

Diabetes insipidus

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Diabetes insipidus is a condition in which the kidneys are unable to conserve water.

Causes, incidence, and risk factors

Diabetes insipidus (DI) is an uncommon condition that occurs when the kidneys are unable to conserve water as they perform their function of filtering blood. The amount of water conserved is controlled by antidiuretic hormone ([ADH](#)), also called vasopressin.

ADH is a hormone produced in a region of the brain called the hypothalamus. It is then stored and released from the pituitary gland, a small gland at the base of the brain.

DI caused by a lack of ADH is called central diabetes insipidus. When DI is caused by a failure of the kidneys to respond to ADH, the condition is called nephrogenic diabetes insipidus.

Central diabetes insipidus can be caused by damage to the hypothalamus or pituitary gland as a result of:

- Head injury
- Infection
- Loss of blood supply to the gland
- Surgery
- Tumor

There is also a form of central diabetes insipidus that runs in families.

Nephrogenic DI involves a defect in the parts of the kidneys that reabsorb water back into the bloodstream. It occurs less often than central DI. Nephrogenic DI may occur as an inherited disorder in which male children receive the abnormal gene that causes the disease from their mothers.

Nephrogenic DI may also be caused by:

- Certain drugs (such as [lithium](#), amphotericin B, and [demeclocycline](#))
- High levels of calcium in the body ([hypercalcemia](#))
- Kidney disease (such as [polycystic kidney disease](#))

Symptoms

- [Excessive thirst](#)
 - May be intense or uncontrollable

- May involve a craving for ice water
- [Excessive urine volume](#)

Signs and tests

- [MRI of the head](#)
- [Urinalysis](#)
- Urine output

Treatment

The cause of the underlying condition should be treated when possible.

Central diabetes insipidus may be controlled with vasopressin (desmopressin, DDAVP). You take vasopressin as either a nasal spray or tablets.

If nephrogenic DI is caused by medication (for example, [lithium](#)), stopping the medication may help restore normal kidney function. However, after many years of [lithium](#) use, the nephrogenic DI may be permanent.

Hereditary nephrogenic DI and [lithium](#)-induced nephrogenic DI are treated by drinking enough fluids to match urine output and with drugs that lower urine output. Drugs used to treat nephrogenic DI include:

- Anti-inflammatory medication ([indomethacin](#))
- Diuretics [[hydrochlorothiazide](#) (HCTZ) and amiloride]

Expectations (prognosis)

The outcome depends on the underlying disorder. If treated, diabetes insipidus does not cause severe problems or reduce life expectancy.

Complications

If thirst mechanisms are normal and you drink enough fluids, there are no significant effects on body fluid or salt balance.

Not drinking enough fluids can lead to the following complications:

- Dehydration
 - Dry skin
 - [Dry mucus membranes](#)
 - Fever
 - [Rapid heart rate](#)

- Sunken appearance to eyes
- Sunken fontanelles (soft spot) in infants
- [Unintentional weight loss](#)
- [Electrolyte imbalance](#)
 - [Fatigue](#), lethargy
 - Headache
 - Irritability
 - [Muscle pains](#)

Calling your health care provider

Call your health care provider if you develop symptoms of diabetes insipidus.

If you have diabetes insipidus, contact your health care provider if frequent urination or extreme thirst return.

References

1. Robinson AL, Verbalis JG. Posterior Pituitary. In: Kronenberg HM, Melmed S, Polonsky KS, Larsen PR, eds. *Williams Textbook of Endocrinology*. 12th ed. Philadelphia, Pa: Saunders Elsevier; 2011:chap 10.

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