

BLADDER CANCER at work

What are the risks?

Prevention of any major disease is always at the forefront of research. We have long known that smoking is the major cause of bladder cancer; here, Professor Catto looks at the evidence for work-related incidences of this cancer.

Bladder cancer is usually caused by exposure to chemical agents (carcinogens) that enter the circulation through inhalation, ingestion or skin contact. The agents reach the bladder lining when they are excreted through the urine.



Factory workers were 16 times more likely to be diagnosed with bladder cancer compared to people in other occupations, dye workers were 13 times more likely, and tobacco workers were 1.7 times more likely.



Smoking

The most common exposures to these carcinogens are from smoking tobacco, which accounts for around half of all bladder cancers. This includes smoking yourself (direct exposure) and inhaling secondhand smoke from someone else (indirect). Cancer risk varies with gender, smoking history (how many per day for how long) and the type of tobacco (blonde American or black Mediterranean). The exact carcinogenic agents are thought to be combustion products (that is, smoke and burnt cigarette) rather than nicotine. As such, electronic cigarettes may be less hazardous to the bladder.

Occupational hazards

The second most common exposure is through occupational tasks. In this case, fumes from the chemicals are typically inhaled or the chemicals come into contact with unprotected skin. Whilst the exact proportion of bladder cancers that arise from occupational chemicals is unknown, the Health and Safety Executive (HSE) estimates that it is 5–10%.

We conducted a study to determine which occupations were associated with bladder cancer and found that many chemicals were implicated, notably aromatic amines – found in tobacco and dyes – and polycyclic aromatic hydrocarbons. In both cases, workers were more likely to develop bladder cancer than workers in other occupations.

- aromatic amines affect rubber workers, hairdressers, printers and leather workers.
- polycyclic aromatic hydrocarbons affect chimney sweeps, nurses, waiters, aluminum workers, seafarers, and oil or petroleum workers

What is a carcinogen?

Carcinogens are substances that cause cancer. A common example of a carcinogen is tobacco smoke. Carcinogens come from both natural and man-made substances.

ARTICLE

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Bladder cancer deaths

We also looked at what type of workers were more likely to die from bladder cancer. The highest rates occurred:

- in workers exposed to heavy metals and polycyclic aromatic hydrocarbons (metal workers, aluminum workers, electricians and mechanics)
- to those making diesel and combustion products (military and public safety workers)
- and those exposed to aromatic amines (domestic assistants and cleaners, rubber workers, painters and hairdressers)

What should be done?

Bladder cancer can be prevented by avoiding its causes, and one of those causes is carcinogens in the workplace, making bladder cancer an occupational health issue that puts many workers at increased risk. Despite improvements in working conditions, more effort is needed to reduce exposure to carcinogens, particularly in occupations that show an increased mortality risk.

References

Noon, AP, Martinsen, JI, Catto, JW, & Pukkala, E (2018). 'Occupation and bladder cancer phenotype: identification of workplace patterns that increase the risk of advanced disease beyond overall incidence'. *European urology focus*, 4(5), 725–730.

Chemical workers were 27 times more likely to die from bladder cancer compared to workers in other occupations, metal workers were 10 times more likely, and gardeners were 5 times more likely.

Success stories

Exposure to carcinogens has already been reduced through workplace health and safety regulations in most countries, such as the European Union directives (Council Directives 90/394/EEC7 and 98/24/EC8, for example) and the 2002 Control of Substances Hazardous to Health Regulations in the United Kingdom.

Success stories include the identification of the carcinogenicity of beta-naphthylamine in the dye industry, followed by reduction and substitution. Among hairdressers, the decrease in bladder cancer has been substantial, most likely because of restriction in the use in the 1970s of 4-aminodiphenyl (4-ABP), which used to be found in a lot of hair dyes.

Exposure to heavy metals (occurring, for example, among plumbers, welders, electrical workers, telephone installers and repairers, telephone linesmen and cable joiners) has decreased over time, but we haven't yet seen a corresponding decrease in bladder cancer incidence and death.

However, exposure to polycyclic aromatic hydrocarbons continues to cause bladder cancer, despite recent changes in industrial processes that reduce the possibility of exposure, such as changes in anode manufacture in the aluminium industry. Inhalation of diesel fumes still puts drivers, miners, marine workers and seamen at bladder cancer risk.

Occupations exposed to painting and dyes have shown limited reduction in risk compared with data from before 2009.

Moving forward

Workers around the world have the right to demand and get a safe and carcinogen-free workplace. Those people who are in an industry with known risks must receive workplace education and targeted screening.

Introducing our section on **BLADDER CANCER** at work

What can you do?



See your GP if you have any of these symptoms:

- Blood in your wee
- Frequent need to wee
- Recurring UTIs

If you are working as a:

- tobacco/dye/leather/rubber/metal worker
- factory/chemical worker
- oil/petroleum worker
- hairdresser
- printer/painter
- leather worker
- nurse
- cleaner/domestic assistant
- gardener
- waiter
- electrician/mechanic
- seafarer

Then:

- Talk to your employer about the potential risks
- Ask your employer for a risk assessment
- Ask to use personal protection equipment
- Talk to your union

**Find out more about
Bladder Cancer at work
on pages 13–23!**