

NCLEX-RN • 2026 TEST PLAN • PHARMACOLOGY

Antidiuretic Hormone (ADH)

Vasopressin (Pitressin, Vasostrict) • Desmopressin (DDAVP, Stimate)

CLASS: POSTERIOR PITUITARY HORMONE

SYSTEM: ENDOCRINE / RENAL

HIGH-ALERT MEDICATION

DI (Diabetes Insipidus)

NOT enough ADH → massive dilute urine, dehydration, ↑ serum Na⁺

TREAT WITH ADH ✓

SIADH (Syndrome of Inappropriate ADH)

TOO MUCH ADH → water retention, dilutional ↓ Na⁺, concentrated urine

ADH CONTRAINDICATED ✗

SECTION 01 Drug Overview

PRIMARY INDICATIONS

- ▶ **Central (neurogenic) Diabetes Insipidus** — #1 NCLEX use
- ▶ **Nocturnal enuresis** in children (DDAVP intranasal/PO)
- ▶ **Von Willebrand disease & mild Hemophilia A** (DDAVP ↑ Factor VIII & vWF)
- ▶ **Vasodilatory / septic shock** (vasopressin IV drip — V1 vasoconstriction)
- ▶ **GI / esophageal variceal bleeding** (vasopressin — splanchnic vasoconstriction)
- ▶ Post-op polyuria after pituitary surgery

NOT for: Nephrogenic DI (kidneys can't respond) • SIADH • Psychogenic polydipsia

SECTION 02 Mechanism of Action

V2 RECEPTORS — KIDNEY (WATER RETENTION)

ADH → V2 receptor → ↑ cAMP
→ inserts aquaporin-2 channels
→ collecting duct reabsorbs H₂O
= **concentrated urine, ↓ urine output, ↑ BP**

V1 RECEPTORS — VESSELS (VASOPRESSIN ONLY)

Vasopressin → V1 receptor on smooth muscle
→ **vasoconstriction**
= **↑ SVR, ↑ BP (shock, variceal bleed)**

DDAVP = V2 selective (safer for DI)

Vasopressin = V1 + V2 (cardiac risk)

SECTION 03

Therapeutic Effects

"IT'S WORKING" SIGNS

- ▶ ↓ Urine output (goal <200 mL/hr in DI)
- ▶ ↑ Urine specific gravity (toward 1.010–1.030)
- ▶ ↑ Urine osmolality
- ▶ ↓ Serum Na⁺ back into normal range (135–145)
- ▶ ↓ Serum osmolality
- ▶ Resolution of polyuria, polydipsia, nocturia
- ▶ Stable BP & daily weight
- ▶ (*Vasopressin shock drip*): ↑ MAP ≥ 65 mmHg
- ▶ (*DDAVP for bleeding*): ↑ Factor VIII, shortened bleed time

SECTION 04

Side Effects & Adverse Reactions

COMMON

- ▶ Headache
- ▶ Nausea, abdominal cramping
- ▶ Facial flushing
- ▶ Nasal irritation (intranasal)
- ▶ Mild hyponatremia
- ▶ Drowsiness

SERIOUS 🚨

- ▶ **Water intoxication** → seizures, coma
- ▶ **Severe hyponatremia** (Na < 120)
- ▶ Cerebral edema
- ▶ Pulmonary edema / HF exacerbation
- ▶ MI, angina, chest pain (*V1 coronary constriction*)
- ▶ HTN crisis
- ▶ Bronchoconstriction
- ▶ Tissue necrosis (IV extravasation)

🚨 **TOXICITY TRIAD (Water Intoxication):** Headache + confusion/drowsiness + weight gain + ↓ serum Na⁺ → **HOLD drug, notify provider, restrict fluids, seizure precautions.**

SECTION 05

Priority Nursing Considerations

→ ASSESS / MONITOR

- ▶ Strict **I&O every hour** (critical in DI)
- ▶ **Daily weight** — same time, same scale, same clothes
- ▶ Vital signs — esp. BP & HR (vasopressin)
- ▶ Serum Na⁺, osmolality, BUN, creatinine
- ▶ Urine specific gravity & osmolality
- ▶ Neuro status — LOC, headache, confusion (water intoxic)
- ▶ Lung sounds — crackles = fluid overload
- ▶ Cardiac — chest pain, ECG (vasopressin)

→ HOLD & NOTIFY IF...

- ▶ Serum Na⁺ < 135 mEq/L
- ▶ Weight gain > 2 lb/day or > 5 lb/week
- ▶ Headache, confusion, drowsiness, seizures
- ▶ Chest pain, dysrhythmias, HTN
- ▶ Crackles, dyspnea, JVD, peripheral edema

CONTRAINDICATIONS

- ▶ **SIADH** & hyponatremia
- ▶ Severe renal impairment (CrCl < 50 for DDAVP)
- ▶ Known CAD / unstable angina (vasopressin)
- ▶ Hypersensitivity
- ▶ Caution: HF, HTN, elderly, young children

DRUG INTERACTIONS

- ▶ **↑ ADH effect** Carbamazepine, chlorpropamide, SSRIs, TCAs, NSAIDs → ↑ hyponatremia risk
- ▶ **↓ ADH effect** Lithium, demeclocycline, alcohol, phenytoin
- ▶ Combined with other vasopressors → severe HTN

SECTION 06

Labs & Diagnostics

LAB	NORMAL RANGE	IN UNTREATED DI	CRITICAL / ABNORMAL
Serum Na⁺	135–145 mEq/L	↑ (hypernatremia)	< 120 → seizures, coma
Serum osmolality	275–295 mOsm/kg	↑ (concentrated)	< 270 = water intoxication
Urine osmolality	300–900 mOsm/kg	↓ < 200 (dilute)	Drug working → should rise
Urine specific gravity	1.005–1.030	↓ < 1.005	Drug working → should rise toward 1.010+
Urine output	0.5–1 mL/kg/hr	> 3 L/day (up to 20 L!)	Goal: normalize to < 200 mL/hr
Daily weight	Stable	↓ (dehydration)	↑ > 2 lb/day = fluid overload

Diagnostic test: *Water deprivation test* — in DI, urine stays dilute despite fluid restriction; responds to exogenous ADH = **central DI** (no response = nephrogenic DI).

SECTION 07

Administration & Safety

ROUTES

- ▶ **IV** Vasopressin — shock, variceal bleed (central line preferred)
- ▶ **SubQ / IM** Vasopressin, DDAVP
- ▶ **Intranasal** DDAVP — alternate nostrils, blow nose first
- ▶ **PO** DDAVP tablets

HIGH-ALERT PRECAUTIONS

- ▶ **IV vasopressin = HIGH-ALERT** — 2-RN independent double-check
- ▶ Monitor IV site q1h — **extravasation = tissue necrosis**
- ▶ Titrate to urine output & MAP — never bolus routinely
- ▶ Refrigerate most formulations; check expiration of intranasal
- ▶ Correct hyponatremia **slowly** (≤ 0.5 mEq/L/hr) to avoid osmotic demyelination

SECTION 08

Patient Education

- ▶ **Daily weight** — same time, scale, clothing; report $\uparrow > 2$ lb/day
- ▶ **Limit free water** intake to prescribed amount (avoid water intoxic)
- ▶ Wear **medical alert bracelet** ("Diabetes Insipidus / Vasopressin")
- ▶ Never skip or double dose
- ▶ Proper intranasal technique: upright, alternate nostrils
- ▶ Avoid alcohol ($\downarrow$ effect) & NSAIDs without approval ($\uparrow$ effect)
- ▶ Report immediately: **headache, confusion, drowsiness, seizures, chest pain, SOB, facial swelling**
- ▶ Carry extra doses when traveling; refrigerate as directed
- ▶ DDAVP for enuresis: give at bedtime, limit evening fluids

SECTION 09

NCLEX Test Traps ⚠️

- ▶ **TRAP:** "Give ADH for SIADH" ❌ — SIADH is *too much* ADH; treat with fluid restriction, tolvaptan, hypertonic saline
- ▶ **TRAP:** "ADH works for nephrogenic DI" ❌ — kidneys can't respond; treat with thiazides, low-Na diet
- ▶ **TRAP:** Urine specific gravity — *low* after ADH = NOT working; *high* = working (opposite of what feels right)
- ▶ **TRAP:** First sign of water intoxication = **headache & weight gain**, NOT seizures (seizures are late)
- ▶ **TRAP:** Confusing vasopressin (V1+V2, cardiac risk) with DDAVP (V2 only)
- ▶ **TRAP:** Correcting Na⁺ too fast → **osmotic demyelination syndrome**
- ▶ **TRAP:** DDAVP for enuresis — limit fluids in evening, NOT all day
- ▶ **Priority trap:** Ask "what's the earliest sign?" — usually **weight gain + headache**, not vitals

SECTION 10

Memory Boosters

"ADH = ADD Hydration"

ADH makes you *add* water back to your body.

DI = "Dry Inside"

Polyuria · polydipsia · HIGH Na⁺ · LOW urine SG → needs ADH

SIADH = "Soaked Inside, All Drenched Here"

Oliguria · LOW Na⁺ · HIGH urine SG → restrict fluids

V1 = Vessels · V2 = Voiding less

V1 constricts vessels (↑ BP). V2 makes you void less (water back).

DDAVP = "Don't Drink A Very lot, Please"

Fluid restriction is the main teaching point.

Water intoxic signs: "HEADS Down"

Headache · Edema · Altered mental status · Drowsy · Seizures · ↓ Na⁺

AUTO-INCLUDE • DRUG CLASS SECTION

Most Tested Drugs in This Class

Know the differences — NCLEX loves to swap them.

DRUG	RECEPTORS	PRIMARY USE	ROUTE	KEY NCLEX POINT
Vasopressin (<i>Pitressin, Vasostrict</i>)	V1 + V2	Septic/vasodilatory shock · variceal bleed · central DI	IV drip (central line), SubQ, IM	Cardiac risk → monitor for chest pain, MI, HTN. High-alert. Extravasation = necrosis.
Desmopressin (DDAVP) (<i>Stimate, Noctiva</i>)	V2 only	Central DI · nocturnal enuresis · von Willebrand · mild Hemophilia A	Intranasal, PO, SubQ, IV	Safer cardiac profile. #1 risk = hyponatremia / water intoxication. Fluid restriction teaching.
Tolvaptan (<i>Samsca</i>) — antagonist	V2 blocker	SIADH · euvolemic hyponatremia · ADPKD	PO	<i>Opposite</i> of ADH — causes water loss. Hepatotoxicity BBW. Hospital-start only (rapid Na ⁺ rise risk).
Conivaptan (<i>Vaprisol</i>) — antagonist	V1a + V2 blocker	Hospitalized SIADH / euvolemic & hypervolemic hyponatremia	IV only	Short-term use; central line preferred; monitor Na ⁺ rise rate closely.

🧠 NCJMM • CLINICAL JUDGMENT SNAPSHOT



The 60-Second Save

① #1 PRIORITY RISK

Water intoxication → severe hyponatremia → cerebral edema & seizures. The drug works *too well*.

② WHAT HARMS THE PATIENT FIRST

Dilutional hyponatremia — shows up as *headache + weight gain + confusion* before seizures or coma. Catch it at the headache.

③ FIRST NURSING ACTION

ASSESS neuro status & LOC → HOLD the drug → draw STAT serum Na^+ → restrict fluids → notify provider → seizure precautions.

REMEMBER:

In DI, the patient is dying of thirst — ADH is the rescue.

In SIADH, the patient is drowning from the inside — ADH is the enemy.

Always match the drug to the disorder, and always protect the sodium.