

How does smoking affect the eyes?

Not many smokers are aware that they are twice as likely to lose their sight, compared to non-smokers. Smoking can cause and worsen a number of eye conditions, some of which can lead to permanent loss of vision.

How does smoking affect the eye?

- noxious particles present in tobacco smoke act as irritants to the conjunctiva
- various components of cigarette smoke can lead to an acute constriction of the ciliary arteries which reduces the blood flow to the eye
- nicotine and carbon monoxide accelerate atherosclerosis and interfere with lipid homeostasis causing fatty deposits in the blood vessels
- increases platelet aggregation and can induce blood clotting. If these processes affect the ophthalmic branch of the carotid vasculature, this may also cause ocular ischemic episodes
- tobacco smoke contains free radicals that reduce the presence of protective antioxidants and therefore can cause oxidative damage to the retina
- heavy metals such as cadmium, lead and copper found in tobacco smoke can accumulate in the lens causing the formation of cataracts

What is the relationship between smoking and eye diseases?

Research has shown that, compared to those who have never smoked, smokers have an increased risk of developing:

- **Age related macular degeneration (AMD)** (2-3.5 times increase in risk), and the risk has been demonstrated to be dose-dependent. AMD is the breakdown of the macula which allows the eye to see fine details clearly. When the macula doesn't work properly vision becomes blurred and dark in the centre.
- **Graves-disease** related eye disease, which is associated with the number of cigarettes smoked per day. Graves' disease is when the thyroid gland produces too much thyroid hormone, causing problems to many parts of the body, especially the eyes. An excess of thyroid hormone can cause protrusion of the eyes, double vision and problems to the muscles of the eyes. It can occasionally lead to permanent visual impairment.
- **Age-related cataract**, which is twice as likely to occur in those who smoke more than 20 cigarettes a day compared to non-smokers. A cataract is a gradual thickening and loss of transparency in the lens of the eye. The condition develops gradually as patients' age however it can affect people in their 50s and 60s. Cataracts can be removed by surgery but they can still cause a large amount of sight loss. The formation of a cataract is thought to be accelerated due to accumulation of heavy metals, found in tobacco smoke.
- **Optic neuropathy**, which smokers are 16 times more likely to develop and up to 12 years earlier than non-smokers. Optic neuropathy is a sudden loss of vision often leading to permanent blindness. It happens when the blood vessels to the eyes are completely or partially blocked.
- **Optic neuritis**, which is thought to result from the lack of oxygen caused by carbon monoxide inhaled from tobacco smoke. Optic neuritis occurs when the nerve fibers in the optic nerve, that carry messages from the eye to the brain, become inflamed and

results in damage to the vision. Smoking makes this condition worse and results in colour defects to the eye.

- **Diabetic retinopathy**, which is an eye complication associated with diabetes in which the blood vessels that supply the retina are damaged by high blood sugar levels. When these blood vessels become damaged, they may leak fluid or blood and grow scar tissue which can distort the images the retina sends to the brain. This can eventually lead to blindness. Smoking is a significant risk factor for developing diabetic neuropathy due to a reduced supply of oxygen to the eye, with a corresponding increase in carbon monoxide. Smoking also increases blood pressure and raises blood sugar levels in diabetics, therefore making it harder to control the diabetes.
- **Contact lens problems:** smokers are more likely to have problems if they wear contact lenses, such as irritation of their cornea.
- **Abnormal eye movements:** Smoking is linked to nystagmus, or abnormal eye movements, which can include jerky or circular movements. Nicotine is thought to disrupt the balance centre in the brain that results in nystagmus.
- **Amblyopia** is loss of vision in both eyes and ocular histoplasmosis syndrome is an inflammation of the eye. Both these diseases have a number of causes but they are both linked to smoking.

What are the health benefits of stopping smoking for patients with eye diseases?

Stopping smoking has been associated with a:

- reduction in the risk of surgical cataract extraction, taking 10 to 20 years for the risk to reduce to that of non-smokers.
- decrease in progression of age related macular degeneration (AMD). It takes about 20 years after stopping smoking for the risk of AMD incidence to reduce to that of non-smokers.
- reduction of risk of anterior ischemic optic neuropathy to that seen in non-smokers.
- improved response to treatment for Graves' ophthalmology.

Stopping smoking is one of the most important things you can do for your health. You are **four times** more likely to stop with an NHS service (using stop smoking medication and support).

To be referred to your local service or to speak to a specialist advisor please contact the stop smoking service:

Royal Free Hospital: 020 7472 6393 or email: Rf.stopsmoking@nhs.net

Barnet Hospital and Chase Farm Hospital: 020 8216 4175 or email: RF-TR.bcf-smokefree@nhs.net

Alternatively you can call the national stop smoking service on 030 0123 1044.