

Is Genetic Testing for ADPKD right for me?

Autosomal Dominant Polycystic Kidney Disease (ADPKD) is a genetic disease, usually passed from parent to child. Autosomal dominant refers to the way the gene is inherited. If you have ADPKD there is a 1 in 2 (50 %) chance of passing the faulty gene onto each child. In some cases, ADPKD occurs when there is no family history, with the gene abnormality having arisen from a new genetic mutation.

ADPKD is caused by an abnormality in a gene that is often called a mutation or variant. More than 90% of people with ADPKD will have a mutation or variant in one of two genes called PKD1 and PKD2.

How is PKD diagnosed?

Doctors are usually alerted to the possibility of ADPKD if there is a family history of the disease and/or signs and symptoms commonly associated with ADPKD are present. Genetic testing is not usually needed to make a diagnosis of ADPKD if your specialist is confident you have the disorder. However, the situation is beginning to change, because of new treatments and clinical trials, where it is important to know the gene abnormality causing the disorder, and for the reasons mentioned in the next section. If you have a family history of ADPKD, we would suggest you talk to your own doctor about the most appropriate investigation for you. You may be offered an ultrasound examination of your kidneys which can detect cysts in the kidneys, even when they are quite small. Sometimes cysts are discovered on an ultrasound which is done for another reason.

What are the benefits of having genetic testing for PKD?

- help to confirm whether or not you have ADPKD. This may be helpful for people who have an atypical presentation, do not quite fulfil the ultrasound diagnostic criteria or those who have a family history but do not yet have signs of ADPKD (This requires prior identification of the genetic variant in your family by testing an affected person in the family with clear diagnosis of ADPKD).
- better understand the condition in your family and may sometimes help predict how the disorder might affect you in the future.
- may be used to help with predicting the clinical outcome and help to guide clinical management (please note; a genetic test is not required for treatment with tolvaptan in Australia under the approved PBS criteria, but it may be used as part of therapeutic decision making in some other countries overseas).

- inform your family planning decisions. See section “How can genetic testing be used to help me start a family?” below.
- enable identification of appropriate living kidney donors for transplantation (if you are considering donating a kidney to a family member with ADPKD or if you have ADPKD and a family member is considering donating a kidney to you). This requires prior identification of the genetic variant in your family by testing an affected person in the family with clear diagnosis of ADPKD.

How do I arrange a test?

If you are thinking about whether you might undergo genetic testing for ADPKD, then the best person to talk to would be your Nephrologist (Kidney Specialist) or General Practitioner. They can give you general information and refer you to a Clinical Geneticist or Nephrologist specialising in Inherited Kidney Diseases who can then further discuss your and your family's situation, provide genetic counselling and potentially order any clinically indicated genetic testing. Sometimes, other non-genetic tests or investigations may also be required, such as further specialised kidney imaging.

There is now a national network of multidisciplinary renal genetics clinics who together are part of the KidGen Collaborative. These clinics in QLD, NSW, Vic, Tas, SA, WA and NT bring together Adult Nephrologists, Paediatric Nephrologists, Clinical Geneticists and Genetic Counsellors to see patients and families affected by known or suspected genetic kidney diseases. These clinics can help guide and undertake clinical genetic testing, if and when clinically indicated. Details of the KidGen Collaborative and its affiliated clinics are available at: www.kidgen.org.au

You can find genetic a list of genetic services here: <https://www.genetics.edu.au/genetic-services/general-genetics-clinics>

Is there a cost involved?

Genetic testing is currently paid for by state health systems, but which tests are paid for is totally dependent on the individual hospital. Some hospitals will pay for genetic testing only if it is very likely to change the patient's management, and other hospitals aren't able to pay for any testing. Tests that are not eligible to be paid for by the health system can be arranged and incur a significant out-of-pocket expense. PKD Australia are advocating for medicare-rebatable genetic testing - so all PKD patients in Australia can have the same access to genetic testing, see: <https://pkdaustralia.org/advocacy/>.

How is genetic testing performed?

Once your doctor decides that genetic testing may provide useful information for you, they will discuss the pros and cons of this option with you. This discussion will often involve a clinical geneticist or genetic counsellor. When you have been fully informed and have consented to the test by signing consent forms, your doctor will order the test.

The test can be done on any source of DNA but is usually done on DNA sourced from a blood sample. The DNA is sequenced turning it into useful information that can be analysed by experts in the laboratory. Once the team has interpreted the results and reached a conclusion, a report is prepared by the laboratory and sent to the doctor who ordered your test. Your doctor and/or your genetics team will discuss the test results with you.

What could the results be?

Genetic Testing involves looking for variants in the genes linked with ADPKD (or sometimes in genes associated with other conditions causing kidney cysts).

The possible results to consider are:

- **PATHOGENIC (DISORDER-CAUSING) VARIANT FOUND:** a variant has been found in a gene that causes ADPKD and can be accepted as the cause of the disorder in you.
- **VARIANT OF UNCERTAIN SIGNIFICANCE FOUND:** a variant has been found, but it is not known whether it is the cause of your condition. This does not change any clinical diagnosis you may have or ongoing health care. The significance of the variant may be clarified in the future.
- **NO CLINICALLY SIGNIFICANT VARIANT FOUND:** the cause of your condition has not been found. You may still have ADPKD, but the testing has not been able to identify the cause. Or, you may have a variant in a gene that was not analysed or is not yet known to science. This does not change any clinical diagnosis you may have or ongoing management.
- **VARIANT FOUND IN A GENE THAT CAUSES PKD BUT IS NOT ONE OF THE GENES KNOWN TO CAUSE ADPKD:** this can happen if your doctor has asked for testing of a number of genes associated with PKD, in addition to the two genes associated with ADPKD (PKD1 and PKD2). Your doctor or genetic counsellor will explain what the result means for you and your family.

Will results affect my insurance?

Under current Australian law, a person's private health insurance will not be affected by their decision to have genetic testing, or by the result of genetic testing.

But life insurance, such as cover for death, disability, trauma, income protection, CAN be affected. Life insurance companies may increase premiums, exclude certain conditions or deny policy applications based on genetic or genomic test results.

The Financial Services Council (FSC), the peak body for the life insurance industry in Australia have proposed a moratorium (temporary ban) to stop using genetic test results as part of insurance applications which came into effect on 1 July 2019.

Under the moratorium people can apply for certain levels of coverage (certain financial limits may exist) without having to disclose previous genetic test results. However, you may wish to apply for a new policy, or for an increase in the value of an existing policy, which is greater than these proposed financial limits. In which case, you may be asked to provide results of any genetic tests you have had done in the past. Under the moratorium, companies would not be able to ask you to take a genetic test as part of your application. It is important to know that not all insurance companies are members of the FSC and therefore some companies may not comply with the moratorium. Find out more about the moratorium here: <https://www.genetics.edu.au/publications-and-resources/facts-sheets/fact-sheet-20-life-insurance-products-and-genetic-testing-in-australia> You should be aware that factors other than the results of genetic testing, such as symptoms or family history of PKD, can have implications for a person's ability to obtain life insurance. This could include denial of cover, exclusion from cover or increased premiums.

Do I need Genetic Counselling?

The Human Genetics Society of Australasia recommends genetic counselling for all patients considering or undergoing genetic testing for PKD, especially if it is an at risk individual who wants to clarify their risk of the condition prior to symptom development. Genetic counselling aims to provide individuals and their families with information and support when there is a suspected genetic condition in the family. Genetic counselling is usually performed pre- and post-genetic testing to help patients understand genetic conditions and the implications of genetic information for themselves and their family. Genetic information can have medical, psychological, family and reproductive implications. Genetic counselling may be offered to individuals undergoing genetic testing through the service provider.

How can genetic testing be used to help me start a family?

Each of the children of an affected parent will have a 1 in 2 (50%) chance of inheriting the gene for ADPKD. Patients may face difficult decisions when planning a family. The decision on how or whether to have children is a very personal one.

Genetic testing can provide testing options in pregnancy (prenatal diagnosis) or parents might also want to think about pre-implantation genetic diagnosis (PGD). This involves genetically testing embryos, created through in vitro fertilisation (IVF), for the gene abnormality that has been identified in the family. Only embryos that do not have the mutated gene are implanted into the mother.

For many the decision is down to their lived experience of having the disease and the options available to them. There is no right or wrong choice.

“The disease (ADPKD) didn’t come into any decision-making process about having children. I knew PKD was inherited, but I didn’t think it would be a major issue, because I still hadn’t seen any consequences for the people around me.” ADPKD patient, 47, Australia

“We did talk about it a lot. IVF, apart from anything else, is a tough process for women, it is very ‘medical’, and it’s expensive. But we decided that, for us, it made sense.” ADPKD patient, 36, Australia

Emotional Impact

When undergoing genetic testing it is important to be aware of the emotional impact the process can have. These can be associated with unexpected results, how people cope with certainty vs. uncertainty, the impact of informing the family and more.

Other resources

For more information about genetics and genetic testing please see

The Australian Genetics Health Alliance <https://www.genomicsinfo.org.au/>

The Centre for Genetics Education <https://www.genetics.edu.au/>