INSULIN (REGULAR) CONTINUOUS INFUSION – ICU

PURPOSE: To outline the management of patients receiving continuous intravenous insulin.

SUPPORTIVE DATA:

Hyperglycemia frequently occurs in the critically ill. Patients are often hypermetabolic from tissue injury/ischemia and/or sepsis.

Other patient populations commonly treated for hyperglycemia are those with pancreatitis and diabetes mellitus including diabetic ketoacidosis (DKA) and hyperglycemia hyperosmolar non-ketotic (HHNK) syndrome [also known as hyperosmolar hyperglycemic state (HHS) or HONK)]. DKA & HHNK (HHS, HONK) require a special approach to management of blood sugar including goal glucose levels; refer to specific guidelines on the Provider order.

Some medications may alter serum glucose, e.g., steroids. The goal for glucose control for adults and pediatric patients while on continuous insulin infusion is usually between 140-180 mg/dL. Ranges for other conditions/age groups are as follows: Burn ICU 100-150 mg/dL, and NICU is 80-180 mg/dL.

ASSESSMENT:

1. Determine insulin concentration and verify dosage upon initiation, within one hour of assuming care for the patient or earlier as clinically appropriate, and with bag changes. In addition, verify accurate dosage with every rate change.
2. Monitor for signs/symptoms of hypoglycemia a minimum of every hour including:
   - Diaphoresis, pallor
   - Tachycardia, dysrhythmias
   - Deterioration in level of consciousness (LOC)
   - Seizures
3. Monitor blood glucose using point of care testing (POCT) initially every hour, then a minimum of every 2 hours (as ordered).
4. Resume monitoring blood glucose every hour as ordered until within target range for 3 consecutive hours if there is a:
   - Change in nutritional support (e.g. TPN or tube feeding is held/discontinued, patient has new NPO order)
   - Significant change in clinical condition
   - Change in infusion rate
   - Glucose level is out of desired range
   - Initiation or discontinuous of vasopressor, dialysis or CRRT or steroids
5. Monitor potassium, magnesium, phosphate, bicarbonate, and blood glucose results as ordered.

ADMINISTRATION:

6. Verify MAR and pump settings with second RN prior to administering each new bag for correct:
   - Type of insulin
   - Dose
   - Concentration
   - Pump settings
   - Patient
7. Administer insulin, as ordered. Order to include:
   - Dose (Pediatrics/NICU in units/kg/hour)
   - Titration parameters (if applicable)
8. Verify with provider, insulin dosage to be administered when patient tube feeding or TPN is unable to be administered/is on hold.
9. Administer electrolyte replacement, as ordered.

10. Titrate to ordered parameters.

HYPOGLYCEMIA

11. Perform the following if blood glucose less than 70 mg/dL (or as ordered for NICU)
    - Discontinue infusion
    - Notify provider
    - Administer Dextrose or glucagon as ordered
    - Obtain follow-up POCT blood glucose as ordered

SAFETY

12. Ensure two RNs verify and document that MAR, medication and dose match prior to starting medication.
13. Administer insulin via infusion pump with Guardrails™.
14. Avoid administering other medications into the same line with the continuous insulin infusion (especially avoid bolus/IV push).
15. Infuse primary fluid (to which insulin is attached) at a constant rate.

REPORTABLE CONDITIONS:

16. Notify provider immediately and document (Perform Insulin Pause):
    - If patient's insulin drip is ordered without orders to discontinue oral diabetic agents or other insulin
    - For:
        - Deterioration in LOC
        - Diaphoresis, pallor
        - Tachycardia, dysrhythmias
        - Seizures
        - Glucose below or above specified therapeutic range
        - Abnormal associated lab values
        - Withholding or decrease in nutritional support
        - Nausea/ vomiting

PATIENT/FAMILY TEACHING:

17. Instruct on indication for treatment.
18. Instruct to report:
    - Discomfort/pain at IV site
    - Any signs/symptoms of hypoglycemia

ADDITIONAL STANDARDS:

19. Refer to the following as indicated:
    - Electrolyte (Intravenous) Replacement
    - Enteral Feedings and Medication Administration
    - Total Parenteral Nutrition

DOCUMENTATION:

20. Document in accordance with documentation standards.
21. Both RNs document on MAR.

Initial date approved:	Reviewed and approved by:	Revision Date:
11/94	Critical Care Committee Professional Practice Committee Pharmacy & Therapeutics Committee Nurse Executive Council Attending Staff Association Executive Committee	05/96, 11/00, 11/03, 03/05, 12/05, 11/06, 9/11, 05/16, 06/19

REFERENCES:

Consult: LAC+USC Pharmacy

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Stapleton, R. D., & Heyland, D. K. (2017). *Glycemic control and intensive insulin therapy in critical illness.* Retrieved from uptodate.com