

The Clinical Case for providing stop smoking support to Renal 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 As': 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 renal function?

Constituents of cigarette smoke increase heart rate and blood pressure, promote atherosclerosis and thrombosis, increase lipid peroxidation and impair endothelial cell-dependent vascular dilation and the immune system. These are some of the most likely smoking related processes to effect renal function. Some cross sectional studies have shown that in individuals with no pre-existing renal disease, diabetes or hypertension, smoking is associated with an increase in renal vascular resistance, intraglomerular capillary pressure, proteinuria and a decrease in glomerular filtration rate compared to non smokers.¹⁻⁴ Smoking is an independent risk factor for renal failure, increasing the risk by about four-fold.⁵

In addition, compared to non-smokers, smokers have an increased risk of the following:

- Microalbuminuria in patients with primary hypertension.⁶
- Diabetic nephropathy and almost double the rate of progression to end-stage renal failure in type I and type II diabetic patients. The increased risk and progression rate are independent of age and disease duration.⁷
- Progression to end stage kidney failure in men with primary renal disease.^{7, 8}
- Renal allograft loss.^{9,10}
- Renal cell cancer.¹¹

What are the health benefits of stopping smoking for renal patients?

Successfully stopping smoking will not only benefit a patient's long term health by reducing the risk of developing other disease,¹² abstinence from smoking may 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 renal outcomes (see page 3).

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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.¹³
(24 – 48 hours)
- Formation of carboxyhaemoglobin leading to a reduction in oxygen delivery to the tissues.¹⁴
(8 – 24 hours)
- Formation of carboxymyoglobin leading to a reduction in oxygen storage in the muscles.¹⁵
(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.^{16,17}
- Hypersecretion of mucus, narrowing of the small airways, decrease in ciliary function and change in mucus rheology leading to a decrease in mucociliary transport.^{16,17} **(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.^{16,17} **(1 week – 2 months)**
- Induction of hepatic enzymes which increases drug metabolism through both pharmacokinetic and pharmacodynamic mechanisms.¹⁸ **(6 – 8 weeks)**

Renal benefits associated with stopping smoking

- Decreased rate of progression of nephropathy in type I and type II diabetes.¹⁹⁻²²
- After controlling for the effects of other renal risk factors, stopping smoking is associated with a reduced risk of end stage renal failure.⁵

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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.²³ Offering VBA is the single most cost effective and clinically proven preventative action a healthcare professional can take²⁴ and it is important to keep giving advice at every opportunity, as smokers may take several attempts to stop smoking successfully.²⁵ In addition, by referring a patient to a local stop smoking service, they are four times more likely to stop smoking.²⁶

Research shows that 95% of patients expect to be asked about smoking and a short intervention can make all the difference.^{27,28} 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 renal outcomes. Studies were found by searching MEDLINE and EMBASE using combined exploded subject headings of 'kidney', 'nephrology', 'kidney diseases', 'kidney neoplasms' and 'tobacco use cessation' from 01/1990 – 09/2012 and by searching for key words in google scholar.

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References

1. Briganti EM et al Smoking is associated with renal impairment and proteinuria in the normal population: The AusDiab kidney study. *American journal of kidney diseases* 2002; 40: 4: 704–712
2. Orth SR The renal risks of smoking. *Kidney International* 1997; 51: 1669–1677
3. Hillege et al Microalbuminuria is common, also in a diabetic, nonhypertensive population, and an independent indicator of cardiovascular risk factors and cardiovascular morbidity. *Journal of Internal Medicine* 2001; 249: 519–526
4. Pinto-Sistsma SJ et al Smoking is related to albuminuria and abnormal renal function in nondiabetic persons. *Annals of Internal Medicine* 2000; 133:585–591
5. Hallan SI and Orth SR Smoking is a risk factor in the progression to kidney failure. *Kidney International* 2011; 80: 516–523
6. Horner D et al Albuminuria in normotensive and hypertensive individuals attending offices of general practitioners. *Journal of Hypertension* 1996; 14: 655–660
7. Orth SR Smoking and the kidney. *Journal of the American Society of Nephrology* 2002; 13: 1663–1672
8. Orth SR et al Smoking as a risk factor for end-stage renal failure in men with primary renal disease. *Kidney International* 1998; 54: 926–931
9. Sung RS et al Excess risk of renal allograft loss associated with cigarette smoking. *Transplantation* 2001; 71: 1752–1757
10. Doyle SE et al Predicting clinical outcome in the elderly renal transplant recipient. *Kidney International* 2000; 57: 2144–2150
11. Hunt JD Renal cell carcinoma in relation to cigarette smoking: Meta-analysis of 24 studies. *International Journal of cancer* 2005; 114: 101–108
12. Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years. observations on male British doctors. *BMJ* 2004; 328:1519
13. Warner DO. Perioperative abstinence from cigarettes: physiologic and clinical consequences. *Anesthesiology* 2006; 104:356–367
14. Rietbrock N, Kunkel S, Worner W, Eyer P. Oxygen-dissociation kinetics in the blood of smokers and non-smokers: interaction between oxygen and carbon monoxide at the hemoglobin molecule. *Nanunyn Schmiedebergs Arch Pharmacol* 1992; 98:528–534
15. Akrawi W, Benumof JL. A pathophysiological basis for informed preoperative smoking cessation counselling. *Journal of cardiothoracic and vascular anesthesia* 1997; 11(5):629–640
16. Moller A, Tonnesen H. Risk reduction: perioperative smoking intervention. *Best practice and research clinical anaesthesiology* 2006; 20(2):237–248
17. Ambrose J. The pathophysiology of cigarette smoking and cardiovascular disease. *Journal of the American College of Cardiology* 2004; 43(10):1731–1737
18. Zevin S, Benowitz NL. Drug interactions with tobacco smoking. An update. *Clinical Pharmacokinetics* 1999; 36(6):425–43
20. Chase HP et al Cigarette smoking increases the risk of albuminuria among subjects with type I diabetes. *JAMA* 1991; 265:614–617

The Clinical Case for providing stop smoking support to Renal Patients

21. Phisitkul K, Hegazy K, Chuahirun T, Hudson C, Simoni J, Rajab H et al. Continued smoking exacerbates but cessation ameliorates progression of early type 2 diabetic nephropathy. *American Journal of the Medical Sciences* 2008; 335(4):284–291
22. Chuahirun T, Simoni J, Hudson C, Seipel T, Khanna A, Harrist RB et al. Cigarette smoking exacerbates and its cessation ameliorates renal injury in type 2 diabetes. *American Journal of the Medical Sciences* 2004; 327(2):57–67
23. 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.
24. Anczakj, Nogler (2003). Tobacco cessation in primary care: maximizing intervention strategies. *Clinical Medicine & Research* 2003; 1: 201–216
25. Fu S, Partin M, Snyder A, An LC, Nelson DB, Clothier B, Nugent S, Willenbring ML, Joseph AM. (2006) Promoting repeat tobacco dependence treatment: are relapsed smokers interested? *American Journal of managed Care* 2006; 12 235–243
26. Smoking Toolkit Study (2001) Available at: <http://www.smokinginengland.info/>
27. Slama KJ, Redman S, Cockburn J, Sanson-Fisher R. Community views about the role of general practitioners in disease prevention. *Family Practice* 1989; 6: 203–209.
28. Department of Health (2009), Stop Smoking Interventions in Secondary Care. Available online: www.ncsct.co.uk/Content/FileManager/documents/NCSCCT-CIC-Delivery-Projects/Secondary-care/stop-smoking-interventions-in-secondary-care-guidance-oct09.pdf