

# Glucagon.

*The hormone that wakes the liver. First-line rescue when hypoglycemia meets an unconscious patient and no IV is in sight.*

GENERIC • GLUCAGON

BRAND • GLUCAGEN • BAQSIMI • GVOKE

CLASS • ANTIHYPOGLYCEMIC HORMONE

SYSTEM • ENDOCRINE / PANCREATIC

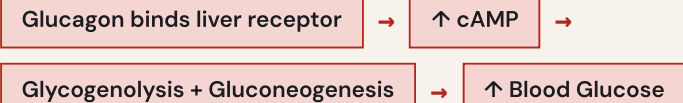
## 01 Drug Overview

WHY WE GIVE IT

- ▶ **Severe hypoglycemia** — unconscious patient, seizing, or unable to swallow safely
- ▶ **No IV access** — when D50 IV push is unavailable (1st line if IV is in)
- ▶ **Beta-blocker overdose** — reverses bradycardia + hypotension (bypasses  $\beta$ -receptors)
- ▶ **Calcium channel blocker overdose** —  $\uparrow$  contractility + HR
- ▶ **Diagnostic aid** — relaxes GI smooth muscle for endoscopy, radiographic studies, esophageal food bolus

## 02 Mechanism

HOW IT WORKS



- ▶ **Made by  $\alpha$ -cells** of pancreas — *insulin's opposite*
- ▶ **No glycogen = no glucose** — won't work in alcoholics, starvation, liver failure
- ▶ **Cardiac effect:**  $\uparrow$  contractility + HR independent of  $\beta$ -receptors  $\rightarrow$  rescue for BB overdose

### 03 Therapeutic Effects

- ▶ **↑ BG within 5–20 min** (IM/SubQ)
- ▶ **Return of consciousness** + improved LOC
- ▶ **BG rises ~30–40 mg/dL** in 10–15 min
- ▶ **For BB/CCB overdose:** ↑ HR, ↑ BP, ↑ contractility
- ▶ **Short duration: 60–90 min** — MUST follow with PO carbs once awake

### 04 Side Effects & Adverse Reactions

COMMON • SERIOUS 🚨

#### COMMON

- ▶ **Nausea / vomiting** — VERY common; aspiration risk
- ▶ **Headache**
- ▶ **Rebound hyperglycemia**
- ▶ **Dizziness**
- ▶ **Injection-site reactions**

#### SERIOUS 🚨

- ▶ **Aspiration** — vomiting + altered LOC
- ▶ **Rebound hypoglycemia** — short duration
- ▶ **Anaphylaxis** / hypersensitivity
- ▶ **Hypokalemia** — monitor K<sup>+</sup>
- ▶ **HTN crisis** in pheochromocytoma

### 05 Priority Nursing Considerations

ASSESS • MONITOR • HOLD • NOTIFY

#### MONITOR

- ▶ **Blood glucose q15 min** post-administration
- ▶ **LOC & mental status**
- ▶ **Airway** — vomiting risk
- ▶ **Vital signs** — HR, BP, RR
- ▶ **Serum K<sup>+</sup>** — hypokalemia risk

#### HOLD / CONTRAINDICATED

- ▶ **Pheochromocytoma** — HTN crisis (absolute)
- ▶ **Insulinoma** — rebound hypo
- ▶ **Hypersensitivity** to glucagon/protein
- ▶ **Glycogen depletion** — chronic alcoholism, starvation, adrenal insufficiency, liver failure (won't work!)

#### DRUG INTERACTIONS

- ▶ **Warfarin** — ↑ anticoagulant effect → monitor INR
- ▶ **Beta-blockers** — prolonged glucagon effect
- ▶ **Indomethacin** — blunts glucagon response
- ▶ **Anticholinergics** — additive GI effects

## 06 Labs & Critical Values

- ▶ **BG <70 mg/dL** = hypoglycemia
- ▶ **BG <54 mg/dL** = clinically significant
- ▶ **BG <40 mg/dL** = severe / emergency
- ▶ **Goal:** BG >70 mg/dL + awake
- ▶ **K<sup>+</sup> <3.5 mEq/L** = hypokalemia (possible post-dose)
- ▶ **INR** if patient on warfarin (may rise)

## 07 Administration & Safety

HIGH-ALERT

### ROUTES & DOSE

- ▶ **IM** 1 mg adult · 0.5 mg peds (<25 kg or <6 yr)
- ▶ **SubQ** — same dosing
- ▶ **IV** — hospital; onset ~1 min
- ▶ **Intranasal (Baqsimi)** 3 mg — no inhalation needed
- ▶ **Auto-injector (Gvoke)** — ready-to-use

### KEY SAFETY RULES

- ▶ **Position on SIDE** before/after — aspiration risk
- ▶ **Reconstitute:** gently swirl, do NOT shake; use immediately; clear solution only
- ▶ **Follow with PO carbs** + protein once awake (prevents rebound hypo)
- ▶ **Call 911 / Rapid Response** in community setting
- ▶ **Have suction ready**

## 08 Patient & Family Teaching

- ▶ **Family MUST be trained** — patient is unconscious & can't self-administer
- ▶ **Recognize hypoglycemia:** cold, clammy, confused, diaphoretic, tachycardic, shaky
- ▶ **Turn person on their side** before giving dose
- ▶ **After the dose:** call 911 → once awake, give fast carb (juice/glucose tab) → then complex carb + protein (crackers + PB)
- ▶ **Recheck BG in 15 min;** repeat if still <70
- ▶ **Nasal Baqsimi:** works without inhalation — just spray
- ▶ **Store kit at room temp** · check expiration quarterly
- ▶ **Won't work** if chronic alcoholism or prolonged fasting

## 09 NCLEX Test Traps ⚠

PRIORITY LOGIC

- ▶ **Awake + able to swallow?** → 15g PO carb (juice, glucose tabs), NOT glucagon
- ▶ **Has IV access + unconscious?** → D50 IV push (1st line, faster)
- ▶ **No IV + unconscious?** → Glucagon IM/SubQ/IN
- ▶ **15-15 Rule** (PO route): 15g carbs → recheck in 15 min
- ▶ **Must position on SIDE** — trap: students leave patient supine → aspiration
- ▶ **Must follow with complex carbs + protein** — trap: glucagon alone = rebound hypo
- ▶ **Glucagon ≠ glucose** — it's a hormone that releases stored glucose
- ▶ **Won't work** without glycogen stores (alcohol use disorder, starvation)
- ▶ **BB / CCB overdose?** → Glucagon IS the answer (high-yield!)

## 10 Memory Boosters

MNEMONICS · PATTERNS · RECALL

### G-L-U-C-A-G-O-N

- G** Glycogenolysis (breaks down glycogen)
- L** Liver must have glycogen stores
- U** Unconscious / Unable to swallow
- C** Contraindicated in pheochromocytoma
- A** Aspiration risk → side-lying position
- G** Give complex carbs after (short duration)
- O** Overdose reversal: Beta-blocker / CCB
- N** Nausea & vomiting are expected

#### INSULIN VS GLUCAGON

- ▶ **Insulin** from  $\beta$ -cells → ↓ BG
- ▶ **Glucagon** from  $\alpha$ -cells → ↑ BG
- ▶ They are hormonal **opposites**
- ▶ Insulin drives glucose *into* cells; glucagon pulls it *out* of liver

#### DECISION TREE

- ▶ **Awake + swallows?** → PO carbs
- ▶ **Unconscious + IV?** → D50 IV
- ▶ **Unconscious + no IV?** → Glucagon
- ▶ **BB/CCB tox + bradycardia?** → Glucagon
- ▶ **Alcoholic / starved?** → Dextrose, NOT glucagon

## + Most-Tested Formulations

KNOW THE DIFFERENCES

| FORMULATION                     | ROUTE · DOSE                  | ONSET                  | NCLEX KEY POINT                                   |
|---------------------------------|-------------------------------|------------------------|---------------------------------------------------|
| <b>Glucagon (GlucaGen)</b>      | IM / SubQ / IV · 1 mg adult   | 5–20 min IM · 1 min IV | Must reconstitute; gently swirl, don't shake      |
| <b>Baqsimi (nasal)</b>          | Intranasal · 3 mg single dose | ~15 min                | No inhalation required; works if congested        |
| <b>Gvoke (HypoPen)</b>          | SubQ auto-injector · 1 mg     | ~10–15 min             | Pre-mixed; no reconstitution; easy for caregivers |
| <b>Zegalogue (dasiglucagon)</b> | SubQ · 0.6 mg auto-injector   | ~10 min                | Glucagon analog; stable in aqueous solution       |

CLINICAL JUDGMENT

## Snapshot • NCJMM Priority Logic

### PRIORITY RISK # 1

*What is the #1 priority risk with this drug?*

**Aspiration.** Vomiting is very common after glucagon, and the patient has an altered LOC. Airway compromise will kill faster than the hypoglycemia you just treated.

### WHAT HARMS FIRST

*What will harm the patient FIRST?*

**Aspiration pneumonitis / airway obstruction.** Secondary concerns: rebound hypoglycemia once glucagon wears off (short duration, 60–90 min) if complex carbs + protein are not given.

### FIRST NURSING ACTION

*What is the FIRST nursing action in a scenario?*

**Position patient on their SIDE** (left lateral / recovery position), ensure airway patency, *then* administer glucagon. After the dose: recheck BG q15 min, and give PO complex carbs + protein the moment they can safely swallow.