

## Just a single cigarette a day linked to sudden death

### Behind the Headlines

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Women who smoke are at risk of sudden cardiac death

Light smoking 'doubles sudden heart death risk in women', BBC News reports. It says women who are light smokers – including those who smoke just one cigarette a day – double their chance of sudden death.

This headline comes from a large, long-term US study that assessed whether women's smoking habits affected their risk of sudden cardiac death (SCD), where the heart suddenly and unexpectedly stops beating.

This usually happens because the electrical activity that normally regulates the muscles of the heart has suddenly become very erratic and so the heart cannot pump normally.

Over the 30-year study period there were 351 sudden cardiac deaths, meaning approximately 0.35% of the women suffered SCD during this time. While this may seem small, this amounts to hundreds of deaths. Because millions of women across the globe smoke, there may be thousands of sudden cardiac deaths potentially caused by smoking.

Even after taking into account other risk factors, researchers found that women who were light smokers (defined as between one and 14 cigarettes a day) were around twice as likely to die of SCD. This useful piece of research further reinforces the point that there is no such thing as a safe level of smoking: a single cigarette a day can kill you.

Encouragingly for those planning to quit in the New Year, SCD risk decreased in proportion to the length of time since quitting, and after 20 years of quitting the risk was equivalent to that of someone who had never smoked.

Read more about the [resources available that can help you stop smoking](#).

### The myth of 'healthy smoking'

Internal tobacco industry memos brought to light recently through freedom of information requests revealed that there was a deliberate marketing strategy from the 1960s onwards to push the idea of healthier cigarettes, after the health risk associated with smoking became well-known. This led to branding techniques we can still see today, such as so-called "light", "low tar" or "slim" cigarettes.

### Where did the story come from?

The study was carried out by researchers from Harvard Medical School (USA) and the University of Alberta (Canada), and was funded by the US National Institutes of Health and an Established Investigator Award from the American Heart Association. No conflicts of interest were declared.

The study was published in the [peer-reviewed](#) medical journal, *Circulation: Arrhythmia and Electrophysiology*.

Both the BBC and the Daily Mail coverage of this study was accurate and balanced, although it would have benefited from stating the absolute risk of suffering sudden cardiac death (which is relatively rare) to help readers work out whether they should worry or not.

While we at Behind the Headlines frown on hyped-up risk factors in headlines, the fact remains that smoking may not kill you by causing sudden cardiac death, but unless something else kills you first it's highly likely to kill you eventually.

### What kind of research was this?

This was a prospective [cohort study](#) that examined the association between cigarette smoking and stopping smoking, and the risk of sudden cardiac death risk in women initially free from cardiovascular disease over 30 years.

The researchers report that sudden cardiac death is a leading cause of cardiovascular deaths. SCD is where the heart suddenly and unexpectedly stops beating. This usually happens because the electrical activity that normally regulates the heart has suddenly become very erratic (called ventricular fibrillation) and so the heart cannot pump normally.

The underlying heart conditions that can cause this to happen vary, but can include problems with the heart muscle (abnormally thickened or dilated muscle, known as cardiac hypertrophy), [coronary heart disease](#) (blockages in the heart arteries), or heart valve disease.

Cigarette smoking has previously been strongly linked to SCD risk. This research group sought to better understand the relationship and explore the effect of quitting smoking on the risk of SCD in the long-term.

## What did the research involve?

Information on 101,018 women was analysed for this study. These women were participating in a well-known cohort study called the Nurses' Health Study. This is a US study set up in 1976 that has followed the lives of more than 100,000 female nurses ever since, documenting their health and lifestyle along the way. The women recruited for this study had no known coronary heart disease, stroke or cancer at baseline, which was assessed in 1980. The women were followed-up until January 1 2011.

Information on self-reported smoking status was available from each of the women from a two-yearly survey. This included whether the women were never, past or current smokers, as well as the amount they smoked, the duration they had smoked for and, among former smokers, the time since quitting.

SCD was reported to the researchers by next of kin, postal authorities and national death registers, and confirmed via death certificates. These were further confirmed through review of medical records, autopsy reports and interviews with family members about the circumstances surrounding the death.

For the main analysis, smokers were categorised into the following groups:

- 1-14 cigarettes per day
- 15-24 cigarettes per day
- greater than or equal to 25 cigarettes per day

They also performed analysis using other classifications, including the exact number of cigarettes smoked, smoking duration and the time since stopping smoking to see how this related to risk of SCD.

## What were the basic results?

Among the 101,018 women without known coronary heart disease, stroke or cancer at baseline, 29.1% were current smokers, 26.4% past smokers and 44.5% had never smoked. During 30 years of follow-up, there were 351 cases of SCD, meaning that approximately 0.35% of the women suffered from SCD over the 30-year period.

Compared with never smokers, current smoking was associated with a 244% increased risk (relative risk 2.44 95% confidence interval (CI) 1.80 to 3.31) of SCD and women who quit smoking had a 40% increased risk (relative risk 1.40 95% CI 1.10 to 1.79) of SCD.

This analysis accounted for numerous well-known risk factors for heart disease, including:

- age
- body mass index
- diabetes
- high blood pressure
- alcohol consumption

The quantity of cigarettes smoked daily and the duration the women had smoked for were linearly associated with SCD risk. This means that as the quantity smoked increased, so did the risk of SCD by a proportionate amount. Similarly, the longer people smoked for in their lives, the higher the resulting increase in risk of SCD.

Compared to never smokers, small to moderate cigarette consumption ( 1-14 cigarettes per day) was associated with a statistically significant 84% increase in SCD risk (relative risk 1.84 95% CI 1.16 to 2.92) and every five years of continued smoking was associated with an 8% increase in SCD risk (HR 1.08 95% 1.05 to 1.12).

SCD risk decreased in proportion to the length of time since quitting, and after 20 years of quitting the risk was equivalent to that of someone who had never smoked.

## How did the researchers interpret the results?

The researchers concluded that there was a "strong response relationship between cigarette smoking and SCD risk" and that "smoking cessation significantly reduced and eventually eliminated excess SCD risk". They thought this suggested "efforts to prevent SCD among women should include aggressive strategies for smoking cessation".

## Conclusion

This large, long-term prospective cohort study indicates that the quantity and duration of cigarette smoking was directly associated with risk of sudden cardiac death. An increased risk was found even among those smoking small to moderate amounts (1-14 cigarettes per day) compared with those who had never smoked.

Furthermore, SCD risk reduced in line with the length of time since quitting smoking and reached the level of someone who had never smoked after 20 years.

This study had many strengths, including its large size, thorough method of assessing SCD, adjustment for well-known heart health risk factors, and long-term follow-up period of 30 years. However, the following should be considered when interpreting the research.

The participants in the Nurses' Health Study were predominately white (96%), relatively healthy and a similar group. The results may vary in other ethnic groups who adopt different health and lifestyle behaviours.

The actual risk of SCD for women in this study was relatively low (0.35%) and so the approximately two-fold increase in the relative risk due to smoking reported in this study should be considered in this context. But even with this proviso in mind, a doubling of deaths in a historical population of millions accounts for thousands of otherwise preventable deaths.

Another limitation is that this study only looked at women, and so the results may not be applicable to men. The researchers point out that similar but inconsistent results have been found in some studies done in men, but these often didn't have the same definition of SCD. Hence, the exact relationship in men seems less clear.

Overall, the number of cigarettes smoked (in a dose-response relationship) was linked to SCD risk in both women with and without symptoms of coronary heart disease (CHD). However, the results also suggested that the increased risk was less clear among women who developed symptoms of coronary heart disease during the course of the study. This may warrant further research to see if the effect of smoking upon SCD risk is different in women with and without symptoms of CHD, which was touched on by this study.

This research reinforces the important idea that some of the damaging effects of smoking may be reduced by quitting smoking, as long as quitting is done early enough in life to reap the health benefits.

This may give added incentive to current smokers wanting to kick the habit, especially as the time for New Year's resolutions approaches.

Analysis by [Bazian](#). Edited by [NHS Choices](#). Follow [Behind the Headlines on Twitter](#).

## Links to the headlines

[Just one cigarette a day doubles a woman's risk of having a fatal heart attack](#). Daily Mail, December 11 2012

[Light smoking 'doubles sudden heart death risk in women'](#). BBC News, December 12 2012

## Links to the science

Sandhu RK, Jimenez MC, Chiuve SE, et al. [Smoking, Smoking Cessation and Risk of Sudden Cardiac Death in Women](#). Circulation: Arrhythmia & Electrophysiology. Published online December 12 2012

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