Is the Damage from Smoking Permanent?

LAURA BLUE

Tens of millions of people have quit smoking cigarettes. The benefits of quitting — no matter what your age — are prodigious. Risks of heart disease and stroke plummet. So does the risk of lung cancer, along with cancers of the mouth, throat, bladder, cervix and pancreas. But can the damage from smoking ever be completely undone? Norman Edelman, chief medical officer of the American Lung Association, explains.

Q: Does your body fully heal after quitting smoking?
A: When you quit smoking, the inflammation in the airways goes down. The little hair-like projections in the airways that we call cilia — which are paralyzed by smoke — begin to work again. So the lungs will get better in weeks to months. Breathing will get better. Exercise capacity will get better. Paradoxically, people find that they cough a little more right after they stop smoking, but that's natural. That's the lungs cleaning themselves out.

But if you've been smoking a long time and have developed COPD [(or, chronic obstructive pulmonary disease)], which includes chronic bronchitis or emphysema, the lungs never totally heal. Chronic bronchitis is an inflammation of the airway. Some of that inflammation can be reversed. But if the inflammation has led to scarring of the walls of the airway, some of that cannot. Emphysema is a disease in which the walls of the fine air sacs of the lung — the place where the lung does its business of exchanging oxygen for carbon dioxide — break down. So tiny little air sacs become bigger ones — and they're less efficient in transporting oxygen. The lung can't grow new walls for these air sacs. The lung loses tiny blood vessels and can't grow new ones. So that's permanent.
When it comes to cancer, we calculate that the risk for lung cancer probably returns to that of a nonsmoker somewhere between 10 and 15 years after smoking cessation. (We have less data on the [other smoking-related cancers].) But the risk that people have for smoking-related diseases is directly related to the total number of cigarettes they've smoked in their life. We measure that

with something we call "pack-years": that's the average number of packs per day multiplied by the number of years they've smoked. The greater the pack-years, the greater the risk. When you're getting up around 50 pack-years and beyond, that's a lot. If people have a lot of pack-years, the risk of, say, lung cancer never goes back down to [the risk of a non-smoker].

There is a famous study that shows that if you quit smoking by age 30, scientists can't show a statistically significant difference in mortality — [that is, when you'll die]. But those data are just mortality statistics. It doesn't mean the lungs are completely normal. Somebody who smoked a lot, even if they quit by 30, probably will have some impairment in lung function, and their exercise capacity might be reduced. Their lungs will always be a little bit more susceptible to other insults, to pneumonia infection for example.

Of course, the way people react to cigarette smoke varies enormously. Everybody has a 90-year-old uncle who smoked all his life and feels fine. And everybody's got a 45-year-old cousin who's dying of emphysema. These two people have reacted to cigarette smoke differently. It's an important scientific question to understand what the differences are, and we're beginning to work on it. Genetics seem to play a role.