

# Each year spent working with certain chemicals raises risk of pancreatic cancer, finds study

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Jobs that regularly expose you to certain chemicals appear to steadily increase your risk of pancreatic cancer, a new analysis reports.

People with more than 20 years of exposure to some chemical agents had a 39% increased risk of pancreatic cancer, compared with an 11% higher risk for 11 to 20 years' exposure and a 4% higher risk for 1 to 10 years' exposure, researchers found.

"Our findings revealed that the risk of pancreatic cancer increases significantly for each additional year of exposure among workers exposed to these chemicals," said study author Ro-Ting Lin, an associate professor of occupational safety and health at China Medical University in Taiwan.

The analysis evaluated 12 [industrial chemicals](#) and found that five significantly increased the risk of pancreatic cancer in workers, Lin said.

"The No. 1 chemical that most increased a person's risk of pancreatic cancer was [ethylene oxide](#), followed by [polycyclic aromatic hydrocarbons](#), rubber dust and fumes, styrene, and metalworking fluids," Lin said.

These chemicals are predominantly used in the chemical, metal, plastic, rubber and petroleum industries, researchers said.

The study adds to mounting evidence that workplace exposure to certain chemicals is associated with a higher risk of cancer, said Dr. Steven Nimmo, president of the Faculty of Occupational Medicine in the United Kingdom.

"What this new meta-analysis adds is a definite dose-response relationship. The longer people are exposed, the more likely they are to develop pancreatic cancer," said Nimmo, who also edits the journal in

which the study was published on April 27, *Occupational Medicine*.

"It's another piece in the jigsaw puzzle," he said. "That the risk increases with time of exposure is a quite important bit that adds toward whether there is direct causation."

However, Nimmo noted that while the relative risk of pancreatic cancer rises significantly in people exposed to these chemicals, the overall risk of this cancer remains low.

Pancreatic cancer accounts for about 3% of cancers in the United States and 7% of all cancer deaths, according to the American Cancer Society.

"It's an increase in a very tiny risk," Nimmo said.

Pancreatic cancer is one of the top five causes of cancer death globally, and is usually found at an advanced stage, researchers said in background notes. Fewer than 10% of patients survive.

For the study, Lin and her colleagues combined info from 31 occupational health studies around the world, a data pool that included more than 288,000 people.

Overall, they found that [occupational exposure](#) to chemical agents accounts for 9% to 47% of pancreatic cancer cases among workers.

Some chemicals like ethylene oxide, styrene and metalworking fluids significantly increased the risk of pancreatic cancer even with brief exposure of less than 10 years, Lin said.

But longer exposure to higher concentrations of these dangerous chemicals more than doubled a worker's risk, she said.

"Our findings revealed that the risk of pancreatic cancer increases significantly for each additional year of exposure among workers exposed to these chemicals," Lin said.

Ethylene oxide is a gas often used in the manufacture of chemicals and the sterilization of medical devices, Lin said. Styrene is used to make insulation, rubber and plastics.

Polycyclic [aromatic hydrocarbons](#) (PAHs) are compounds produced when organic substances like coal, oil or natural gas are burned.

PAHs "pop up here, there and everywhere as being carcinogenic," Nimmo said.

Health and [safety regulations](#) that would protect workers from these chemicals vary widely between countries, he noted. For example, the U.S. bases its regulations on general rules set for industry, while the U.K. has a risk-based approach that assesses each specific potential hazard.

Lin noted that most of the chemical agents targeted in this study enter the body by inhalation.

"We recommend reducing exposure by shortening the working duration in the risky operation, enclosing chemical operations, improving ventilation, and ensuring effective personal protective equipment is worn, but ultimately high-risk chemical processes should still be phased out," Lin said.

Men with more than 10 years of exposure on the job were found to be the most at risk, the results showed.

Based on that, researchers said employers should monitor male employees for symptoms and signs of pancreatic cancer, if they've been

exposed to known cancer-causing chemicals for more than a decade.

Nimmo said that's not realistic, given that pancreatic cancer is often a silent killer.

"The bottom line is that there aren't early symptoms of [pancreatic cancer](#). There is also no screening test for it," Nimmo said. "Being mindful of symptoms is not really an option."

**More information:** H Boonhat et al, Duration–response association between occupational exposure and pancreatic cancer risk: meta-analysis, *Occupational Medicine* (2023). [DOI: 10.1093/occmed/kqad050](https://doi.org/10.1093/occmed/kqad050)

The American Cancer Society has more about [pancreatic cancer](#).

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