



## Advice for GPs following release of ANU PFAS Study

### What are PFAS?

Per- and poly-fluoroalkyl substances (PFAS) are a class of manufactured chemicals that have been used since the 1950s to make products that resist heat, stains, grease, and water. Products that might contain PFAS include:

- furniture and carpets treated for stain resistance
- foams used for firefighting
- food containers
- make-up and personal care products
- cleaning products.

Because they are in so many products, most people living in Australia have some exposure to PFAS. However, in Australia, PFAS have been particularly found to have contaminated sites where there has been historic use of fire-fighting foams that contained PFAS. Over time, these chemicals have worked their way through the soil to contaminate surface and ground water and migrate into adjoining land areas. People living or working in, or close to, these sites may therefore have had greater exposure.

There is currently no evidence that PFAS has a significant impact on human health. However, because these chemicals persist in humans and the environment, human exposure to these chemicals should be minimised as a precaution.

### Australian health research

The Government, through the Department of Health, funded the ANU Study to improve understanding of the potential human health effects of exposure to PFAS in the Australian context.

The Study examined three communities with known PFAS exposure because of historic use of firefighting foams containing PFAS on nearby Defence Force bases —Katherine in the Northern Territory, Oakey in Queensland, and Williamstown in New South Wales (PFAS affected communities).

The Study team compared the PFAS blood serum levels of, and health outcomes for, people who had lived or worked in these towns with other similar communities that had no or little PFAS contamination.

In other similarly PFAS affected communities, the overall findings relating to PFAS exposure are expected to be broadly applicable.

The ANU Study found clear evidence of elevated blood serum concentrations of PFAS in residents and workers in the PFAS-affected communities, and of increased psychological distress in the three PFAS affected communities. The evidence for other adverse health outcomes was generally limited. For most health outcomes studied, findings were consistent with previous studies that have not conclusively identified causative links between PFAS and health.

The findings from this Study are generally consistent with available evidence. For example, latest evidence, including the findings of the Expert Reference Panel established by the Department of Health, suggests higher levels of PFAS exposure similar to that seen in the PFAS exposure sites, has been associated with mildly elevated levels of cholesterol, effects on kidney function and effects on the levels of some hormones.

Similarly, this Study found some evidence of associations between higher PFAS levels and raised cholesterol levels and uric acid. However, it is important to note that none of these associations were consistent across all three PFAS affected communities. This suggests that these health outcomes could be the result of other contributing factors such as diet, family history, and chronic conditions such as diabetes.

It should also be noted that the health effects identified in this Study are small and within ranges seen in the general population.

More information regarding the ANU Study can be found on the [Department of Health's PFAS website](#).

### The effect of PFAS on mental health

The study found that people living in all three PFAS affected communities, irrespective of PFAS serum concentrations were more likely to have experienced psychological distress than those who lived in comparison communities. Many participants of the Focus Groups that were held in early on in the study also discussed the psychological stress and anxiety they experienced as a result of living in an area with PFAS contamination, along with concerns about health and financial implications.

The Australian Government funds a range of mental health services to ensure all Australians can access the right care and essential services whenever and wherever they need.

Individuals affected by PFAS can access mental health support through a range of face-to-face, digital and phone services.

- Anyone experiencing distress can seek immediate advice and support through Lifeline (13 11 14), Kids Helpline (1800 55 1800), or the Government's digital mental health gateway, Head to Health ([www.headtohealth.gov.au](http://www.headtohealth.gov.au)).
- If you are concerned about suicide, living with someone who is considering suicide, or bereaved by suicide, the Suicide Call Back Service is available at 1300 659 467 or [www.suicidecallbackservice.org.au](http://www.suicidecallbackservice.org.au).
- Eligible people can receive Medicare rebates for up to 20 individual psychological services available via video conference or telephone through the Better Access Initiative. Further information is available at <https://www.health.gov.au/initiatives-and-programs/better-access-initiative>.
- Primary Health Networks (PHNs) are a great place to find locally available services. The Government funds PHNs to engage with local mental health resources in addition to what is available through Head to Health. Australian's can find the contact details for their local PHN at: <https://www.health.gov.au/initiatives-and-programs/phn/your-local-phn>.

More information regarding mental health services and supports for communities affected by PFAS, can be found on the [Department of Health's PFAS website](#).

## Reducing exposure

In areas contaminated with PFAS, the main sources of exposure identified have been consumption of contaminated bore water and locally sourced or produced food. This includes home slaughtered meat, eggs, milk, poultry, fruit, vegetables, locally sourced bushfood, and seafood.

Exposure routes can differ slightly between communities and if necessary local advice regarding the consumption of water and locally sourced or produced food will be issued and should be followed. This local advice will be provided by the relevant state or territory government.

## PFAS blood testing

Blood testing for PFAS is not recommended because there is at present insufficient evidence for a medical practitioner to be able to tell a person whether their blood level will make them sick now or later in life, or if any current health problems are related to the PFAS levels found in their blood.

A blood test can measure the level of PFAS in a person's blood and can tell a person how their blood levels compare with the levels seen in the general Australian population. However, tests to determine the level of PFAS in blood have no current value in informing clinical management, including diagnosis, treatment, or prognosis.

Blood testing for PFAS may however be sought by some patients and is a clinical decision for discussion between you and your patient. Please note that a blood test for PFAS is an expensive test and is not subsidised. The patient will be charged the full cost of the test.

## Discussion points regarding PFAS blood testing if required

- All Australians are expected to have detectable levels of PFAS in their blood. A broad range of levels would be expected in all communities due to background exposures.
- A "normal" PFAS range for an individual is not available in Australia or internationally.
- Blood levels are not predictive of health problems in individuals. There is no consistent evidence of PFAS resulting in health impacts therefore levels considered higher than the Australian general population may have no clinical relevance to the individual. For this reason, a "minimal risk" level also does not exist in Australia.
- A PFAS blood test will only tell you the current level of PFAS in an individual's blood.
  - PFAS have a very long half-life in humans and persist in the body for many years. The blood level will usually reflect cumulative exposure over this extended period.
  - A PFAS blood test cannot tell you when exposure occurred. Nor is it possible to determine the source of PFAS found in an individual's blood.
  - The PFAS blood test does not measure the blood level precisely. Tests taken from the same person at the same time show variability because of the test methodology.
  - The same level in two different individuals may not mean the same level of exposure, due to toxicokinetic differences.
- There are no specific biomarkers to look at effects of PFAS exposure.
- An individual's blood result can be compared to historic pooled community levels.

- If blood tests for PFAS are requested, a return visit to discuss the results should be considered noting that the results will not inform clinical management, including diagnosis, treatment or prognosis but can be considered alongside the table (below) that includes pooled Australian comparison points.

### Interpretation of results

No valid reference ranges exist for PFAS in humans. The results will be reported in terms of comparison with the previously published general population data from Australia (Table 1 and Table 2)

**Table 1: Estimated 95th percentile for the Australian population, 2016–2017<sup>1</sup>**

Compound	Age group	ng/mL
<b>PFOS</b>	1–4 years	7.2
	5–15 years	6.9
	16–30 years	8.0
	31–45 years	10.4
	46–60 years	13.1
	>60 years	16.7
<b>PFOA</b>	1–4 years	5.7
	5–15 years	4.0
	16–30 years	4.0
	31–45 years	3.9
	46–60 years	3.9
	>60 years	5.3
<b>PFHxS</b>	1-4 years	3.4
	5-15 years	4.2
	16-30 years	5.3
	31-45 years	5.1
	46-60 years	5.7
	>60 years	6.2
<b>PFNA</b>	1-4 years	1.3
	5-15 years	0.9
	16-30 years	1.1
	31-45 years	1.1
	46-60 years	1.1
	>60 years	1.4
<b>PFDA</b>	1-4 years	0.7
	5-15 years	0.6
	16-30 years	0.7
	31-45 years	0.7
	46-60 years	0.7
	>60 years	0.7

<sup>1</sup> Toms LM, Braeunig J, Vijayasathay S, Phillips S, Hobson P, Aylward L, et al. Per- and Polyfluoroalkyl Substances (PFAS) in Australia: Current Levels and Estimated Population Reference Values for Selected Compounds, 2019, <https://doi.org/10.1016/j.ijheh.2019.03.004>

The Department of Health will continue to monitor PFAS exposure at a population level through the Intergenerational Health and Mental Health Study. New comparison values will be available from the publication of this study.

**Table 2: Interpretation of individual results**

Interpretation	
≤95th percentile by age range	This is consistent with background exposure in the general population of that specific age-group.
>95th percentile by age range	Suggestive of previous exposure to PFAS at levels higher than the general population

Note: A PFAS blood test does not measure the blood level precisely. Two tests taken from the same person at the same time may report levels that differ by up to 20% or more because of the test methodology.

### Testing Frequency

The half-life for various PFAS compounds varies depending on the compound and the animal species. For humans, studies suggest it takes most of the PFAS substances about five years for levels to go down by half, so frequent blood monitoring is of no clinical value and should be discouraged. Population level blood tests will sometimes be undertaken to monitor the exposure of a community over time to determine if exposure reduction measures are working.

If individuals present with test results which have been repeated, these should be interpreted in the context of the analytical variability of the test, which may differ by plus or minus 20%.

### Examples

Scenario	Interpretation	Discussion Points
An 18 month old, fully breastfed infant with a serum PFOS of 5ng/mL.	<ul style="list-style-type: none"> <li>This is within the range of levels expected in any Australian community because of non-specific background PFOS exposures.</li> <li>Most Australian children under 4 years old will have blood levels less than 7.2 ng/mL.</li> </ul>	<ul style="list-style-type: none"> <li>Children born in Australia would be expected to have detectable levels of PFOS in blood, acquired during the pregnancy.</li> <li>PFOS is present in breast milk in very low levels, however the significant health benefits of breast feeding are well established and far outweigh any potential health risks to an infant from any PFOS transferred through breast milk.</li> <li>This blood level is unlikely to cause harm.</li> </ul>
A 35 year old adult with a serum PFOS of 210 ng/mL.	<ul style="list-style-type: none"> <li>This is higher than the range of levels expected because of non-specific background PFOS exposures, therefore; additional specific exposure sources are likely.</li> <li>Most adults in the 31 to 45 year age group will have blood levels under 10.4 ng/mL.</li> </ul>	<ul style="list-style-type: none"> <li>Additional specific exposure(s) have likely occurred at some stage during the previous 10 or more years. There may or may not be recent exposure.</li> <li>The most significant exposure pathways for adults</li> </ul>

Scenario	Interpretation	Discussion Points
	<ul style="list-style-type: none"> <li>Similar and higher levels have been noted in Australian adults who have had occupational exposures or lived in contaminated environments.</li> </ul>	<p>are the consumption of water and food containing PFOS.</p> <ul style="list-style-type: none"> <li>Those living in recognised contaminated areas should follow local precautionary advice to limit further exposure.</li> <li>Evidence concerning elevated levels is still being evaluated but currently there is no evidence that PFAS has a significant impact on human health.</li> <li>Repeat blood testing is of no clinical value.</li> <li>In the absence of ongoing exposure, blood levels of PFOS will fall slowly over many years.</li> </ul>

Pathology providers

[Sullivan Nicolaides Pathology](#) (Sonic Healthcare) and [Envirolab Services](#) offer PFAS blood testing.