RWJBarnabas PICU Collaborative DKA Order Set

Initial orders

Admit to PICU under pediatric critical care attending
Potential diagnoses:
diabetic ketoacidosis (primary/admitting), altered mental status, metabolic acidosis pH < 7.3 or HCO3<12, diabetes mellitus with hyperosmolarity no coma, diabetes mellitus with hyperosmolarity with coma, dehydration, other disorders of fluids and electrolytes NEC.
Full Code
Vital Signs monitoring every hour; hourly neurochecks
Strict I/O's
Weigh patient on admission, then daily
Notify clinician immediately for any of the following:
Systolic Blood Pressure less than _____mmHg or greater than _____mmHg
Diastolic Blood Pressure less than _____mmHg or greater than _____mmHg
Urine output less than 0.5 ml/kg/hour over 4 hours or greater than 2 ml/kg/hour over 4 hours
Mental status changes
Blood sugar less than or equal to 100 mg/dL
Blood sugar dropping more than 100 mg/dL per hour
NPO except ice chips, water, diet soda when mental status allows
Maintain 2 IV's
Please stop and remove insulin pump

Initial labs (may have been completed prior to PICU admission)

- **Known diabetic:** CBC, BMP, Mg, Phos, HbgA1c, VBG, UA, POC ketones (if available), MRSA screen (if performed at your site), BHCG for pubertal females
- **New Onset-diabetic:** Labs for Known diabetic AND Anti-thyroid antibodies, C-peptide, TSH, Free T4, Anti-Gliadin Antibodies, IgA, Insulin level, Tissue Transglutaminase IgA, Anti GAD 65 Antibodies, Anti Insulin Antibodies, Anti IA2 antibodies, fasting lipid panel,

Continuing Labs

Urine dipstick Q 2 hours (or Urinalysis Q void) for glucose and ketones if POC (point of care) ketones not available
Glucose by POC q1 until off insulin drip
If POC glucose is greater than 600 mg/dL, obtain serum glucose in lab
BMP, Mg, Phos q4
VBG q2hrs x2 and if improving then q4 hours until pH >7.25
POC ketones by bedside meter q4 if available

Fluid Orders
Total IVF rate 1.5 x maintenance

Bag 1: 0.9%NaCl+ 20 mEq KCl/L + 15 mmol KPhos/L
Bag 2: D10W/0.45%NaCl + 20 mEq KCl/L + 15 mmol KPhos/L
Remove all potassium from the 2 bags until potassium is less than 5.5 mEq/L

Blood Sugar	**Bag 1**	**Bag 2**
>300	100%	0%
150-300	50%	50%
100-150	0%	100%
<100 hold insulin infusion for 30 minutes, notify attending, and recheck blood glucose. Restart insulin infusion and consider changing IVF bag 2 to D12.5 W/0.45%NaCl + 20 mEq KCL/L + 15 mmol KPhos/L	0%	100%

Aim for glucose drop of 50-100mg/dL per hour after starting insulin drip.
Aim to achieve glucose of 200-300mg/dL while on insulin drip.

Medications
Insulin Regular via continuous infusion at standard concentration to run at 0.05 units/kg/h - ensure tubing gets flushed with appropriate priming volume in order to minimize insulin adsorption to IV tubing. *(BMSCH: for a bag flush tubing with 50 ml of insulin, for a syringe flush microbore tubing with 2mL of insulin solution)*

Administer insulin glargine (Lantus) 0.3 Units/kg subcutaneously, on arrival to PICU, if patient is 5 years of age or older, in conjunction with discussion with pediatric endocrinologist on call.

Pneumococcal vaccine if indicated prior to D/C *(should have completed 13 valent series, will need 23 valent dose if has not received it)*
Flu vaccine in season prior to D/C

Consults
Endocrine consult
Nutrition consult
Social Work consult
Case management consult
Psych Consult if indicated

Transition to subcutaneous insulin

DKA has resolved when anion gap ≤16. [Anion Gap = Sodium – (Chloride + Bicarbonate)]

Obtain from Pediatric Endocrinologist on call (*See Appendix for examples of transition calculations*)

- Correction Factor (CF)
- Carbohydrate to Insulin Ratio (CIR)
- Target Blood Sugar (target)

NOTE: Currently RWJBH's formulary short-acting insulin is Eli Lilly's Humalog. The following insulins can be used interchangeably without any dosage adjustments – Humalog, Lispro, Novolog, Aspart.

Immediately before transition:

- Ensure patient's food tray is in the room, check pre-meal blood glucose
- Calculate number of units of short-acting insulin to be given based on CF calculation and pre-meal blood glucose. Do not give insulin yet.
- Correction short-acting insulin = (blood sugar – target) divided by correction factor; do not round until this value is added to the meal insulin

Transition:

- Patient eats meal. Count grams of carbohydrates consumed.
- Calculate number of units of insulin to be given as follows:
    - Meal short-acting insulin = carbohydrates consumed / CIR
- Add CIR and CF calculations together unrounded and then round to the nearest half-unit. Give this dose of short-acting insulin by subcutaneous injection immediately after the patient completes meal.
- Turn off insulin IV drip when administering dose of short-acting insulin.
- Change IV fluid bag to 0.9%NaCl+20 mEq/L KCl @ 1x Maintenance rate.

After transition:

- Continue IV fluid bag @ 1x maintenance rate until POC ketone meter is <1 mmol/L or urine ketones are normal.
- Discuss with pediatric endocrinology for further insulin dosing guidelines, including administration of next dose of insulin glargine (Lantus) or resuming insulin pump.
- Anticipated subsequent lantus dosing to be administered 20 to 28 hours after the prior dose, with goal of gradually reaching chronic dose and administration time.
- Anticipate reconnecting insulin pump and resuming administration 20 hours after the prior insulin glargine (Lantus) dose. (Insulin pump settings may be further modified by Endocrinology for chronic management.)

Relevant Literature

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