

Why Every Medical Practice Must Include **Environmental Medicine**

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Why Include Environmental Medicine?

**90,000 chemicals in current use...very few with any testing whatsoever:
Issues related now abound**

- Increase in incidence of PCOS & female infertility
- Increase in male fertility – low testosterone, sperm ct
- Increase in autoimmune disease, asthma, & allergies
- Increase in Autism Spectrum Disorder & ADHD
- Increase in chronic infections – vaginal, Lyme Dx, viral
- Increase in levels of anxiety & depression
- Increase in atrial fibrillation
- Increase in certain cancers



Environmental Toxicants Linked to Illness

Cancers

Autoimmunity

Headaches and Neurological problems

Digestive problems

Skin problems

Mood disorders

Cardio-metabolic Disorders

Infertility

ADHD, Autism Spectrum Disorders



Environmental Medicine Matters!

- Every year more than **13 million deaths** worldwide are due to environmental pollutants
- Approximately **24% of diseases are caused by environmental exposures** that might be averted through preventive measures
- Evidence links environmental pollutants with **epigenetic variation, including changes in DNA methylation, histone modifications and microRNAs**

Think... Environmental Etiology

- **Odor sensitivity:** tip-off for a chemical or environmental contributor to patient's malfunction—perfumes, food additives, detergents, fabric softener, newsprint, phenols, alcohols, natural gas, gasoline fumes, car exhausts, pesticides, formaldehyde, cigarettes, wood smoke
- **Recurrent & chronic infections** in sinuses, bronchi, throat, bladder, vagina – can be related to environmental factors

Think... Environmental Etiology

IF YOUR PATIENT COMPLAINS OF...

- Abdominal bloating, sleepiness after eating, chronic gas, diarrhea or constipation, pain in abdomen...diagnosis of irritable bowel syndrome, duodenal ulcer or duodenitis, nonspecific colitis, Crohn's Disease
- Look into food allergies, food additives, drinking water contaminants, mold sensitivity, cytotoxin overload, air pollution as agents

Think... Environmental Etiology

- **Symptoms:** Chronic Fatigue, arrhythmias, heart failure, GI upset, cerebral dysfunction, fibromyalgia, neuropathy...
- **Think:** food allergies, food additives, mold, mycotoxins, volatile organic hydrocarbons, heavy metals, particulate dust, car exhausts, mold and mycotoxins....

Biotoxins: Mold is an Environmental Hazard

BLACK MOLD: *Stachybotrys chartarum*

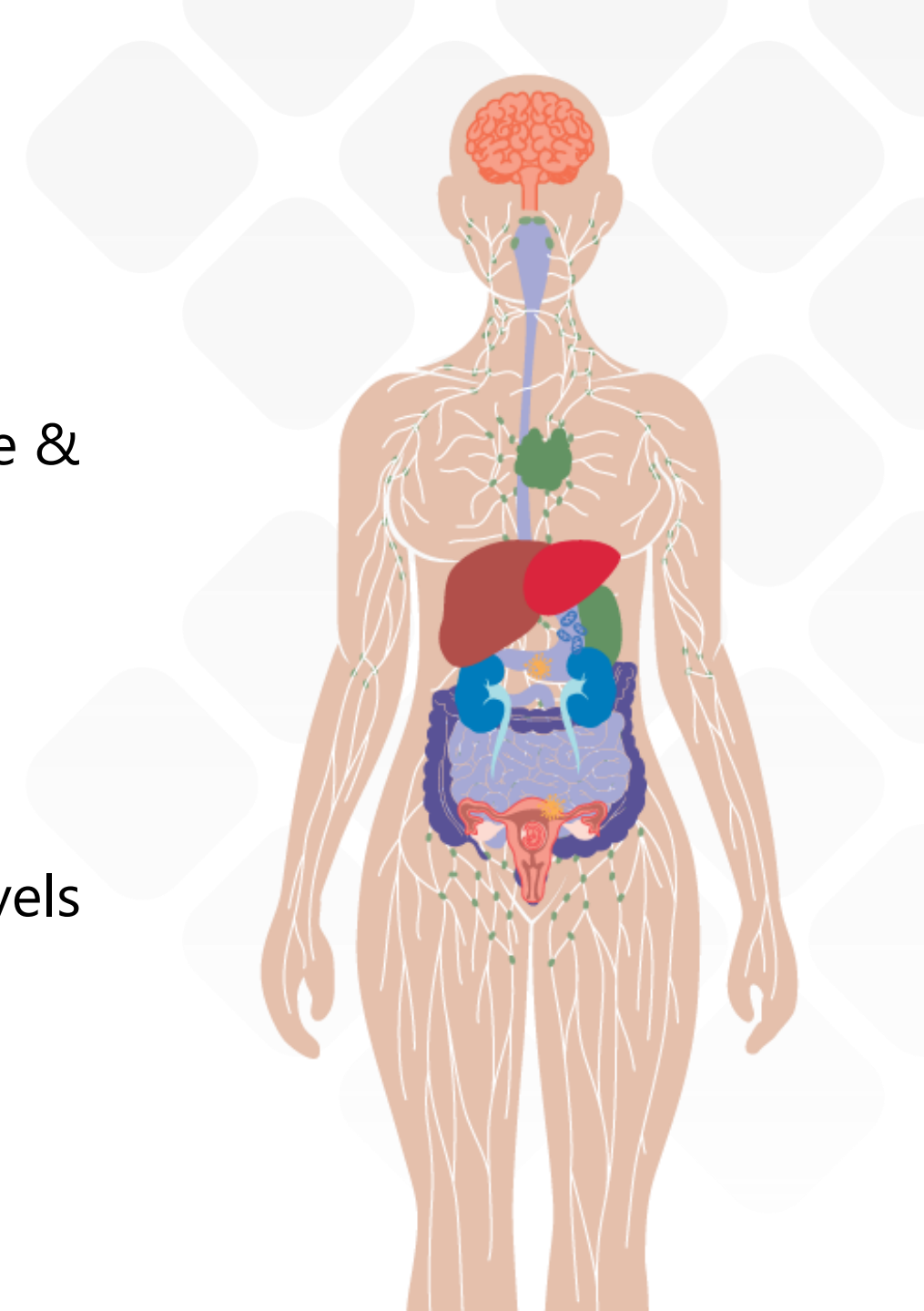


Here is a picture of black mold growing on a ceiling, which often happens after a roof has been leaking for a while. If you see mold on your ceiling, there is a good chance you have mold in your attic, as well.

Patient Example

MAN

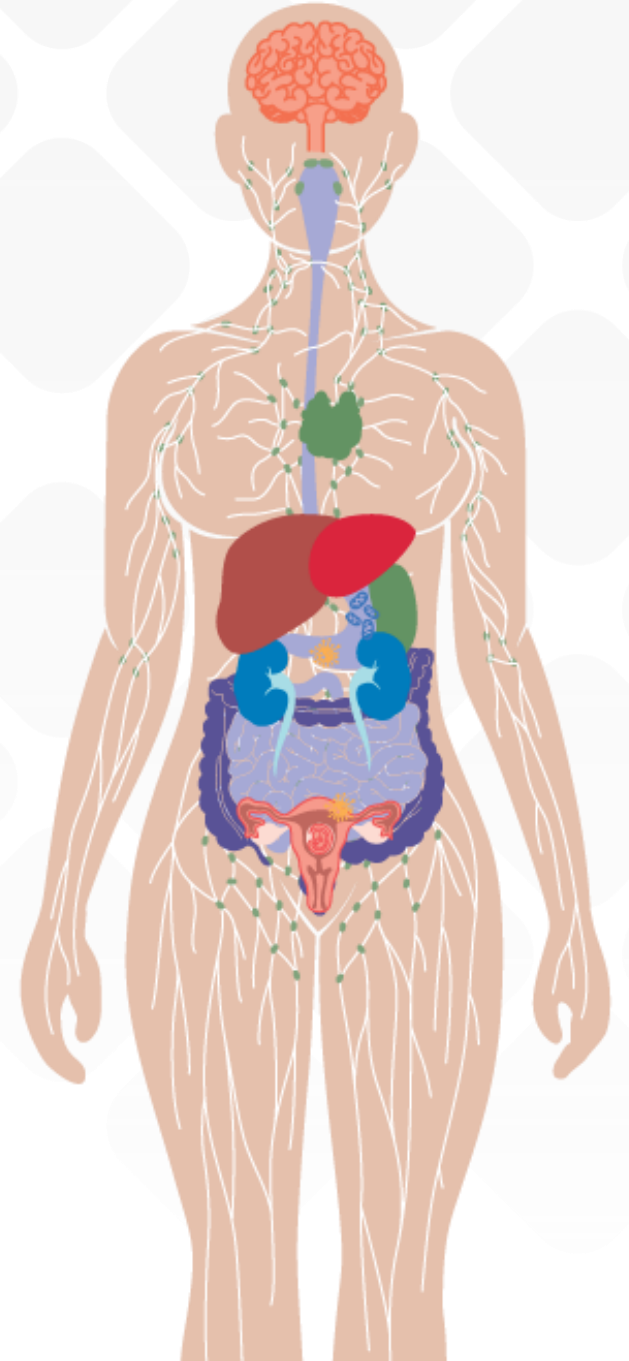
- Man developed incapacitating chronic fatigue & fibromyalgia-his office was extremely moldy
- Mold cultures showed high levels *Aspergillus niger*, ochratoxins, & *Stachybotrys*
- Mycotoxin levels in urine showed elevated levels of aflatoxin, ochratoxin, and trichothecene



Patient Example

15-YEAR-OLD GIRL

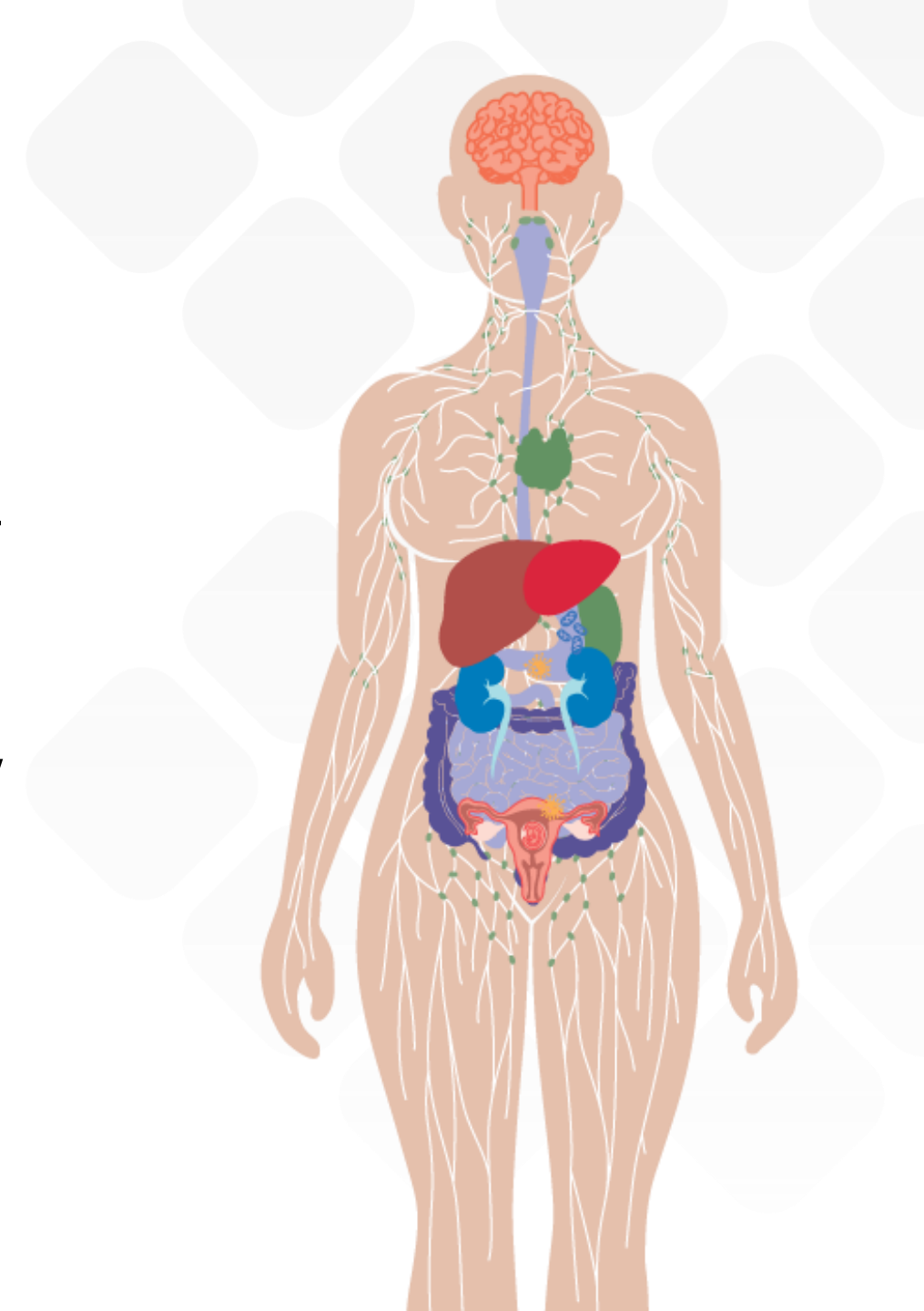
- C-Section, bottle fed
- Mom insisted she was born with a sinus infection!
- Chronic sinusitis, asthma, allergies, fatigue, foggy brain, ADHD, antibiotics, tonsillectomy
- Grew up in a house with known Black Mold in England, finally moved 1 year ago but kept all the same furniture!



Patient Example

11-YEAR-OLD GIRL

- Living within 3 blocks of the 405 freeway her entire life has significant allergies & asthma – especially triggered by exercise
- She also gets frequent episodes of bronchitis, sinusitis, headaches, & suffers from attention deficit disorder



Diesel Exhaust: A Big Problem for Kids

“Dirty Buses, Sick Kids” – NY Times

Old school buses run on diesel fuel - emit toxic mix of gases, including nitrogen oxides associated with asthma & worsening lung disease.

Diesel exhaust seeps into bus cabin - directly sickening children (levels inside up to 4X greater than in cars)



Air Pollution is Very Harmful: Views of Air Pollution in Beijing



Toxic Air in Salt Lake City, Utah

Toxic Fog Creates Health Emergency in Salt Lake City

Published:

Associated Press



Polluted Snow!

Forget yellow snow, you shouldn't eat any of it! The white stuff acts as a sponge for **pollutants** emitted by car exhausts

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SELECTION

- Scientists in **Canada** found that snow acts as a sponge for pollutants
- They used a snow chamber, into which they added diluted exhaust fumes
- In just one hour the level of pollutants in the snow more than doubled
- The findings could have a particularly significance when snow falls in industrial areas, leaving toxic pollutants when it melts

Air Pollution Kills

Premature deaths attributed to particulate pollution rose in 2013 after falling in previous years, government figures show



The rise in deaths attributed to air pollution was announced as scientists warned of high particulate pollution across much of London and south-east England. Photograph: Trevor Aston/Alamy

The number of premature deaths attributed to particulate pollution has risen, [government figures show](#).

According to [Public Health England](#), the percentage of premature deaths attributable to minute particles known as PM2.5s rose to 5.3% in 2013 in England from 5.1% in 2012. The death rate in London rose to 6.7% from 6.6%. The figures follow significant improvements in air quality across England in 2010 and 2011.

Environmental Cardiology

- Accumulating evidence suggests exposure to pollutants and chemicals could elevate the risk of cardiovascular disease
- Fine particles in ambient air/particulate air pollution can result in:
- Ischemic heart disease, arrhythmias, heart failure, increases in peripheral thrombosis, & atherosclerotic lesion formation

Pesticides: Toxins in the News

Commentary: Federal foot-dragging must end on dangerous pesticide

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Austin Valley/flickr

Amid mounting pressure and health concerns, the EPA needs to ban chlorpyrifos from our farms to protect consumers, farmworkers

January 4, 2016

Data Base for Pesticide Information



National Pesticide Information Center

1.800.858.7378 FREE

npic@ace.orst.edu

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Pesticide Use Around Pets

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Pesticides and Perinatal Exposures

- Mother's exposure to pesticides before, during and after pregnancy may increase risk of infant leukemia diagnosed before the age of 2 (Brazilian study)
- Children are twice as likely to develop rare cancers if mothers exposed three months before conception... compared to mothers with no exposure

Glyphosate Politics

ENVIRONMENT

Thu Jan 21, 2016 | 4:37 PM EST

Monsanto sues to keep herbicide off California list of carcinogens

By *Karl Plume*

CHICAGO (Reuters) - Monsanto Co stepped up its defense of a widely used weed killer on Thursday by filing a lawsuit in California seeking to prevent glyphosate, the main ingredient in its Roundup herbicide, from being added to the state's list of known carcinogens.

The seed and agrochemicals company said it filed the suit against the state's Office of Environmental Health Hazard Assessment (OEHHA) and the agency's acting director, Lauren Zeise, in California state court, according to the filing seen by Reuters.

California law requires the state to keep a list of cancer-causing chemicals to inform residents of their risks.

OEHHA said in September that it planned to add glyphosate to the list after the World Health Organization's International Agency for Research on Cancer (IARC) classified it as a probable human carcinogen last March.

Monsanto has disputed assessment, citing decades of studies deeming glyphosate safe, including a 2007 study by OEHHA that concluded the chemical was unlikely to cause cancer.

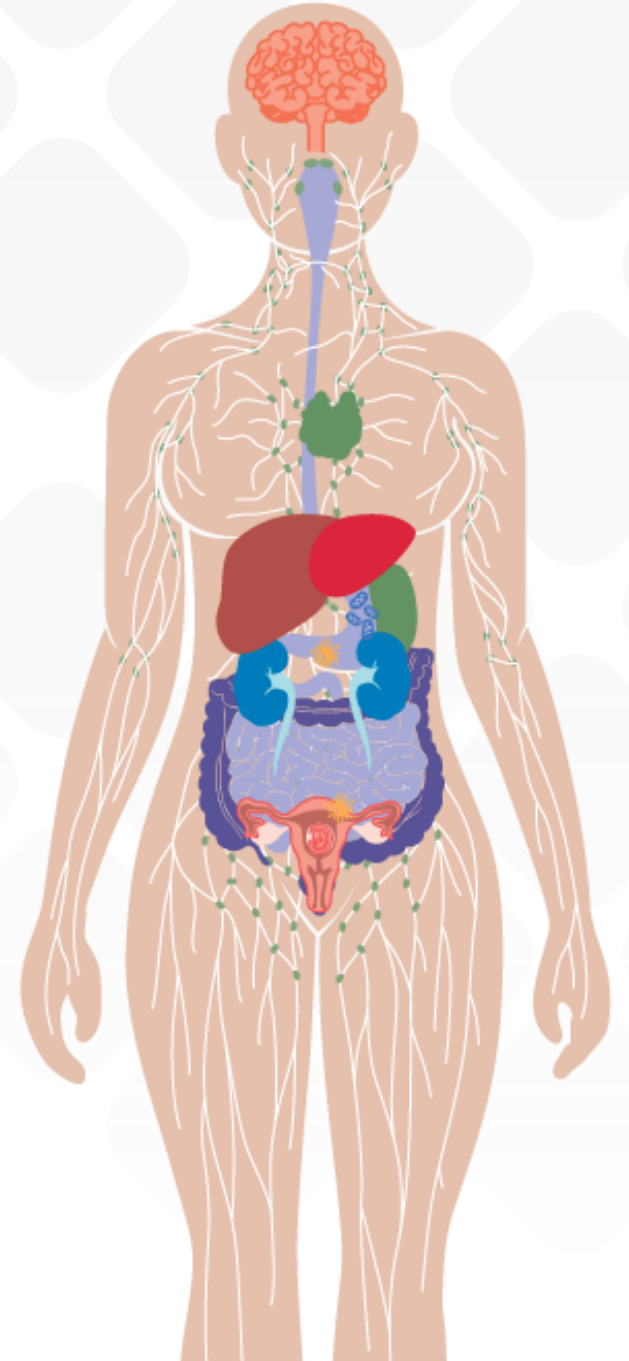
"The IARC classification of glyphosate is inconsistent with the findings of regulatory bodies in the United States and around the world, and it is not a sound basis for any regulatory action," said Phil Miller, Monsanto's vice president of regulatory affairs.



Patient Example

35-YEAR-OLD WOMAN

- Developed a sore throat 4X a year... then sinusitis...bronchitis...then cystitis
- 3 years of suffering followed
- Labs showed a leukopenia and low Serum IgA
- Environmental finding: worked in a flower shop where many pesticides were used on the plants-suppressed her immune system
- Elimination of daily pesticide exposures-immune system normal - infection & antibiotic free X5 years to date



Environmental Cardiology

- Exposures to arsenic, lead, cadmium, pollutant gases, solvents, & pesticides affect cardiovascular health
- Attributed to changes in synthesis or reactivity of nitric oxide due to environmental oxidants & increased endogenous production of reactive oxygen species

Toxicants Found in the Great Lakes

New year, old pollutants for popular Great Lakes sport fish

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Still on their slow decline, long-banned pollutants still “dominate” chemical loads for predator fish such as walleye, trout

January 11, 2016

By Brian Bienkowski
Environmental Health News

Toxic banned chemicals like DDT and PCBs are declining in the Great Lakes food chain, but the long-lived compounds still dominate the chemical load in top predators such as walleye and lake trout, based on a new review.

“We realized 35 years ago that these might build up and be harmful,” said Thomas Holsen, an engineering professor at Clarkston University who studies Great Lakes chemicals. “The lesson is we have to be careful about what we use going forward ... the impact of using chemicals we probably shouldn’t use can last a long time.”

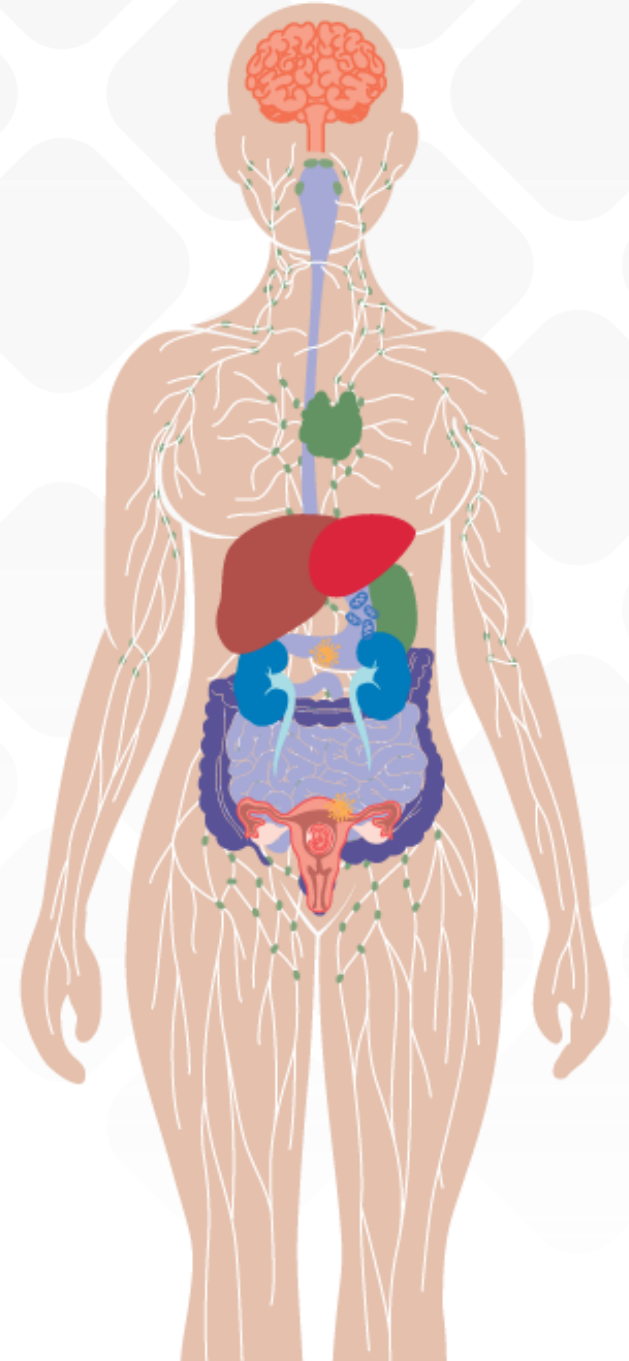


The findings are further evidence of the long shadow cast by pollution from decades ago. It also suggests that mandatory and voluntary elimination of some newer contaminants, such as flame-retardants, seems to be working: they aren’t building up in fish as much as legacy pollutants have.

Patient Example

65-YEAR-OLD MALE

- Obesity, foggy brain, fatigue, history PE, pre-diabetes, scent sensitive, hypogonadism, hypertension, recent occurrence of a mild Lacunar CVA
- History: Vacationed summers with family, fished in Lake Michigan, also solvent exposures on military base for many years, pesticide exposures on grass and chronic exposure to artificial turf (soccer coach), radiation exposure in Nevada, sleeps on a memory foam mattress



Breathing in Chicago is Risky



Environmental Health **NEWS**



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Long-banned chemicals still in paint, contaminating Chicago's air

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urbanfeel/flickr

Hundreds of pounds of toxic PCBs, banned in the '70s, taint Chicago's air each year; sources include paints still sold on the market

October 21, 2015

By Brian Bienkowski

PCBs Linked to CVD

Polychlorinated biphenyls and links to cardiovascular disease.

Perkins JT, et al. Environ Sci Pollut Res Int. 2015.

[Show full citation](#)

Abstract

The pathology of cardiovascular disease is multi-faceted, with links to many modifiable and non-modifiable risk factors. Epidemiological evidence now implicates exposure to persistent organic pollutants, such as polychlorinated biphenyls (PCBs), with an increased risk of developing diabetes, hypertension

POPs Cause Mitochondrial Dysfunction & Metabolic Syndrome

Persistent organic pollutants, mitochondrial dysfunction, and metabolic syndrome

Ann. N.Y. Acad. Sci. 2010, Vol 1201: 166–176

- **Much evidence has emerged showing that environmental toxins, including POPs, affect mitochondrial function and subsequently induce insulin resistance**
- **Possible mechanisms include oxidative stress, persistent inflammation, and lipotoxicity**
- **By damaging mitochondria, POPs may play a significant role in the obesity epidemic**

Obesity Not Just About What One Eats

NEWS

Posted January 6 | Updated January 6

INCREASE FONT SIZE **A⁺**

UNH study links flame retardant chemicals to obesity

Fat cells in exposed rats develop a sensitivity to hormones that is also exhibited by people who are overweight, the study finds.

THE ASSOCIATED PRESS

Share      Comment

DURHAM, N.H. — A recent University of New Hampshire study has concluded that chemicals used in flame retardants commonly found in household items can lead to insulin resistance and potential obesity.

More Bad News on Flame Retardants

- Chlorinated organophosphate flame retardants replaced polybrominated diphenyl ethers (PBDEs). Inhalation is major route of exposure – ubiquitous in indoor air!
- Found in children's car seats, baby strollers, furniture, building insulation
- Flagged as carcinogens, cause reproductive problems, hamper brain development, alter hormones

Inhaling Flame Retardants



Environmental Health **NEWS**

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As Washington state decides on stronger toxics law, residents are breathing flame retardants

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Researchers report inhalation is an important exposure route for new generation of flame retardant chemicals

January 25, 2016

By [Brian Bienkowski](#)
Environmental Health News

A new generation of chemicals added to furniture, building insulation and baby products like car seats to slow the spread of flames are escaping into air at higher levels than previously thought, according to a new study out of Washington state.

The findings come as Washington lawmakers decide on bolstering flame retardant bans. The state was one of the first to ban an earlier generation of retardants, known as PBDEs.

The new research found flame retardant chemicals used to replace polybrominated diphenyl ethers (PBDEs) also escape, are ubiquitous in indoor air and suggest inhalation is a major route of exposure for people.

The compounds, called chlorinated organophosphate flame retardants, found in the study have been linked to cancer and reproductive problems, and some can alter hormones essential for development.

Unexpected Toxins in Our Homes

Home, sweet home: how to combat the 'indoor pollution' of scented candles

Air fresheners and cleaning products release chemicals that are harmful in enclosed spaces. But houseplants could help cut the risks



Cancer and Environmental Toxins

BPA:

Breast & Prostate

ORGANIC SOLVENTS:

Trichloroethylene-liver, biliary tract, non-Hodgkin's Lymphoma

Tetrachloroethylene-lymphohematopoietic malignancies

Methylene chloride-liver & biliary tract, pancreatic

Cancer & Toxicants (Solvents)

Trichloroethane - multiple myeloma

Benzene - leukemia, lung, nasopharynx

Toluene - gastrointestinal cancers

Styrene - leukemia

Painters have 40% increased risk of lung cancer

Hazards of Drinking Water

Camp Lejeune: Past Water Contamination

From the 1950s through the 1980s, people living or working at the U.S. Marine Corps Base Camp Lejeune, North Carolina, were potentially exposed to drinking water contaminated with industrial solvents, benzene, and other chemicals.

Learn about [research on past chemical contamination](#).



Julian C. Smith Hall, Camp Lejeune

Poisoned Water to Half Million People

Poisoned: why West Virginia's water crisis is everyone's problem

COMMENTS

How regulators allowed chemicals to literally slip through the cracks and threaten the water supply

By **Matt Stroud** on January 14, 2014 02:15 pm



Colorado Mine Disaster Poisons Rivers

EPA Taking Claims From Colorado Mine Spill

Posted: Tue 12:43 PM, Aug 11, 2015

By: Associated Press

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Autoimmune Disease & Toxicants



Environ Health Perspect. 2011 Jun; 119(6): A248–A253.

PI

doi: [10.1289/ehp.119-a248](https://doi.org/10.1289/ehp.119-a248)

News

Focus

Questions Persist: Environmental Factors in Autoimmune Disease

[Charles W. Schmidt, MS](#)

Autoimmunity Affects **50 million** Americans

- 1996 US Census Bureau numbers - autoimmune diseases affect 1 in every 31 Americans, based only on 24 such diseases
 - Approximately 120 distinct autoimmune diseases
 - RA, SLE, Scleroderma linked to solvents, silica, asbestos
 - Increased by intake of processed foods
-

Effects of Toxicants on Fertility

Air pollution and traffic fumes tied to infertility risk

BY LISA RAPAPORT



Chimneys of a power plant are pictured from a plane, on the outskirts of Beijing January 8, 2016.
REUTERS/KIM KYUNG-HOON

Women who live close to major highways where the air is polluted by traffic exhaust fumes may be slightly more likely to have fertility problems than women who live further away where the air is cleaner, a U.S. study suggests.

Toxicant Effects on Female Fertility

- 1996 US Census Bureau numbers - autoimmune diseases affect 1 in every 31 Americans, based only on 24 such diseases
 - Approximately 120 distinct autoimmune diseases
 - RA, SLE, Scleroderma linked to solvents, silica, asbestos
 - Increased by intake of processed foods
-

Toxicant Effects on Female Fertility

- Among 1240 women from the Danish National Birth Cohort recruited from 1996 to 2002
- Longer “time to pregnancy” was associated with higher maternal levels of PFOA and PFOS
- 2009 study-women with high blood levels of PFCs took over one year to get pregnant or needed IVF compared to controls

Male & Female Infertility

The Toxicant Worst Offenders

Organochlorine compounds
(chlorinated pesticides, polychlorinated biphenyls, dioxins)

Bisphenol A (BPA)

Organophosphate pesticides

Herbicides

Many other chemicals, metals, air pollutants

Toxicant Impact on Male Fertility

Bisphenol A (BPA)

Reduced sperm concentration, motility, morphology

Phthalates

Reduced fertility and semen quality

Air Pollution

Reduced sperm motility

Toxicant Impact on Male Fertility

Dioxins

Reduced normal sperm morphology

Fracking Chemicals

Reduced sperm concentration and motility

Parabens

Reduced fertility outcomes in couples

Toxicants Impact Female Fertility

BPA

- Disrupted menstrual cycles, reduced number of antral follicles
- More miscarriages
- More preterm deliveries
- Poor fertility treatment outcomes
- PCOS, Endometriosis, Uterine Fibroids
- IVF – those with top 25% body load – 211% more likely to have implantation failure

Toxicants Impact Female Fertility

PHTHALATES

Fewer antral follicles

More preterm deliveries

PCOS

DIOXINS

Reduced fetal growth

Endometriosis

BISPHENOL A

Reduces number of oocytes & lowers successful number of births

Creates major & permanent changes in gene expression - differences only apparent after estrogen exposure

Affects the estrogen receptors - alpha, beta, cell membrane

Negatively affects mitochondrial function
alters estrogen receptor function

Alters estrogen production and function, along with progesterone production, melatonin receptor function, and thyroid receptor function

Toxicant Impact on Female Fertility

Pesticides

Disrupted menstrual cycles

More miscarriages

More preterm births

PCOS, Endometriosis, Uterine Fibroids

Fracking Chemicals

Reduced overall fertility

More miscarriages

More preterm births

Toxicant Effects on Rate of Miscarriage

- 89 Women with repeated miscarriages were evaluated - found to have high levels of chlorinated hydrocarbons
- Numerous studies linking occupational exposure to PCBs, Benzene, gasoline, xylene, styrene, BPA, cadmium, lead, mercury, & hydrocarbons to increased rate of miscarriage

Toxicant Effects on Premature Births

- **Phthalates:** Study of preterm birth found that 30 women who gave birth prematurely had high third trimester urinary levels of phthalates
- **Mercury and fish consumption:** 1,000 women who gave birth prematurely were 3X more likely to have high blood levels of mercury – linked to fish consumption

Why Environmental Health Matters

- Toxicants are ubiquitous: in food, air, water, clothes, buildings, pharmaceuticals, cosmetics, personal care products, the great outdoors
 - Toxicants affect the climate, disease location, disease prevalence
 - Toxicants impact every aspect of cellular & mitochondrial health
 - Toxicants affect our gut, our cognition, our immune system, our cardiovascular systems, our fertility, our lungs, our mental health....and more....
-

Environmental Medicine can no Longer be a Separate Part of Medicine

- Our environmental exposures determine who we are...
 - They are in what we eat, the air we breath, the water we drink, & the chemicals bathing our bodies on a continuous basis
 - They affect the planet we reside on...our Earth is being transformed by environmental toxins
 - Each of us **MUST** be an advocate for our patients, our families, our planet, **OURSELVES!**
-

**Discover what happens
to your body during the
three stages of menopause**

Understanding the why and how of menopause empowers you to shape your own journey during this important transition. This book is an honest, accurate guide to menopause and how it impacts your body, preparing you for what may lie ahead and helping you handle any health concerns you may have. Learn about 50 of the most common symptoms of menopause, why they occur, and the best ways to support yourself as your body changes.

FIND AN INCLUSIVE APPROACH Discover straightforward and practical guidance that gives you the tools to approach menopause in a way that's authentic to you.

KNOW WHAT TO EXPECT Get to know the symptoms commonly experienced during each stage of menopause: perimenopause, early menopause, and late menopause.

LEARN THE SCIENCE Find scientifically supported facts and concise advice to help you navigate the ups and downs of menopause.

FELICE GERSH, MD, is board-certified in OB-GYN and integrative medicine, the director of the Integrative Medical Group at Emory, and the bestselling author of the PCOS SOS books. She currently serves as a consultative faculty member at the University of Arizona School of Medicine.



GERSH
MENOPAUSE: 50 THINGS YOU NEED TO KNOW

**MENOPAUSE:
50 Things You
Need to Know**

**What to Expect During the
Three Stages of Menopause**

Felice Gersh, MD, with Alexis Perella

Featuring a bonus section on male fertility by renowned expert, PROFESSOR KELTON TREMELLEN, M.D.

**PCOS SOS
Fertility
Fast Track**

**The 12 week plan to optimize
your chances of a successful
pregnancy and a healthy baby**

Felice Gersh, M.D.

Bestselling author of *PCOS SOS*
with ALEXIS PERELLA



Foreword by
SARA GOTTFRIED, M.D.

PCOS SOS

A Gynecologist's Lifeline
To Naturally Restore
Your Rhythms, Hormones, and Happiness



Felice Gersh, M.D.
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Thank You
Q & A

