

## Nephrogenic Diabetes Insipidus Diagnosis and Management

Nephrogenic diabetes insipidus is diagnosed by the presence of hypernatremia, normal or increased plasma osmolality, and decreased urine osmolality. Tests that can be used to differentiate it from other disorders include the water deprivation test and DDAVP test. Treatments include stopping triggers, thiazide diuretics, amiloride, and indomethacin.



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### Diagnosis

#### Hypernatremia

[Hiker-salt-shaker](#)

Hypernatremia can result from nephrogenic diabetes insipidus and is defined as a sodium level greater than 145 mmol/L. It is an effect of free water loss from polyuria.

#### Normal or Increased Plasma Osmolality

[Normal-sign Up-arrow Plasma-TV Ozzy](#)

Normal or increased plasma osmolality ( $\geq 300$  mOsm/Kg) can be seen in patients with diabetes insipidus, either central or nephrogenic. This will differentiate it from primary polydipsia, which presents with normal or low plasma osmolality ( $\leq 280$  mOsm/Kg).

#### Decreased Urine Osmolality

[Down-arrow Urinal Ozzy](#)

Decreased urine osmolality is seen in this disorder. It is also seen in central diabetes insipidus (DI). Patients present with a urine osmolality  $< 300$  mOsm/kg in Complete DI and 300–500 mOsm/kg in Partial DI. It occurs due to the inability to concentrate urine in the nephron.

#### Water Deprivation Test

[Water-bottle Restricted-belt Test-tubes](#)

A water deprivation test (restriction) will cause no change or a slight increase in urine osmolality in patients with diabetes insipidus, both central and nephrogenic. This will distinguish diabetes insipidus from primary polydipsia, which presents with a significant rise in urine osmolality, ( $>700$  mOsm/kg).

#### Desmopressin Test

[Designated Driver Vase-present Test-tube](#)

When desmopressin is administered to patients with nephrogenic diabetes insipidus (DI), urine osmolality may slightly increase or remain unchanged from baseline. This is different from central DI, in which desmopressin causes an increase of  $>50\%$ . Desmopressin is helpful to differentiate between nephrogenic and central DI.

### Management

## Stop Triggers

### Stop-sign Trigger

The first step in managing nephrogenic diabetes insipidus is to stop triggers. These include drugs such as lithium and electrolyte imbalances (e.g., hypokalemia and hypercalcemia).

## Thiazide Diuretics

### Tarzan Die-Rocket

Thiazide diuretics are used to trigger hypovolemia. This will induce aldosterone secretion from the renin-angiotensin-aldosterone system, promoting the water and sodium reabsorption. As a result, less water will be delivered to the collecting duct where ADH should act.

## Amiloride

### Amelia-rider

Amiloride may be used to treat lithium-induced nephrogenic diabetes insipidus. It acts by blocking epithelial sodium channels (ENaCs) in the nephron.

## Indomethacin

### Indigo-moth-man

Indomethacin is an NSAID that inhibits prostaglandin synthesis. As prostaglandins antagonize ADH, a decrease in prostaglandins will increase ADH.