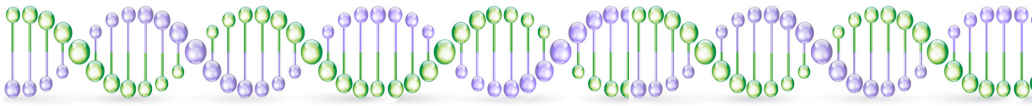
Information Sheet



Neurofibromatosis Type 2 and the NF2 gene

Neurofibromatosis Type 2 is a hereditary cancer syndrome caused by germline mutations in the NF2 gene. It is rare, affecting 1 in 25,000 to 1 in 40,000 people.

How is Neurofibromatosis Type 2 diagnosed?
NF2 is characterised by growths affecting certain types of nerve cells resulting in meningioma, schwannoma, glioma and neurofibroma. It is usually diagnosed clinically due to the presence of these growth at a young age. A diagnosis of NF2 should be considered if an individual has:

- unilateral vestibular schwannoma before age 30 or bilateral at any age.
- cranial meningioma before age 20.
- schwannoma before age 16.
- retinal hamartoma before age 16.
- two NF2-related tumours such as a meningioma, schwannoma, glioma, neurofibroma or posterior subcapsular lenticular opacities

Unlike many hereditary cancer syndromes, in which a mistake in a gene has been passed down over many generations, in NF2 around half of the cases are caused by a new mistake (a "de novo" mutation) that occurred just in that particular sperm or egg or in the first few divisions are fertilisation. In this situation, the parents are not affected but the mutation can be passed on to the next generation.

Also, in some of these de novo cases, the mistake in the NF2 gene occurred a bit later, in the first weeks. In this case, only some parts of the body may be affected. This is known as mosaicism. If genetic testing is performed, the NF2 mutation may not be present in the blood and testing of the tumour itself is preferred.

What are vestibular schwannomas?
A vestibular schwannoma (also known as an acoustic neuroma) is a benign growth which arises within the sheath protecting the acoustic nerve (also known as the vestibulocochlear nerve or the eighth cranial nerve). As the tumour grows, it presses on the nerve, which runs from the ear to the brain, affecting hearing and balance. It can also be associated with tinnitus (ringing in the ear).

Almost all individuals with NF2 develop vestibular schwannomas affecting both ears by age 30. If detected early, the vestibular schwannoma can be removed before problems occur and this is curative.

What are intramedullary and extramedullary tumours?
These are tumours affecting the brain and/or spinal cord. They affect 50 to 90% of individuals with Neurofibromatosis Type 2. The tumours that occur in NF2 usually cause problems by compressing important structures. They are divided into tumours that are:

- intramedullary (growing within the spinal cord). These tumours include glioma and ependymoma.
- extramedullary (growing around the spinal cord or brain or the peripheral nerves). These tumours include meningioma and schwannoma.

If a tumour is detected, it can be monitored if it is small, slow growing and/or not compressing other structures.

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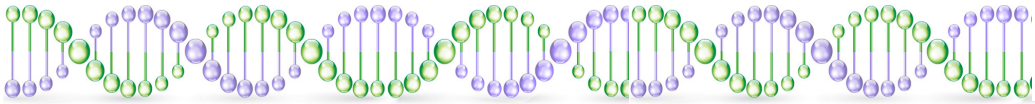

What are posterior subcapsular lenticular opacities?
Posterior subcapsular lenticular opacities (also known as juvenile cataracts) can occur in the eyes and affect sight.

How is Neurofibromatosis Type 2 managed?
Screening in NF2 helps to detect growths early before damage, including loss of hearing or sight, occurs. It includes:

- Specific hearing tests to screen for hearing loss caused by a vestibular schwannoma starts in infancy and is performed every year.
- From age 10 annual brain MRIs to look for a vestibular schwannoma are performed. Screening usually stops at age 40 if no growths are present.
- Screening for intramedullary and extramedullary tumours starts at age 10 with an annual MRI including the brain and spinal cord. From age 20, the scans may be done every 3 years and screening usually stops at age 40 if no tumours are present.
- Screening for posterior subcapsular lenticular opacities starts in infancy with an annual ophthalmological examination.

Does this sound like you or your family?
Have you had an acoustic neuroma? Has an NF2 mutation been detected in a blood relative or has a clinical diagnosis of NF2 been made in you or your family?

Make an appointment with Dr Hilda High at Sydney Cancer Genetics. It is a confidential opportunity to discuss your personal and family history of cancer and genetic testing can be organised, if needed.

More information is available on our website, including links to the following:

- The Children's Tumour Foundation Conquering NF is based in Australia and has information on research studies and support groups.
- The Cancer Genetics section of the Cancer Institute's eviQ website provides up-to-date Australian-based management guidelines as well as the lifetime risk of tumours for individuals with NF2.
- The US National Library of Medicine website has more information about this syndrome.

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