

# Chemicals in indoor swimming pools could be harmful, three studies show

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Swimming is terrific exercise, but people who regularly swim in indoor pools may be exposing themselves to some health risks from the chemicals used to disinfect pools, according to new research.

The concern is over what are called disinfection byproducts. These substances form in pool water from reactions between disinfectants such as chlorine and organic matter that is present naturally in the water or is introduced by swimmers from sweat, skin cells and urine. Long-term exposure to the substances has been linked to an increased risk of bladder cancer. Disinfection byproducts are also found in drinking water, and the amounts found in swimming pools and drinking water are similar. However, indoor pools may pose a bigger health risk from the substances because people have higher uptake of the compounds by breathing them from the air or through skin contact.

In one of three studies published Sunday in the journal [Environmental Health Perspectives](#), researchers collected blood, urine and exhaled air samples from 49 non-smoking, healthy adults before and after they swam in an indoor, chlorinated pool for 40 minutes. They found that, after swimming, concentrations of four biomarkers suggested toxicity from disinfection byproducts.

A second study measured short-term changes in several respiratory biomarkers to explore potential lung damage from swimming pool exposure. Among 48 people who swam for 40 minutes, researchers found a slightly higher level of one marker that indicates cell damage in the lungs.

A third study looked at differences in public swimming pools that disinfected with chlorine or bromine. Researchers found levels of disinfection byproducts were similar in chlorinated and brominated pools. However, they found more than 100 different disinfection byproducts, some of which have not been previously reported in either swimming pool or drinking water.

The research does not mean that the significant health benefits of swimming are outweighed by the potential risks from chemical by-products. The studies are preliminary, the authors noted, and long-term research is needed to reduce any potential health damage from pool chemicals. However from the results it would be prudent to apply caution in respect of swimming in highly chlorinated pools.

"Despite the public health relevance, only a few studies, most rather recent, have investigated the chemistry and potential health effects of swimming pool water," the authors wrote.

-- Shari Roan / Los Angeles Times