

Quick wins: the short-term benefits of stopping smoking

Full report

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Executive Summary

- This briefing summarises evidence relating to short-term positive consequences of smoking cessation, covering *quick gains* within the first year of stopping smoking related to physical and mental health, financial as well as psychosocial, behavioural and cosmetic improvements
- Within 12 months, stopping smoking quickly reduces the risk of death from cardiovascular disease and from chronic obstructive pulmonary disease (COPD) exacerbations. These are 'quick wins' in terms of reduced mortality and healthcare costs
- While smokers do struggle to maintain abstinence in the face of acute and unpleasant withdrawal symptoms it is important to stress the immediate benefits of smoking cessation to increase motivation to remain abstinent
- Within three months of stopping smoking there is improvement in lung function and for those smokers with COPD and asthma there is a reduction in symptoms
- Within two months of stopping smoking there will be less constriction of blood vessels and lower heart rate. By 12 months there is a significant decrease in the risk of coronary heart disease
- Erectile dysfunction shows an improvement within one month of quitting and by three months sperm quality can be improved
- Smoking cessation before, or during, pregnancy reduces the risk of low birth babies, perinatal death and preterm delivery
- Wound healing is improved by stopping smoking and post-operative complications are reduced within two months of quitting
- Within a year of stopping smoking the level at which ex-smokers enjoy life nears the enjoyment reported by people who have never smoked. The majority of recent ex-smokers report feeling happier than when they were a smoker
- Anxiety levels start to decrease from one week after quitting while ex-smokers suffer less from anxiety and depression than continuing smokers
- Ex-smokers save an average weekly spend on cigarettes of £23.7 and £26.3 for hand-rolled and manufactured cigarettes respectively, or £1,232.40 and £1,367.60 per year
- Bad breath, stained teeth and periodontal disease all improve quickly following smoking cessation. Skin disorders and the general appearance of the skin also improve quickly
- Ex-smokers also appear to become more self-confident and to engage in other healthy life choices after quitting smoking

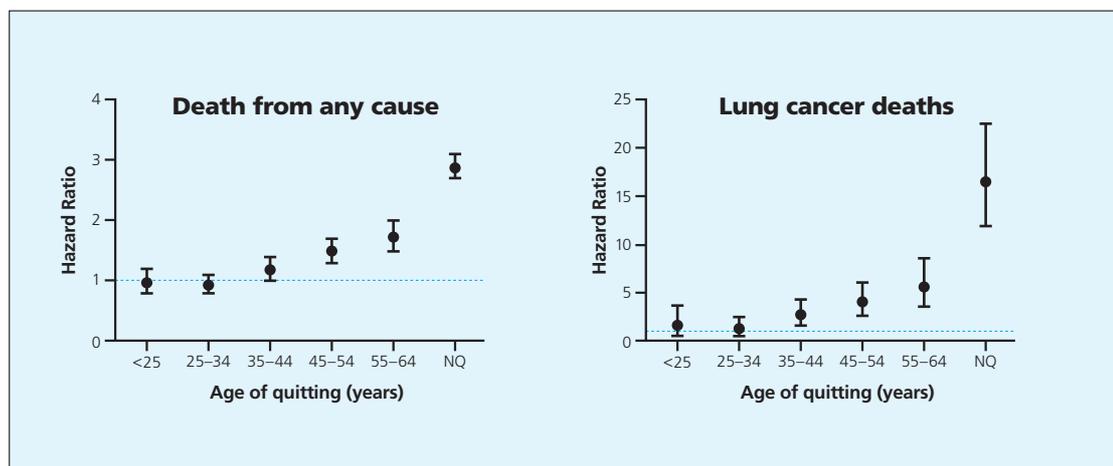
1. Background

The benefits of smoking cessation are self-evident. Stopping smoking is possibly the single most important step a person can take to improve their well-being, whatever their age. Quitting smoking can prevent tobacco-related diseases within only a few years of cessation; it halves the risk of contracting lung cancer,¹ attenuates lung function decline,² improves reproductive health^{3, 4} and reduces the risk of various cardiovascular diseases.⁵

The positive effects of smoking cessation also extend to non-smokers through the reduction of environmental tobacco smoke;^{6–8} which is the reason for the increasing introduction of smoking bans worldwide. Altogether, it is estimated that up to 90% of excess mortality caused by smoking can be prevented if smokers stopped before they reached middle age¹ but even people who have smoked most of their lives can still expect substantial health benefits when they stop smoking.⁹

Large epidemiological studies have shown that stopping smoking before age 34 reverts life expectancy close to that of a non-smoker and stopping smoking at 40, 50 and 60 years leads to gains of 9, 6 and 3–4 years compared with continuing smokers.¹⁰ As shown in Figure 1, excess risk from smoking tends to be attenuated even if smoking cessation occurs at later stages in life suggesting relatively fast benefits.

Figure 1: Adjusted hazard ratio for deaths as function of age of quitting among former versus never smokers (adjusted for age, gender, education, alcohol use and adiposity). NQ=Never quit. Data come from¹¹



Because of the long time horizon of benefits generally associated with smoking cessation, more acute gains from stopping smoking may be more motivating, especially for younger smokers.¹² This briefing summarises the main *quick gains* – those that occur within the first year of stopping smoking.

2. Methods

Electronic research databases (PubMed, Web of Science and Google Scholar) were reviewed using the terms "benefit", "advantage", "improvement", "amelioration" or "gain" and the terms "short-term", "immediate", "acute", "rapid", "instant" or "quick" in addition to terms for smoking cessation. Where existing reviews were found these were used. Otherwise, primary research findings were analysed and summarised.

3. Physical health gains

A surprising number of physical health benefits occur early on into the quitting process. These range from benefits with regards to reproductive health, pulmonary and cardiovascular function through to wound healing and gastro-intestinal problems as detailed in Table 1.

Table 1: Expected physical health benefits within 12 months of smoking cessation

Time since quit	System				
	Respiratory	Vascular*	Re-productive	Gastro-intestinal	General
<1 months	Improvement in pulmonary CO diffusing capacity ^{13,14} and pulmonary epithelial permeability ¹⁵	Improvement in coronary vaso-constriction, lipid and fibrinolytic profile and oxidative injury ¹⁶⁻¹⁸	Improvement in hemodynamics, rigidity and tumescence in men with erectile dysfunction ^{8,9}	Reduction in daily gastro-esophageal reflux, ²¹ faster gastric ulcer healing ²²	Metabolites of tobacco constituents are eliminated within days ²³
<2 months	Improvement in FEV1, decreased sputum neutrophils in asthmatics ²⁴	Lowered arterial pressure and heart rate ^{25,26}			Reduced post-operative complications and improved wound healing ^{27,28}
<3 months	Decrease in COPD/respiratory disease symptoms (wheeziness, expectoration, cough) and reduced severity ²⁹⁻³¹		Possible improvement in sperm quality ²⁰		
<4 months	Improved airway hyper-activity and respiratory symptoms in asthmatics ³³				
<6 months		Improved airway hyper-activity and respiratory symptoms in asthmatics ³⁴	Excess risk of low birth weight and associated complications eliminated ²³⁻²⁵	Faster healing of duodenal ulcers, ³⁸ reduced recurrence of gastric ulcer ³⁹	
<9 months			Perinatal death and preterm delivery likely to be reduced ¹¹		
<12 months	Improved FEV1 and reduced airway inflammation in healthy smokers or smokers with mild COPD; ⁴⁰⁻⁴² improved airway hyper-reactivity and decreased epithelial remodelling in COPD patients ^{42,43}	Decreased risk of primary as well as secondary CHD ^{22,44,45} including MI; ^{46,47} improved survival following surgery for PAD ²²		Reduction in duodenal ulcer relapse and Crohn's disease flare-up ^{48,49}	Improved olfaction ⁵⁰

Table 1: Rapid health gains from stopping smoking; *Generally, most pronounced benefits are seen in those with pre-existing conditions; CO: carbon monoxide, COPD: Chronic obstructive pulmonary disease, FEV1: Forced-expiratory volume in one second; CHD: Coronary heart disease, PAD: Peripheral arterial disease

The only group of diseases that carry no short-term benefits following cessation are neoplastic diseases in general, and lung cancer in particular. For most of these, risk following cessation remains elevated for the rest of an ex-smokers life and does not decrease substantially until at least two-to-five years following cessation,²² possibly due to reverse causation (those with more severe disease symptoms are more likely to stop but are, therefore, also more likely to die soon after stopping).

4. Well being

There are a number of other positive corollaries of smoking cessation which occur within a relatively short amount of time:

Aesthetic improvements

- Smoking cessation is associated with a number of oral conditions such as bad breath, stained teeth and periodontal disease and these tend to be quickly reversible in the early stages after smoking cessation^{65, 66}
- Smoking also has dermatological consequences, and there are a number of rapid improvements following smoking cessation, such as a reduction in the recurrence of psoriasis, palmoplantar pustulosis and skin ulcers⁶⁷ in addition to improving appearance of skin and nails in the absence of nicotine staining and a halting in the precocious aging of skin and formation of wrinkles which is enhanced in smokers⁶⁸

Psychosocial improvements

- There is evidence that smoking cessation is not only a consequence of higher self-confidence (or self-efficacy) and greater internal locus of control but that this relationship is bidirectional and that smoking cessation also causes improvements in both these cognitions within a short timeframe^{22, 69–71}
- Studies increasingly suggest that as former smokers play an active role in structuring social interactions and support so as to maintain abstinence and remain at the centre of social networks, continuing smokers become pushed to the periphery and socially isolated^{22, 72}

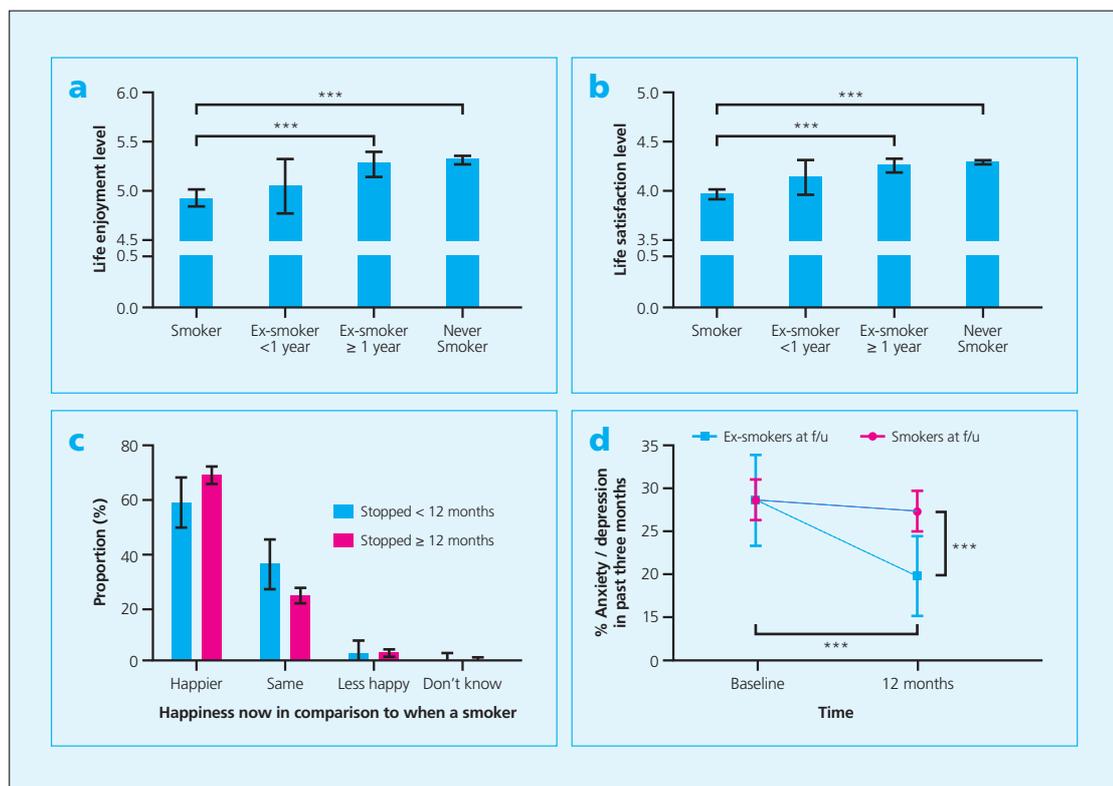
Improvements in other health behaviours

- Smoking cessation appears to go hand in hand with fairly rapid improvements and orientation towards other healthy life choices including increases in exercise, healthy dieting, reduction in alcohol consumption and taking part in health screening programs^{22, 73–77}

5. Mental health gains

There is increasing evidence that stopping smoking yields improvement in psychological well-being and that this occurs relatively soon after the quit date. Whilst low mood, anxiety and dysphoria are common withdrawal symptoms, they are relatively short-lived.⁵¹ In fact, as shown in Figure 2a and b, even within a year of stopping smoking, ex-smokers' life enjoyment and satisfaction levels start to increase towards the levels of a never smoker.⁵² Moreover, as shown in Figure 2c, the majority of recent ex-smokers report feeling happier than when they were a smoker.⁵³

Figure 2: Changes in mental health and well-being as a function of smoking status and length of abstinence. Data come from^{52–54}



In terms of psychiatric comorbidities, there is also good evidence that benefits from smoking cessation accrue relatively rapidly. Thus, it has been shown that anxiety levels may decrease from one week post cessation⁵⁵ and that this is maintained at six months, leading also to a reduction in the prevalence of anxiety disorders.⁵⁶

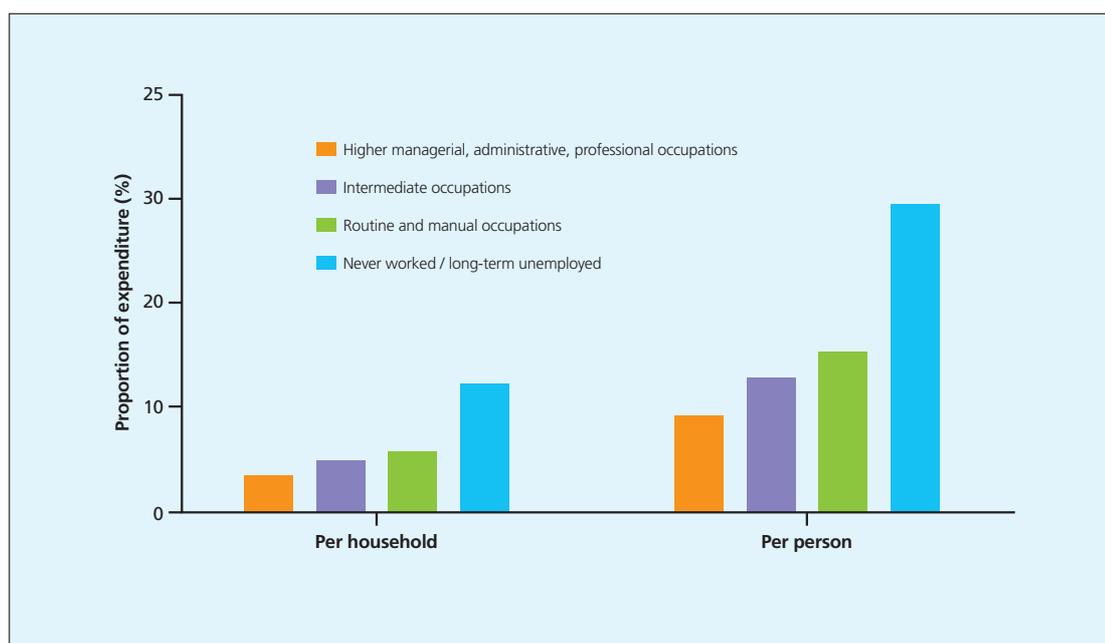
Likewise, there is evidence (as shown in Figure 2d.) that the prevalence of anxiety and depression decreases within 12 months of stopping smoking in the general population and is not associated with any exacerbation of symptoms following smoking cessation, among those with a history of mental health problems.^{54, 57, 58}

6. Financial gains

Stopping smoking results in obvious financial gains. Recent data from the UK show that on average smokers spent £5.45 for twenty hand-rolled cigarettes and £6.06 for twenty manufactured cigarettes.⁵⁹ Given that the latest figures show that smokers on average consume 12.4 cigarettes a day,⁶⁰ this means a weekly spend on cigarettes of £23.7 and £26.3 for hand-rolled and manufactured cigarette smokers, respectively, or £1,232.40 and £1,367.60 per year.

Taken the mean of hand-rolled and manufactured cigarettes, the cost of cigarettes that one smoker spends is equivalent to 5.2% of the average UK household spend.⁶¹ However, as Figure 3 shows, money spent on cigarette is proportionally much higher in lowest income groups and can make up a substantial proportion of an individual's expenditure.

Figure 3: Spent on cigarettes (manufactured or hand-rolled) as a function of socio-economic classification and household expenditure (assumes equal spent on cigarettes across groups). Data come from ^{59, 61}



In fact, it has been argued that at an individual level, the costs associated with buying cigarettes may lead to an increase in poverty.⁶² There is evidence that smoking can lead to financial hardship, irrespective of household income.⁶³ Unfortunately, it also appears that financial hardship in itself is a barrier to quitting smoking, creating a vicious cycle.⁶⁴ Breaking this cycle by stopping smoking will have an immediate positive effect by improving a household's financial position.

7. Conclusion

There are many immediate benefits or “quick gains” from stopping smoking: ranging from improvements in physical and mental health, general well-being and appearance, plus substantial financial savings.

Making those struggling to quit aware of these acute and rapid positive effects of smoking cessation, and asking them to self-monitor to observe these improvements for themselves, may strengthen their motivation to remain abstinent and provide further reasons to stick with a quit attempt.

References

1. Peto R, Darby S, Deo H, Silcocks P, Whitley E, Doll R. Smoking, smoking cessation, and lung cancer in the UK since 1950: combination of national statistics with two case-control studies. *BMJ* 2000 Aug 5;321(7257):323–9.
2. 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. *JAMA* 1994 Nov 16;272(19):1497–505.
3. Peate I. The effects of smoking on the reproductive health of men. *Br J Nurs* 2005 Apr 14;14(7):362–6.
4. Lindley AA, Becker S, Gray RH, Herman AA. Effect of continuing or stopping smoking during pregnancy on infant birth weight, crown-heel length, head circumference, ponderal index, and brain:body weight ratio. *Am J Epidemiol* 2000 Aug 1;152(3):219–25.
5. Rich-Edwards JW, Manson JE, Hennekens CH, Buring JE. The primary prevention of coronary heart disease in women. *N Engl J Med* 1995 Jun 29;332(26):1758–66.
6. Eisner MD, Smith AK, Blanc PD. Bartenders' respiratory health after establishment of smoke-free bars and taverns. *JAMA* 1998 Dec 9;280(22):1909–14.
7. Wong CM, Hu ZG, Lam TH, Hedley AJ, Peters J. Effects of ambient air pollution and environmental tobacco smoke on respiratory health of non-smoking women in Hong Kong. *Int J Epidemiol* 1999 Oct;28(5):859–64.
8. Hopkins DP, Briss PA, Ricard CJ, Husten CG, Carande-Kulis VG, Fielding JE, et al. Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke. *Am J Prev Med* 2001 Feb;20(2 Suppl):16–66.
9. Taylor DH, Jr., Hasselblad V, Henley SJ, Thun MJ, Sloan FA. Benefits of smoking cessation for longevity. *Am J Public Health* 2002 Jun;92(6):990–6.
10. Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. *BMJ* 2004 Jun 26;328(7455):1519–28.
11. Jha P, Ramasundarahettige C, Landsman V, Rostron B, Thun M, Anderson RN, et al. 21st-century hazards of smoking and benefits of cessation in the United States. *N Engl J Med* 2013 Jan 24;368(4):341–50.
12. Vuckovic N, Polen MR, Hollis JF. The problem is getting us to stop. What teens say about smoking cessation. *Prev Med* 2003 Sep;37(3):209–18.
13. Sansores RH, Pare P, Abboud RT. Effect of smoking cessation on pulmonary carbon monoxide diffusing capacity and capillary blood volume. *Am Rev Respir Dis* 1992 Oct;146(4):959–64.
14. Knudson RJ, Kaltenborn WT, Burrows B. The effects of cigarette smoking and smoking cessation on the carbon monoxide diffusing capacity of the lung in asymptomatic subjects. *Am Rev Respir Dis* 1989 Sep;140(3):645–51.
15. Minty BD, Jordan C, Jones JG. Rapid improvement in abnormal pulmonary epithelial permeability after stopping cigarettes. *Br Med J (Clin Res Ed)* 1981 Apr 11;282(6271):1183–6.
16. Gourlay SG, Benowitz NL. The benefits of stopping smoking and the role of nicotine replacement therapy in older patients. *Drugs Aging* 1996 Jul;9(1):8–23.
17. Minami J, Todoroki M, Yoshii M, Mita S, Nishikimi T, Ishimitsu T, et al. Effects of smoking cessation or alcohol restriction on metabolic and fibrinolytic variables in Japanese men. *Clin Sci (Lond)* 2002 Aug;103(2):117–22.
18. Pilz H, Oguogho A, Chehne F, Lupattelli G, Palumbo B, Sinzinger H. Quitting cigarette smoking results in a fast improvement of in vivo oxidation injury (determined via plasma, serum and urinary isoprostane). *Thromb Res* 2000 Aug 1;99(3):209–21.
19. Sighinolfi MC, Mofferdin A, De SS, Micali S, Cicero AF, Bianchi G. Immediate improvement in penile hemodynamics after cessation of smoking: previous results. *Urology* 2007 Jan;69(1):163–5.
20. Guay AT, Perez JB, Heatley GJ. Cessation of smoking rapidly decreases erectile dysfunction. *Endocr Pract* 1998 Jan;4(1):23–6.
21. Waring JP, Eastwood TF, Austin JM, Sanowski RA. The immediate effects of cessation of cigarette smoking on gastroesophageal reflux. *Am J Gastroenterol* 1989 Sep;84(9):1076–8.
22. USDHHS. The health benefits of smoking cessation: a report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services (USDHHS); 1990.
23. Benowitz NL. Pharmacology of nicotine: addiction and therapeutics. *Annu Rev Pharmacol Toxicol* 1996;36:597–613.
24. 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. *Am J Respir Crit Care Med* 2006 Jul 15;174(2):127–33.
25. Minami J, Ishimitsu T, Matsuoka H. Effects of smoking cessation on blood pressure and heart rate variability in habitual smokers. *Hypertension* 1999 Jan;33(1 Pt 2):586–90.
26. Oren S, Isakov I, Golzman B, Kogan J, Turkot S, Peled R, et al. The influence of smoking cessation on hemodynamics and arterial compliance. *Angiology* 2006 Oct;57(5):564–8.
27. Moller AM, Villebro N, Pedersen T, Tonnesen H. Effect of preoperative smoking intervention on postoperative complications: a randomised clinical trial. *Lancet* 2002 Jan 12;359(9301):114–7.

28. Wong J, Lam DP, Abrishami A, Chan MT, Chung F. Short-term preoperative smoking cessation and postoperative complications: a systematic review and meta-analysis. *Can J Anaesth* 2012 Mar;59(3):268–79.
29. Etter JF. Short-term change in self-reported COPD symptoms after smoking cessation in an internet sample. *Eur Respir J* 2010 Jun;35(6):1249–55.
30. Eagan TM, Gulsvik A, Eide GE, Bakke PS. Remission of respiratory symptoms by smoking and occupational exposure in a cohort study. *Eur Respir J* 2004 Apr;23(4):589–94.
31. Stein MD, Weinstock MC, Herman DS, Anderson BJ. Respiratory symptom relief related to reduction in cigarette use. *J Gen Intern Med* 2005 Oct;20(10):889–94.
32. Santos EP, Lopez-Costa S, Chenlo P, Pugliese MN, Curi S, Ariagno J, et al. Impact of spontaneous smoking cessation on sperm quality: case report. *Andrologia* 2011 Dec;43(6):431–5.
33. Tonnesen P, Pisinger C, Hvidberg S, Wennike P, Bremann L, Westin A, et al. Effects of smoking cessation and reduction in asthmatics. *Nicotine Tob Res* 2005 Feb;7(1):139–48.
34. Hosokawa S, Hiasa Y, Miyazaki S, Ogura R, Miyajima H, Ohara Y, et al. Effects of smoking cessation on coronary endothelial function in patients with recent myocardial infarction. *Int J Cardiol* 2008 Aug 1;128(1):48–52.
35. McDonald AD, Armstrong BG, Sloan M. Cigarette, alcohol, and coffee consumption and prematurity. *Am J Public Health* 1992 Jan;82(1):87–90.
36. Kramer MS. Determinants of low birth weight: methodological assessment and meta-analysis. *Bull World Health Organ* 1987;65(5):663–737.
37. Lieberman E, Gremy I, Lang JM, Cohen AP. Low birthweight at term and the timing of fetal exposure to maternal smoking. *Am J Public Health* 1994 Jul;84(7):1127–31.
38. Hull DH, Beale PJ. Cigarette smoking and duodenal ulcer. *Gut* 1985 Dec;26(12):1333–7.
39. Tatsuta M, Iishi H, Okuda S. Effects of cigarette smoking on the location, healing and recurrence of gastric ulcers. *Hepato-gastroenterology* 1987 Oct;34(5):223–8.
40. 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. *Am J Respir Crit Care Med* 2000 Feb;161(2 Pt 1):381–90.
41. Wise RA, Kanner RE, Lindgren P, Connett JE, Altose MD, Enright PL, et al. The effect of smoking intervention and an inhaled bronchodilator on airways reactivity in COPD: the Lung Health Study. *Chest* 2003 Aug;124(2):449–58.
42. Willemse BW, ten Hacken NH, Rutgers B, Lesman-Leegte IG, Postma DS, Timens W. Effect of 1-year smoking cessation on airway inflammation in COPD and asymptomatic smokers. *Eur Respir J* 2005 Nov;26(5):835–45.
43. Lapperre TS, Sont JK, van SA, Gosman MM, Postma DS, Bajema IM, et al. Smoking cessation and bronchial epithelial remodelling in COPD: a cross-sectional study. *Respir Res* 2007;8:85.
44. Twardella D, Kupper-Nybelen J, Rothenbacher D, Hahmann H, Wusten B, Brenner H. Short-term benefit of smoking cessation in patients with coronary heart disease: estimates based on self-reported smoking data and serum cotinine measurements. *Eur Heart J* 2004 Dec;25(23):2101–8.
45. Ockene JK, Kuller LH, Svendsen KH, Meilahn E. The relationship of smoking cessation to coronary heart disease and lung cancer in the Multiple Risk Factor Intervention Trial (MRFIT). *Am J Public Health* 1990 Aug;80(8):954–8.
46. Rosenberg L, Palmer JR, Shapiro S. Decline in the risk of myocardial infarction among women who stop smoking. *N Engl J Med* 1990 Jan 25;322(4):213–7.
46. Rosenberg L, Palmer JR, Shapiro S. Decline in the risk of myocardial infarction among women who stop smoking. *N Engl J Med* 1990 Jan 25;322(4):213–7.
47. Rosenberg L, Kaufman DW, Helmrich SP, Shapiro S. The risk of myocardial infarction after quitting smoking in men under 55 years of age. *N Engl J Med* 1985 Dec 12;313(24):1511–4.
48. Breuer-Katschinski BD, Armstrong D, Goebell H, Arnold R, Classen M, Fischer M, et al. Smoking as a risk factor for duodenal ulcer relapse. RUDER Study Group. *Z Gastroenterol* 1995 Sep;33(9):509–12.
49. Cosnes J, Carbonnel F, Carrat F, Beaugerie L, Cattani S, Gendre J. Effects of current and former cigarette smoking on the clinical course of Crohn's disease. *Aliment Pharmacol Ther* 1999 Nov;13(11):1403–11.
50. Frye RE, Schwartz BS, Doty RL. Dose-related effects of cigarette smoking on olfactory function. *JAMA* 1990 Mar 2;263(9):1233–6.
51. Hughes JR. Effects of abstinence from tobacco: valid symptoms and time course. *Nicotine Tob Res* 2007 Mar;9(3):315–27.
52. Shahab L, West R. Differences in happiness between smokers, ex-smokers and never smokers: cross-sectional findings from a national household survey. *Drug Alcohol Depend* 2012 Feb 1;121(1–2):38–44.
53. Shahab L, West R. Do ex-smokers report feeling happier following cessation? Evidence from a cross-sectional survey. *Nicotine Tob Res* 2009 May;11(5):553–7.

54. Shahab L, Andrew S, West R. Changes in prevalence of depression and anxiety following smoking cessation: results from an international cohort study (ATTEMPT). *Psychol Med*. In press 2013.
55. West R, Hajek P. What happens to anxiety levels on giving up smoking? *Am J Psychiatry* 1997 Nov;154(11):1589–92.
56. McDermott MS, Marteau TM, Hollands GJ, Hankins M, Aveyard P. Change in anxiety following successful and unsuccessful attempts at smoking cessation: cohort study. *Br J Psychiatry* 2013 Jan;202:62–7.
57. Jamal M, Willem Van der Does AJ, Cuijpers P, Penninx BW. Association of smoking and nicotine dependence with severity and course of symptoms in patients with depressive or anxiety disorder. *Drug Alcohol Depend*. In press 2012.
58. Hausteil KO, Haffner S, Woodcock BG. A review of the pharmacological and psychopharmacological aspects of smoking and smoking cessation in psychiatric patients. *Int J Clin Pharmacol Ther* 2002 Sep;40(9):404–18.
59. Iringe-Koko B, McNeill A, Joossens L, West R, Brown J, Dockrell M, et al. Trends in purchase of illicit tobacco and price of cigarettes in England 2007/8–2010/11. *Tobacco Control*. In press 2013.
60. West R, Brown J. Smoking and Smoking Cessation in England 2011. www.smokinginengland.info 2012
61. Office for National Statistics. Family Spending – 2012. www.ons.gov.uk/ons/rel/family-spending/family-spending/family-spending-2012-edition/index.html 2012
62. WHO. Tobacco increases the poverty of individuals and families. www.who.int/tobacco/communications/events/wntd/2004/tobaccofacts_families/en/print.html 2004
63. Siahpush M, Borland R, Scollo M. Smoking and financial stress. *Tob Control* 2003 Mar;12(1):60–6.
64. Marsh A, McKay S. Poor smokers. London: Policies Studies Institute; 1994.
65. Johnson NW, Bain CA. Tobacco and oral disease. EU-Working Group on Tobacco and Oral Health. *Br Dent J* 2000 Aug 26;189(4):200–6.
66. Thomson WM, Broadbent JM, Welch D, Beck JD, Poulton R. Cigarette smoking and periodontal disease among 32-year-olds: a prospective study of a representative birth cohort. *J Clin Periodontol* 2007 Oct;34(10):828–34.
67. Ortiz A, Grando SA. Smoking and the skin. *Int J Dermatol* 2012 Mar;51(3):250–62.
68. Seitz C, Strack R, Wyrick D. Cigarette smoking and facial wrinkles: a review of the literature. *J Smok Cess* 2012;7:18–24.
69. Perkins KA, Parzynski C, Mercincavage M, Conklin CA, Fonte CA. Is self-efficacy for smoking abstinence a cause of, or a reflection on, smoking behavior change? *Exp Clin Psychopharmacol* 2012 Feb;20(1):56–62.
70. Kadden RM, Litt MD. The role of self-efficacy in the treatment of substance use disorders. *Addict Behav* 2011 Dec;36(12):1120–6.
71. Stuart K, Borland R, McMurray N. Self-efficacy, health locus of control, and smoking cessation. *Addict Behav* 1994 Jan;19(1):1–12.
72. Christakis NA, Fowler JH. The collective dynamics of smoking in a large social network. *N Engl J Med* 2008 May 22;358(21):2249–58.
73. Gerace TA, Hollis J, Ockene JK, Svendsen K. Smoking cessation and change in diastolic blood pressure, body weight, and plasma lipids. MRFIT Research Group. *Prev Med* 1991 Sep;20(5):602–20.
74. Osler M, Tjonneland A, Suntum M, Thomsen BL, Stripp C, Gronbaek M, et al. Does the association between smoking status and selected healthy foods depend on gender? A population-based study of 54 417 middle-aged Danes. *Eur J Clin Nutr* 2002 Jan;56(1):57–63.
75. Laaksonen M, Luoto R, Helakorpi S, Uutela A. Associations between health-related behaviors: a 7-year follow-up of adults. *Prev Med* 2002 Feb;34(2):162–70.
76. Rimer BK, Orleans CT, Keintz MK, Cristinzio S, Fleisher L. The older smoker. Status, challenges and opportunities for intervention. *Chest* 1990 Mar;97(3):547–53.
77. Nagaya T, Yoshida H, Takahashi H, Kawai M. Cigarette smoking weakens exercise habits in healthy men. *Nicotine Tob Res* 2007 Oct;9(10):1027–32.

