Multiple attempts to stop smoking, even with relapses, reduced loss of pulmonary function

Murray RP, Anthonisen NR, Connett JE, et al for the Lung Health Study Research Group. *Effects of multiple attempts to quit smoking and relapses to smoking on pulmonary function.* *J Clin Epidemiol* 1998 Dec; **51**:1317–26.

Question

What are the effects of multiple failed attempts to stop smoking on pulmonary function of adults?

Design

Retrospective analysis of a cohort of participants involved in a randomised controlled trial (Lung Health Study), with annual follow up for 5 years.

Setting

10 clinical centres in North America.*

Participants

5887 adults aged 35–60 years, who smoked and had evidence of early chronic obstructive pulmonary disease (ie, had an FEV₁/FVC [forced expiratory volume at 1 sec/forced vital capacity] interval of ≤70%, and an FEV₁ of 55–90% of predicted normal).

Assessment of risk factors

Smoking status was assessed at baseline and at 5 annual visits thereafter. Participant reports of abstinence were confirmed by salivary cotinine concentrations (<20 ng/ml) or if nicotine substitution therapy was used, by CO concentrations (<10 ppm in end tidal expired air). Participants were classified as sustained quitters (verified non-smokers at the first follow up visit, who remained abstinent at all subsequent follow up visits, and who recalled no month with average smoking >1 cigarette/d, starting 4 mo after study entry); continuous smokers (reported smoking at all 5 annual visits), and intermittent smokers (verified non-smokers at ≥1 annual visit and reported smoking at ≥1 annual visit).

Main outcome measures

FEV₁ assessed using spirometry (after bronchodilator use) and change in FEV₁ reported as a percent of predicted normal, adjusted for African-American and Asian participants.

Main results

149 participants who died, 66 participants who reported lung cancer during follow up, and 21 participants with extreme FEV₁ values were excluded from the analysis. At 5 years, sustained quitters had the highest FEV₁ (79.8), followed by intermittent quitters (77.9), and continuous smokers (73.1). From years 1 to 5, sustained quitters had the smallest annual rate of loss in FEV₁ predicted (loss of 0.33%/y), followed by intermittent quitters (loss of 0.58%/y), and continuous smokers (loss of 1.18%/y). Continuous smokers lost the most lung function at all doses of cigarettes; intermittent smokers who had 1 change in smoking status did better than continuous smokers, and those who had ≥2 changes did even better. Multivariate analysis found that men who were sustained and intermittent quitters had better FEV₁% predicted but no difference in FEV₁ change when compared with continuous smokers. Women had the same pattern for FEV₁% predicted but intermittent smokers had a lower FEV₁ than continuous smokers.

Conclusion

Adults who attempted to stop smoking (and may have relapsed) lost less pulmonary function, and lost function less rapidly, than people who smoked continuously, given the same average dose of cigarettes over a 5 year period.

*Anthonisen NR, Connett JE, Kiley JP, et al for the Lung Health Study Research Group. *JAMA* 1994; **272**:1497–505.

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Commentary

Despite broad consensus that stopping smoking reduces the decline in lung function caused by smoking, little has been published on the effects of relapsed smoking cessation. One study found that participants who attempted to stop smoking and then relapsed had steeper rates of decline in FEV₁ compared with participants who continued to smoke without attempting to stop,¹ which contradicts the findings of this study by Murray *et al*.

The authors used data from a randomised controlled trial of a smoking cessation intervention to examine the association between multiple smoking cessation attempts with relapses to smoking and pulmonary function in adults. The study design was robust—inclusion and exclusion criteria were explicit, as

were those for the construction of the study categories (ie, quitters, continuous smokers, and intermittent smokers). The authors accounted for sex differences, ethnicity, number of cigarettes smoked, and for potential errors in lung function measurement by using spirometry. They excluded patients who died during the study or were diagnosed with lung cancer. Smoking cessation was verified using either salivary cotinine levels or CO concentrations, thus eliminating the potential for participant misreporting of smoking.

The results of the study can be used by nurses in the context of providing individual advice and public health education on the benefits of smoking cessation. Smokers who attempted to stop smoking but relapsed lost less pulmonary function

and lost pulmonary function less rapidly than people who did not attempt to stop: in other words, trying to stop smoking was beneficial, even if it was not maintained. Also, Murray *et al* suggest that women seemed to benefit more from stopping smoking than men because, for some reason, women's lung function deteriorates more rapidly than men's with continued smoking.

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1 Sherrill DL, Enright P, Cline M, et al. *Chest* 1996; **109**:1001–5.