Diseases And Conditions

Question: How is fluid regulated in the body?

Answer: A person's body regulates fluid by balancing liquid intake and removing extra fluid. Thirst usually controls a person’s rate of liquid intake, while urination removes most fluid, although people also lose fluid through sweating, breathing, or diarrhea. The hormone vasopressin, also called antidiuretic hormone, controls the fluid removal rate through urination. The hypothalamus, a small gland located at the base of the brain, produces vasopressin. The nearby pituitary gland stores the vasopressin and releases it into the bloodstream when the body has a low fluid level. Vasopressin signals the kidneys to absorb less fluid from the bloodstream, resulting in less urine. When the body has extra fluid, the pituitary gland releases smaller amounts of vasopressin, and sometimes none, so the kidneys remove more fluid from the bloodstream and produce more urine. **What are the types of diabetes insipidus?** The types of diabetes insipidus include

- central
- nephrogenic
- dipsogenic
- gestational

Each type of diabetes insipidus has a different cause. **Central Diabetes Insipidus** Central diabetes insipidus happens when damage to a person's hypothalamus or pituitary gland causes disruptions in the normal production,

storage, and release of vasopressin. The disruption of vasopressin causes the kidneys to remove too much fluid from the body, leading to an increase in urination. Damage to the hypothalamus or pituitary gland can result from the following:

- surgery
- infection
- inflammation
- a tumor
- head injury

Central diabetes insipidus can also result from an inherited defect in the gene that produces vasopressin, although this cause is rare. In some cases, the cause is unknown. **Nephrogenic Diabetes Insipidus** Nephrogenic diabetes insipidus occurs when the kidneys do not respond normally to vasopressin and continue to remove too much fluid from a person's bloodstream. Nephrogenic diabetes insipidus can result from inherited gene changes, or mutations, that prevent the kidneys from responding to vasopressin. Other causes of nephrogenic diabetes insipidus include:

- chronic kidney disease
- certain medications, particularly lithium
- low potassium levels in the blood
- high calcium levels in the blood
- blockage of the urinary tract

The causes of nephrogenic diabetes insipidus can also be unknown. **Dipsogenic Diabetes Insipidus** A defect in the thirst mechanism, located in a person's hypothalamus, causes dipsogenic diabetes insipidus. This defect results in an abnormal increase in thirst and liquid intake that suppresses vasopressin secretion and increases urine output. The same events and conditions that damage the hypothalamus or pituitary—surgery, infection, inflammation, a tumor, head injury—can also damage the thirst mechanism. Certain medications or mental health problems may predispose a person to dipsogenic diabetes insipidus. **Gestational Diabetes Insipidus** Gestational diabetes insipidus occurs only during pregnancy. In some cases, an enzyme made by the placenta—a temporary organ joining mother and baby—breaks down the mother's vasopressin. In other cases, pregnant women produce more prostaglandin, a hormone-like chemical that reduces kidney sensitivity to vasopressin. Most pregnant women who develop gestational diabetes insipidus have a mild case that does not cause noticeable symptoms. Gestational diabetes insipidus usually goes away after the mother delivers the baby; however, it may return if the mother becomes pregnant again.