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**Submission to the Department of Health's  
Expert Health Panel for Per- and Poly-  
Fluoroalkyl Substances (PFAS)**

November 2017

## Introduction

The Policy and Advocacy Committees of the Australasian Faculty of Public Health Medicine (AFPHM) and the Australasian Faculty of Occupational and Environmental Medicine (AFOEM) of The Royal Australasian College of Physicians (RACP) commend the Australian government on establishing an Expert Health Panel to advise on the potential health impacts associated with Per- and Poly-fluoroalkyl Substances (PFAS) exposures and to identify priority areas for further research.

At a joint meeting of member representatives of the policy and advocacy committees of AFPHM and AFOEM, it was agreed that a submission be written to assist the expert panel in its investigation of the potential health effects of PFAS and to advise on research priorities.

We have provided our answers in the requested format and we have also summarised our position in an introductory statement with three main points, namely:

1. Health advice - The current Australian Environmental Health Standing Committee (enHealth) advice is likely to be confusing for the public. It weakens approaches that apply the precautionary principle when advising the public about food and water consumption at sites potentially contaminated with PFAS. We advocate for a change to the national health advice that incorporates the latest international evidence for adverse human health effects.
2. Perfluorooctane sulfonate (PFOS) ratification - The ratification of the Stockholm Convention PFOS 2009 listing, and consideration of a swifter ratification of the PFOA listing in 2019 may through a 'domestic treaty-making process' reduce exposures to PFAS in Australia.
3. State and Commonwealth inconsistencies - There is an inconsistency between the Queensland and Commonwealth legislation with regard to these firefighting foams. A ban on firefighting foam containing PFOA and PFOS should be implemented nationally so that inconsistencies between States and the Commonwealth are removed.

## Introductory statement

### 1. Health Advice

The USA Environmental Protection Authority's "*Drinking water advice for PFOA and PFOS*" provides the following summary: it states that its guidelines are: "...based on the best available peer-reviewed studies of the effects of PFOA and PFOS on laboratory animals (rats and mice) and were also informed by epidemiological studies of human populations that have been exposed to PFASs. These studies indicate that exposure to PFOA and PFOS over certain levels may result in adverse health effects, including developmental effects to fetuses during pregnancy or to breastfed infants (e.g., low birth weight, accelerated puberty, skeletal variations), cancer (e.g., testicular, kidney), liver effects (e.g., tissue damage), immune effects (e.g., antibody production and immunity), thyroid effects and other effects (e.g., cholesterol changes)."<sup>1</sup>

In 2016 the German Human Biomonitoring (HBM) Commission advised that:

*"Following evaluation of human epidemiological studies (status: July 2015/May 2016), the HBM Commission rates effects in the following areas **as well proven, relevant, and significantly associated with exposure to PFOA and/or PFOS:***

1. *Fertility and pregnancy -Time to wanted pregnancy-Waiting period for pregnancies >1 year - gestosis and gestational diabetes*
2. *Weight of newborns at birth*
3. *Lipid metabolism*
4. *Immunity after vaccination, immunological development*
5. *Hormonal development, age at puberty/menarche*
6. *Thyroid metabolism*
7. *Onset of menopause*<sup>2</sup>

<sup>1</sup> [https://www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories\\_pfoa\\_pfos\\_updated\\_5.31.16.pdf](https://www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf) [last accessed 14/11/17]

<sup>2</sup> [https://www.umweltbundesamt.de/sites/default/files/medien/355/dokumente/hbm\\_i\\_values\\_for\\_pfoa\\_and\\_pfos\\_0.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/355/dokumente/hbm_i_values_for_pfoa_and_pfos_0.pdf) [last accessed 14/11/17]

The British health advice lists “PFOA/PFOS Health Effects”<sup>3</sup> as follows:

- Toxic by ingestion
- Repeated exposure by ingestion can cause stomach upset, liver toxicity and effects on thyroid hormones
- Skin or eye contact can cause irritation
- Prolonged exposure may cause cancer

PFOS, its salts and perfluorooctane sulfonyl fluoride were listed under the Stockholm Convention on Persistent Organic Pollutants for restriction in 2009 concluding “that PFOS is likely, as a result of its long-range environmental transport, to lead to significant adverse human health and environmental effects, such that global action is warranted.”

PFOA, its salts and PFOA-related compounds were nominated for listing on the Stockholm Convention in 2015. In September 2016, the subsidiary body decided that these chemicals are likely, as a result of their long range environmental transport, to lead to significant adverse human health and environmental effects, such that global action is warranted.

The International Agency on Research on Cancer (IARC) has classified PFOA as a class 2b carcinogen (possibly carcinogenic to humans). In its opinion of 2 Dec 2011, the European Union’s European Chemical Agency<sup>4</sup> (ECHA) Risk Assessment Committee concluded that the evidence is sufficiently convincing to classify PFOA for developmental effects as: Repro. 1B- may damage the unborn child, and as STOT RE1(liver) – causes damage to organs (liver) through prolonged or repeated exposure.

The Australian Environmental Health Standing Committee (enHealth) - a standing committee of the Australian Health Protection Principal Committee - currently advises that *‘there is currently no consistent evidence that exposure to perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) causes adverse human health effects’* (enHealth, 2016).

EnHealth has released *“interim national guidance on human health reference values for per- and poly-fluoroalkyl substances for use in site investigations in Australia.”* These interim values are not however reflected in the health advice. We are concerned that the health advice “that there is currently no consistent evidence of health effects” could be interpreted to mean there is no unsafe dose and no health effects even for exposures above the interim values. We suggest that including a statement such as “at levels below the Tolerable Daily Intake (µg/kg/d); Drinking Water Quality Guideline (µg/L) and / or Recreational Water Quality Guideline (µg/L)” may be beneficial when discussing the difference between Australian advice for PFAS (as currently constructed) and international advice.

The existing enHealth advice as currently worded is highly problematic in that it does not adequately address the entire body of evidence demonstrating the association of PFAS with adverse human health effects; is inconsistent with the guidelines, health advice and classifications as referenced above; and takes the narrow view of evidence for causation alone.

All this taken together highlights that the current health advice is likely to be confusing for the public. It essentially weakens the concurrent approaches in Australia that apply the precautionary principle when advising the public about food and water consumption at sites potentially contaminated with PFAS. The approaches of some jurisdictions with regard to restricting the sale of potentially contaminated stock intended for human consumption is yet another example of such contradictory messages.

We therefore strongly advocate for a change to the national health advice that incorporates the latest complete body of evidence and that provides a more complete (if complex) picture of the evidence for adverse human health effects.

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[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/338258/PFOS\\_PFOA\\_General\\_Information\\_phe\\_v1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/338258/PFOS_PFOA_General_Information_phe_v1.pdf) [last accessed 14/11/17]

<sup>4</sup> <https://echa.europa.eu/documents/10162/8059e342-1092-410f-bd85-80118a5526f5> [last accessed 14/11/17]

## 2. Stockholm Convention PFOS ratification

The RACP commends the Department of the Environment and Energy which has released a Regulation Impact Statement (RIS) on options for a national phase-out of perfluorooctane sulfonic acid (PFOS) and related chemicals, including its salts and perfluorooctane sulfonyl fluoride (PFOSF).<sup>5</sup>

“PFOS, its salts and perfluorooctane sulfonyl fluoride were listed under the Stockholm Convention on Persistent Organic Pollutants for restriction in 2009. Australia is considering ratification of this decision, which requires a domestic treaty making process.” The consultation RIS, together with other information are intended to inform the Government's decision on ratification of the PFOS amendment to the Stockholm Convention.

The RACP and its Faculties note that Australia is one of 13 signatories that have not yet ratified the PFOS listing. The RACP supports the RIS analysis which found ratification of the Stockholm Convention listing of PFOS and banning of all non-essential uses would deliver the greatest net benefit to Australia and would effectively prevent the ongoing risk of accidental releases of PFOS by requiring its withdrawal from use. Australia's current non-ratification may have contributed to our legislation and action plan for PFOS being delayed when compared to the 174 countries that have ratified the decision. Ratifying the decision has contributed to environmental legislation and action in other countries.<sup>6</sup> (Examples are provided below) European Union – Persistent Organic Pollutants Regulation, 2010(EU-POP)

- Production, supply and use are now banned with some exemptions.

Canada Gazette June 2008

- As of June 2013 production, supply and use are banned with some exemptions for military use.

United States Environmental Protection Agency

- January 26, 2006 announced the “2010/2015 PFOA Stewardship Program”

In Australia, a Senate inquiry in 2016 identified significant contamination issues at a range of Commonwealth, state and territory locations. The contamination is predominantly linked to the use of firefighting foams, which previously contained perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).

The ratification of the PFOS 2009 listing, and the consideration of a swifter ratification of the PFOA listing in 2019 may through a ‘domestic treaty-making process’ reduce exposures to PFAS in Australia.

## 3. State and Commonwealth inconsistencies

In July 2016, the Queensland Department of Environment and Heritage Protection introduced a policy to ban the use of the firefighting foams containing PFOS and PFOA.<sup>7</sup> The Environment Protection Authority (EPA) in South Australia is undertaking public consultation on a draft amendment to the Environment Protection (Water Quality) Policy 2015 to include a ban on the use of fire-fighting foams containing PFOA and PFOS and chemicals that degrade to PFOA and PFOS.

There is an inconsistency between the Queensland and Commonwealth legislation with regard to these firefighting foams. This was highlighted recently when a firefighting foam spillage at a Qantas hangar occurred at the Brisbane Airport on Monday 10 April, 2017. This hangar was on Commonwealth land and was able to keep using PFOA and PFOS foam. Qantas has since banned the use of these firefighting foams nationally as have many other firefighting organisations, yet this is a decision of commercial entities and organisations; the legislative framework allowing the storage and use of these firefighting foams on Commonwealth land remains. This is another example of ‘mixed messages’ related to potential toxicity when one jurisdiction takes

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<sup>5</sup> <http://www.environment.gov.au/protection/chemical-management/pfas/ris-phase-out-pfos-consultation> [last accessed 14/11/17]

<sup>6</sup> <http://pubs.sciepub.com/ces/2/1/3/index.html> [last accessed 14/11/17]

<sup>7</sup> <https://www.qld.gov.au/environment/pollution/management/investigation-pfas/firefighting-foam> [last accessed 14/11/17]

action to protect the public from exposure whilst the Commonwealth (within that same jurisdiction) allows potential ongoing exposure.

A ban on firefighting foam containing PFOA and PFOS should be implemented nationally so that inconsistencies between States and the Commonwealth are removed.

## Responses to survey questions

We are making a submission on behalf of a group/organisation.

This is a joint submission by the Policy and Advocacy Committees of the Australasian Faculty of Public Health Medicine (AFPHM) and the Australasian Faculty of Occupational and Environmental Medicine (AFOEM) of The Royal Australasian College of Physicians.

### Exposure

#### 1. Why is PFAS exposure of interest to you?

PFAS exposure is of interest to both the AFPHM and AFOEM because of our professional expertise as specialist doctors who work in population health, occupational health and environmental toxicology. We have concerns about the potential adverse health effects on members of Australian public and Australian workers who may have been exposed to PFAS. It is possible that some of our patients and some of our members may have consumed food and or water originating from an area being investigated for PFAS contamination. AFPHM in particular takes a population view of potential national risks to health; the precautionary principle is intrinsic to public health and environmental health approaches to ensuring health and wellbeing at a population level. The precautionary principle has four central components: taking preventive action in the face of uncertainty; shifting the burden of proof to the proponents of an activity; exploring a wide range of alternatives to possibly harmful actions; and increasing public participation in decision making. All these principles lend themselves to action on PFAS and an alteration of the *status quo* with respect to both the health advice and to use of these substances.

#### 2. What sources of potential exposure to PFAS concern you the most?

1. Working in industries that use PFAS chemicals
2. Highly contaminated legacy sites with historical exposure to PFAS
3. Commercial produce
4. Drinking water
5. Contaminated soil
6. Home grown produce
7. Recreational swimming sites
8. Shower/ bathing water
9. Contaminated air
10. Skin contact with PFAS-containing products

#### Is there a potential source of exposure to PFAS not listed in the table that you are more concerned about?

Breastfeeding, pregnancy and in-utero exposures are also important. There is a need to consider the exposure routes and potential sources that are more likely to affect infants, young children and those in their reproductive age who may have higher health risks from PFAS exposure.

Sources that may result in the greatest lifetime cumulative exposures to the largest population cohorts should be prioritized.

### Concerns about health impacts

#### 3. How concerned are you about the following? Please use the scale below ranging from 1 (not at all concerned) to 5 (very concerned).

That you or your family's health has already been affected by PFAS?  
That you or your family's future health might be affected by PFAS?  
About avoiding exposure to PFAS?

**That you or your family's health is being indirectly affected by living in a PFAS Investigation area (e.g. stress and anxiety due to financial impacts, publicity or media attention?)**

The RACP, AFPHM and AFOEM represent many medical specialists throughout Australia and New Zealand with specific areas of professional expertise. It is therefore not possible to reflect individual views by responding to these questions in a 1 to 5 response format. However, the RACP, AFPHM and AFOEM are sufficiently concerned about the potential current and future adverse health effects of PFAS, both on individuals, populations and workers, to provide this submission.

**4. If you are concerned about exposure to PFAS, what potential impacts on human health from PFAS exposure are you concerned about?**

The USA EPA's "Drinking water advice for PFOA and PFOS" provides the following summary. It states that its guidelines are: "based on the best available peer-reviewed studies of the effects of PFOA and PFOS on laboratory animals (rats and mice) and were also informed by epidemiological studies of human populations that have been exposed to PFASs. These studies indicate that exposure to PFOA and PFOS over certain levels may result in adverse health effects, including developmental effects to fetuses during pregnancy or to breastfed infants (e.g., low birth weight, accelerated puberty, skeletal variations), cancer (e.g., testicular, kidney), liver effects (e.g., tissue damage), immune effects (e.g., antibody production and immunity), thyroid effects and other effects (e.g., cholesterol changes)." <sup>8</sup>

In 2016 the German Human Biomonitoring (HBM) Commission advised that:

*"Following evaluation of human epidemiological studies (status: July 2015/May 2016), the HBM Commission rates effects in the following areas as well proven, relevant, and significantly associated with exposure to PFOA and/or PFOS:*

1. *Fertility and pregnancy -Time to wanted pregnancy-Waiting period for pregnancies >1 year - gestosis and gestational diabetes*
2. *Weight of newborns at birth*
3. *Lipid metabolism*
4. *Immunity after vaccination, immunological development*
5. *5 Hormonal development, age at puberty/menarche*
6. *Thyroid metabolism*
7. *Onset of menopause* <sup>9</sup>

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<sup>8</sup> [https://www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories\\_pfoa\\_pfos\\_updated\\_5.31.16.pdf](https://www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf) [last accessed 14/11/17]

<sup>9</sup> [https://www.umweltbundesamt.de/sites/default/files/medien/355/dokumente/hbm\\_i\\_values\\_for\\_pfoa\\_and\\_pfos\\_0.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/355/dokumente/hbm_i_values_for_pfoa_and_pfos_0.pdf) [last accessed 14/11/17]

<sup>10</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/338258/PFOS\\_PFOA\\_General\\_Information\\_phe\\_v1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/338258/PFOS_PFOA_General_Information_phe_v1.pdf) [last accessed 14/11/17]



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The existing enHealth advice as currently worded is highly problematic in that it does not adequately address the entire body of evidence demonstrating the association of PFAS with adverse human health effects; is inconsistent with the guidelines, health advice and classifications as referenced above; and takes the narrow view of evidence for causation alone.

All this taken together highlights that the current health advice is likely to be confusing for the public. It essentially weakens the concurrent approaches in Australia that apply the precautionary principle in advising the public about food and water consumption related to sites potentially contaminated with PFAS. The approaches of some jurisdictions with regard to restricting the sale of potentially contaminated stock intended for human consumption is yet another example of such contradictory messages.

We therefore strongly advocate for a change to the national health advice that incorporates the latest complete body of evidence and that provides a more complete (if complex) picture of the evidence for adverse human health effects.

## Information and understanding

### **5. How informed do you feel on the following topics? Please use the scale below ranging from 1 (not at all informed) to 5 (very informed).**

The Policy and Advocacy committees of the RACP, the AFPHM and the AFOEM are highly informed in each of these matters. 5.

Levels of exposure to PFAS in specific communities

Research on the effects of PFAS exposure

Different ways people and communities may be exposed to PFAS

The Government's response to address the health concerns of communities exposed to PFAS

## Future health impact and exposure research priorities

### **6. How important is it that the Australian Government undertakes more research to understand the long-term health impacts of exposure to PFAS?**

This is an important area (4).

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<sup>11</sup> <https://echa.europa.eu/documents/10162/8059e342-1092-410f-bd85-80118a5526f5> [last accessed 14/11/17]



**7. Do you have a preference for research on preventing further PFAS contamination, or for methods to monitor and treat already exposed communities?**

Preventing more PFAS contamination  
Monitoring and treating existing PFAS contamination

Both are equally important.

**8. What areas of human health research do you think should be prioritised?**

**Research area Ranking (1 – 5)**

1. The potential health effects on workers exposed to high levels of PFAS at work (occupational exposure).
2. The potential health effects on communities that have experienced high exposure to PFAS due to contamination.
3. The potential health effects of PFAS exposure on vulnerable populations such as pregnant women, babies, young children and the elderly.
4. The best methods to minimise exposure to PFAS in individuals and communities.
5. The potential health effects on communities that have experienced lower background exposure to PFAS chemicals

**Is there an area of human health research not listed here that you would like to see prioritised for further research?**

Yes.

1. In view of recent scientific publications it would be beneficial to include immunotoxicity in risk assessments and research programs.
2. Bio-persistence / half-life in animal food stock that is removed from highly contaminated settings.
3. Establishing maximum thresholds for food and water in Australia.
4. Establishing correlations of historical and current environmental concentrations and exposure assessments with human and animal bio-monitoring levels.