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Cochrane Database of Systematic Reviews 2012, Issue 12. Art. No.: CD004705.
DOI: [10.1002/14651858.CD004705.pub4](https://doi.org/10.1002/14651858.CD004705.pub4).

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[Intervention Review]

Biomedical risk assessment as an aid for smoking cessation

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Editorial group: Cochrane Tobacco Addiction Group.

Publication status and date: New search for studies and content updated (no change to conclusions), published in Issue 12, 2012.

Citation: Bize R, Burnand B, Mueller Y, Rège-Walther M, Camain JY, Cornuz J. Biomedical risk assessment as an aid for smoking cessation. *Cochrane Database of Systematic Reviews* 2012, Issue 12. Art. No.: CD004705. DOI: [10.1002/14651858.CD004705.pub4](https://doi.org/10.1002/14651858.CD004705.pub4).

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ABSTRACT

Background

A possible strategy for increasing smoking cessation rates could be to provide smokers who have contact with healthcare systems with feedback on the biomedical or potential future effects of smoking, e.g. measurement of exhaled carbon monoxide (CO), lung function, or genetic susceptibility to lung cancer.

Objectives

To determine the efficacy of biomedical risk assessment provided in addition to various levels of counselling, as a contributing aid to smoking cessation.

Search methods

For the most recent update, we searched the Cochrane Collaboration Tobacco Addiction Group Specialized Register in July 2012 for studies added since the last update in 2009.

Selection criteria

Inclusion criteria were: a randomized controlled trial design; subjects participating in smoking cessation interventions; interventions based on a biomedical test to increase motivation to quit; control groups receiving all other components of intervention; an outcome of smoking cessation rate at least six months after the start of the intervention.

Data collection and analysis

Two assessors independently conducted data extraction on each paper, with disagreements resolved by consensus. Results were expressed as a relative risk (RR) for smoking cessation with 95% confidence intervals (CI). Where appropriate, a pooled effect was estimated using a Mantel-Haenszel fixed-effect method.

Main results

We included 15 trials using a variety of biomedical tests. Two pairs of trials had sufficiently similar recruitment, setting and interventions to calculate a pooled effect; there was no evidence that carbon monoxide (CO) measurement in primary care (RR 1.06, 95% CI 0.85 to 1.32) or spirometry in primary care (RR 1.18, 95% CI 0.77 to 1.81) increased cessation rates. We did not pool the other 11 trials due to the presence of substantial clinical heterogeneity. Of the remaining 11 trials, two trials detected statistically significant benefits: one trial in primary care detected a significant benefit of lung age feedback after spirometry (RR 2.12, 95% CI 1.24 to 3.62) and one trial that used ultrasonography of carotid and femoral arteries and photographs of plaques detected a benefit (RR 2.77, 95% CI 1.04 to 7.41) but enrolled a population of light smokers and was judged to be at unclear risk of bias in two domains. Nine further trials did not detect significant effects. One of

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these tested CO feedback alone and CO combined with genetic susceptibility as two different interventions; none of the three possible comparisons detected significant effects. One trial used CO measurement, one used ultrasonography of carotid arteries and two tested for genetic markers. The four remaining trials used a combination of CO and spirometry feedback in different settings.

Authors' conclusions

There is little evidence about the effects of most types of biomedical tests for risk assessment on smoking cessation. Of the fifteen included studies, only two detected a significant effect of the intervention. Spirometry combined with an interpretation of the results in terms of 'lung age' had a significant effect in a single good quality trial but the evidence is not optimal. A trial of carotid plaque screening using ultrasound also detected a significant effect, but a second larger study of a similar feedback mechanism did not detect evidence of an effect. Only two pairs of studies were similar enough in terms of recruitment, setting, and intervention to allow meta-analyses; neither of these found evidence of an effect. Mixed quality evidence does not support the hypothesis that other types of biomedical risk assessment increase smoking cessation in comparison to standard treatment. There is insufficient evidence with which to evaluate the hypothesis that multiple types of assessment are more effective than single forms of assessment.

PLAIN LANGUAGE SUMMARY

Does giving people feedback about the effects of smoking on their body help them to quit?

Biomedical risk assessment is the process of giving smokers feedback on the physical effects of smoking using physiological measurements (for example: exhaled carbon monoxide measurement or lung function tests). It has been considered as a tool to encourage smokers to quit. This review includes 15 studies. Of them, only two found that biomedical risk assessment significantly increased long term quitting. In one study, smokers who had their lung function tested and the results explained in terms of lung age compared to their actual age were more likely to quit than people given the same test but without the explanation. In another study, light smokers who were shown images of their arteries were more likely to quit than those who were not shown images. Mixed quality evidence does not suggest that other types of biomedical risk assessment increase a smoker's chance of successfully quitting compared with standard treatments.