

INSULIN REGULAR

(Humulin R, Novolin ge Toronto)

HIGH ALERT MEDICATION
AUTOMATIC SUBSTITUTION

IV DIRECT PUSH - Nurses: All Depts.
CONTINUOUS IV - Nurses: Critical Care, ED.

For Neonates, Infants and Older Children, refer to the Lexicomp Hospital for Sick Children eFormulary:

- [Insulin Regular](#)

DRUG TYPE: Antidiabetic

INDICATIONS:

- Treatment of emergency situations such as diabetic ketoacidosis.
- Treatment of hyperkalemia with dextrose (IV Direct Push).
- Treatment of calcium channel blocker or beta-blocker overdose/toxicity.
- Note: additional indications for use may be appropriate; this is not a complete list.

AVAILABILITY:

- Humulin R 100 units/mL, 3 mL vial: used for all IV doses.
- Humulin R Kwikpen 100 units/mL: used for all Subcutaneous doses.

PREPARATION:

Dilution:

- **IV Direct Push:** Given undiluted.
- **Continuous IV:**
 - **1 unit/mL solution:** Dilute 100 units in 100 mL of 0.9% Sodium Chloride. Invert bag three times to ensure insulin is well mixed in the infusion solution.
 - **16 unit/mL solution** (may be used for calcium channel or beta-blocker overdose): Dilute 800 units in 50 mL of 0.9% Sodium Chloride. Invert bag three times to ensure insulin is well mixed in the infusion solution.

Stability:

- Do not use if solution is not clear and colourless.
- Once opened, vials or cartridges may be kept at room temperature for up to 28 days and are patient-specific.
- **Administration of the product must begin within 1 hour after the start of preparation; otherwise it must be discarded.**
- **Continuous infusions prepared on patient care unit must be discarded after 24 hours.**

ADMINISTRATION: (See Lexicomp for additional [Compatibility](#) information)

- **IV Direct Push:** Administer over 1 minute.
- **Continuous IV:**
 - Administer by Infusion Pump.
 - Insulin is known to bind to IV tubing. Priming IV tubing with insulin regular prior to initiation of the infusion will improve accuracy of the insulin dose received by the patient during the first hour of therapy, or after a tubing change.
 - Prior to connecting IV line to the patient, fill the IV line with the prescribed insulin infusion and let it stand 15 minutes.
 - After 15 minutes, open the IV and rapidly flush 20 mL of the insulin infusion through the line to prime it.

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- If there is no time to let insulin stand in the line, flush line with 20 mL of the insulin infusion over a 1 minute period immediately prior to connecting the tubing to the patient.
- Subcutaneous (using Kwikpen): Administer in the upper arms, thighs, buttocks or abdomen. Rotate injection site.

USUAL DOSAGE:

- Dosage based on lab and bedside glucose values.
- Diabetic ketoacidosis: Refer to Adult Diabetic Ketoacidosis Order Sets.
- Hyperkalemia: 5-10 units IV direct push **followed immediately** by 25-50 g of dextrose (50-100 mL 50% solution) IV administered over 5 minutes.
- Calcium channel blocker or beta-blocker overdose/toxicity (off-label): 1 unit/kg IV x 1 dose, followed by a continuous infusion of 0.5 – 1 unit/kg/hr titrated to clinical response. Once hemodynamic parameters have stabilized, gradually decrease insulin infusion.

ADVERSE EFFECTS:


- **Hypersensitivity:** rare; urticaria, rash, anaphylaxis.
- Hypoglycemia (**Antidote:** oral carbohydrates or 25-50% dextrose IV or glucagon IV/IM/SC). Follow blood glucose carefully.
 - Signs and symptoms include:
 - Sweating
 - Trembling
 - Palpitations
 - Anxiety
 - Hunger
 - Nausea
 - Headache
 - Tingling
 - Disturbed sleep
 - Weird dreams
 - Weakness
 - Dizziness
 - Difficulty concentrating
 - Vision changes
 - Drowsiness
 - Difficulty speaking
 - Seizures
 - Loss of consciousness
- Hypokalemia as insulin shifts potassium into the cells.
- **Local reactions:** itching, pain, swelling, redness.

MONITORING:

- Prevention of severe hypoglycemia requires frequent blood glucose testing and insulin dosage adjustment. Refer to prescriber orders.
- Monitoring for signs and symptoms of hypoglycemia (see above) is also important for early detection.

REFERENCES:

1. Insulin Regular. Lexi-drugs Online. Lexicomp. Wolters Kluwer Health, Inc. Hudson, OH. Available at: <http://online.lexi.com>. Accessed September 16, 2022.
2. Insulin Regular. The Ottawa Hospital Parenteral Drug Therapy Manual Forty-First Edition. Ottawa, ON. 2020.
3. Insulin, Regular (Human) IV Drug Monograph. Sunnybrook Health Sciences Centre. Toronto, ON. Revised October 2019.

 <p>Lakeridge Health</p>	Insulin Regular (Humulin R, Novolin ge Toronto) IV Monograph	
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	<input checked="" type="checkbox"/> Harmonized Cross Reference to: Administration of Intravenous Medication Policy and Procedures Independent Double-Checking of Medications – Policy and Procedures Infusion Pump – Policy and Procedures Document Applies to: Lakeridge Health (LH) Interprofessional Team	
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