Blood/plasma Donation Can Speed Up the Elimination of Per- and Poly-fluoroalkyl Substances (PFAS)

This factsheet includes information from a study conducted by Queensland Alliance for Environmental Health Sciences (QAEHS), The University of Queensland[1]. As part of this study, we looked at whether blood or plasma donations could speed up the elimination of PFAS.

Background

Following detection of PFAS contamination in the mains water at Avalon Airport in October 2022, Airservices Australia provided an alternative drinking water source, and conducted a deep clean of its facilities. QAEHS was invited to conduct a study to better understand the PFAS exposure experienced by Avalon Aviation Rescue Fire Fighting Service (ARFFS) staff. This included blood tests for those who wished to be tested. Airservices also encouraged staff who had concerns about their PFAS serum levels to donate blood or plasma, in consultation with their GPs, since there was some evidence that this could help reduce PFAS levels in the blood.

What Did We Do?

Soon after the detection of the contamination, ARFFS staff who were concerned about their exposure were offered a blood test. About 8-11 months later, staff were invited to have a follow up blood test and to also complete a survey that included information about whether they had been donating blood or plasma. A total of 29 ARFFS staff participated in the study. Out of these, 66%, had donated plasma at least once, and 15% had also donated blood. The number of donations ranged from 1-15 times. We assessed whether the number of donations were related to a change in PFAS serum levels[2].What

What Did We Find and What Does It Mean?

Decreasing PFAS serum levels were observed for most participants, whether or not they were donors.

The change in PFAS serum level[2] was related to the number of blood/plasma donations (**Figure 1)** - the greater the number of donations, the greater the decrease in PFAS serum level. These findings agree with previous research that showed that blood and plasma donations are associated with a more rapid decrease and lower PFAS serum levels[3].

This study provides evidence that the rate of elimination of PFAS can be increased by blood/plasma donation. People with higher PFAS levels may find it reassuring to know how PFAS serum levels can be reduced.

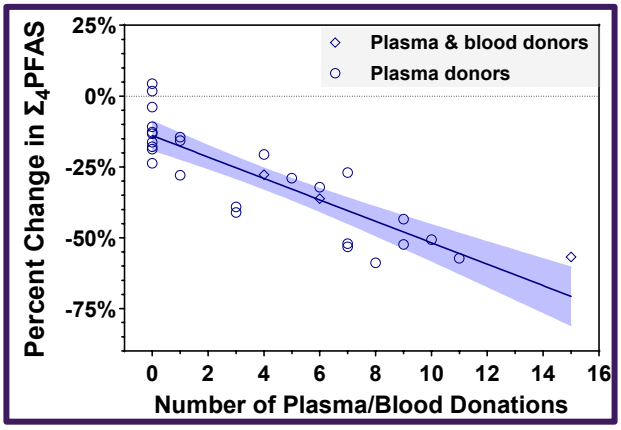

***Figure 1**. The relationship between blood donation and the percent change of the sum of PFOA, PFHxS, PFHpS and PFOS serum levels (∑4PFAS) in 29 study participants over the course of 8-11 months.*

References

1. Avalon Case Study Report
2. PFAS is measured in blood serum. This is the fluid portion of the blood. In this factsheet, 'PFAS serum level' represents the sum of the four dominant PFAS: PFOA (*Perfluorooctanoic acid)*, PFHxS *(Perfluorohexanesulfonic acid)*, PFHpS (*Perfluoroheptanesulfonic acid)* & PFOS (*Perfluorooctanesulfonic acid)*
3. Airservices Exposure Study II Report (2020), Nilsson et al. (2022), Gasiorowski et al. (2022), Genuis et al. (2014)

Frequently Asked Questions

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Question	Answer
Will the PFAS levels in my blood decrease even if I do not donate blood?	If you are no longer being exposed to elevated levels of PFAS, your PFAS levels will slowly decrease over time without any intervention. PFAS are naturally eliminated from the body through urine, faeces, or loss of blood (e.g., menstruation). As the body eliminates these chemicals, the PFAS level in blood will decrease.
My PFAS levels have not decreased. Am I still exposed to PFAS?	Due to the slow rate of elimination of PFAS, it is difficult to demonstrate a decrease in PFAS levels when blood tests are taken a short time apart. We recommend 2 years between tests to be able to document a decrease in PFAS levels if you are not a blood donor. When blood samples are analysed, the result can vary if the test is repeated. For PFAS analysis, the measured PFAS levels can vary up to 25% (higher or lower) when a test is repeated. If your PFAS levels have not changed, or increased compared to a recent blood test, it is possible that this may be due to this analytical variation. If you are concerned that you are experiencing elevated exposure to PFAS, another blood test may be necessary. It is also important to note that everyone has some background exposure to PFAS in their daily activities. We are exposed to PFAS through everyday products (e.g., water-resistant fabrics, non-stick cookware, cleaning, and personal care products), dust, air, food and water. This background exposure results in the presence of PFAS in our body. If your PFAS levels are very low, your blood tests may show little or no change in PFAS level over time.
Is it better to donate plasma or blood?	Our study did not look into whether there was a difference between blood and plasma donation. Because plasma donations can be made more frequently, it is possible that plasma donors may reduce their PFAS levels more quickly. However, both plasma and blood donations are effective in reducing PFAS levels.
I want to donate my blood, but I am not eligible to become a donor. What can I do?	Blood and plasma donations in Australia are arranged through Lifeblood. Not everyone can donate blood or plasma. You can see if you are eligible here: Lifeblood Eligibility There are three main reasons why you may not be able to donate blood. • Your age • Your blood is not eligible for donation (e.g., Hepatitis B positive). • You have a medical condition that prevents you from donating blood. If you cannot donate through Lifeblood, then you could discuss this issue with your GP. Sometimes a GP can arrange a venesection to be done at their clinic. This is only for blood donations, not plasma donations. Your GP will know if your health will allow you to have the venesection. Usually about 400 ml is taken with a venesection, but sometimes a person's health will only allow a smaller amount of blood to be taken such as 200 ml. Your GP will be able to explain how often this procedure can be done. Even small donations will still help the PFAS levels to reduce more quickly over time.
Should I be concerned that the person receiving my donated blood/plasma also receive PFAS?	Lifeblood have no concerns regarding the PFAS level in the donor's blood. People receiving blood and plasma are only given the blood/plasma if there is a serious need for this. This need outweighs any concern about PFAS. The blood is only a fraction of the blood that is circulating and if a person requires lots of blood, there will be many donors involved.
Where can I get more information?	**Further information about PFAS is available at the following links:** PFAS Australian Information Portal PFAS Factsheet - enHealth **Further information about PFAS and blood donation/venesections is available here:** General Information about blood donation **Further information about our studies:** Please use the study e-mail for any questions: PFASstudyUQ@uq.edu.au. Alternatively, you can call 1800 370 760