NHS
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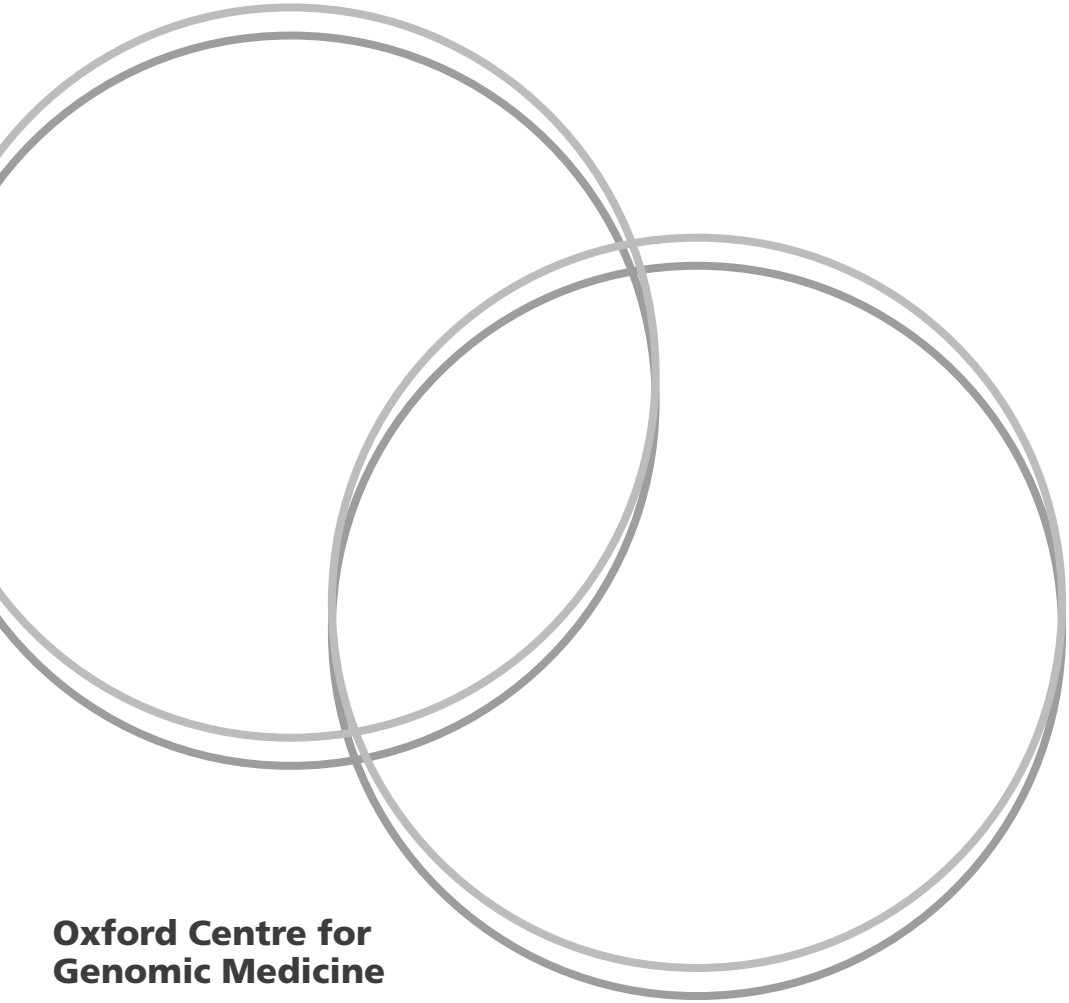
Von Hippel-Lindau Disease

An information leaflet for patients and families



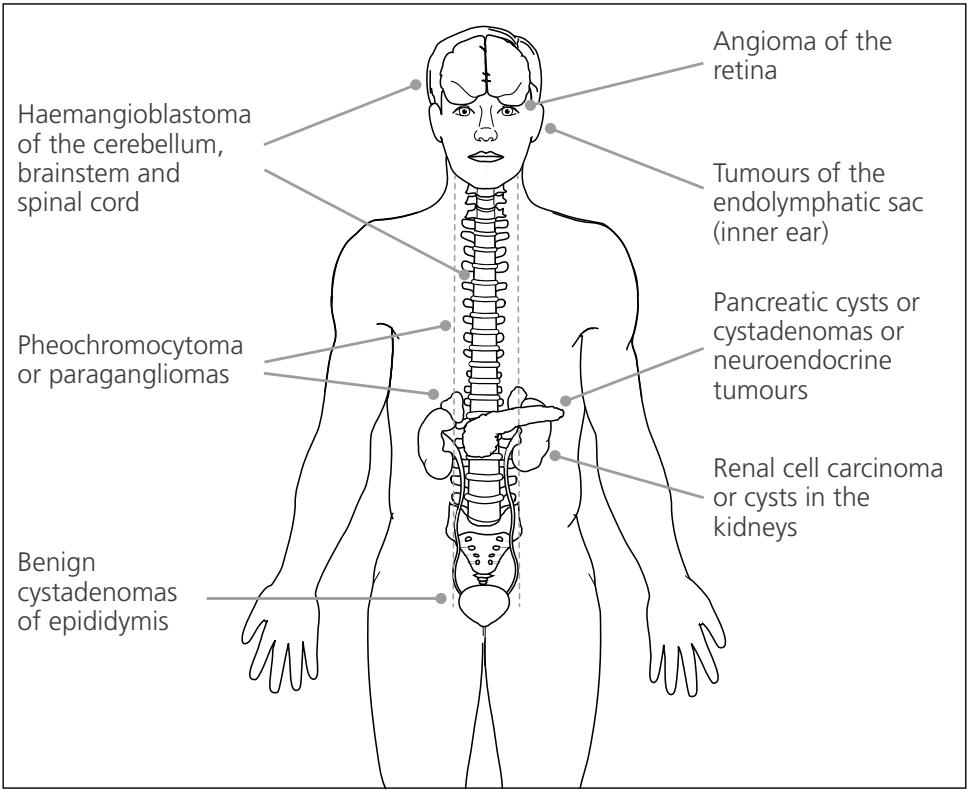
Oxford Centre for Genomic Medicine

What is Von Hippel-Lindau disease?

Von Hippel-Lindau (VHL) disease is a rare inherited disorder caused by a genetic alteration (mutation) in the *VHL* gene. It is named after the two doctors who described it. Although VHL disease can have serious complications, if these are detected early they can usually be treated successfully.

What are these complications?

VHL disease can affect different parts of the body, most frequently the eyes, back of the brain (cerebellum), kidneys, spinal cord, adrenal gland or pancreas. (See diagram)



Angiomas

In the eye, enlarged blood vessels (angiomas) can occur on the retina (back of the eye). When small, these do not cause any problems and can only be seen by an ophthalmologist (eye specialist). However, if an angioma is not detected and treated, it may enlarge, damage the retina and eventually impair vision.

Haemangioblastomas

Cysts or benign tumours called haemangioblastomas can occur in the cerebellum or spinal cord. These are benign and do not spread. If they occur in the cerebellum they usually cause a headache and unsteadiness when walking.

Haemangioblastomas in the spinal cord can cause pain or numbness. These cysts can be detected by a CT or MRI brain scan, or an MRI scan of the spine.

Renal and pancreatic tumours

Cysts in the kidney are frequent in *VHL* disease. They are benign and do not cause symptoms. However, in some patients a solid tumour may develop. If detected early these tumours can be easily removed and do not cause problems. If not detected and treated the tumour can become cancerous and eventually spread around the body.

Cysts can also occur in the pancreas and infrequently tumours also develop.

Phaeochromocytoma

In some patients a benign tumour called a phaeochromocytoma can develop in the adrenal gland. This produces adrenaline and causes high blood pressure.

Other tumours

Rarely a small tumour may occur in the inner ear. This can be detected by a brain scan in patients with hearing problems. Occasionally benign cysts may develop in the scrotum.

VHL disease is very variable, so that whereas one family member may develop an eye problem, another family member with the same genetic alteration may develop a kidney problem. Similarly, although several members of the same family may develop complications at an early age, another may not develop a complication until they are much older. However there is a tendency for Phaeochromocytoma to run in particular families.

How is VHL disease inherited?

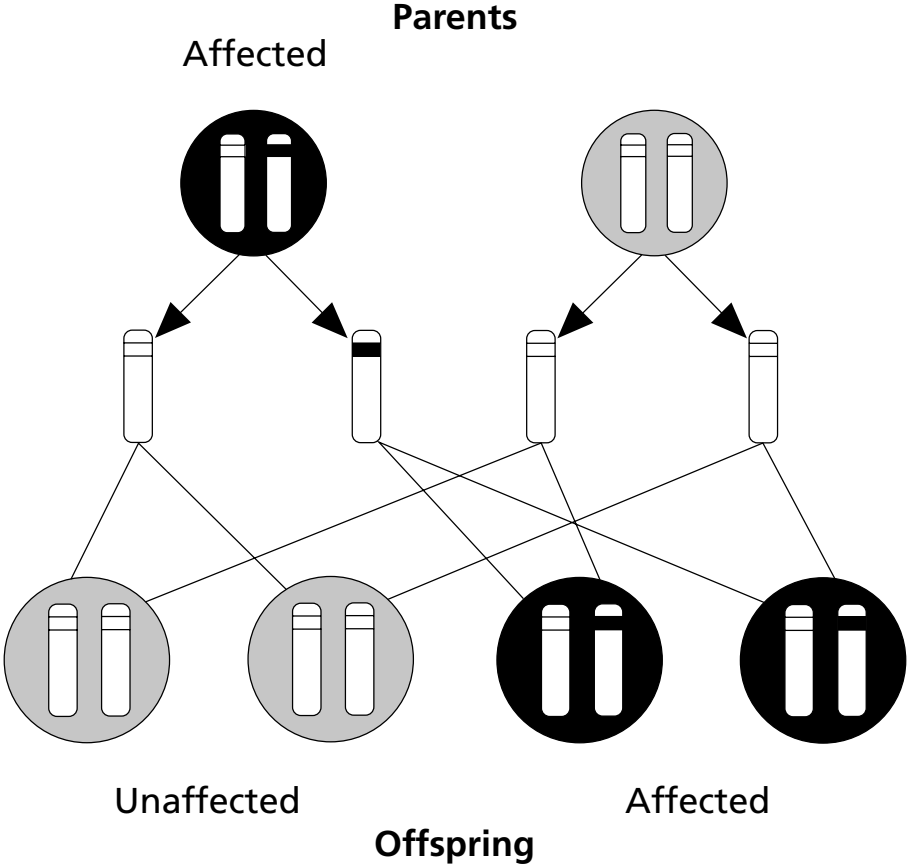
VHL disease is caused by a mutation (fault) in one copy of the *VHL* gene. As genes come in pairs (one is inherited from each parent) a person with *VHL* disease has one altered *VHL* gene and one normal *VHL* gene. When he/she has children either the altered gene or the normal gene is passed on to each child.

Each person with an affected parent therefore has a 50% (1 in 2) chance of inheriting the altered gene (see figure). Although on average 50% of the children of a person with *VHL* disease will also inherit the disease, in some families a higher or a lower proportion of the children may be affected.

It is now possible to identify the gene alteration in most (but not all) *VHL* families. This enables family members to be tested to determine if they carry the altered gene.

Not all patients with *VHL* disease will have inherited the altered gene from an affected parent. Sometimes, the altered gene may have started with that particular patient.

Autosomal dominant inheritance



At what age do complications develop?

This is variable. Onset during childhood is rare, but most patients have developed a complication by age 40, and often the disease starts in the late teens or twenties. However, in some cases, complications may only develop after 50 or 60 years of age. This means that it is difficult to be sure that a person with an affected parent has not inherited the altered gene until they are aged about 60.

By then almost everybody who has inherited the altered gene can be detected if the appropriate screening tests are performed.

What treatment is available?

The complications of VHL disease are easier to treat if detected early. Retinal angiomas may be treated by laser or by freezing. Haemangioblastomas in the cerebellum or spine are usually removed surgically if they are causing symptoms. Renal cysts do not need treatment, but if a tumour or phaeochromocytoma is detected it will often be surgically removed.

Is any research being performed?

A research team studying patients from all over Great Britain and Ireland is based in Cambridge and works closely with doctors from many centres. Their main research projects are firstly to determine what and when complications in *VHL* disease develop, so that better methods of detection and treatment can be developed. Secondly, they are investigating how the *VHL* gene works. They hope that this research will eventually lead to better testing and treatments for *VHL* disease.

As *VHL* disease is so rare, if research is to be successful, they need to involve as many patients as possible. If you would like further information on participation, please speak to your genetic doctors.

What does screening involve?

The purpose of screening is to detect complications early when treatment is usually easier. The exact type and timing of investigations for screening will vary according to individual circumstances. A patient known to have VHL disease will usually have a check-up by a doctor, an eye examination by an ophthalmologist, a scan of the kidneys and a urine test (for adrenaline levels) every year. A brain scan may be performed every few years.

A person who has no symptoms but has a parent with VHL disease should also have regular check-ups. Annual eye examinations are started during childhood (from about 5 years), urine tests at 11

years and kidney scans at about 16 years. Brain scans may also be performed every few years from the age of 15, but a cerebeller haemangioblastoma will usually only be removed if it is causing symptoms.

If a patient with VHL disease or a relative develops symptoms they should seek medical advice as soon as possible. A personal or family history of VHL disease should always be mentioned whenever you see a doctor, even if it does not appear to be relevant at the time.

If you need more advice, please contact:

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Website: **www.ouh.nhs.uk/clinical-genetics/**

Further information

If you would like an interpreter, please speak to the department where you are being seen.

Please also tell them if you would like this information in another format, such as:

- Easy Read
- large print
- braille
- audio
- electronic
- another language.

We have tried to make the information in this leaflet meet your needs. If it does not meet your individual needs or situation, please speak to your healthcare team. They are happy to help.

Author: This leaflet is based, with permission, on a leaflet produced by the West Midlands Regional Genetic Department. Oxford Regional Genetic Department

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