

## Cancer

# Cancer Sites Associated with Occupational Exposures

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## Is exposure to a specific carcinogen associated with a certain type of cancer?

In many cases, certain types of cancer are associated with specific carcinogens. The table below lists some of these associations.

Please note: This list was compiled from information available from reputable sources, but it is not complete. It represents associations that have been reported in literature between certain types of cancer and specific carcinogen exposures.

Exposure to a carcinogen does not necessarily mean that you will develop cancer. The OSH Answers on [Occupational Cancer](#) has more information.

**Some Cancer Sites Associated with Occupational or Environmental Carcinogen Exposures**

Cancer Site	Examples of High-risk Substances or cancer-causing agents	Examples of High-risk Processes, Industries and Occupations with Increased Risks
Bladder (urinary)	Aromatic amines (e.g., Aniline, 4,4'-Methylene bis(2-chloroaniline) (MOCA), para-Chloroaniline, 2,6-Dimethylaniline (2,6-Xylidine), ortho-Toluidine); Arsenic and inorganic arsenic compounds; Benzidine and benzidine-based dyes; Benzo[a]pyrene; Coal tars & pitches; Diesel engine exhaust; Mineral oils; Nitrobenzene; Polyaromatic hydrocarbons (PAHs); Polychlorinated biphenyls; Tetrachloroethylene	Barbers; Beverage workers; Cable makers; Calendar operatives; Chemical or petroleum workers; Chimney sweeps; Cooks; Coke production; Dry cleaners; Firefighters; Gas-retort house workers; Hairdressers; Machinists; Miners; Nurses; Painters; Pipefitters; Plumbers; Sheet metal workers; Waiters and waitresses; Working with tobacco  Coal gasification; Dry cleaning, Dyestuffs industry; Manufacturing of: aluminum, magenta, auramine, p-chloro-o-toluidine, pigment chromate, textiles, and dyes; Petroleum refineries; Printing processes; Rubber and plastic production; Shoe and boot manufacturing and repair; Synthetic latex production; Textile manufacturing; Tire curing
Bone and connective tissue (a rare cancer site)	Ionizing radiation	<b>Accelerator sector:</b> Chemical and Radiation Control, Construction, Electrical and mechanical maintenance; Scientists, etc.

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		<p><b>Industry sector:</b> Aircrew, Dial painter, Fuel processor, Ground transportation, Industrial radiographer, Instrument technician, Scientist, engineer, etc.</p> <p><b>Medical sector:</b> Chiropractor; Dentist, Dental hygienist. Dental assistant, Dental nurse; Gynecologist, Medical Laboratory technician, Medical physicist, Nuclear medicine technologist, Nurse, Radiation therapist, Radiological technologist, Veterinarian, etc.</p> <p><b>Mining sector:</b> Uranium mine electricians, mill workers, office staff, support workers, surface maintenance, etc.</p> <p><b>Nuclear sector reactor:</b> chemical and radiation control, electrical maintenance, fuel handling, health physics, industrial radiographer, mechanical maintenance, scientists, etc.</p> <p>Radiopharmaceutical industry</p>
Bone and connective tissue (a rare cancer site)	Lubricants	Petroleum refineries

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Brain and Central Nervous System (CNS)	Ionizing radiation	<p><b>Accelerator sector:</b> Chemical and Radiation Control, Construction, Electrical and mechanical maintenance; Scientists, etc.</p> <p><b>General industry sector:</b> Aircrew, Dial painter, Fuel processor, Ground transportation, Industrial radiographer, Instrument technician, Scientist, Engineer, etc.</p> <p><b>Medical sector:</b> Chiropractor, Dentist, Dental hygienist. Dental assistant, Dental nurse, Gynecologist, Medical Laboratory technician, Medical physicist, Nuclear medicine technologist, Nurse, Radiation therapist, Radiological technologist, Veterinarian, etc.</p> <p><b>Mining sector:</b> Uranium mine electricians, mill workers, office staff, support workers, surface maintenance, etc.</p> <p><b>Nuclear sector reactor:</b> chemical and radiation control, electrical maintenance, fuel handling, health physics, industrial radiographer, mechanical maintenance, scientists, etc.</p> <p>Radiopharmaceutical industry</p>

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Brain and Central Nervous System (CNS)	Lubricating oil Epichlorohydrin Non-arsenical insecticides	Petroleum refineries – maintenance workers, boiler makers, operators, pipe fitters  Chemical plants, laboratory workers, researchers
Breast	Ethylene oxide; Ionizing radiation; Polychlorinated biphenyls	Shiftwork that involves circadian disruption
Colon and rectum	Asbestos; Ionizing radiation; Soot	Automobile repair workers  Beverage production industry (brewery workers)  Steel and metal workers  Repair and installation of machinery labourers  Petrol stations  Possibly: communication and other utilities, trade, educational services and mining
Esophagus	Ionizing radiation	Dry cleaning; Rubber production industry
Eye	Possibly Solar radiation, UV radiation from manmade sources such as sunlamps, sun beds, tanning booths, and electrical arc welding.	Engine operators; dentists; farmers; mechanics; military personnel; physicians; transport workers; welders
Kidney	Arsenic and inorganic arsenic compounds; Cadmium and cadmium compounds; Perfluorooctanoic acid; Trichloroethylene	Printing processes
Larynx	Acid mists, strong inorganic; Asbestos	Insulation material production (pipes, sheeting, textiles, clothes, masks, asbestos)

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		cement products); Insulators and pipe coverers; Isopropanol manufacture (strong-acid process); Rubber production industry; Shipyard and dockyard workers
Leukemia and/or lymphoma	Benzene; 1,3-Butadiene; Diazinon; Formaldehyde; Ethylene oxide; Lindane; Ionizing radiation; Malathion; Methylene chloride; Styrene; Trichloroethylene	Boot and shoe manufacturing and repair; Firefighters; Painting; Petroleum refining; Rubber industry
Liver and bile duct	Arsenic and inorganic arsenic compounds; 1,2-Dichloropropane, Methylene chloride; Ionizing radiation; Occupational infections with hepatitis B and C; Polychlorinated biphenyls (PCBs); Trichloroethylene	Beverage workers; Cooks; Building caretakers and cleaners; Electricians; Health care workers; Journalists; Pest control workers; Smelter and metal foundry workers; Seamen; Tobacco manufacture workers; Waitresses and waiters; Wood workers  Smelting of ores containing arsenic;  Vinyl chloride production;  Wood preservation
Lung	Arsenic and arsenic compounds; Asbestos; Benzo[a]pyrene; Beryllium; 1,3-Butadiene; Cadmium & cadmium compounds; Chromium (hexavalent) compounds; Coal tars & pitches; Diesel engine exhaust; Epichlorohydrin; Fibrous silicon carbide; Ionizing radiation; Lead; Mineral oils (untreated and mildly	Agriculture workers (e.g., vineyard workers)  Asphalt workers;  Building maintenance workers  Construction workers (residential, industrial, commercial, road)

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<b>Cancer Site</b>	<b>Examples of High-risk Substances or cancer-causing agents</b>	<b>Examples of High-risk Processes, Industries and Occupations with Increased Risks</b>
	treated); Nickel and nickel compounds; Pesticides; Radon; Silica (crystalline); Solar radiation; Soots; Strong inorganic acid mists containing sulfuric acid; Talc containing asbestiform fibers; 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD); Tobacco smoke - Involuntary (passive) smoking; Welding fumes	Electricians Mechanics Metal workers Oil and gas workers Painters Pest control workers Plumbers Pulp and paper mill and wood products manufacturing workers Roofers Welders Aluminum production; Coal gasification; Copper smelting; Hematite mining (underground) with radon exposure; Iron and steel founding; Isopropanol manufacture (strong acid process); Printing processes; Rubber production; Uranium mining;
Mesothelioma	Asbestos; Talc containing asbestiform fibres	Blasters; Boilermakers; Bricklayers; Building maintenance workers; Construction workers; Drillers; Electricians; Insulation workers; Machinists;

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		<p>Mechanics; Metalworkers; Miners; Pipefitters; Plumbers; Pulp and paper mill and wood products; Manufacturing workers; Roofers, Seamen; Sheet metal workers; Shipbuilding workers; Smelters; Thermoelectric power plant workers; Welders</p> <p>Manufacturers of cement; Manufacturers of textiles; Oil refining; Petroleum industry; Cigarette and filter manufacturing; Railroad industry</p>
Nasal cavities and paranasal sinuses	Chromium (hexavalent) compounds; Formaldehyde; Selected nickel compounds including combinations of nickel oxides and sulfides in the nickel refining industry; Wood dust	<p>Boot and shoe manufacturing and repair; Carpenters; Construction workers; Furniture and cabinet making; Isopropanol manufacture (strong acid process); Miners; Plumbers; Pulp and paper mill workers; Textile workers; Welders; Wood workers</p>
Nasopharynx	Formaldehyde; Wood dust	<p>Artistic workers; Beverage manufacturer workers; Cooks; Chimney sweeps; Embalmers; Furniture and cabinet makers; Healthcare workers and medical personnel; Laboratory workers; Pulp and paper mill and wood products manufacturing workers; Seamen</p>



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		Formaldehyde production; Plywood production / particle-board production
Ovary	Asbestos; Ionizing radiation; Leather dust; Man-made vitreous fibres; Diesel, gasoline and engine exhausts; Polycyclic aromatic hydrocarbons (PAHs); Talc; Hair dyes	Accountants; Hairdressers, barbers, beauticians; Occupations in retail trade; Postal workers; Printers; Sewers and embroiders; Teaching occupations
Prostate	Arsenic and inorganic arsenic compounds; Cadmium and cadmium compounds; Ionizing radiation; Malathion	Agriculture occupations; Dentists; Firefighting occupations; Shift work; Whole-body vibrations  Rubber production industry
Skin	Arsenic and inorganic arsenic compounds; Coal tar distillation; Creosotes; Ionizing radiation; Mineral oils (untreated and mildly treated); Polycyclic aromatic hydrocarbons (PAHs) like benzo[a]pyrene, benz[a]anthracene, and dibenz[a,h]anthracene; Shale oils or shale-derived lubricants; Solar radiation; Soots	Construction workers (residential, industrial, commercial); Dentist and dental workers; Outdoor workers (e.g., agricultural workers, road construction workers, physicians, roofers, vineyard workers); Pest control workers; Postal workers; Printers  Coal gasification; Coke production; Petroleum refining
Stomach	Asbestos; Lead compounds, inorganic; Airborne particles of cement and silica dust; Ionizing radiation	Chimney sweeps  Electrical workers  Fisherman  Insulators and pipe coverers;  Mechanics

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		Miners Shipyards and dockyard workers Asbestos mining; Insulation material production (pipes, sheeting, textiles, clothes, masks, asbestos cement products); Rubber production industry

**Adapted from:**

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