

# **ADRENOLEUKODYSTROPHY/ ADRENOMYELONEUROPATHY**

## **THE FACTS YOU NEED TO KNOW**

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### **WHAT IS ADRENOLEUKODYSTROPHY/ADRENOMYELONEUROPATHY?**

X-linked adrenoleukodystrophy (ALD) is an inherited male-limited disorder that can affect the nervous system and the adrenal glands. Its prevalence is estimated at about 1 in 15,000-20,000 individuals, and has been diagnosed more often since the advent of newborn screening for ALD.

### **WHAT CAUSES ADRENOLEUKODYSTROPHY?**

ALD is in the class of peroxisomal storage diseases, and is caused by mutations in the ABCD1 gene that codes for a protein known as ALD protein (ALDP). A deficiency of ALDP prevents breakdown of very long chain fatty acids (VLCFA). The accumulation of VLCFA triggers an inflammatory reaction and consequent destructive changes in the adrenal cortex and brain myelin.

Genetic testing and counseling should be offered to families of ALD patients. Women, because they carry two X chromosomes (of which only one is usually affected with the ABCD1 mutation), are protected from developing severe forms of ALD.

Women carriers transmit the X-linked ALD trait to half their sons. Any male with adrenal insufficiency or unexplained neurologic problems should be tested for ALD.

### **TYPES OF ADRENOLEUKODYSTROPHY**

There are several potential manifestations of X-linked adrenoleukodystrophy:

- pre-symptomatic disease in persons with the ALD gene mutation
- a severe childhood form with cerebral neurologic problems
- a mild form called adrenomyeloneuropathy (AMN)
- combined adrenal insufficiency and neurologic problems

It is relatively unusual for infants and toddlers to show signs or symptoms of ALD. Infants are detected in newborn screening programs and followed by specialists to observe them for signs of disease onset necessitating treatment.

Children with the CEREBRAL FORM of X-linked adrenoleukodystrophy often begin to show signs of learning and behavioral problems between the ages of 4 and 10. The symptoms eventually worsen, and may lead to severe physical and mental disabilities by young adulthood. Adrenal insufficiency is variably present. Careful endocrinologic and genetic testing must be done to diagnose this problem, as it is often subtle at first.



The age of onset for adrenomyeloneuropathy is typically early adulthood, but can be later. Symptoms include leg stiffness and weakness, genitourinary tract disorders, and behavior changes. Addison's disease is common in AMN.

The ADDISON'S DISEASE ONLY form presents anytime from early childhood through adult life with non-specific symptoms and signs of weakness, weight loss and failure to thrive, skin darkening, vomiting, and shock. Lifelong replacement hormones (usually oral glucocorticoids and mineralocorticoids) are required in such cases, and will usually prevent episodes of acute adrenal insufficiency. Patients should wear and/or carry a medical identification tag specifying adrenal insufficiency.

Life expectancy depends on the severity of the signs and symptoms, timing of the diagnosis and treatment for adrenal insufficiency.

## **WHAT IS THE TREATMENT FOR ALD?**

There is no cure at present for ALD, however, research is underway directed at ameliorating disease progression. If diagnosed in early childhood with brain white matter changes, hematopoietic stem cell transplant may halt the progression of disease. Gene therapy is another potential method of treatment now in clinical trials. Prior to these therapeutic trials, children were thought to benefit from strict diet plus Lorenzo's Oil that prevented VLCFA accumulation. For details concerning current research trials, see: [clinicaltrials.gov/ct2/results?term=adrenoleukodystrophy](https://clinicaltrials.gov/ct2/results?term=adrenoleukodystrophy).

## **ADDITIONAL RESOURCE: ALDCONNECT.ORG**

ALD Connect is an organization dedicated to improving the health outcomes for patients with adrenoleukodystrophy (ALD). They offer ways for patients and health providers to better connect, and offer tools to help educate and raise awareness. ALD Connect is working to develop a strong social network for patients and advocates for support and to promote guidance in research and advocacy for ALD. Their website offers tools to help find research trials for various related illnesses.

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The National Adrenal Diseases Foundation is a non-profit organization providing information, education and support to all persons affected by adrenal disease. For more information on joining NADF, or to find a support group in your area, contact:

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