from sleep, especially if occurring or worsening after initiation of treatment
 - j. Elevated BP (e.g. diastolic BP >90 mmHg)
 - h. Major criteria:
 - g. Abnormal or deteriorating mental status after initiation of therapy, agitated behavior, or fluctuating level of consciousness
 - h. Incontinence inappropriate for age
 - i. Inappropriate slowing of heart rate (e.g. decline >20 bpm that is not attributed to improved intravascular volume or sleep)
 - i. Diagnostic criteria:
 - g. Abnormal motor or verbal response to pain
 - h. Decorticate or decerebrate posture
 - i. Abnormal pupillary response or other CN palsy
 - j. Abnormal neurogenic respiratory pattern (e.g. grunting, Cheyne-Stokes respirations, apnea)
 - j. Treatment Indications:³
 - g. 1 diagnostic criteria, OR
 - h. 2 major criteria, OR
 - i. 1 major and 2 minor criteria, OR
 - j. 1 major and 1 minor criteria (if child is under 5 years)
- j. PICU admission criteria:
 - g. Initial pH < 7.25 or bicarb < 15 and/or requiring insulin drip
 - h. Concern for cerebral edema
 - i. Cardiorespiratory instability
 - j. Age < 2 years
 - k. Severe electrolyte disturbances (e.g. K < 2 or > 7)
- k. If giving mannitol, closely monitor intake and output (i.e. consider a foley catheter if unable to urinate or measure output). Mannitol is contraindicated if hypotensive.²
- l. Do NOT use hypertonic saline if hypernatremic. May develop hyperchloremic acidosis.²

References:

1. [MU Emergency Department – Pediatric DKA – Nurse Initiated-Protocol](#), 2026.
2. [MU Emergency Department – Pediatric Diabetic DKA – Protocol](#), 2024.
3. [Diabetic ketoacidosis in children: Cerebral injury \(cerebral edema\)](#), UpToDate, 2025.