Growing Evidence of Fracking's Health Risks

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* Experts are saying that extraction of natural gas by fracking may have health risks we are only beginning to understand. Here’s why they're pushing back against the fracking boom.



**Links between fracking and potential health risks raise concerns.**

NEED TO KNOW

Among water contaminants found at fracking sites are chemicals that can [**disrupt normal hormone function**](http://www.everydayhealth.com/columns/jackie-arnett-green-plate-special/could-hormone-disrupters-in-our-food-be-leading-to-obesity/).

[**Polluted air**](http://www.everydayhealth.com/allergy/air-pollution-hurts-kids-moms.aspx) is potentially dangerous for people with health problems like asthma.

Radioactive materials can [**contaminate water**](http://www.everydayhealth.com/healthy-home/food-and-water/improve-drinking-water-at-home.aspx) after fracking.

A growing body of medical evidence links fracking, the politically controversial process of natural gas extraction, to specific health risks, said a group of health professionals in a recent open [letter to New York Gov. Andrew Cuomo](http://concernedhealthny.org/wp-content/uploads/2014/05/Medical-Experts-to-Governor-Cuomo-May-29FINAL.pdf) and acting state health commissioner Howard Zucker.

Fracking, also called hydraulic fracturing, uses water and chemicals mixed with sand to blast open hidden gas reserves deep under the earth’s surface.

Fracking has faced opposition around the globe because the chemicals used in the process may contaminate air and water, and also affect the [food supply](http://documents.foodandwaterwatch.org/doc/FrackingFoodSystem.pdf), according to the nonprofit advocacy group Food and Water Watch. One public health concern about fracking is the potentially toxic and [hormone-disrupting chemicals](http://www.endocrine.org/~/media/endosociety/Files/Publications/Scientific%20Statements/EDC_Scientific_Statement.pdf) — described in a recent Endocrine Society Scientific Statement — used in the blasting process, as well as radiation and methane gas released from the ground at fracking sites.

“What concerns me the most about fracking is the almost complete lack of comprehensive study of health risks,” said [Susan Nagel, PhD](http://medicine.missouri.edu/obgyn/susan-nagel-phd.html), a researcher of the Department of Obstetrics, Gynecology and Women’s Health at the University of Missouri in Columbia, whose work is focused on the effects of hormone-disrupting chemicals in the environment.

Why Researchers Recommend Caution on Fracking

Fracking has been banned in New York State since 2008. Doctors, nurses, scientists and other health workers who are part of [Concerned Health Professionals of New York](http://concernedhealthny.org/), the group that sent the open letter to New York officials, are calling for an extension of three to five years on the state's fracking ban.

The Concerned Health Professionals spelled out fracking-related health risks in the open letter, which was signed by 25 health and medical organizations, including the New York Chapter of the American Academy of Pediatrics and the American Lung Association of New York, as well as more than 200 individual health professionals. The letter points to new data on potential health dangers of fracking, and follows a similar call for a ban from the [Medical Society of the State of New York](http://www.mssny.org/) (MSSNY).

"A three- to five-year fracking ban will allow the emerging science to become clearer," said [Sandra Steingraber, PhD](http://steingraber.com/), biologist and co-founder of Concerned Health Professionals of New York. Instances of health harms have been reported in areas of the United States — places like Pennsylvania and Texas — where fracking has been used for years. The environmental consortium Environment America has published individuals' accounts of their experiences with toxic chemicals in drinking water and blood samples, and high levels of cancer-causing chemicals in the air, in [Shalefield Stories](http://www.environmentamerica.org/reports/ame/shalefield-stories). "I fully believe that, three to five years hence, the evidence for harm will be so overwhelming that a decision to go forward with fracking in New York will become unthinkable," Dr. Steingraber said.

5 Possible Health Risks of Fracking

Toxic chemicals, gas leaks, radiation and more — here are five ways the health experts’ letter warned that fracking may threaten health, based on recently published evidence:

**1. Harmful chemicals can contaminate water at fracking sites.** [Hormone-disrupting chemicals](http://www.medpagetoday.com/Endocrinology/GeneralEndocrinology/43452) were among the contaminants found in water supplies at fracking sites. Of the chemicals used in the fracking process, many are substances that can act like the human hormones estrogen and androgen while others block the activity of these hormones. In a [study of 39 groundwater samples](http://press.endocrine.org/doi/pdf/10.1210/en.2013-1697) taken near fracking sites by Dr. Nagel and others, they found higher levels of chemicals that could block estrogen, compared to specimens not near fracking sites.

**2. Methane gas can leak at fracking wells.** Even new [fracking wells can leak](http://www.psehealthyenergy.org/data/PSE__Cement_Failure_Causes_and_Rate_Analaysis_Jan_2013_Ingraffea1.pdf), and over time more of the wells leak — releasing methane gas, according to researchers at the advocacy group Physicians, Scientists & Engineers for Healthy Energy. Odorless and colorless, methane gas is not only explosive; it can also cause health problems if it contaminates air and drinking water. Methane contamination can cause a person to feel tired or dizzy and have headaches. Long-term effects of these gas leaks are not yet clear.

**3. Earthquakes can result from fracking-waste disposal.** Fracking waste injection into deep wells may have triggered earthquakes in Oklahoma, according to the [U.S. Geological Survey](http://www.usgs.gov/newsroom/article.asp?ID=3819#.U4jjVfldXTo). The earthquakes have yet to be directly linked to hydrofracturing. In New York, health experts warned in the May 29th letter that earthquakes from fracking — or fracking waste disposal — could affect the drinking water supply for millions in New York City. "Seismic damage to these aqueducts that results in a disruption of supply of potable water to the New York City area would create a catastrophic public health crisis," the letter notes.

**4. Radioactive materials can contaminate water after fracking.** Fracking wastewater has been found to [contain radioactive substances](http://www.sciencedirect.com/science/article/pii/S0883292712002752), by Lara Haluszczak and others at Pennsylvania State University, in waste that flows back to the surface after blasting to recover natural gas deposits. While underground, this naturally occurring radiation does not pose a health risk. Once it emerges in fracking wastewater, however, analysis by graduate student researcher Andrew Nelson and others at the University of Iowa found that radioactive [radium contaminated water sources](http://pubs.acs.org/doi/abs/10.1021/ez5000379). Long-term exposure to radium raises the risk of developing lymphoma, leukemia, and bone cancer, according to the U.S. Environmental Protection Agency.

**5. Air pollution levels may rise in areas where there is fracking.** Levels of cancer-causing pollutants like silica dust, ozone, and the chemical benzene should be monitored more carefully to see if they are [on the rise in fracking areas](http://www.utexas.edu/news/2014/03/27/hydraulic-fracturing-texas/), according to Rachael Rawlins at the University of Texas, Austin. The pollutants come from fracked gas wells, gas that escapes, and even fracking pits that store waste. This contaminated air is potentially dangerous for people with health problems like asthma, and for children.

The Problem of Hormone-Disrupting Chemicals

Higher concentrations of harmful chemicals specifically used in fracking have been found in ground and surface water in areas undergoing fracking, as the recent study from Nagel and others showed. Nagel explained that chemicals related to human hormones cause the most concern because they can prevent the female hormone estrogen and the male hormone androgen from functioning normally in the body — and therefore affect health across all ages and genders.

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“We absolutely need estrogen and androgen to get pregnant and to stay pregnant,” said Nagel, who noted that hormone-disrupting chemicals can damage a woman's ability to get pregnant and stay pregnant, and increase risk of breast cancer. In men, hormone-disrupting chemicals can cause reduced sperm counts and infertility, she said. Nagel added that in children, these chemicals could interfere with normal psychological development. “The most sensitive endpoints [for children] are behavioral,” including increased hyperactivity, she said.

"The immediate impacts that concern me most are those that result from exposure to fracking-related air pollution," said Steingraber, including pollution from leaks of both methane and benzene.

"These kinds of pollutants are linked to heart attack, stroke risk, and cognitive decline among adults, as well as asthma and cancer in children, and low birth weight among infants. We are starting to see some of these impacts in heavily fracked areas," Steingraber said. According to an April 2014 Physicians, Scientists & Engineers for Health Energy report published in [Environmental Health Perspectives](http://ehp.niehs.nih.gov/1307866/), studies suggest fracking contributes to air pollution known to be associated with rising health risk rates. The authors noted more research is needed to understand possible health outcomes faced by people living near fracking operations.

“It should be the government’s job to keep us safe and protect our water,” said Nagel. Until a comprehensive health assessment is completed and a consensus reached about the extent of fracking's possible health risks, protecting public health is going to be difficult. According to a [Preventive Medicine and Family Health Committee of the MSSNY](http://nysaap.org/update-on-hydrofracking/) report, the potential benefits of fracking cannot yet be balanced with the health risks.

Susan Nagel PhD