Smoking and Cancer

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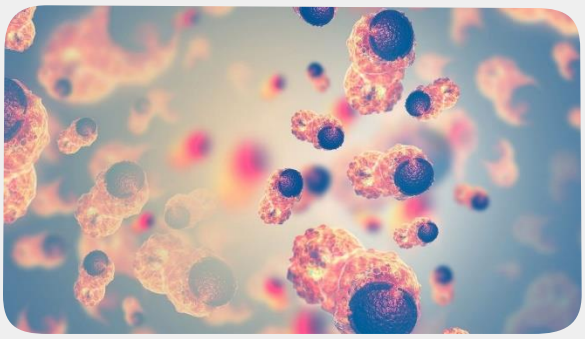
Plain English Summary



Smoking is the biggest avoidable cause of cancer. In the UK, smoking causes 3 in 20 cancer cases and 6 in 20 cancer deaths.

It has been proven that smoking can cause cancer in at least fifteen parts of the body: nose, mouth, voice box, throat, gullet, lung, liver, stomach, kidney, pancreas, bowel, ovary, bladder, cervix, and bone marrow.

Smoking causes cancer by damaging the DNA inside cells. When people inhale tobacco smoke into their lungs the smoke also touches the nose, mouth, voice box, throat and gullet. But the dangerous chemicals in tobacco smoke can also damage organs that aren't in the airway because they are absorbed into the bloodstream in the lungs.

Secondhand smoking is when a non-smoker breathes in tobacco smoke in the air caused by someone else smoking. It is also called passive smoking, involuntary smoking or environmental smoke. Secondhand smoking increases the chance of non-smokers developing lung cancer and cervical cancer.

Most of the cancer risks of cigarette smoking are true for cigars, pipes and waterpipes. Snuff has also been shown to cause some types of cancer.

Introduction

This fact sheet reviews the risks of developing various types of cancer from smoking, other tobacco use and exposure to other people's tobacco smoke.

It is estimated that 1 in 2 people in the UK born after 1960 will be diagnosed with some form of cancer during their lifetime[1] and that one in four will die from the disease.[2] Up to two in three long-term smokers are expected to die from a smoking-related disease.[3] [4] Smoking is the single biggest avoidable risk factor for cancer.[5] Tobacco smoke is estimated to be responsible for 15% of all cancer cases[6] and tobacco causes more than one quarter (28%) of all cancer deaths in the UK.[7]

Worldwide, a quarter of cancer deaths (26%) are caused by tobacco[7], although they are at an earlier stage of the epidemic than high income countries.[8] Economically developing countries currently account for about 57% of all cancer cases and 65% of cancer deaths worldwide, with lung cancer now being the leading cause of cancer morbidity and mortality among men in these nations.[9] However, it is estimated that, as the tobacco epidemic matures, the future burden of tobacco-related cancers on less economically developed countries is expected to lead to a 70% increase in tobacco-related cancer cases.[8]

The 2004 IARC review, published by The Lancet Oncology, concludes that there is sufficient evidence to confirm that smoking is a cause of at least 15 types of cancer, namely, from the head down: paranasal sinuses and nasal cavity (nose), oral cavity (mouth, including lips and tongue), larynx (voice box), pharynx (throat), oesophagus (gullet), lung, liver, stomach, kidney & ureter, pancreas, colorectum (bowel), ovary (mucinous), bladder and cervix and myeloid leukaemia (a type of bone marrow cancer).[10] These have continued to be confirmed in subsequent publications,[11] [12] with smoking listed among the "Carcinogenic agents with sufficient evidence in humans" on the IARC website for each of these parts of the body.[13] A 2004 US Surgeon General's report had similar conclusions, finding "sufficient evidence" that smoking causes cancer of the oral cavity, larynx, pharynx, oesophagus, lung, stomach, ovary, kidney, pancreas, bladder and cervix, and myeloid leukaemia. It also concludes that the evidence is "suggestive" that smoking causes liver and colorectal cancers.[14]

Tobacco smoking is extremely well-established to be a cause of each of the 15 types of cancer listed above. There is more limited evidence to suggest that smoking may also be a cause of breast cancer, Hodgkin lymphoma, prostate cancer, and cancer of the vagina and vulva. The evidence for a connection between tobacco smoking and these is weaker, and only breast cancer is currently classed as having even limited evidence in the current IARC list of carcinogens.[13]

In the UK, smoking is particularly strongly associated with an increased risk of cancer of the lung, liver, bladder, kidney and pancreas.[15]

Some people are unable to quit smoking after a cancer diagnosis.[16] [17] Continued smoking can limit the effectiveness of cancer treatments; increase the risk of complications and of developing additional primary and secondary cancers; increase pain; and reduce quality of life and survival.[16] [18]

The risk of cancer may also be increased when smoking is combined with other unhealthy risk factors. For example, research suggests current and ex-smokers who drink 15+ units per week may be positively associated with smoking-related cancer deaths.[19] There is also evidence that alcohol can make it easier for the cancer-causing tobacco chemicals found in cigarettes to get into tissue and cells.[20] [21]

Recent research is in the early stages of discovering the process of how smoking causes cancer and damages DNA, i.e., through cell mutations. Most of the mutations affect the tissues with direct exposure to smoke, such as in the lungs, but also in organs not directly

exposed to smoke. Until recently, epidemiological research could only link smoking and cancer, but now the molecular changes caused by cigarette smoking can actually be quantified.[22] [23] [24] Additional research is needed to unlock the complexities of cancer development caused by smoking.

All head and neck cancers

Head and neck cancer includes cancer of the sinuses, nose, mouth, larynx and pharynx. Smokers have a higher risk of developing all types of head and neck cancers.[25] A yearly average of 12,400 new cases of head and neck cancer were recorded in the UK in 2016-2018. Head and neck cancer incidence rates have increased by 37% in the UK since the early 1990s.[26] People who combine alcohol and tobacco use have a higher risk of head and neck cancers than would be expected by just combining the risks of each alone.[27]

A meta-analysis showed that the risk of head and neck cancers particularly increases with the length of time a person has been a smoker, as well as with the number of cigarettes consumed.[28] Quitting smoking reduces the risk of head and neck cancers.[28]

- **Paranasal sinuses and nasal cavity**
  Although nasal and sinus cancers are rare,[29] smoking significantly increases the risk of developing them.[30] [31] Smoking appears to particularly increase the risk of for the squamous cell carcinoma type of sinonasal cancer.[32] A case-control study carried out in the United States found that heavy smokers had a two- to three-fold increased risk of nasal cancer and that there was also an increased risk associated with snuff use.[33]

- **Oral cavity**
  Cohort studies and meta-analyses have shown that smoking is a risk factor for cancer of the oral cavity.[34] [35] Nearly one in five (17%) of oral cavity cancers in the UK are caused by smoking.[36] Oral cavity cancer is almost twice as high (91% higher) in current smokers compared with never smokers.

  People who combine alcohol or cannabis with tobacco use have a much higher risk of oral cancers than those using each of these substances individually.[37] [38] [39]Oral cavity cancer incidence rates in the UK are expected to continue to increase by a further 32% from 2014 to 2035.[40]

  Also see: **ASH Research Report Tobacco and Oral Health**.

- **Larynx**
  Cigarette smoking is a major risk factor for cancers associated with the larynx,[23] [41] and is linked to an estimated 64% of laryngeal cancer cases in the UK.[36] A case-control study found that the heaviest smokers have laryngeal cancer risks 20 times greater than never-smokers.[42] It has also been shown that the more one smokes and the longer one smokes, the greater the risk of laryngeal cancer.[43]

- **Pharynx**
  It has been estimated that smoking is a cause of 37% of cancers of the pharynx in the UK.[36] A meta-analysis showed that pharyngeal cancer risk is 3 times higher in current smokers compared with never-smokers.[44] Oropharangeal cancer risk is almost twice as high in men in the heaviest- and longest-smokers versus the lightest- and shortest-smokers.[35] Similarly, nasopharangeal cancer risk is three times as high in women among the heaviest- and longest-smokers compared with the lightest- and shortest-smokers.[45]

Oesophagus

Smoking is linked to an estimated 34% of oesophageal cancer cases in the UK.[36] Cigarette smoking is one of the main risk factors for both of the main types of oesophageal cancer; adenocarcinoma,[46] and squamous cell carcinoma.[47] The risk increases with the number of cigarettes smoked and duration of smoking and also remains elevated many years after smoking cessation.[48] There is a particularly poor prognosis for all-cause oesophageal cancer; only 17% of patients survive their disease for 5 years or more.[49]

Lung

Lung cancer has been estimated to be the most common cause of cancer deaths in the world for a number of decades.[50] [51] It is the second most common type of cancer worldwide, after breast cancer.[52] In 2020, there were an estimated 2.2 million new cases of lung cancer worldwide,[52] an estimated 1.8 million deaths.[50] Lung cancer is the third most common cancer in the UK, accounting for about 13% of the total new cancer diagnoses.[53] In the UK, around 48,500 people were diagnosed with lung cancer each year 2016-2018 (over 130 every day).[53] [36]

Lung cancer has the largest proportion of cases caused by smoking. In the UK about 72% of lung cancer cases are attributable to tobacco smoking.[54] People are over 8 times as likely to develop lung cancer if they smoke, compared to never smokers.[55] Even people who only smoke 5 cigarettes a day have triple the risk of developing lung cancer, compared to those that don't smoke.[55]

Because of its poor prognosis and relatively high prevalence, lung cancer is responsible for more than 1 in 5 (21%) of all cancer deaths in the UK.[56] Only 8% of men and 11% of women with lung cancer in England will survive at least ten years beyond diagnosis.[57] In fact, since the majority of lung cancer cases are diagnosed at a late stage (stage 3 or 4), only 4 in 10 people diagnosed with lung cancer in England survive their disease for one year or more.[57] [58]

A case-control study suggests that current smokers are 15 times more likely to die from lung cancer than life-long non-smokers.[61] The number of years a person has smoked for

is the strongest determinant of lung cancer in smokers,[10] [59] and the risk of dying from lung cancer is even higher in daily smokers than nondaily smokers.[60] [61]

Smokers who start when they are young are at a particularly increased risk of developing lung cancer. A study by Professor Richard Peto and colleagues found that taking up smoking before the age of 15 doubles the risk of lung cancer compared to starting at the age of 20 or later, after taking into account the amount smoked.[62]

The study by Peto et al. also examined the effects of prolonged cigarette smoking and prolonged cessation on mortality from lung cancer.[62] They found that if people who have been smoking for many years stop, even well into middle age, they avoid most of their subsequent risk of lung cancer. Also, stopping smoking before middle age avoids more than 90% of the risk attributable to smoking. Several other major studies have shown similar results.[63] [64] [65] [66]

Quitting smoking even improves health and life expectancy after a diagnosis of lung cancer.[67] [68] Despite the benefits of quitting, many smokers diagnosed with lung cancer continue to smoke even after treatment, with estimates ranging from 13% to 60%.[69]

See also: **ASH Fact Sheet: Smoking and Respiratory Disease**

Liver

Large studies have demonstrated an association between smoking and risk of liver cancer.[70] [71] It is estimated that one in five (20%) of liver cancer cases in the UK are caused by smoking.[36]

In many studies, as with cancer of other organs, the risk increases with duration of smoking or number of cigarettes smoked daily.[72] Similar to lung cancer, by the time any symptoms appear, liver cancer is typically at an advanced stage, leaving limited options for treatment.[73] In the UK, it is estimated that one in five (20%) of liver cancers are linked to smoking.[36] Liver cancer incidence rates are accelerating in the UK and are expected to increase 43% in men and 21% in women from 2014 to 2035.[40]

People who have a Hepatitis B or C infection have around a 20 times higher risk of hepatocellular liver cancer, and it is increased even further if they smoke, with greater increases in risk shown for people who smoke and are also infected with hepatitis viruses.[74]

Stomach

Stomach cancer rates have been in decline in recent years but it remains the fifth most common cancer in the world [52] and the fourth most common cause of cancer death.[50] Studies have long shown a consistent association between cigarette smoking and cancer

of the stomach.[75] [76] [77] [78] An estimated 15% of stomach cancers in the UK are linked to smoking.[36]

Current smokers who smoke daily have almost twice the risk of stomach cancer compared to never-smokers.[79] Risk increases with duration of smoking and number of cigarettes smoked.[80] There is some evidence that the risk decreases with smoking cessation.[80] [81] [82]

Kidney

In the UK, kidney cancer accounts for 4% of all new cancers in men and 3% in women.[83] Although comparatively rare, kidney cancer has consistently been found to be more common in smokers than in non-smokers and there is sufficient evidence to show that smoking is a risk factor for kidney cancer.[84] [85] [86]

Kidney cancer risk is over a third (36%) higher in current smokers compared with non-smokers.[84] There is a dose-response relationship, with a higher risk the greater the number of cigarettes smoked per day.[85] Smoking more than 20 cigarettes a day can double the risk in male smokers of the most common type of kidney cancer (renal cell cancer) compared to never-smokers.[85] For women, the risk is over one-and-a-half times greater. Risk appears to reduce after smoking cessation.[86]

Tobacco smoking has been shown to cause cancer of the ureter (a tube that carries urine from the kidney to the urinary bladder) in both men and women.[87] [88] Even though this is a relatively rare type of cancer, smoking is one of the few major risk factors.[89] Smoking also worsens the prognosis of people who have cancer of the ureter.[90]

Kidney cancer incidence rates are expected to continue to increase by a further 28% in men and 18% in women from 2014 to 2035 in the UK.[40]

Pancreas

Cancer of the pancreas typically has poor prognosis because it is often diagnosed at a late stage.[91] A quarter (25%) of people diagnosed with pancreatic cancer in the UK survive their disease for one year or more and 7.3% survive for five years or more.[92] Smoking is the single most significant risk factor for pancreatic disease [93] [36] and is estimated to be responsible for 11-32% of pancreatic cancer worldwide.[94] [95] Cigarette smoking is linked to 22% of cases of pancreatic cancer in the UK.[54]

Risk of pancreatic cancer is related to amount and duration of smoking.[96] [97]. A cohort study suggests, smokers are almost twice as likely to develop pancreatic cancer as people who have never smoked.[98] A 2012 study calculated a 27% increased risk of pancreatic cancer for every five cigarettes smoked per day.[99]

The risk of cancer can diminish after cessation. Research has shown it takes around 20 years for the level of cancer risk of an ex-smoker to fall to the level of someone who has never smoked,[98] [100] although estimates vary.[101]

With the reduction in smoking among men over the last several decades, a study in Australia showed that the mortality rate of pancreatic cancer among men has also decreased.[102] It is expected that this change will also occur in women in Australia and other economically developed countries as smoking rates are further reduced.

Colorectal

Colorectal cancer is the third most common type of cancer globally,[52] and the second most common cause of cancer deaths.[50] Smoking is a cause of colorectal (bowel) cancer. [103] [104] Smoking is linked to an estimated 7% of bowel cancers in the UK.[36] Colorectal cancer risk is 17-21% higher in current cigarette smokers compared with never-smokers.

A recent meta study found that the risk of colorectal cancer increases with greater smoking intensity and duration.[105] Long-term smokers are more likely than never-smokers to have and die from colorectal cancer. Continued smoking after diagnosis increases the risk of death.[106]

Ovary (mucinous)

Ovarian cancer is the sixth most common cancer in women in the UK.[107] Less than 1% of all ovarian cancers in the UK are deemed to be caused by smoking.[36]

Smoking increases women's risk for particular sub-type of the disease, mucinous ovarian cancer, by 31-49%.[108] [109] The risk of developing mucinous ovarian cancer increases with the length of time a woman has smoked.[108] [109]

Bladder

Tobacco contains cancer-causing chemicals that pass into a smoker's bloodstream and are filtered by the kidneys into the urine, thereby putting the bladder at risk.[110] Tobacco smoking is the single largest preventable risk factor for bladder cancer in both men and women.[111] Smoking is linked to an estimated 45% of bladder cancer cases in the UK.[36]

The risk of developing bladder cancer is 2-4 times higher in smokers than in people who have never smoked.[112] [113] [114] The incidence of bladder cancer is 3-4 times higher among men than women in the UK.[115]

As with many other types of cancer, the risk is associated with both the dose and duration of smoking.[116] People who stop smoking reduce their risk, although they remain at higher risk than never-smokers for over 25 years after they quit.[116] [117] [118]

Cervix

Cervical cancer is almost always in part caused by high-risk human papillomavirus (HPV) infection,[119] but smoking is also known to increase the risk. In the UK, it is estimated that around one in five (21%) of cervical cancer cases are linked to smoking.[36]

It is not yet fully understood how the risk factors of smoking and HPV interact in cases of cervical cancer,[120] but smoking appears to particularly increase the risk of squamous cell carcinoma. [121] [122] The risk of cervical squamous cell carcinoma is increased by the number of cigarettes smoked and starting smoking at a young age.[123]

An analysis of epidemiological studies concluded that risk of cervical cancer as a whole is increased by 60% in current smokers.[124] Cases of cervical cancer are rising in the UK, with an expected 43% increase from 2014 to 2035.[40]

A UK study of women aged 16 and over on cervical cancer awareness determined that few women know the risk factors for cervical cancer. Sixty-five percent (65%) of study participants could not recall any risk factors and 75% were unable to recall any symptoms.[125] This lack of knowledge may be deadly. A US study found that continued smoking among cancer survivors may increase their risk of subsequent tobacco-related malignancies and related death. Despite the risks, almost 40% of women diagnosed with cervical cancer are estimated to continue smoking after diagnosis.[126] As with other cancers, stopping smoking can halt the growth of the cancer and reduce early cervical lesion size in women who give up smoking after diagnosis.[127] [128]

Myeloid leukaemia

Leukaemia is a cancer of the white blood cells and bone marrow. There are four main types of leukaemia: acute myeloid (AML), acute lymphoblastic (ALL), chronic myeloid (CML) and chronic lymphocytic (CLL).[129] Smoking increases the risk of myeloid leukaemia,[130] [131] and is linked to around 3% of all leukaemia cases in the UK.[36]

Emerging evidence

There is overwhelming evidence for the impact of smoking on a range of cancers. In addition to those already discussed, there is emerging evidence for links to additional cancer sites.

Breast

Most older studies found no association between smoking and breast cancer but some studies published since 2000 suggest that there may be a link.[132] An expert panel in Canada reviewed the results of cohort studies and concluded that risk of breast cancer is 10% to 30% higher in long-term smokers than nonsmokers.[133] Other studies suggest that the increase in breast cancer risk from smoking mostly affects pre-menopausal women,[134] [135] [136] although a British study of middle-aged women found no evidence of an association

with either active or passive smoking.[137] A number of studies over the past decade have suggested causation.[138] [139] [140] [141] [142]

As of IARC's 2012 classification, it considers the evidence for smoking as a causal factor for breast cancer to be limited.[12] The US Surgeon General's report of 2014 concluded that:

> "1. The evidence is sufficient to identify mechanisms by which cigarette smoking may cause breast cancer. [...]
> "3. The evidence is suggestive but not sufficient to infer a causal relationship between active smoking and breast cancer. [...]"[143]

In light of the evidence for a connection between smoking and breast cancer some commentators have urged the IARC to re-review the evidence.[144]

Hodgkin lymphoma
Hodgkin lymphoma, a cancer of the lymphatic system that starts in white blood cells called lymphocytes,[145] is a relatively rare type of cancer accounting for less than 1% of all cancer cases[146] and cancer deaths in the UK in 2017-2019.[147]

Several major studies suggest an increased risk for Hodgkin lymphoma in smokers.[148] [149] In general Hodgkin lymphoma carries a 10-15% higher risk in ever-smokers than never-smokers.[148] [149] [150] Smoking may especially increase the risk for older men and the risk of certain types of Hodgkin lymphoma, such as those associated with the Epstein–Barr virus.[150]

The Million Women Study, which followed outcomes for British women between 1996 and 2001, revealed that the risks of Hodgkin lymphoma and mature T-cell lymphomas were doubled in women who smoked around 15 or more cigarettes a day. The risks of other types of haematological (blood) cancer were also increased among smokers, but to a lesser extent.[151]

Prostate
The 2004 US Surgeon General's Report states that, "The evidence is suggestive of no causal relationship between smoking and risk for prostate cancer." [152] The latest IARC report from 2012 agrees that most studies have not shown a consistent correlation between smoking and prostate cancer.[12]

However, since these reports were issued, new research has found that smoking may increase the risk of prostate cancer [153] [154] and that heavy smokers have a 24-30% increased risk of death from prostate cancer.[155] Smoking may also increase the risk of recurrence of prostate cancer.[156] [157]

Additional research is needed before being able to determine definitively if smoking causes prostate cancer.

Endometrium (womb)
Smoking does not increase the risk of endometrial (womb) cancer. In fact, a body of evidence shows that smoking can be protective against endometrial cancer, especially in post-menopausal women and long-term, heavy smokers.[158] [159] [160] One meta-analysis found that post-menopausal smokers had a 29% reduced risk compared with never-smokers.[161]

Given the strong causal link between smoking and other cancers, any reduced endometrial cancer risk among female smokers is not directly relevant to public health[162] and smoking should still be strongly discouraged.

Vulva and vagina
Although not included in the latest IARC review of cancers caused by smoking, some studies suggest an association between smoking and cancer of the vulva and vagina.[163] One study reported at least double the risk for vulvar and vaginal squamous cell carcinoma in women who smoke and have high-risk HPV compared to lifelong non-smokers with the virus.[164] Smoking is among the most well-established HPV cofactors in the etiology of vulvar cancer,[165] and rates of vulvar cancer are higher in countries with high smoking prevalence.[166]

Secondhand smoke (Passive smoking/environmental smoke)

Adults
Since 2004, IARC has stated that "there is sufficient evidence that involuntary smoking (exposure to secondhand or 'environmental' tobacco smoke) causes lung cancer in humans."[10] This conclusion was echoed by the US Surgeon General's report in 2006.[167] The IARC further confirmed that secondhand smoke can cause lung cancer in never smokers in their 2012 publication '**Personal Habits and Indoor Combustions**'.[12] Non-smokers are at risk of lung cancer from exposure to other people's smoke, particularly if they are genetically predisposed[168] [169] [170] or if the exposure is long-term.[171] [172]

The UK's Scientific Committee on Tobacco and Health (SCOTH) reported an increased risk of lung cancer in non-smokers of between 20% and 30% from secondhand exposure to smoke.[173] A subsequent review of the evidence by SCOTH in 2004 confirmed that the increased risk was around 24%.[174] In cases of very high exposure, the risk of lung cancer can even double.[175] It is estimated that in the UK 15% of lung cancer cases in never smokers are caused by exposure to secondhand smoke.[176]

A meta-analysis has shown that the risk for cervical cancer is 73% higher in never-smokers exposed to secondhand smoke, compared to those who are not exposed.[177]

The 2012 IARC update reports limited evidence showing an association between exposure to secondhand smoke and cancers of the larynx and pharynx.[12] As for nasal cancer, the 2006 US Surgeon General's report concluded that, "the evidence is

suggestive but not sufficient to infer a causal relationship" between secondhand smoke exposure and a risk of both nasal sinus cancer and nasopharyngeal carcinoma among non-smokers.[167]

IARC also reported in 2012 and the US Surgeon General in 2014 that the evidence linking secondhand smoke to breast cancer is inconclusive but suggestive.[12] [178] Some scientists are urging that a causal link between breast cancer and secondhand smoke be declared by authoritative organizations, but some studies show the link only in pre-menopausal women with certain genetic variants.[179] [180] [181] Exposure to secondhand smoke in young women between menarche and their first full-term pregnancy seems to be particularly harmful.[182]

Recent studies have found a possible link between secondhand smoke and many other types of cancer,[183] including oral[184] and bladder.[185]

More research is needed in all these areas except for lung cancer to determine causality.

Thirdhand smoke

Thirdhand smoke is made up of the residual gases and particles that stick to surfaces and that are found in dust wherever people smoke indoors. Recent research indicates a possible link between thirdhand smoke and lung cancer,[186] [187] and that thirdhand smoke can cause biological changes in mice.[188] However, there is not yet a body of evidence large enough to infer causality.

Children

It is well-established that prenatal and postnatal exposure to tobacco smoke is harmful to foetuses, infants and children, worsening asthma and increasing the risk of stillbirth.[189] [190] [191]

The evidence about the risks of secondhand smoke in children's cancers is emerging and inconsistent.[192] In 2006, the US Surgeon General concluded that, "The evidence is suggestive but not sufficient to infer a causal relationship between prenatal and postnatal exposure to secondhand smoke and childhood cancer."[167]

Children who are exposed to tobacco smoke on a daily basis grow up to have more than triple the risk of lung cancer as adults compared to those who grow up in smokefree environments.[193] Furthermore, exposure to tobacco smoke during childhood may lead to head and neck squamous cell carcinoma later in life, although the research is limited on this topic.[194]

Exposure to parental smoking is a cause of hepatoblastoma (a type of liver cancer) in children [195], supported by the IARC which includes parental tobacco smoke as a carcinogenic agent to the liver with sufficient evidence in humans.[13]

There is some evidence that children of smokers have an increased risk of childhood leukaemia, according to IARC and others.[12] [196] Additional research suggests that heavier paternal smoking around the time of conception may be a risk factor for childhood acute

lymphoblastic leukaemia (ALL).[197] [198] ALL is the most common form of leukaemia in children.

Further research is needed to support any emerging research, as well as to break new ground in linking tobacco smoke to other childhood cancers or cancers later in life for those who had long-term childhood exposure.

Smokeless tobacco

Smokeless tobacco is tobacco that is chewed, sucked or sniffed, such as chewing tobacco, moist snuff and snus. It excludes e-cigarettes (vapes) as they do not contain tobacco, although like cigarettes and smokeless tobacco they normally contain nicotine. In 2007, IARC concluded that there is sufficient evidence in humans to state that smokeless tobacco causes cancer of the mouth, oesophagus and pancreas.[11] [199] [200] This evidence was reconfirmed by IARC in 2012[12]**Error! Bookmark not defined.**, but a 2014 r eview found insufficient evidence to declare smokeless tobacco a cause of pancreatic cancer.[201]

Long-term use of smokeless tobacco increases the risk of head and neck squamous cell carcinoma, especially for snuff users.[202] [203] [204]

The 2012 IARC updates also concluded that *"switching from cigarette smoking to smokeless tobacco significantly increased the risk for lung cancer compared to never-tobacco users, and the risk was of greater magnitude than for quitting all together."*[205]

Animal studies point to the additional possibility of smokeless tobacco causing cancer of the forestomach and skin, but epidemiological studies are inconclusive at this stage.[206]

Ongoing research is needed by type of smokeless tobacco and among people who only use a specific product and those who use it in conjunction with other smokeless tobacco product(s) or cigarettes.

Waterpipes

Waterpipes (also known as hookah, shisha or narghile) have recently increased in popularity, especially among youth and young adults who may consider them "healthier" than smoking cigarettes. Using a waterpipe is not safer than smoking. In fact, it contains 27 known or suspected carcinogens.[207]

There is sufficient evidence to link waterpipe smoking to lung cancer, and some evidence linking shisha use to oral cancer, leukaemia, oesophageal squamous cell carcinoma, stomach and possibly other cancers. [208] [209] [210] [211] [212] [213]

Waterpipe smoking may more than double the risk of lung cancer.[214] [215] Additional research is required to definitively assess the relative risks,[216] but the body of evidence that waterpipes cause cancer is increasing.

Cigars and pipes

Cigar, pipe and cigarette smoking carry many of the same risks.[217] People who smoke cigars only – with no history of smoking cigarettes or pipes – are at risk of several types of cancer. A 2015 systematic review and the IARC 2004 report both concluded that cigar and/or pipe smoking can cause cancers of the lung, oral cavity, pharynx, larynx, esophagus and pancreas.[217] [10] Another study also indicated an increased risk for liver cancer in both cigar and pipe smokers.[218]

Strong daily cigar use and inhalation, which are relatively rare except among current or former cigarette smokers, further increase the risk for oral, esophageal, laryngeal, and lung cancers.[217] Even without inhalation, the relative mortality risk is still high for oral, esophageal, and laryngeal cancers. [217]

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