

thrive

Risk of Exposure

How Does our
Environment
Contribute
to Cancer?



**COMPREHENSIVE
CANCER CENTER**
UNIVERSITY OF MICHIGAN
HEALTH SYSTEM



thrive

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Precise Treatment, Precise Care

Radiation Oncology takes a patient and family centered approach

Patients who receive radiation therapy understand that the process often comes with anxiety. In order to best appreciate the wants and needs of patients and families, the Department of Radiation Oncology formed a Patient and Family Centered Care (PFCC) committee. The goal of the group, which consists of former radiation patients, family members and radiation therapy caregivers, is to offer patients and families the opportunity to reflect on their treatment and recommend potential ways to improve the experience for others.

“Both pediatric and adult patients may experience anxiety about their appointments and treatments,” says Kristan Freitag, a child life specialist in radiation oncology. “Rather than guessing what our patients and families want and need, we realized it was best to ask them.”

Because Freitag’s role involved helping patients and families cope through radiation therapy, the Department of Radiation Oncology tapped her expertise in the area of patient and family centered care, a well-established practice among pediatric patients at C.S. Mott Children’s Hospital.

Freitag, along with Joumana Dekmak, the radiation therapist supervisor, leads the PFCC committee. The group currently includes six advisers (former patients or family members), as well as a variety of clinical staff, including physicians, radiation therapists and supervisors. The committee meets monthly.

“Radiation therapy varies depending on the doctor’s prescription,” says Dekmak. “We work hard to calm the patient and set expectations on the first day. Radiation feels no different from receiving an X-ray, but some patients require special immobilization when they’re on the table. This can be stressful.”

Treatment can take as little as 10 minutes, or as long as an hour depending on the patient’s treatment prescription. Because patients cannot move, they are encouraged to listen to music or audio books for distraction.

“We’ve tried to improve the patient experience by having iPods in each room with different types of music, guided imagery and books. We also project a night sky on the ceiling to help patients relax,” Freitag says.

The goal, Dekmak says, is to take the time to understand patient concerns so they can be addressed on the first day of treatment.

Improvements have already begun since increasing the focus on patients and families. The number of pediatric patients requiring anesthesia during radiation treatment due to anxiety has been reduced from around 40 percent to just 3 percent. The same types of techniques have been implemented with anxious adult patients.

“Often the fear of the unknown can be scarier than the actual treatment,” Freitag says. The best way to improve the patient experience is individualized patient preparation and patient and family involvement throughout the treatment journey.”



Email Kristan Freitag at kristang@umich.edu if you’re interested in improving the future of patient care for those receiving radiation therapy.

Child life specialist Kristan Freitag strives to improve the patient experience during radiation therapy.



Q&A The Natu

An expert's take on environmental fa

What in the world caused my cancer?

It's a huge question with many factors, including a person's health history, lifestyle, exposure to elements in the environment and how an individual's DNA responds to all of it. We sat down with Justin Colacino, Ph.D., a research assistant professor at the University of Michigan School of Public Health, whose work focuses on understanding environmental and dietary factors that cause cancer — and how to prevent it.



Justin Colacino, Ph.D.

Q. How do scientists know if a substance in the environment causes cancer?

Short-term tests usually use cells in a dish to see whether a compound can cause DNA mutations. Longer-term tests typically involve exposing laboratory rodents to multiple doses of a chemical for an extended period of time, usually two years. Scientists then monitor the rodents for tumor development and calculate if the rate of tumor formation is greater than would be expected by chance.

The gold standard for determining whether a compound is a human carcinogen (cancer-causing agent) is by examining cancer rates in individuals who have been highly exposed to a compound, usually in a work-related setting. If these people have higher than expected rates of cancer, particularly rare cancers, this provides the strongest evidence that a compound is a human carcinogen.

Q. How do scientists decide which substances to test in animals, labs or humans?

With drugs and medical devices, the manufacturer is responsible for demonstrating safety to the FDA before the product is released to the market. However, with the vast majority of chemicals, food additives, and cosmetics, the burden is instead on regulators to prove that the compound is dangerous. Much of this work ends up being performed by scientists working for the government or at universities, who choose compounds to study based on exposure trends or the likelihood of the compound causing a biological effect.

Q. How do scientists determine the risk levels associated with cancer-causing substances?

Two major groups worldwide that evaluate the potential carcinogenicity of chemicals are the International Agency for Research on Cancer (IARC) and the United States Environmental Protection Agency. Panels of scientists will determine the carcinogenicity risk of a compound by reviewing all of the data from cell and animal experiments in combination with data on the cancer rates and types in highly exposed human populations.

re of Cancer

ctors linked to cancer and best bets for prevention

Q. How do public health officials determine acceptable levels of exposure?

Regulatory agencies and public health officials conduct a human health risk assessment based on available data. This involves:

1. Identifying whether a substance has the potential to cause harm to humans or ecological systems
2. Determining how much of a compound is necessary to cause a negative health effect
3. Assessing the major routes by which people are exposed to a compound and determining at what concentration they are exposed
4. Determining how well the existing data support conclusions about the risk of exposure to the substance

These guidelines often have the goal of protecting the most vulnerable individuals in a population (the very young and very old). Rarely, however, do they set limits of exposure to multiple chemicals simultaneously.

Q. What do you think are the most pressing environmental concerns people should be aware of?

There is a lot of interest in understanding the effects of chemicals that mimic estrogen in the body, such as bisphenol A or parabens. Animal experiments show that exposure to these compounds in utero influence how the breast develops and can increase the risk of breast cancer later in life. Many research groups are working to understand if exposure to these compounds can cause breast cancer in people.

Additionally, there is growing evidence that links obesity to the development of many types of cancer, including breast cancer. The prevalence of obesity worldwide has more than doubled since 1980, making obesity one of the largest preventable risk factors for cancer.

Q. What can people do to protect themselves?

There are some well-defined risk factors: eating a poor quality diet, smoking and not exercising. Eating a healthy, well-balanced diet, not smoking and getting the recommended amount of exercise are still the best ways we know of to prevent cancer.

There are a number of cancers that are linked with viral infections that are preventable by vaccine, such as the human papillomavirus (HPV) vaccine. The hepatitis B vaccine has been shown to effectively prevent hepatitis-associated liver cancer.

Finally, look for and demand products that are not made with estrogen mimicking compounds like bisphenol A and parabens. In recent years, consumer pressure on companies to change their manufacturing processes has been more successful in removing toxicants from products than government regulation.

Occupational

One patient shares his story to protect automotive technicians of the future



Hazards

Stan Urban, 63, loves anything with an engine so it's not surprising he's spent his career teaching automotive technology. He focuses on electrical systems, transmissions and engines. Along the way, though, he worked on brakes. Not a lot, but enough.

Two years ago, Urban received the diagnosis of mesothelioma, a rare cancer that affects the tissue surrounding the lungs. The primary risk factor for the disease is exposure to a mineral called asbestos.

Asbestos contains strong fibers and withstands high heat, making the mineral ideal for use in products like insulation, roof shingles, flooring and brakes. It creates dust during the manufacturing process that settles in the lining of the lungs. While some people work around asbestos for years without a problem, for others, even one exposure can cause mesothelioma.

The disease often remains dormant for as many as 30 or more years before causing symptoms.

"Asbestos fibers lead to chronic inflammation in the tissue in which they get lodged," says Gregory Kalemkerian, M.D., director of the U-M Multidisciplinary Lung Cancer Clinic. "Excessive multiplying of the normal cells occurs over years, resulting in DNA damage that leads to cancer."



Urban doesn't know when he was exposed to the toxic dust, banned from products since the 1980s. However, employers were not as stringent about wearing protective gear as they are now.

"I did not find out about the issue with asbestos until after I graduated from college," Urban says. "After learning of the dangers, I started wearing a mask when available."

Mesothelioma has no cure, as it is usually diagnosed at an advanced stage after it has spread to lymph nodes or other areas of the body. Treatment includes surgery (in early-stage disease only), chemotherapy and radiation.

"I had virtually no symptoms," Urban says. "The day after Christmas, I pulled a can of frozen OJ from the freezer. When I stood up I couldn't get any wind. Later, my son asked why I was breathing so heavy while watching TV."


Urban's wife gave him an aspirin just in case it was a cardiac issue and took him to the doctor. He was diagnosed with bilateral pulmonary embolisms. Once the doctor learned he worked in the automotive field, they ran tests that were conclusive for mesothelioma.

Urban doesn't harbor bad feelings toward companies that continued using asbestos after it was suspected of being dangerous, but he does all he can to teach his students to protect themselves.

"We don't know what chemicals will cause a health issue later," he says. "I didn't wear a mask at first because I didn't know about the link to cancer. My students need to be safe."

Urban is thankful that the initial five months of chemotherapy is keeping his cancer from growing. Now, he gets a different chemo drug the first Friday every month until Kalemkerian says otherwise.

"There are some promising results in some vaccine trials and more trials are being done with molecularly targeted therapies in mesothelioma now," Kalemkerian says.

Despite some side effects like nausea and fatigue, Urban has missed just two days of teaching since his diagnosis. 

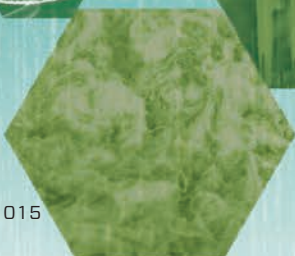


Visit mCancer.org for information on what employers should be doing to minimize exposure to dangerous materials at work.

Know Your Environment

Potentially dangerous substances

- Tobacco
- Poor diet, obesity and physical activity
- Alcoholic drinks
- Ultraviolet radiation
- Viruses and bacteria
- Ionizing radiation
- Pesticides
- Medical drugs
- Solvents
- Fibers, fine particles and dust
- Dioxins
- Polycyclic aromatic hydrocarbons
- Metals
- Diesel exhaust particles
- Toxins from fungi
- Vinyl chloride
- Benzidine



Cancer can be linked to our environment, but a large number of cancers can be prevented. Here's what you need to know.

Reduce your risk

- Don't smoke
- Maintain a healthy weight
- Exercise regularly
- Avoid high-calorie, high-fat food
- Eat red meat in moderation
- Eat fruits, vegetables and whole grains
- Drink alcohol in moderation
- Use sunscreen
- Avoid viral and bacterial infections
- Protect from X-ray exposure
- Use radon detectors
- Avoid pesticides
- Open windows when painting (solvents)
- Wear protective gear at work

Ask your employer about Material Safety Data Sheets (MSDS) that are required for any toxic substances in your work environment.



Visit mCancer.org/thrive for a link to the report "Cancer and the Environment" by the U.S. Department of Health and Human Services.

Up in Smoke

One patient fights the stigma of blame tied to lung cancer and smoking



At 47, Mary Jo Grand was a busy wife and mother of two kids in college. She worked as a fundraising event manager for the University of Michigan Comprehensive Cancer Center. She had quit smoking more than 15 years ago.

Mention the word smoking and what cancer automatically comes to mind?

Indeed, Grand received a stage IV lung cancer diagnosis after discovering a small lump above her right collarbone. Even worse than the grim statistics, Grand understood the reality of having a cancer with a stigma: people diagnosed with lung cancer brought it upon themselves.

"It is abjectly unfair," says Gregory Kalemkerian, M.D., director of the U-M Multidisciplinary Lung Cancer Clinic. "When someone has a heart attack, no one asks them about how many hamburgers they ate. As health professionals, we are trained to care for people regardless of how they got into their predicament."

Growing up in a time when smoking was heavily promoted and glamorized, Grand recalls family videos of her large family. Virtually all the adults smoked while the kids ran around and played in a cloud of smoke.

"Other cancers don't get labeled this way," Grand says. "Lung cancer is the least funded of the major cancers in terms of research dollars because of the stigma. Nearly 80 percent of new cases are former and never smokers. It's time to stop blaming and start funding."

Kalemkerian encouraged her to look beyond the stigma and the statistics to the treatment options available. She joined a clinical trial for a new combination of chemotherapy.

"Dr. K.'s way of handing it was very different," Grand says. "He said, 'Look, I have to give you the statistics, but you are not a statistic. I think I can give you a lot more time, Mary Jo.'"

He reminded her that treatment options for lung cancer were evolving, giving her hope the disease could be managed. With success in the clinical trial, perhaps new options would be available.

Grand underwent 11 rounds of chemotherapy. The infusion nurses, she says, were sympathetic and understanding, giving her a sense of confidence. She exercised and changed her diet to keep her immune system strong.

As the chemo worked against the cancer, Grand worked against the stigma. She created an event called the MJ Grand Breathe Easy 5K Walk & Dine fundraiser to benefit lung cancer research at the University of Michigan. Over two years, the event raised close to \$40,000.

"I wanted to offer others battling this disease, their caregivers and those who wanted to honor loved ones who lost their battle a place to come where they could benefit from being part of an extended community that offered compassion and support."

Grand's participation in the clinical trial was a success. The drugs eradicated the cancer in her lymph nodes, making her a surgical candidate for the small tumor on her lung. She underwent surgery in 2013.

Six years after diagnosis, she has no evidence of disease. **t**



Grand says, "I am riding the first wave of what my doctors believe late-stage cancer is going to be in the very near future: a manageable disease."



Visit **mCancer.org** for information on lung screening at the Cancer Center.

Plant-Based Diets:

BY NANCY BURKE, R.D., DANIELLE KARSIES, M.S., R.D., AND MELISSA SHANNON-HAGEN, R.D., CSO
U-M COMPREHENSIVE CANCER CENTER SYMPTOM MANAGEMENT AND SUPPORTIVE CARE PROGRAM

You may be asking, “What is a plant-based diet?” It is a diet that focuses on minimally processed foods of plant origin including fruits, vegetables, whole grains and legumes. For all those meat lovers out there, not to worry.

Your diet does not need to be vegetarian or vegan. It’s simply that the majority of your diet comes from these foods.

Now that you know the definition, why is a plant-based diet important? In terms of cancer prevention, the nutrients found in plant-based foods — including vitamins, minerals, phytochemicals and fiber — have been shown to reduce risk of several types of cancer.

LEGUMES

Beans

Kidney
Pinto
Great Northern
Black

Yellow Split Peas

Red Lentils



Other Healthful Compounds with Potential Anti-Cancer Activity

Lignans and saponins

Resistant starch

Antioxidants from flavonoids, inositol, sterols and other phytochemicals

FOODS HIGH IN DIETARY FIBER SHOW:

1. Convincing evidence that it lowers the risk of colorectal cancer
2. Limited and mixed evidence that it reduces breast cancer
3. Consistent link to lower body and abdominal fatness –which can decrease the risk of six other types of cancer



Why All the Hype?

Instead of focusing on what you shouldn't eat or foods to avoid, start including more whole grains and legumes in your diet and, in turn, decrease your risk of cancer and improve your health.

WHOLE GRAINS*

Brown Rice
Oatmeal
Whole Wheat Bread
Barley
Bulgur
Kasha
Millet
Faro
Quinoa

Other Healthful Compounds with Potential Anti-Cancer Activity

- Resistant starch
- Polyphenols including lignans
- Protease inhibitors

*Keep in mind, processed grains with dietary fiber added back in, such as fiber-rich white bread, have not shown the same, if any, level of protective effect. These refined grains lack the nutrient-packed bran and germ.

FLAXSEED

Needs to be ground to be digested

Other Healthful Compounds with Potential Anti-Cancer Activity

Alpha-linolenic acid (ALA)

Lignans

Gamma-tocopherol



To make an appointment for nutritional counseling, call **877-907-0859**.

Quitting Matters

A patient prepares for surgery, healthy changes and the future

AN EARLY START

At 17, Doug Klein's parents agreed to let him join the Air Force. Jobs were scarce in the '70s and Klein thought the discipline and skills would jumpstart a bright future. Everything about his military experience was positive except that he started smoking, a habit that stuck.

"The accessibility of cigarettes makes it pretty easy," Klein says. "It's like anything. My body craves it. I started when I was younger, went down that path and you live with it."

Klein completed his service in 1979, married and moved back to the Midwest. He found a job with the Wayne County sheriff's office and, 23 years later, was starting to think about retirement.

While preparing for his daughter's wedding last summer, he noticed blood in his urine. He received the diagnosis of bladder cancer. In addition to major decisions about treatment and surgery, Klein had another challenge: setting a realistic quit date and sticking to it.

His urologist, Cheryl T. Lee, M.D., noted his desire to quit smoking. "Smoking cessation in bladder cancer patients is critical since cumulative smoking exposure among both current and former smokers has been associated with recurrence, progression of the disease and overall survival," she says.

HELPING PATIENTS ACROSS MICHIGAN

According to Alon Weizer, M.D., associate professor of urology and medical director of the U-M Comprehensive Cancer Center, 50 percent of bladder cancer cases are attributed to smoking.

The disease, when caught early, is highly treatable but also likely to recur. Continuing to smoke is a major risk factor for recurrence, as the harmful chemicals can be excreted in a person's urine, causing damage to the lining of the bladder. There is compelling evidence from several cancer types that people who quit smoking have better outcomes with cancer treatment.

Weizer and Lee believe oncologists can play a vital role in helping patients stop smoking simply through education and offering resources. They are participating in a new stop-smoking program created by the Michigan Oncology Quality Consortium to improve cancer care across Michigan. The group wants every patient who uses tobacco to be offered scientifically sound options to quit.


The program, Michigan Tobacco Quitline Services, is free and confidential. Well-trained professionals provide callers with support, local resources and counseling seven days a week from 7 a.m. – 1 a.m.

MAKING A PLAN

For many patients, including Klein, quitting smoking isn't as simple as wanting to. He plans to quit completely during his hospital stay and recovery after surgery.

"Right or wrong, it's the one time I can really wrap my head around," Klein says. "I know I can do more good for my body if I quit. I'll be able to get over all the cravings and should be stable when I go home."

Klein, whose children are grown adults, has big plans for the future: not only is he engaged to be married, he and his fiancée are parents to two rescue pit bulls.

"Importantly, over time, smoking cessation can reduce the risk of disease recurrence by 30-40 percent and the risk of bladder cancer progression by up to 50-60 percent," says Lee. 



Visit [mCancer.org](https://www.mCancer.org) for more information on smoking cessation resources at the Cancer Center.



Doug Klein is glad his daughter, Michelle, a nursing student, helps with research and information gathering on his illness. He wears a Red Wing's hat, a gift from his other daughter, for good luck.

A new leader at the Cancer Center

After 26 years at the helm, Max S. Wicha, M.D., has stepped down as director of the University of Michigan Comprehensive Cancer Center to focus on his research. The University of Michigan has appointed Theodore S. Lawrence, M.D., Ph.D., as the center's new director and Max S. Wicha M.D. Distinguished Professor of Oncology.



Theodore S. Lawrence, M.D., Ph.D.

Lawrence, who also chairs radiation oncology at the University of Michigan, will continue to advance the Cancer Center's research excellence and plans to grow the center's statewide presence as part of an effort to bring cancer care closer to home.

"The vast majority of cancer care can be done in the community with strong partnerships. We want to create more of those partnerships to allow more patients in our state to receive the right care in the right place," he says.

Lawrence also cites the Cancer Center's strength in precision medicine, drug discovery and health policy research as well as opportunities to deepen clinical and translational research efforts.

Wicha founded the Cancer Center in 1988. The center's "comprehensive" status is designated by the National Cancer Institute. U-M is one of two comprehensive cancer centers in Michigan and one of 41 across the country.

"Michigan has been the epicenter of many global advances in cancer research and care. As patients, families and the scientific community look to us for the next breakthroughs, we are fortunate to have the expertise of an established leader of Dr.

Lawrence's caliber to guide the Cancer Center into a very promising future," says James O. Woolliscroft, M.D., Dean of the U-M Medical School and Lyle C. Roll Professor of Medicine.

Lawrence's laboratory interests are focused on drugs that make tumor cells more sensitive to radiation therapy. His research aims to combine his laboratory studies to better treat patients with pancreatic and other gastrointestinal cancers. He expects to continue patient care and research as director of the Cancer Center.

Lawrence is currently president of the Radiation Oncology Institute, a member of the Board of Scientific Advisors of the National Cancer Institute and a member of the Institute of Medicine of the National Academy of Sciences. He has served in leadership positions in many of the most prestigious oncology societies.

He joined the faculty at U-M in 1987.

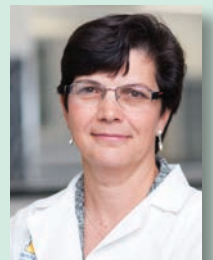
NEW STUDY SHEDS LIGHT ON WHY PANCREATIC CANCER IS SO AGGRESSIVE

New research from the University of Michigan Comprehensive Cancer Center helps explain why pancreatic cancer is so lethal, with fewer than a third of patients surviving even early-stage disease.



The researchers found a gene known to be involved in nearly 90 percent of pancreatic cancers promotes cancer growth and spread. The gene, ATDC, plays a key role in how a tumor progresses from a preinvasive state to an invasive cancer to metastatic cancer.

"We know that patients with the earliest stage of pancreatic cancer have a survival rate of only 30 percent. This suggests that even in that very early stage of invasive cancer there are already cells that have spread to distant parts of the body," says study author Diane M. Simeone, M.D., director of the Pancreatic Cancer Center at the University of Michigan Comprehensive Cancer Center.

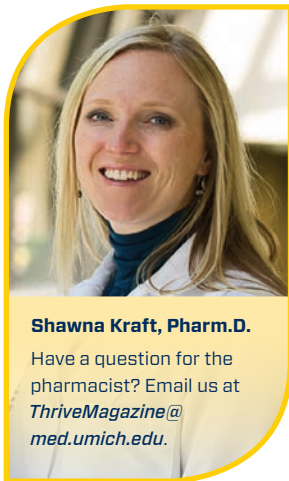


Diane M. Simeone, M.D.

"This study sheds important light on what it is about pancreatic cancer that makes it so aggressive early in the game," she adds. The study appears in *Genes and Development*.

Your Home Environment

Tips for safe handling of medications for cancer therapy



Shawna Kraft, Pharm.D.

Have a question for the pharmacist? Email us at ThriveMagazine@med.umich.edu.

Whether your cancer treatment is oral or intravenous, some medications may be harmful to those who live with you. Limiting exposure of other people to your pills and body fluids is your best bet to keeping everyone safe, even if the effect would be minimal.

Keeping prescription medication away from others sounds simple, but cancer therapy can be complex. Here are some general tips to ensure a safe home environment:

If you're instructed to dissolve your oral medication in liquid, do this in a paper or plastic cup that can be thrown away.

If you have a caregiver assisting with your oral medication, have the caregiver wear gloves while handling the medication or wash hands before and after giving you the medication.

Small amounts of chemotherapy may be present in your urine, stool, semen and vomit. If you or your caregiver is exposed to body wastes, wash that area with soap and water.

You may use the toilet as usual. Wash your hands well with soap and water after using the toilet. Other people in your household may use the same toilet as long as all the waste is flushed.

Caregivers should always wear gloves when disposing of urine, stool or other human waste and cleaning equipment.

Never flush your medication down the drain or toilet. Instead, wrap the medication with duct tape in its container and wrap it in two plastic bags before putting it in the trash. Another option for safe disposal is to take the medication out of its original container and mix it with kitty litter or used coffee grounds before putting it in a can or zipper bag to throw away.



Just a Phone Call Away

Art Therapy
877-907-0859

Cancer AnswerLine
800-865-1125

Clinical Trials
800-865-1125

Education Clinic
877-907-0859

Fertility Counseling
877-907-0859

Financial Counseling
734-647-5120

Guided Imagery
877-326-9155

Make a Donation
734-998-6893

Music Therapy
877-907-0859

Nutrition Services
877-907-0859

Patient Education Resource Center
734-647-8626

Pharmacy
734-647-8911

Practical Assistance Center
877-907-0859

PsychOncology
877-907-0859

Social Work
800-888-9825

Smoking Cessation Counseling
734-998-6222

Symptom Management and Supportive Care
877-907-0859



THRIVE ONLINE

mCancer.org/thrive

Thrive doesn't end here! Visit **MCancer.org/thrive** for more. Here's what you'll find:

- Resources for smoking cessation at the Cancer Center and how to make a quit plan
- More information on what employers should be doing to minimize exposure to dangerous materials at work
- A link to the report "Cancer and the Environment" from the U.S. Department of Health and Human Services
- Healthy recipes including super foods known for cancer prevention
- Details on how to apply for the Department of Radiation Oncology Patient and Family Centered Care committee