

PFAS: Polyfluoroalkyl Substances: “Forever Chemicals” and the hidden dangers of clothing

As a brief review, PFAS (Polyfluoroalkyl substances) have been nicknamed “forever chemicals” because their unique chemistry makes them particularly persistent under typical environmental conditions. These “forever chemicals” break down very slowly, often building up in people, animals, and the environment. These PFAS substances have been around and in use since the 1940’s and while very useful, their toxicity is now becoming better understood.

According to the Agency for Toxic Substances and Disease Registry (ATSDR), PFAS can harm our heart, liver, reproductive, renal systems and cause certain cancers. There is some evidence that they can increase cholesterol levels and increase blood pressure in pregnant women, leading to birth defects and dangerous conditions such as pre-eclampsia (a condition in pregnancy characterized by high blood pressure, sometimes with fluid retention and proteinuria.). PFAS can change liver enzymes and decrease the vaccine response in children. The EPA has identified over 9,100 PFAS substances and they can be present in our water, soil, air, and food as well as in materials found in our homes or workplaces, including drinking water, fire extinguisher foam, manufacturing or chemical production facilities that produce or use PFAS substances, food packaging, household products, dust, personal care products, furniture and biosolids.

What about PFAS in clothing?

There could be more than just fashion risks involved when buying a pair of leggings or a raincoat.

Just how much risk is still not clear, but toxic chemicals have been found in hundreds of consumer products and clothing bought off the racks nationwide.

From production to being worn, washed, and then disposed, "PFAS in clothing and textiles can lead to harmful exposures," claimed Avinash Kar, a senior attorney at the National Resources Defense Council, an international nonprofit environmental advocacy organization.

Although the full health risks of wearing togs alleged to be toxic are still unknown, the potential implications are wide-reaching. A report from the National Academies of Sciences, Engineering, and Medicine linked PFAS exposure to cancer, thyroid dysfunction, minor changes in birth weight, and high cholesterol, among other concerns.

So how concerned should consumers be about wearing clothing with forever chemicals in them?

PFAS have been found in a wide variety of garments such as rain jackets, hiking pants, shirts and yoga pants and sports bras made by popular brands.

Forever chemicals are used as surface treatments to block water and stains. In fact, a 2022 report by Toxic-Free Future, an environmental health research and advocacy organization, found that nearly three-quarters of products labeled as water- or stain-resistant tested positive for them.

The group points to research demonstrating that fabrics with that type of PFAS, called side-chain fluorinated polymers, emit volatile chemicals into the air and, when washed, into the

water. "What you can expect is that a raincoat that has this surface treatment, over time, is releasing PFAS to the environment," said Erika Schreder, Toxic-Free Future's science director.

PFAS can also be used as a membrane — a thin layer sandwiched in the fabric that blocks water from passing through. Such breathable yet waterproof layers of fabric are used in jackets, pants, boots, and gloves in dozens of brands of outdoors wear. Sometimes, garments have both membranes and surface treatments.

A study published last year by the American Chemical Society found textile products sold in the U.S. and Canada contained high concentrations of PFAS in materials used in children's uniforms marketed as stain-resistant, a clothing item worn 8 – 10 hours per day.

Studying skin or "dermal exposure" from wearing fabric is particularly tricky. Just because a product contains PFAS does not mean the chemical will travel from that jacket or pair of shorts across the skin into the bloodstream," said Stuart Harrad, a professor of environmental chemistry at the University of Birmingham.

So far, Harrad has found that PFAS can end up — either from fabric or dust particles — in the skin's oil and sweat. But more research needs to be done to examine whether those chemicals transfer into the blood. "From what we've seen, it's certainly something that we shouldn't be ignoring," he said.

In general, however, it is harder for PFAS chemicals to enter the body through transdermal exposure than through the digestive system, said Dr. Ned Calonge, associate dean for public health practice of the Colorado School of Public Health who co-authored the national academies' report.

So where does that leave consumers? Calonge said that people who already have elevated levels of PFAS in their blood serum should have a heightened sense of awareness about the clothing they wear. Community-level blood testing is underway in areas with known PFAS exposure, but individuals can also seek it out by asking their doctors.

Summarized from: [Hannah Norman, "Raincoats, undies school uniforms: Are your clothes dripping in "forever chemicals"?" March 30, 2023, Kaiser Health News.](#)

Flame Retardants in Children's Products: Facts & Frequently Asked Questions Choosing Flame Retardant-Free Products

Children's garments, are held to a very high standard in regard to flammability. This can be a two-edged sword as flame retardants used in children's clothing, baby clothing, and nightwear, are made from PFAS chemicals. The clothing label has to display wording that states you meet BS-5722, which is the British Standard for flammability. If clothing does not meet these standards, you have to state on the label, "**KEEP AWAY FROM FIRE.**" This wording does carry some specific font and character requirements to ensure it can be read clearly. It must be in bold and red Arial font and in at least size 10pt in capital letters.

This is a labeling requirement that should always be adhered to as any failure to follow this requirement can have severe consequences for consumers if they are not fully informed. If you need further information, take a look at flammability standards detailed in The Nightwear (Safety) Regulations, 1985.

It's important for you to pick the safest products possible for your home. That means reading the label and doing research about your purchases. The information below will be helpful to you in this process.

Newer is Better. Manufacturers are less likely to use flame retardants now that there is increased awareness about potential harm they may cause. Older products are more likely to contain banned flame retardants (Polybrominated DiPhenyl Ether aka PBDE) which were replaced because of toxicity concerns.

Type of Materials: Children's products which contain urethane foam, such as cushions, padding and mats, childhood furniture, and toys are more likely to have been made with flame retardants because of the flammability of foam. Wool, down and polyester stuffing is less flammable and thus less likely to have needed retardants.

The reader is referred to <https://portal.ct.gov/-/media/DCP/migrated-docs/FlameRetardantFactSheet.pdf> for a more in-depth discussion on the various actions being taken by children product manufacturers and how best to protect your family.

FYI: There is no evidence of any PFASs in the Borough of Kutztown's wells or in our drinking water.

Please check out the following links for more detailed information:

www.epa.gov/pfas

www.greenmatters.com/p/pfas-chemicals

<https://www.cnn.com/2023/01/17/health/freshwater-fish-pfas-contamination-wellness/index.html>

<http://www.dep.pa.gov/PFAS>

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