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J&J Sunscreens Recalled for Carcinogenic Ingredients

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STORY AT-A-GLANCE

- Pharmaceutical testing company Valisure discovered 78 sunscreen products contain benzene, the highest levels of which were found in Neutrogena, Sun Bum, CVS Health and Fruit of the Earth products
- Two months after the report was released, Johnson & Johnson voluntarily recalled five of their products that tested positive for benzene, while the FDA considers what action they may take
- Most of the products positive for benzene were aerosol sunscreen products. One expert warns applying any aerosolized sunscreen product indoors may carry significant risk
- Research by the FDA demonstrates your body absorbs at least six of the active ingredients the agency tested, including oxybenzone that enhances the ability of other chemicals to penetrate the skin
- It is important to balance sun exposure to optimize vitamin D and protect your skin from sunburns. Zinc oxide and titanium dioxide are generally recognized as safe and effective when they are not nanosized

Beauty is big business. So, when a company that sells cosmetics volunteers to recall their products, it's an indication that something is drastically wrong.[1] Johnson & Johnson announced in July 2021 they were recalling five of their aerosol sunscreen products after an independent lab found benzene contamination in them in May 2021.

Another company whose products were found to contain benzene, CVS, followed by stopping sales of two of their sun products.[2]

The FDA published an announcement of Johnson & Johnson's voluntary withdrawal with this caveat at the top of the release: "When a company announces a recall, market withdrawal, or safety alert, the FDA posts the company's announcement as a public service. FDA does not endorse either the product or the company."[3]

Unfortunately, with this attitude, the FDA not only has earned itself a reputation for having a lack of oversight, but has allowed products to be sold without basic safety testing of the ingredients.[4] Sunscreen is just one of those products that fly under the radar until something either goes wrong or is investigated by outside agencies.

In this case, independent pharmaceutical testing company Valisure tested hundreds of sunscreen products and discovered that 78 of them contained benzene, a known carcinogen.[5]

This data, which triggered the Johnson & Johnson recall, is not the first to identify health problems, both human and environmental, that may be associated with sunscreen use. In fact, it was found that a different common ingredient in sunscreen — oxybenzone — damages coral reefs by causing deformities and bleaching. The equivalent of just one drop in 6.5 Olympic sized swimming pools is enough to cause damage.[6]

In Hawaii and the Caribbean, the levels of oxybenzone in the water is 12 times higher than the concentrations that cause damage to baby coral,[7] which triggered the governor of Hawaii to sign a bill in 2018 to ban sunscreens that harm the coral reefs.[8] The law took effect January 1, 2021, despite critics' claims that doing so reduced the availability of sunscreen ingredients for humans.

Hawaii has now proposed banning two more chemicals, avobenzone and octocrylene.[9] If enacted, it will go into effect January 1, 2023. Hawaii's actions have inspired Aruba, the Marshall Islands, U.S. Virgin Islands and Key West to pass their own sunscreen bans.

Benzene Detected in 78 Different Products

In the featured independent study, pharmaceutical testing company Valisure released a citizen's petition May 24, 2021, which contained the results of their tests on 294 batches of 69 brands of sunscreen.[10] The tests revealed benzene in 78 of the sunscreens and after-sun products tested.[11]

According to the citizens' petition,[12] the highest levels of benzene were found in Neutrogena, Sun Bum, CVS Health and Fruit of the Earth products. Not all these brands' products contained benzene, but the ones that did had at least 2 parts per million (ppm) or higher. One of the Neutrogena products, Ultra-Sheer Weightless Sunscreen Spray SPF 100 + contained 6.7 ppm. The specific Johnson & Johnson products recalled are:[13]

- Neutrogena Beach Defense aerosol sunscreen
- Neutrogena Cool Dry Sport aerosol sunscreen
- Neutrogena Invisible Daily Defense aerosol sunscreen
- Neutrogena Ultra Sheer aerosol sunscreen
- Aveeno Protect + Refresh aerosol sunscreen

According to Valisure,[14] the FDA says routes of exposure known to increase your risk from benzene are inhalation, ingestion and skin and eye contact. The FDA recognizes benzene as a Class 1 solvent that should not be used in consumer products. However, it also states, "… if their use is unavoidable in order to produce a drug product with a significant therapeutic advance, then their levels should be restricted."

As mentioned, after Valisure's testing, it was apparent that benzene is not a part of the formulation for all sunscreen products. This likely indicates that it is not a necessary component for the product to work and therefore does not fall under the special circumstances for which the FDA allows 2 parts per million (ppm).

Benzene is ubiquitous in the environment. Researchers have known that exposure is additive[15] and it increases your risk of cancers like leukemia and other hematological

cancers. There is growing evidence that it is associated with childhood leukemia. David Light, founder and CEO of Valisure, commented on the results of the study, saying:[16]

> *"Benzene is one of the most studied and concerning human carcinogens known to science. Its association with forming blood cancers in humans has been shown in numerous studies at trace levels of parts per million and below.*
>
> *The presence of this known human carcinogen in products widely recommended for the prevention of skin cancer and that are regularly used by adults and children is very troubling."*

In early June 2021, CBS News reported that Valisure had petitioned the FDA to recall all of the contaminated sunscreen products. The regulating body was reviewing the claim, but had taken no steps before Johnson & Johnson did their recall of five products.

An FDA spokesperson told the CBS News reporter, "The FDA takes seriously any safety concerns raised about products we regulate, including sunscreen."[17] Yet, the agency hasn't appeared to take any action on Valisure's request to order recalls, waiting instead for the manufacturers to voluntarily recall products and issue refunds. (According to The Washington Post,[18] an FDA spokesperson said the FDA doesn't have the authority to order recalls.)

As Valisure notes in their press release, the FDA has determined that because of the unacceptable toxicity of benzene, it should not be used in any "standard" pharmaceutical product.[19] However, the FDA has not established an exposure limit and the 2 ppm concentration only applies in special circumstances, which in this instance does not include sunscreen.

Expert Says Be Wary of Any Aerosol Sunscreen

Dr. Christopher Bunick, associate professor of dermatology at Yale University, believes even the 2 ppm limit established by the FDA in special circumstances is not safe, saying:[20]

> *"There is not a safe level of benzene that can exist in sunscreen products. Even benzene at 0.1 ppm in a sunscreen could expose people to excessively high nanogram amounts of benzene."*

In the analysis, Valisure found 14 sunscreen products with levels of benzene greater than 2 ppm and 78 that contained some level of benzene.[21] Twelve of the 14 products that contained the most benzene were also aerosol products. In fact, the majority of the 78 products identified with benzene were aerosol sunscreen products.

Martyn Smith, professor of toxicology at the University of California Berkeley addressed his concerns about benzene found in aerosol sunscreen products, and not those in the lotion and gels.[22] He believes that benzene would evaporate as it is aerosolized, reducing the risk it is absorbed into the skin.

However, it increases the risk for inhalation. He adds that although sprayed sunscreen increases the risk you will inhale benzene, "if you're outside the benzene will dissipate into very low concentrations quickly."[23]

He also cautions that applying aerosolized sunscreen indoors may carry significant risk because "there are a lot of volatile chemicals that are in there [aerosol sunscreen] apart from benzene that are propellants and other things that are coming out that you shouldn't inhale."[24]

FDA Finds Your Body Absorbs Active Ingredients in Sunscreen

In January 2020, the FDA[25] announced results from their sunscreen absorption study that was published in the Journal of the American Medical Association.[26] The researchers sought to find the plasma concentration of six active ingredients from sunscreen products.

They used lotion, aerosol spray, nonaerosol spray and pump spray formulations to assess the pharmacokinetics of avobenzone, oxybenzone, octocrylene, homosalate, octisalate, and octinoxate. The primary outcome measure was the maximum plasma concentration in 48 randomized participants who completed the trial.

The researchers found the participants absorbed significant amounts of the active ingredients, which led them to conclude the chemicals tested in all four formulations "were systemically absorbed and had plasma concentrations that surpassed the FDA threshold for potentially waiving some of the additional safety studies for sunscreens."[27]

This was a follow-up to a pilot study[28,29] that also showed your body absorbs chemicals at levels that could potentially pose health risks. In the pilot study, the participants applied 2 milligrams (mg) of sunscreen per square centimeter over 75% of their body four times a day for four days. Blood samples were collected over 21 days.

Researchers found that oxybenzone concentrations were far higher than the presumed safety threshold after just a couple of days' use. Despite this, the FDA continues to urge Americans to use sunscreen.

Oxybenzone Is Far From Harmless

In the pilot study discussed above,[30] researchers found that the participants' blood samples who applied formulations with oxybenzone had levels that exceeded 0.5 nanograms per milliliter (ng/mL) within two hours of a single application on the first day. This exposure exceeded 20 ng/mL by day seven.

It is significant to note that oxybenzone and several other active ingredients found in sunscreens enhance the ability of other chemicals to penetrate your skin. This can include toxic herbicides, pesticides and insect repellents.

One study[31] published in 2004 demonstrated that oxybenzone, octyl methoxycinnamate, homosalate, octyl salicylate, padimate-o and sulisobenzone significantly increase the absorption of herbicide 2,4-D. This can be of significant concern for agricultural workers who spend hours each day in the sun.

Oxybenzone is also an endocrine disruptor and research[32] published in 2018 warned it induces changes in the breast tissue when used during pregnancy and lactation. The authors noted:[33]

> *"These data suggest that oxybenzone, at doses relevant to human exposures, produces long-lasting alterations to mammary gland morphology and function. Further studies are needed to determine if exposure to this chemical during pregnancy and lactation will interfere with the known protection that pregnancy provides against breast cancer."*

Vitamin D Deficiency Is Another Concern

As you can see, the history of sunscreens involves long-standing, conventional advice to avoid unprotected sun exposure at all costs. However, this all-or-nothing attitude has likely done public health a great disservice.

The American Academy of Dermatology,[34] for example, stresses daily use of sunscreen to prevent skin cancer, regardless of weather conditions or skin pigmentation — two factors that simply cannot be overlooked when weighing the risks and benefits of sun exposure and sunscreen use.

Unfortunately, so many have been made to fear the sun that vitamin D deficiencies have become a serious problem,[35,36] as has been demonstrated during the COVID-19 outbreak.[37]

Research also suggests inadequate sun exposure may be correlated with the development of "specific cancers, multiple sclerosis, diabetes, cardiovascular disease, autism, Alzheimer's disease and age-related macular degeneration."[38]

Although it is important to avoid getting sunburned, this is why it's important to take care in determining the best way to accomplish your goal of getting vitamin D through proper sun exposure. Consistent and sensible sun exposure is vital for optimal health, but sunscreen products are not your only choice for protecting yourself from overexposure.

Internal Sun Protection and Other Sensible Sun Tips

As researchers in the 2019 pilot study[39] noted, titanium dioxide and zinc oxide are generally recognized as safe and effective as compared to a long list of sunscreen chemicals whose safety is still under investigation. Both also protect against UVA and UVB rays. However, using sunscreen every time you're in the sun blocks your body's ability to produce vitamin D.

Seek out a balanced approach to sensible sun exposure. You can use clothing to protect your skin when you're outside for long periods, which reduces your risk of sunburn. Consider eating plenty of antioxidant-rich fruits and vegetables to help protect your skin. An astaxanthin supplement is an effective internal sunscreen, protecting your skin from UVA radiation damage.

If you do use zinc oxide or titanium dioxide sunscreen, take care not to use products that are nanosized. Remember to give your body a chance to produce vitamin D before applying sunscreen. Stay out just long enough for your skin to turn a very light shade of pink. Additionally, shade your face from the sun by using a safe sunscreen or hat. Your facial skin is thin and more prone to sun damage, such as premature wrinkling.

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