# Review: smoking cessation reduces the risk of death and non-fatal myocardial infarction in coronary heart disease

Critchley JA, Capewell S. Mortality risk reduction associated with smoking cessation in patients with coronary heart disease: a systematic review. *JAMA* 2003;**290**:86–97.

Clinical impact ratings GP/FP/Primary care ★★★★★☆

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Q **In patients with coronary heart disease (CHD), does smoking cessation reduce the risk of all cause mortality?**

## METHODS

**Data sources:** Studies were identified by searching Medline (1966–2003), CINAHL (1982–2003), EMBASE/Excerpta Medica (1980–2003), the *Cochrane Controlled Trial Register* (2003), Science Citation Index (2003), PsycLIT (1971–2003), Dissertation Abstracts (1861–2003), Bath Information and Data Services Index to Scientific and Technical Proceedings (1982–2000), the United Kingdom National Research Register (2003), reference lists of retrieved articles, contact with experts, the Prospective Studies Collaboration, and any relevant publications. Search strategies included terms for CHD, smoking cessation or smoking, and mortality. MeSH terms from the Cochrane randomised controlled trial filter were also used.

**Study selection and assessment:** Studies were selected if they were prospective, included patients diagnosed with CHD (previous myocardial infarction [[MI]] or stable or unstable angina) who were current smokers at baseline, measured smoking status to determine which patients quit smoking, and had follow up ≥2 years. Criteria used for quality assessment were sample size, definitions of the cardiac events, smoking and smoking cessation, confirmation and validation of smoking status, the adequacy of control of confounding, and minimisation of selection bias.

**Outcomes:** all cause mortality and non-fatal MI.

## MAIN RESULTS

20 prospective cohort studies (12 603 patients; follow up 2–26 y, mean 5 y) met the selection criteria. Patients had MI (13 studies), coronary artery bypass surgery or angioplasty (4 studies), and MI with other coronary diseases (3 studies). Of the 12 603 smoking patients at baseline, 5659 (45%) stopped smoking and 6944 (55%) continued to smoke. The meta-analysis (random effects model) showed that fewer patients who stopped smoking died than those who continued to smoke after surviving their initial cardiac event (pooled relative risk [[RR]] 0.64, 95% CI 0.58 to 0.71). Smoking cessation also reduced the risk of non-fatal MI (pooled RR of 8 studies 0.68, 95% CI 0.57 to 0.82).

## CONCLUSION

In patients with coronary heart disease, smoking cessation reduces the risk of all cause mortality and non-fatal myocardial infarction.

## Commentary

The association between tobacco use and CHD has been well established with a 1.5 to 3 fold increase in CHD among smokers compared with non-smokers. Smoking cessation is generally recommended for secondary prevention of CHD, but its effectiveness has been uncertain.

To clarify the impact of smoking cessation in patients who already have CHD, Critchley *et al* reanalysed the data from 20 prospective cohort studies. Women were underrepresented (20% of patients), and the mean age of participants was 55 years of age (which is much younger than the traditional CHD patient). The 36% relative risk reduction (RRR) in all cause mortality associated with smoking cessation is impressive, especially when compared with the standard secondary prevention measures.

Current pharmacological recommendations for reducing CHD risk include aspirin, β blockers (RRR 23%),[1] statin therapy (RRR 30–50% ),[2] and ACE inhibitors (RRR 26%)[3]. Smoking cessation is therefore more effective than β blockers or ACE inhibitors for decreasing mortality in patients with known CHD! Clinicians should assess and treat tobacco abuse as vigorously as other treatment strategies for secondary prevention in patients with CHD.

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1 Freemantle N, Cleland J, Young P, *et al.* Beta blockade after myocardial infarction: systematic review and meta regression analysis. *BMJ* 1999;**318**:1730–7.
2 Allen Maycock CA, Muhlestein JB, Horne BD, *et al.* Statin therapy is associated with reduced mortality across all age groups of individuals with significant coronary disease, including very elderly patients. *J Am Coll Cardiol* 2002;**40**:1777–85.
3 Flather MD, Yusuf S, Kober L, *et al.* Long-term ACE-inhibitor therapy in patients with heart failure or left-ventricular dysfunction: a systematic overview of data from individual patients. ACE-Inhibitor Myocardial Infarction Collaborative Group. *Lancet* 2000;**355**:1575–81.

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