

# **Diabetes Insipidus**

**Series N. 12**



**Patient's Guide**

**Average Readability Leaflet**

## **Diabetes Insipidus - Series 12 (Revised August 2006)**

This leaflet was produced by Fernando Vera MSc and Prof Gary Butler at the Institute of Health Sciences, University of Reading, Reading, UK (August, 2006). Some portions of the text were extracted or modified from the Growth and Growth Disorders Booklet Series (Third edition, 2000)\* and may be used in conjunction with these as they provide a choice of leaflets providing the same information, but for people of different ages and reading abilities. The numbering sequence in each series is the same for easy cross-reference. The original leaflet series can be also obtained from the links given at the end.

All illustrations were created and produced by Fernando Vera MSc.

This leaflet is part of the Hormone Disorders Leaflet Series. The following are also available:

- Series N 3.** Puberty and the Growth Hormone Deficient Child.
- Series N 4.** Precocious Puberty
- Series N 5.** Emergency Information for Children with Cortisol and GH Deficiencies and those Experiencing Recurrent Hypoglycaemia.
- Series N 6.** Congenital Adrenal Hyperplasia
- Series N 7.** Growth Hormone Deficiency in Young Adults.
- Series N 10.** Constitutional delay of growth and puberty
- Series N 11.** Multiple Pituitary Hormone Deficiency
- Series N 12.** Diabetes Insipidus
- Series N 13.** Craniopharyngioma
- Series N 14.** Intrauterine Growth Retardation or Small Gestational Age
- Series N 15.a.** Hyperthyroidism
- Series N 15.b.** Hypothyroidism
- Series N. 16.** Type 2 Diabetes and Obesity

The development of these leaflets was funded (as a service to medicine) by Serono-Merck Ltd, Bedfont Cross, Stanwell Road, Feltham, Middlesex TW14 8NX, UK. Additional help was provided by the Child Growth Foundation ([www.childgrowthfoundation.org](http://www.childgrowthfoundation.org)).

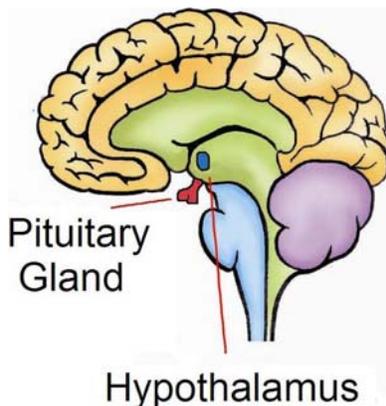
\*Written by Dr Richard Stanhope (Gt. Ormond Street/Middlesex Hospital, London) and Mrs Vreli Fry (Child Growth Foundation)

## Introduction

The aim of this leaflet is to describe a condition known as Diabetes Insipidus. It will discuss information on how it's diagnosed, treated and some of the problems it may cause. Hopefully, this leaflet will help you to understand this condition and give you a basis for discussions with your GP or specialist team.

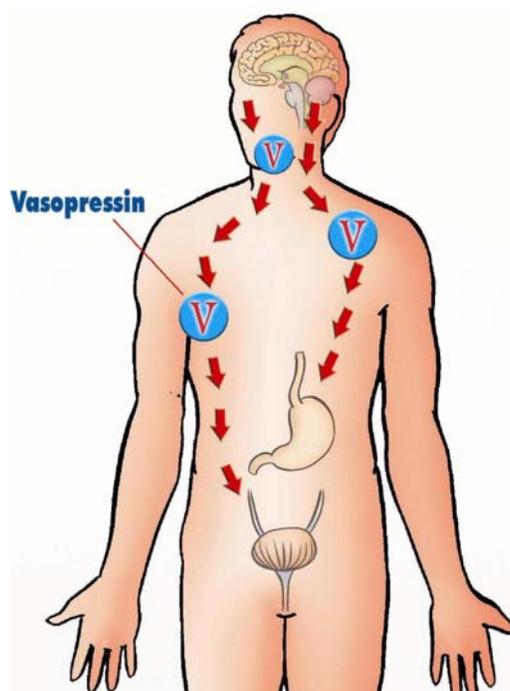
## What are hormones?

Hormones are “messengers” used around the body to produce an effect. These are produced in the brain by the **hypothalamus** and **pituitary gland**. Any deficiency of a hormone may be the result of problems in one or both of these parts of the brain.



## What is diabetes insipidus?

When working properly, the hypothalamus and pituitary gland work to regulate the body's fluid balance. They do this by producing and sending a “messenger” around the body to tell the organs when to retain or when to eliminate water. This “messenger” is a hormone known Vasopressin.



Without Vasopressin the body will not retain fluids, even if we drink large amounts of liquid. The inability of the brain to produce Vasopressin leads to a condition known as Diabetes insipidus or “**water diabetes**”

Water diabetes is not the same as the more common condition Diabetes Mellitus or “sugar diabetes”.

### **What causes water diabetes?**

Water diabetes occurs when the pituitary gland, responsible for producing vasopressin, is not working normally. This malfunction may result from the presence of a small tumour near this gland or because of swelling.

Water diabetes can also be the result of surgery near the pituitary gland. However, this type of water diabetes is usually temporary and doesn't require treatment.

Most commonly there is a genetic problem, which stops the pituitary gland from working properly. In some cases it may affect the newborn baby who will have problems with dehydration. In other cases, the symptoms may not appear until the child is up to 1 year old.

### **What are the symptoms of water diabetes?**

The most common symptoms of this condition are:

- **Passing large volumes of urine:** there is a need to go to the toilet frequently.
- **Increased thirst:** excessive output of urine leads to a severe loss of fluid in the body. As a result, thirst will be triggered and this may be constant throughout the day or night.

### **How is the diagnosis made?**

The diagnosis of water diabetes can usually be made by comparing the concentration of blood and urine in early morning samples. This needs to be done after an overnight fast, and before eating or drinking anything.

If the concentration of the blood is high, and the concentration of the urine is low, this shows that there is a lack of control of the body's fluid levels. This confirms the diagnosis of water diabetes.

Other tests that are used include the “water deprivation test”. This is done in hospital and may require the individual to be admitted overnight. This test measures the concentration of urine and the blood when fluids are withdrawn.

## How is water diabetes treated?

Water diabetes is treated by providing the body with a synthetic form of Vasopressin known as **DDAVP**. DDAVP acts like the natural hormone but lasts longer in the body. It may be given in tablets, intranasal drops or by injection

It's very important to adjust the dose for children and babies/infants as they often need only very small doses. In patients who take DDAVP as a spray or drops, their nose can become very sensitive making it uncomfortable to continue taking their treatment in this form. If so, your specialist may advise you to use the tablets instead.

Sometimes your specialist may advise you to use a combination of these different types of DDAVP to have more control over your symptoms.

It's important not to exceed the dose of DDAVP as indicated by your specialist. Taking too much DDAVP may result in a build up of fluid and convulsions. Under-treatment is less dangerous and causes more urine to pass and increased thirst.



## What happens if there is no sense of thirst?

The brain has a “thirst centre” which triggers our desire to drink fluids. In some individuals this thirst centre is damaged following surgery for a brain tumour. This results in a lack of a sense of thirst. This condition sometimes occurs with water diabetes and can be very dangerous.

It is very important to know whether your child has this condition. Individuals who have no sense of thirst need to be encouraged to drink. Your doctor will provide you with an idea of how much fluid is needed each day. This may be called a fluid “prescription”. The amount of fluid needed will depend on the size of the individual. In addition, it may have to go up during hot weather and minor infections as at these times extra fluid is lost through sweating.

It is important to follow the fluid prescription to keep up with the body's fluid requirements.

## Why is water diabetes a very serious condition in small babies?

Water diabetes in small babies leads to the loss of large amounts of urine and excessive thirst. Often it may be difficult for the parents to recognise this.

As with older children, DDAVP can be given to babies in the form of tablets. The dose of each individual tablet is too large for small babies. As a result, your specialist will advise you how the tablets should be broken.

Alternatively, DDAVP can be given as drops into the nose. However, **very small doses** are needed in this form. Your doctor will ask the pharmacy to make up a diluted solution so that the dose can be accurately assessed and the volume that needs to be given is not too large.



Measuring urine loss in small babies can be quite difficult. In time, most parents can recognise if their baby is passing more or less urine than normal. This means that sometimes, extra water needs to be offered to your baby to make sure he/she does not get dehydrated.

The problems are much greater in babies who are lacking a sense of thirst. It's critical to establish this at a very early stage. These babies will not take extra free water and they will need to have a water prescription to avoid dehydration.

The risks of dehydration during very hot weather or illness are quite high in these babies and in all small babies with water diabetes. Illness where vomiting or diarrhoea develops will usually require a short stay in hospital.

## What are other sources of useful of information?

The goal of this leaflet was to provide a basic overview of diabetes insipidus. Further information can be found in the following sources:

- **European Society for Paediatric Endocrinology**  
ESPE Secretariat, BioScientifica  
Euro House 22 Apex Court Woodlands, Bristol BS32 4JT - UK  
Telephone No: + 44 (0) 01454 642208  
Internet: <http://www.eurospe.org/>
- **British Society for Paediatric Endocrinology and Diabetes**  
BSPED Secretariat, BioScientifica  
Euro House 22 Apex Court Woodlands, Bristol BS32 4JT - UK  
Telephone No: + 44 (0) 01454 642208  
Internet: <http://www.bsped.org.uk/>
- **Child Growth Foundation**  
2 Mayfield Avenue, Chiswick London W4 1PW UK.  
Telephone +44 (0) 20 8995 0257  
Internet: <http://www.childgrowthfoundation.org/>

You can also consult your doctor or nurse for additional information in your local area.

