

Graphic images on cigarette warnings stick with smokers

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Each of the participants in this study were shown one of these three warnings. The image on the far right had the strongest long-term impact. Credit: Ohio State University

If you want smokers to remember cigarette-warning labels, include a graphic image of the results of long-term smoking, a new study suggests.

A vivid image—such as a picture of a nicotine addict smoking through a

surgical hole in his throat—packs an emotional punch for [smokers](#), the researchers found.

Such images are shocking enough that smokers who viewed them actually remembered less of the associated text warning immediately afterward than did those who viewed warnings with only text or a much milder photo.

But six weeks later, fewer smokers who saw the [graphic image](#) had forgotten the warnings, compared to those who received the other messages.

"The high-emotion image sticks with smokers longer and we see less decline in what they remember about the warnings," said Ellen Peters, lead author of the study and professor of psychology at The Ohio State University.

Even more importantly, the study showed smokers who had stronger [emotional reactions](#) to the graphic warnings reported higher risk perceptions of smoking six weeks later and had greater intentions of quitting.

"Warnings with graphic images are the best way to convey the negative health consequences of smoking in a meaningful way," Peters said.

The study appears online in the *Annals of Behavioral Medicine* and will be published in a future print edition.

The study involved 1,932 people who participated in two separate internet surveys. The studies included a nationally representative sample of adult smokers, a sample of Appalachian adult smokers, and a national sample of teens who were smokers or who were at high risk of taking up smoking.

All of the smokers participated online. Each participant was shown the same cigarette warning labels on their computer four times: on the first day of the study, twice after one week, and then a fourth time after either two weeks or six weeks.

Each smoker received one of nine text warnings (for example, "Cigarettes are addictive" or "Smoking can kill you").

Some received only the text. Others saw the text paired with an image that earlier tests showed provoked little emotion (such as hands in chains reaching for cigarettes). A third group saw an image that earlier tests showed triggered strong emotions, such as the man smoking through the hole in his throat. (The hole is called a tracheostomy and may be necessary because of some smoking-related cancers.)

Results showed that smokers who viewed the low-emotion or text-only messages could recall about 30 percent of what the warnings said if they were asked immediately following the study.

But if they were asked after six weeks, warning recall dropped by nearly half for those who saw the low-emotion image and by one-third if they saw the text-only message.

People who saw the highly graphic image remembered slightly fewer of the messages (26 percent) immediately after the study was completed. However, after six weeks, there was a drop-off of only 5 percentage points in amount of warning information remembered.

The researchers found something else interesting about the people who had strong emotional reactions to the warnings: Even when they couldn't remember the exact [warning](#) that was paired with their image, they were more likely than others to spontaneously recall other risk information that they weren't shown.

"They were recognizing real risks of smoking, just not the ones they were shown in the study," said Brittany Shoots-Reinhard, a co-author of the study and a research associate in psychology at Ohio State.

"They were reminded of other bad things about smoking that they already knew."

Compared to those who received the other messages, smokers who received the graphic-image warnings had greater emotional reactions to the images, which related in turn to them thinking they were at greater risk of dying younger or getting a life-threatening disease because of their cigarette use. They were also more likely to say they were thinking about quitting.

"The results suggest that the high-emotion warnings will teach people more about the health risks of smoking and possibly get them to act," Peters said.

"Research has shown that the average smoker has surprisingly superficial knowledge about the risk. They know it is bad for them, but if we can teach them the specific risks of [smoking](#), we believe it will stick in their heads and have a bigger impact in the long-term."

The key is to find a way—such as the graphic images in this study—to arouse people's emotions. Research on memory consolidation shows that strong emotions that excite people can disrupt immediate memory, just as it did in this study, Peters said.

But it also helps to support memory over the long term. "That's why pictorial warnings can be so effective," she said.

More information: Ellen Peters et al. Pictorial Warning Labels and Memory for Cigarette Health-risk Information Over Time, *Annals of*

Behavioral Medicine (2018). [DOI: 10.1093/abm/kay050](https://doi.org/10.1093/abm/kay050)

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