The Clinical Case for providing stop smoking support to Neurology Patients

Why intervene in secondary care?

1. Hospital patients are more receptive to 'Very Brief Advice' (VBA) and an offer of support to stop smoking, as they are often experiencing a period of heightened motivation
2. Giving VBA to a hospital patient (the '3 A's': Ask, Advise, Act) can also encourage compliance to the smokefree hospital policy, and highlight any need for withdrawal management. Providing Nicotine Replacement Therapy (NRT) to a patient during a period of forced abstinence, will ease nicotine withdrawal symptoms
3. Stopping smoking can lead to significant health benefits, and reduce post-operative complications and improve recovery time

What is the aim of this 'clinical case' document?

The aim of this document is to provide clinical support for hospital staff in terms of supporting patients to stop smoking, even if this is just for a period of forced abstinence whilst in hospital. Being in hospital provides an opportune moment to intervene and provide both brief advice and support to stop smoking; including making a referral on to local stop smoking support. There are many benefits for a patient if they have temporary abstinence from smoking, including a shorter time for recovery and this can often stimulate a full attempt to stop smoking.

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What is the relationship between smoking and neurological disorders?

Cigarette smoke contains around 4,300 chemical compounds, at least 40 of which are carcinogenic, and also nicotine which is neuroactive. Nicotine binds to acetylcholinergic receptors, leading to increased activity of cholinergic neurones, acetylcholine receptor upregulation and dopamine release. Constituents of cigarette smoke can also affect the tissue and vasculature of the central nervous system by promoting atherosclerosis and thrombosis, and oxidative damage leading to increased lipid peroxidation. These processes, amongst others, have been implicated in diseases and disorders affecting the central nervous system.[1,2]

Compared to those who don't smoke, smokers have been shown to be at an increased risk of the following:

- Ischemic or haemorrhagic stroke (around 50% increase in risk).[3–5]
- Subarachnoid haemorrhage (around a 100% increase in risk).[6,7]
- Alzheimer's disease. Although early case-control studies indicated that smoking protected against Alzheimer's disease, more recent longitudinal studies have in fact showed that smoking increases the risk of Alzheimer's. An exception to this may be in people who carry the APO-E gene, where smoking doesn't appear to confer a greater risk above that of carrying the gene.[8,9]
- Multiple sclerosis (around a 50% increased risk).[10–12]
- Amyotrophic lateral sclerosis (around a 50% increase in risk). [13,14]
- Smokers are at greater risk of chronic pain, and experience pain in greater intensity when compared to never smokers.[15]

Despite the widely known detrimental effects of smoking on health, smokers have been found to be at about a 50% decreased risk of Parkinson's disease compared to those who don't smoke.[16,17] The longer a person has smoked, the more their risk is reduced.[18] The most likely mechanism for the protective effect of smoking is administration of nicotine.[19]

What are the health benefits of quitting for neurological patients?

Successfully stopping smoking will not only benefit a patient's long term health by reducing the risk of developing other diseases,[20] smoking abstinence may also help a patient recover quicker by eliminating the acute effects of smoking on the body and there is an evidenced benefit of stopping smoking in terms of neurological outcomes (see page 3).

Main acute effects of smoking on the body (estimated time of recovery, if known)

- Increase in sympathetic tone leading to an increase in blood pressure, heart rate and peripheral vasoconstriction leading to an increased demand for oxygen and cardiac function.[21] **(24 – 48 hours)**
- Formation of carboxyhaemoglobin leading to a reduction in oxygen delivery to the tissues.[22] **(8 – 24 hours)**
- Formation of carboxymyoglobin leading to a reduction in oxygen storage in the muscles.[23] **(8 – 24 hours)**
- Increase in red blood cell production, which leads to an increase in blood viscosity, a decrease in tissue perfusion, a decrease in oxygen delivery to the tissues and potentiation of thrombotic process.[1,24]
- Hypersecretion of mucus, narrowing of the small airways, decrease in ciliary function and change in mucus rheology leading to a decrease in mucociliary transport.[1,24] **(12 – 72 hours)**
- Changes in functioning of a range of immune cells (pro- and anti-inflammatory cytokines, white blood cells, immunoglobulins) which lead to decreased immunity and are associated with atherosclerosis.[1,24] **(1 week – 2 months)**
- Induction of hepatic enzymes which increases drug metabolism through both pharmacokinetic and pharmacodynamic mechanisms.[25] **(6 – 8 weeks)**

Neurological health benefits associated with stopping smoking

- Stopping smoking is recommended for both primary and secondary prevention of stroke. The risk of stroke halves within the first year of stopping smoking, and after five years the risk is the same as for people who have never smoked.[26] The greatest benefit in stopping smoking is seen in heavy smokers who are also hypertensive.[5]
- Stopping smoking has been associated with improvement in symptoms and an improved prognosis in multiple sclerosis.[27,28]
- Although smoking reduces the risk of developing Parkinson's disease, beneficial modification of the disease has not been demonstrated in patients who continue to smoke after diagnosis.[19, 29]

Providing 'Very Brief Advice' to hospital patients: the '3 A's'

Providing a stop smoking intervention to a hospital patient is proven to be effective regardless of the reason for admission.[30] Offering VBA is the single most cost effective and clinically proven preventative action a healthcare professional can take[31] and it is important to keep giving advice at every opportunity, as smokers may take several attempts to stop smoking successfully.[32] In addition, by referring a patient to a local stop smoking service, they are four times more likely to stop smoking.[33]

Research shows that 95% of patients expect to be asked about smoking and a short intervention can make all the difference.[34,35] The '3 A's' 30 second approach to giving 'very brief advice' are as follows:

ASK and record smoking status

ADVISE the patient of the personal health benefits of stopping smoking

ACT on the patient's response

- prescribe NRT for patients in withdrawal
- monitor withdrawal and adjust pharmacotherapy accordingly
- refer to local stop smoking service

How was this information sheet put together?

This information is a summary of the current scientific evidence on the association between cigarette smoking and neurological outcomes. Studies were found by searching MEDLINE and EMBASE using combined exploded subject headings of 'neurology', 'nervous system diseases', 'nervous system neoplasms' and 'tobacco use cessation' from 01/1990 – 09/2012 and by searching for key words in google scholar.

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