

The Clinical Case for Smoking Cessation for RESPIRATORY PATIENTS

What is this initiative aiming to achieve?

The aim of this initiative is to provide clinical support for temporary abstinence with a view to prompting a permanent quit supported by a referral to local NHS Stop Smoking Services. To gain maximum benefit, hospital associated abstinence needs to lead to permanent quitting. However, temporary abstinence during treatment and recovery may still have worthwhile benefits.

Why intervene in secondary care?

Hospitalisation is an opportune time to encourage patients to stop smoking for four main reasons.

- Firstly, this time is often a “teachable moment” where patients are more receptive to intervention and are more motivated to quit.
- Secondly, the hospital’s no smoking environment creates an external force to support abstinence.
- Thirdly, patients are ideally placed to be given information about treatment options, support through withdrawal and signposted to specialist services.
- Fourthly, abstaining from smoking at this time can lead to significant health benefits.

What is the relationship between smoking and respiratory illnesses?

Cigarette smoke has been identified as a risk factor for the development, aggravation and/or progression of a number of respiratory diseases including COPD,¹ lung cancer,^{2,3} asthma⁴ and interstitial lung diseases (respiratory bronchiolitis-associated interstitial lung disease, desquamous interstitial pneumonia, pulmonary Langerhans cell histiocytosis)⁵. People who smoke are also at an increase risk of serious respiratory infections such as pneumococcal pneumonia, influenza and tuberculosis.^{6,7}

What are the health benefits of quitting for respiratory patients?

Successful quitting will not only benefit a patient’s long term health by reducing the risk of developing other diseases,² smoking abstinence may help a patient recover quicker by eliminating the acute effects of smoking on the body and smoking cessation has been associated with benefits in terms of respiratory disease outcomes (see below).

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

- Increase in sympathetic tone leading to an increase in blood pressure, heart rate and vasoconstriction which increases demand for oxygen and cardiac function.^{8,9} (24-48 hrs)
- Formation of carboxyhaemoglobin and decreased oxygen dissociation rate in the blood leading to reduction in oxygen delivery to the tissues.¹⁰ (8-24 hrs)
- Formation of carboxymyoglobin leading to reduction in oxygen storage in the muscles.¹⁰ (8-24hrs)
- Increase in red blood cell production which leads to increase in blood viscosity, a decrease in tissue perfusion, a decrease in oxygen delivery to the tissues and potentiation of thrombotic process.^{11,12}
- Hypersecretion of mucus, narrowing of the small airways, decrease in ciliary function and change in mucus rheology leading to a decrease in mucociliary transport.^{11,12} (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^{11,12} (1week-2 months)
- Induction of hepatic enzymes which increases drug metabolism through both pharmacokinetic and pharmacodynamic mechanisms¹³ (6-8 weeks)

Effect of smoking and smoking cessation in respiratory illness

Asthma

- Smoking is associated with more severe symptoms, an accelerated decline in lung function, increased hospital-based care and increased mortality following hospital admission with an acute episode of near fatal exacerbation, compared to levels seen in non-smoking asthma patients.¹⁴
- Smoking has been associated with corticosteroid-resistance and poorer symptom control compared with non-smoking asthma patients.^{15;16}
- Smoking cessation has been shown to improve lung function, reduce self-reported symptoms, medication use and improve asthma specific quality of life scores.¹⁷⁻¹⁹

COPD

- Smoking cessation is the most effective method of slowing respiratory function decline associated with COPD.^{1;20-22}
- Smoking cessation has been associated with a decrease risk in COPD exacerbations, with the size of the risk reduction increasing with duration of smoking abstinence.²³
- Smoking cessation is associated with a 43% decreased risk of hospitalisation (HR 0.57 (95% CI 0.33-0.99)).²⁴

Respiratory infections

- Smoking has been associated with an increase risk of contraction, activation, relapse and mortality due to TB.²⁵⁻²⁷
- Smoking cessation reduces the risk of developing bronchitis and pneumonia compared to continued smoking.⁶

How was this information sheet put together?

This information is a summary of the current scientific evidence on the association between cigarette smoking and respiratory diseases. Studies were found by searching MEDLINE and EMBASE using combined exploded subject headings of “pneumonia, bacterial, “respiratory tract infections” “respiratory tract diseases” and “tobacco use cessation” from 01/1990 – 10/2009 and by searching the Report of the US surgeon general on the health benefits of smoking cessation.⁶ Evidence has been included in this summary from cohort studies, randomised controlled trials and reviews only.

The 3A's

How to approach smoking cessation with patients

Smoking cessation interventions have been proven effective for hospitalised patients regardless of admitting diagnosis²⁸ and specifically for respiratory patients.²⁹

NICE guidance has recommended that smoking cessation interventions should be offered to patients with stable COPD, and health professionals are encouraged to offer pharmacological support and refer patients to local NHS Stop Smoking Services.

The DH guidance, “Smoking Cessation in Secondary Care”,³⁰ is designed to be practical for busy healthcare professionals and outlines a care pathway for supporting smoking cessation that can be adopted for respiratory patients. In essence, the care pathway incorporates a very brief intervention using the 3A's:

ASK and record smoking status

ADVISE the patient of the personal health benefits of quitting

ACT on the patient response

-prescribe NRT for patients in withdrawal

-monitor withdrawal and adjust pharmacotherapy accordingly

-refer to local NHS Stop Smoking Service

Reference List

- (1) Fletcher C, Peto R. The natural history of chronic airflow obstruction. *BMJ* 1977; 1:1645-1648.
- (2) Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. *BMJ* 2004; 328:1519.
- (3) Parsons A, Daley A, Begh R, Aveyard P. Does smoking cessation after a diagnosis of early stage lung cancer influence prognosis? A systematic review of observational studies with meta-analysis. *BMJ* 2010; 340:b5569.
- (4) Piipari R, Jaakkola JJ, Jaakkola N, Jaakkola MS. Smoking and asthma in adults.[see comment]. *European Respiratory Journal* 2004; 24(5):734-739.
- (5) Rao RNG. Smoking-related interstitial lung disease. *Annals of Diagnostic Pathology* 2008; 12(6):December.
- (6) USDHHS. The Health Benefits of Smoking Cessation. U S Department of Health and Human Service, Centres for Disease Control, Centre for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health 1990; DHHS Publication No. (CDC) 90-8416.
- (7) Arcavi L, Benowitz N. Cigarette smoking and infection. *Archives of Internal Medicine* 2004; 164:2206-2216.
- (8) Warner DO. Perioperative abstinence from cigarettes: physiologic and clinical consequences. *Anesthesiology* 2006; 104:356-367.
- (9) Krupski WC. The peripheral vascular consequences of smoking. *Annals of vascular surgery* 5[3], 291-304. 1991.
Ref Type: Journal (Full)
- (10) Akrawi W, Benumof JL. A pathophysiological basis for informed preoperative smoking cessation counselling. *Journal of cardiothoracic and vascular anesthesia* 1997; 11(5):629-640.
- (11) Moller A, Tonnesen H. Risk reduction: perioperative smoking intervention. *Best practice and research clinical anaesthesiology* 2006; 20(2):237-248.
- (12) Ambrose J. The pathophysiology of cigarette smoking and cardiovascular disease. *Journal of the American College of Cardiology* 2004; 43(10):1731-1737.
- (13) Zevin S, Benowitz NL. Drug interactions with tobacco smoking. An update. *Clinical Pharmacokinetics* 1999; 36(6):425-438.
- (14) Hylkema MNS. Tobacco use in relation to COPD and asthma. *European Respiratory Journal* 2007; 29(3):Mar.
- (15) Thomson NCS. The influence of smoking on the treatment response in patients with asthma. *Current Opinion in Allergy and Clinical Immunology* 2005; 5(1):Feb.
- (16) Ahmad T, Barnes PJ, Adcock IM. Overcoming steroid insensitivity in smoking asthmatics. [Review] [64 refs]. *Current Opinion in Investigational Drugs* 2008; 9(5):470-477.
- (17) Boulet L-PF. Influence of current or former smoking on asthma management and control. *Canadian Respiratory Journal* 2008; 15(5):2008.
- (18) Tonnesen PP. Effects of smoking cessation and reduction in asthmatics. *Nicotine and Tobacco Research* 2005; 7(1):Feb.

- (19) Chaudhuri R, Livingston E, McMahon AD, Lafferty J, Fraser I, Spears M et al. Effects of smoking cessation on lung function and airway inflammation in smokers with asthma. *American Journal of Respiratory & Critical Care Medicine* 2006; 174(2):127-133.
- (20) Scanlon PD, Connett JE, Waller LA, Altose MD, Bailey WC, Buist AS. Smoking cessation and lung function in mild-to-moderate chronic obstructive pulmonary disease. The Lung Health Study. *American Journal of Respiratory & Critical Care Medicine* 2000; 161(2 Pt 1):381-390.
- (21) Anthonisen NR, Connett JE, Kiley JP, Altose MD, Bailey WC, Buist AS et al. Effects of smoking intervention and the use of an inhaled anticholinergic bronchodilator on the rate of decline of FEV1. The Lung Health Study.[see comment]. *JAMA* 1994; 272(19):1497-1505.
- (22) Pauwels RAB. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: NHLBI/WHO Global Initiative for Chronic Obstructive Lung Disease (GOLD) workshop summary. *American Journal of Respiratory and Critical Care Medicine* 2001; 163(5):2001.
- (23) Au DH, Bryson CL, Chien JW, Sun H, Udris EM, Evans LE et al. The effects of smoking cessation on the risk of chronic obstructive pulmonary disease exacerbations. *Journal of General Internal Medicine* 2009; 24(4):457-463.
- (24) Godtfredsen NS, V. Risk of hospital admission for COPD following smoking cessation and reduction: A Danish population study. *Thorax* 2002; 57(11):01.
- (25) Gajalakshmi VP. Smoking increases the risk of death from tuberculosis four-fold in adult males in India. *Evidence-Based Healthcare* 2004; 8(1):2004.
- (26) Zellweger J-P. Tobacco and tuberculosis. *Monaldi Archives for Chest Disease - Pulmonary Series* 2008; 69(2):June.
- (27) Chiang C-YS. Associations between tobacco and tuberculosis. *International Journal of Tuberculosis and Lung Disease* 2007; 11(3):Mar.
- (28) Rigotti N, Munafo 'MR, Stead LF. Interventions for smoking cessation in hospitalised patients. *Cochrane Database of Systematic Reviews* 2007; Issue3.Art.No.:CD001837.DOI:10.1002/14651858.CD001837.pub2.
- (29) van der Meer RM, Wagena EJ, Ostelo RW, Jacobs JE, van Schayck CP. Smoking cessation for chronic obstructive pulmonary disease. [Review] [52 refs]. *Cochrane Database of Systematic Reviews* 2003;(2):CD002999.
- (30) Department of Health. Stop smoking interventions in secondary care. 2009. www.dh.gov.uk/publications