

Diabetes Insipidus *vs.* SIADH

Two disorders. One hormone. **Opposite problems.** ADH (antidiuretic hormone, a.k.a. *vasopressin*) tells the kidneys to hold water. In **DI**, there's not enough ADH — the body pees it all out. In **SIADH**, there's too much — the body holds it all in.

DI • LOW ADH



Diabetes Insipidus

"Dry Inside" — kidneys can't reabsorb water

Pituitary/hypothalamic problem → **ADH deficiency** → kidneys dump massive volumes of **dilute urine** (3–20 L/day) → dehydration & **hypernatremia**.

SIADH • HIGH ADH



SIADH

"Soaked Inside" — kidneys retain too much water

Excess ADH secretion → kidneys reabsorb too much water → **water retention**, low-volume **concentrated urine**, weight gain, and dangerous **hyponatremia**.

01 Pathophysiology Flow

MECHANISM • STEP-BY-STEP

DI — Not enough ADH

TRIGGERS: HEAD INJURY • PITUITARY TUMOR/SURGERY • CNS INFECTION • LITHIUM TOXICITY

1 Posterior pituitary fails to release ADH

SIADH — Too much ADH

TRIGGERS: SMALL-CELL LUNG CA • HEAD INJURY • MENINGITIS • SSRIS • CHEMO (CYCLOPHOSPHAMIDE)

1 Excess ADH secreted (ectopic or CNS)

- 2 Renal tubules cannot reabsorb water
- 3 Massive **dilute urine** output (polyuria)
- 4 Blood becomes concentrated → **hypernatremia**
- 5 Thirst center triggered → **polydipsia**

RESULT: Hypovolemia + Hypernatremia

- 2 Renal tubules reabsorb excess water
- 3 Scant **concentrated urine** (oliguria)
- 4 Blood is diluted → **hyponatremia**
- 5 Water shifts into brain cells → cerebral edema

RESULT: Fluid Overload + Hyponatremia

02 Signs, Symptoms & Labs

 = PRIORITY RED FLAG

DI · Dehydration Pattern

DRY

CARDINAL SIGNS

- **Polyuria** — 3 to 20 L/day of dilute, pale urine
- **Polydipsia** — intense, unquenchable thirst (cold water cravings)
- Rapid **weight loss** + dry mucous membranes

DEHYDRATION CUES

- Tachycardia, hypotension, poor skin turgor
- Sunken eyes, fatigue, constipation

SIADH · Dilutional Pattern

SOAKED

CARDINAL SIGNS

- **Oliguria** — small amounts of dark, concentrated urine
- **Weight gain** without obvious edema (water shift is intracellular)
- Reduced thirst, anorexia, nausea & vomiting

NEURO CUES (FROM CEREBRAL EDEMA)

- Headache, irritability, muscle cramps, weakness
- Confusion, lethargy, personality changes

 **Seizures, coma** — when Na^+ falls below 120 mEq/L

Shock & seizures — from severe hypernatremia / hypovolemia

SERUM NA ⁺ ⬆️ >145	URINE SPEC GRAVITY ⬇️ <1.005
SERUM OSMOLALITY ⬆️ >295	URINE OSMOLALITY ⬇️ LOW

SERUM NA ⁺ ⬇️ <135	URINE SPEC GRAVITY ⬆️ >1.030
SERUM OSMOLALITY ⬇️ <275	URINE OSMOLALITY ⬆️ HIGH

03 Priority Nursing Interventions

ORDERED BY NCLEX PRIORITY

DI Interventions REPLACE VOLUME

- 1 **Assess airway, VS, and LOC** first — hypernatremia can cause seizures. ABC
- 2 **Strict I&O, daily weights** (same scale, same time). 1 kg = 1 L of fluid change.
- 3 **Administer Desmopressin (DDAVP)** intranasally, orally, or IV as ordered.
- 4 **Replace fluids** — encourage PO intake; IV hypotonic fluids (D5W, 0.45% NS) per order.
- 5 **Monitor serum Na⁺ & urine specific gravity** — watch for normalization (Na 135–145, SG 1.010–1.025).

SIADH Interventions RESTRICT FLUID

- 1 **Assess neuro status & airway** — cerebral edema can progress to seizure. ABC
- 2 **Fluid restriction** — typically **800–1000 mL/24 hr** (the #1 intervention).
- 3 **Seizure precautions** — pad rails, suction & O₂ at bedside, quiet room.
- 4 **Administer hypertonic 3% saline** *slowly* for severe symptomatic hyponatremia (Na <120).
- 5 **Monitor serum Na⁺ q4–6h**; correct **no faster than 8–12 mEq/L per 24 hr** to avoid osmotic demyelination.

6 **Seizure precautions** while sodium remains elevated.

7 **Safety** — fall risk from orthostatic hypotension; encourage slow position changes.

6 **Daily weights, strict I&O**, head of bed flat or $\leq 10^\circ$ (aids venous return, lowers ADH).

7 **Oral care + ice chips** for thirst comfort during restriction.

04 Side-by-Side Snapshot

MEMORIZE THIS TABLE

Parameter	DI	SIADH
ADH LEVEL	↓ Low / absent	↑ Excessive
URINE OUTPUT	↑ Polyuria (3–20 L)	↓ Oliguria
URINE APPEARANCE	Pale, dilute, "like water"	Dark, concentrated
URINE SPECIFIC GRAVITY	↓ <1.005	↑ >1.030
SERUM SODIUM	↑ HIGH (>145)	↓ LOW (<135)
SERUM OSMOLALITY	↑ Concentrated	↓ Diluted
BODY WEIGHT	↓ Loss	↑ Gain
FLUID STATUS	Hypovolemia / shock	Fluid overload / cerebral edema

Parameter	DI	SIADH
PRIORITY ACTION	REPLACE fluid + DDAVP	RESTRICT fluid + Na correction
SEIZURE TRIGGER	Hypernatremia	Hyponatremia

05 Pharmacology Essentials

DRUG • CLASS • NURSING PEARLS

Desmopressin (DDAVP)

SYNTHETIC ADH • VASOPRESSIN ANALOG

Treatment of choice for **central DI**. Given intranasal, PO, SQ, or IV.

- ACTION** Replaces missing ADH → kidneys reabsorb water → ↓ urine output.
- WATCH** **Water intoxication** — headache, drowsy, weight gain, hyponatremia, seizures.
- TEACH** Daily weights • alternate nares (intranasal) • wear medical ID • do not overdrink.

Vasopressin (Pitressin)

ADH REPLACEMENT • IV/IM

Used for acute DI or post-op pituitary surgery when rapid ADH effect is needed.

- ACTION** Direct ADH effect + mild vasoconstriction.
- WATCH** Angina/chest pain (coronary vasoconstriction), HTN, water intoxication.
- TEACH** Report chest pain immediately; monitor VS and I&O hourly acutely.

Tolvaptan / Conivaptan

VASOPRESSIN (V2) RECEPTOR ANTAGONIST

"**Vaptans**" block ADH at the kidney → excretion of free water (aquaresis) → raises serum sodium.

- ACTION** Promotes water loss without sodium loss.

3% Hypertonic Saline

CONCENTRATED NACL IV SOLUTION

For **severe symptomatic hyponatremia** — seizures, coma, Na <120 mEq/L.

- ACTION** Pulls water out of brain cells back into vasculature.

WATCH Overly rapid Na correction → **osmotic demyelination**; hepatotoxicity (tolvaptan).

TEACH Hospital-initiated only · monitor Na q4–6h · no fluid restriction while taking it.

WATCH **Central line preferred** · fluid overload, pulmonary edema, CPM if corrected too fast.

TEACH Given on IV pump with frequent neuro checks and serum Na monitoring.

06 NCLEX Test Traps

WHERE STUDENTS LOSE POINTS



"Diabetes" ≠ diabetes mellitus

DI has **nothing to do with blood sugar or insulin**. Glucose will be normal. "Insipidus" means *tasteless* — the urine is dilute, not sweet. Do not pick insulin or glucose answers for DI questions.



SIADH weight gain has NO edema

Students expect pitting edema in fluid overload — but in SIADH, water shifts **intracellularly**. Look for **weight gain + neuro changes**, not swelling in the legs.



Correct sodium SLOWLY in SIADH

Raising Na⁺ faster than **8–12 mEq/L in 24 hr** causes **osmotic demyelination syndrome (central pontine myelinolysis)** — permanent neuro damage. "Fast correction" is never the answer.



DDAVP overdose = SIADH-like picture

Too much DDAVP causes **water intoxication** — the labs flip and mimic SIADH. Teach patients to weigh daily and report headache, confusion, or weight gain.



Fluid restriction is the FIRST action in SIADH

Not the IV fluids, not the labs. For mild–moderate SIADH, **restrict fluid before administering medications**. For DI, it's the opposite — **replace fluids** is priority.

Head of bed positioning is OPPOSITE



DI/hypovolemia → elevate HOB cautiously; patient may be orthostatic. **SIADH → keep HOB flat or $\leq 10^\circ$** , which improves venous return to the heart and naturally suppresses ADH release.

07 Clinical Judgment (NCJMM)

RECOGNIZE • ANALYZE • PRIORITIZE • EVALUATE

Scenario: A 64-year-old with small-cell lung cancer is admitted with confusion, headache, and a 4-kg weight gain over 3 days. No peripheral edema. Labs: Na^+ 118 mEq/L · serum osmolality 260 mOsm/kg · urine specific gravity 1.034. Urine output 280 mL in 8 hours.

01 • RECOGNIZE CUES

Spot the pattern

Low Na^+ , low serum osm, concentrated urine, weight gain without edema, neuro changes, lung CA history — classic **SIADH**.

02 • ANALYZE CUES

Connect the dots

Ectopic ADH from small-cell lung CA → water retention → dilutional hyponatremia → cerebral edema causing headache/confusion.

03 • PRIORITIZE

Act fast, act safely

Seizure precautions first ($\text{Na} < 120$, neuro symptoms). Initiate fluid restriction, prepare 3% NaCl per order, monitor Na^+ q4h.

04 • EVALUATE

Measure the response

Na^+ rising by ≤ 8 –12 mEq/24 hr, improving LOC, weight trending down, urine output increasing — safe, effective correction.

08 Patient Education

TEACH-BACK ESSENTIALS

DI • Living with DDAVP

SIADH • Daily Management

- ✓ Take DDAVP exactly as prescribed — never skip or double a dose.
- ✓ Weigh yourself at the same time each day; report a gain of >2 lb in 24 hours.
- ✓ Alternate nostrils with nasal spray to prevent mucosal irritation.
- ✓ Wear a **medical alert bracelet** stating "Diabetes Insipidus."
- ✓ Drink to thirst — do not overconsume fluids (water intoxication risk).
- ✓ Report: severe headache, confusion, muscle cramps, decreased urine output.
- ✓ Carry extra medication when traveling; store intranasal DDAVP refrigerated.
- ✓ Follow the prescribed **fluid restriction** (often 800–1000 mL/day) — measure everything.
- ✓ Include ice chips, soup, Jell-O, and popsicles in your fluid total.
- ✓ Weigh daily; report gain >2 lb in 24 hours or >5 lb in a week.
- ✓ Use hard candy, mouthwash, or lip balm to relieve thirst without fluids.
- ✓ Recognize danger signs: headache, nausea, confusion, seizures — call 911.
- ✓ Avoid medications that may worsen SIADH (many SSRIs, NSAIDs) — check with provider.
- ✓ Attend all follow-up labs to monitor serum sodium.

Memory Boosters

MNEMONICS · PATTERNS · QUICK RECALL

D · I

Dry Inside · Dilute urine · Diuresis

Dehydrated · Dilute pee · Dry mouth

Increased output · Increased thirst · Increased sodium

"The **D**esert patient — give **D**DAVP."

S · I · A · D · H

Soaked · Intoxicated · Anti-Diuretic Hyperflow

Sodium low · Seizures · Soaked

Increased fluid · Increased urine concentration

ADH excess · Decreased urine output · Hyponatremia

"The **S**oggy patient — **S**top the fluids."

DDAVP = "Dad, Don't Add Volume Please"

Remember DDAVP's mechanism and risks

DDAVP makes you hold water. The big risk is **too much** holding → water intoxication. Daily weights & thirst-only drinking keep patients safe.

The Sodium Seesaw

Opposites always — if one goes up, the other goes down

DI: urine ↓ concentrated, blood ↑ concentrated → **Na ↑**

SIADH: urine ↑ concentrated, blood ↓ concentrated → **Na ↓**

Whatever the urine is, the blood does the **opposite**.

⚡ 10-Second Review

*"DI **Dumps** water. SIADH **Saves** water. Dump → replace with fluids + DDAVP. Save → restrict fluids + correct sodium slowly. If you remember only one thing: in **DI** give water, in **SIADH** take water away."*