REGIONAL ADULT PARENTERAL DRUG MONOGRAPH

GENERIC NAME
insulin – regular

HIGH ALERT DOUBLE CHECK

Effective Date: Dec 2011 **Revised Date:** June 2024	CLASSIFICATION **Hypoglycemic Antidiabetic**	OTHER NAMES **Humulin R** **Novolin Toronto**	PAGE 1 of 3

ADMINISTRATION POLICY:
IV Infusion – May be administered by a nurse
IV Bolus – May be administered by a nurse
IM Injection – May be administered by a nurse
Subcutaneous – May be administered by a nurse

RECONSTITUTION/DILUTION/ADMINISTRATION:
Available as: 100 units/mL, 10 mL vial, 3 mL cartridge

IV bolus: Dilute dose in 5 mL of normal saline in a 10 mL syringe for ease of administration over 2 to 3 min
IM/ Subcut: Administer undiluted

IV Infusion: Pump Library: *Note: Use tubing no access ports*

Drug Library	**Dose Rate**	**Short Name**	**Care Unit**
Yes	units/h	insulin	General & Critical Care
Drug	**Diluent**	**Final Volume (VTBI)**	**Final Concentration**
100 units	Premixed bag	100 mL	1 unit/mL
Clinical Advisory: High Alert			
Soft Low Dose Limit: 0.5 units/h	Soft High Dose Limit: 10 units/h		

***If NURSE PREPARED take 1 mL of 100 units/ml Insulin regular add to 100 mL Normal Saline bag. Final concentration: 1 unit/mL (rounded)*

DOSAGE:

Hyperglycemia:
IV bolus: 2 to 10 units
IV continuous: 1 to 10 units/hour – highly individualized based on blood glucose
Subcutaneous: Doses are highly variable based on blood glucose levels

Severe Hyperkalemia:
IV bolus: 5 to 10 units insulin (regular) IV administered with 25 to 50 g (50 to 100 mL) of dextrose 50% solution IV over 5 minutes
IV infusion (preferred): 10 units insulin (regular) in 500 mL 10 % dextrose and administer IV at 50 to 100 mL/hour

Beta Blocker or Calcium Channel Blocker Overdose: SEE HIGH DOSE INSULIN under Additional Notes
0.5 to 1 Unit/kg IV bolus, followed by a 0.5 to 1 Unit/kg/hour continuous infusion, rate may be increased by 1 Unit/kg/hour every 20 to 30 minutes up to 10 Units/kg/hour

Maximum dose: Maximum doses should be titrated to patient response
Maximum rate: IV bolus: over 2 minutes
Maximum concentration: 100 units/mL

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STABILITY/COMPATIBILITY:

Stability of solution: 100 units/mL (10 mL vial): stable 30 days at room temperature after initial use

Stability of Final Admixture: Stable 24 hours at room temperature (no preservative)

Compatibility: Compatible with normal saline, D5W, combination dextrose-saline solutions

PRECAUTIONS, POTENTIAL ADVERSE REACTIONS:

- Hypoglycemia (blurred vision, sweating, tremor, hunger, sweaty palms, palpitations, cold feeling, delirium, somnolence, sudden unexplained loss of consciousness).
- Hypokalemia

ADDITIONAL NOTES AND NURSING CONSIDERATIONS:

- When insulin is given intravenously, blood glucose levels must be closely monitored and doses titrated accordingly
- Insulin should not be filtered - unless insulin is administered mixed with TPN it may be infused through a filter
- In the absence of adequate oral intake, tube feeds or TPN, dextrose IV is recommended
- If tube feeds or TPN are discontinued, insulin requirements will markedly decrease
- When used in hyperkalemia, after insulin, a dextrose solution may be considered in non-diabetic patients to prevent hypoglycemia
- Physician orders for continuous insulin infusion <u>should specify</u>:
  - Initial rate of insulin infusion in units/hour
  - Frequency of blood glucose monitoring. The minimum frequency is every 4 hours. Less frequent monitoring requires approval by the physician.
  - Changes to the rate of insulin infusion are based on range(s) of blood glucose levels.
    - Rate changes may be ordered in:
      - Absolute values (i.e. if glucose 8-10 mmol/L, insulin infusion at 2 units/hour)
      - Relative values (i.e. if glucose 8-10 mmol/L, increase insulin infusion by 1 unit/hour)
    - **Range of values is not acceptable** (i.e. if glucose 8-10 mmol/L, increase insulin infusion by 1 to 2 units/hour)
  - The glucose level (i.e. less than 3.5 mmol/L) or range of levels of (i.e. 0 to 3.5 mmol/L) at which the insulin infusion is to be stopped (if not specified as above)
  - The glucose level (i.e. less than 3.5 mmol/L) or range of levels (i.e. 0 to 3.5 mmol/L) at which the immediate administration of D50W is required
    - The order must specify the volume of D50W to be administered (i.e. if glucose level less than 2.8 mmol/L, give D50W 50 mL IV push)
    - If D50W is administered, contact physician to re-assess insulin orders and dextrose administration
  - Notify physician immediately of any glucose level outside the specified range(s). If no range(s) ordered, notify physician immediately of each result.

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- HIGH DOSE INSULIN - Hypoglycemia is a possible complication of this treatment since the dose of insulin is much higher (approximately 10-fold) than that typically given for diabetic ketoacidosis. Relative hypoglycemia must be corrected PRIOR to initiating high-dose insulin therapy. For patients with a serum glucose concentration below 8.25 mmol/L, we administer 50 mL of 50 percent dextrose (D50W) intravenously (IV). In young children the initial dose of dextrose is 0.25 g/kg body weight, usually given as 2.5 mL/kg of 10 percent dextrose solution When necessary, euglycemia can be maintained by means of a continuous IV infusion of 5 to 10 percent dextrose. A hemodynamic response to high-dose insulin therapy is delayed for 30 to 60 minutes, therefore simultaneous implementation of other therapies to support the patient's pulse and blood pressure are generally required. Repletion of potassium and magnesium may be needed.

ANTIDOTE: D50W