



**ATS 2018**  
*Where today's science  
meets tomorrow's care™*

**International Conference**  
**May 18-23 San Diego, CA**

**FOR RELEASE**

**Embargoed Until May 22, 9:15 a.m. PST**

**FOR MORE INFORMATION, CONTACT:**

Dacia Morris

dmorris@thoracic.org

ATS Office 212-315-8620 (until May 17)

Cell Phone 917-561-6545

**Session:** C16 Cigarette, E-Cigarette, and Marijuana Smoking: Human and Mouse Studies

**Abstract Presentation Time:** Tuesday, May 22, 9:15 a.m. PST

**Location:** San Diego Convention Center, Room 15 A-B (Mezzanine Level)

**Quitting Smoking, But Not Cutting Back, Linked to Better Lung Health**

ATS 2018, San Diego, CA – Long-term light smokers appear to be at greater risk for lung function decline, emphysema and obstructive lung disease than heavy smokers who [quit](#), according to new research presented at the ATS 2018 International Conference.

Researchers analyzed data collected over 30 years from 3,140 participants in the Coronary Artery Risk Development in Young Adults (CARDIA) study. When they enrolled, participants lived in four U.S. cities—Birmingham, AL., Chicago, IL, Minneapolis, MN, and Oakland, CA—and their average age was 25. Nearly half were African American, and nearly half smoked at some point in their lives. Participants underwent periodic [spirometry](#) to assess lung function and a chest CT scans 15, 20 and 25 years after enrolling.

“The CARDIA dataset gave us a unique opportunity to learn about the impact of different levels of smoking on lung health and lung disease risk,” said lead author Amanda Mathew, PhD, research assistant professor at Northwestern University Feinberg School of Medicine.

“Participants were asked about their smoking each year, which minimized recall bias and allowed us to model changes in smoking habits over time.”

Compared to those who never smoked, stable heavy smokers experienced the greatest decline in lung function as measured by FEV<sub>1</sub>, or the amount of air that can be forcibly exhaled in one second (-42.2 mL/year). In addition, stable heavy smokers were 26 times more likely to develop emphysema and nearly eight times more likely to develop obstructive lung disease.

The researchers also examined lung health risk among light smokers, which they defined as having less than a 10 pack-years smoking history. Pack-years is estimated by multiplying the number of cigarette packs smoked a day times the number of years a person smoked. According to the authors, these light smokers are often excluded from clinical trials for chronic lung disease.

The study compared stable, low-rate smokers (those smoking less than 10 cigarettes per day, on average) with smokers who had quit. Those who had quit had a 9.8 pack-year smoking history vs. a 6.4 pack-year history of those who smoked at a low intensity. Despite having smoked more cigarettes, smokers who quit preserved more lung function (-33.8 vs. -35.7 mL/year) and had a lower risk of developing emphysema (3.4 vs. 8.5 times the risk of never smokers) than stable, low-rate smokers.

“We were surprised to find that those who quit had lower disease risk than the group we identified as stable, low-rate smokers, even though those who quit had a greater lifetime exposure to cigarettes,” Dr. Mathew said.

The authors adjusted findings for a number of factors that might have biased results, including age, race, gender, body mass index and asthma. Study limitations include not being able to adjust for secondhand smoke, marijuana smoke or e-cigarette use.

Still, Dr. Mathew said, the study’s take-home message for smokers is clear. “There is no safe threshold of smoking on lung health,” she said. “Cutting down can be a great first step, but quitting for good is the most effective way to reduce lung disease risk.”

#### **Contacts for Media**

Amanda Mathew, PhD,  
[amanda.mathew@northwestern.edu](mailto:amanda.mathew@northwestern.edu)  
312-503-1343

Marla Paul  
Media Relations, Northwestern University  
[marla-paul@northwestern.edu](mailto:marla-paul@northwestern.edu)  
312-503-8928

###

## Abstract 6982

### Life Course Cigarette Smoking and Lung Health from Young Adulthood to Middle Age: Findings from the CARDIA Lung Study

**Authors:** A. Mathew<sup>1</sup>, L. Colangelo<sup>1</sup>, N. Allen<sup>1</sup>, D. Jacobs<sup>2</sup>, G. Washko<sup>3</sup>, R. San Jose Estepar<sup>4</sup>, R. Auer<sup>5</sup>, R. Widome<sup>6</sup>, S. P. Bhatt<sup>7</sup>, M. T. Dransfield<sup>8</sup>, B. Hitsman<sup>1</sup>, R. Kalhan<sup>9</sup>; <sup>1</sup>Preventive Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL, United States, <sup>2</sup>Univ of Minnesota Div of Epidemiology, Minneapolis, MN, United States, <sup>3</sup>Brigham & Womens Hosp, Boston, MA, United States, <sup>4</sup>Brigham Womens Hosp, Boston, MA, United States, <sup>5</sup>Institute of Primary Health Care, University of Bern, Bern, Switzerland, <sup>6</sup>University of Minnesota School of Public Health, Minneapolis, MN, United States, <sup>7</sup>Pulmonary, Allergy and Critical Care Medicine, University of Alabama at Birmingham, Birmingham, AL, United States, <sup>8</sup>Univ of Alabama Birmingham & Birmingham VA Med Ctr, Birmingham, AL, United States, <sup>9</sup>Asthma and COPD Program, Northwestern Univ, Chicago, IL, United States.

**Introduction:** Cigarette smoking is associated with accelerated decline in lung function and risk of lung disease, but current literature is limited by a reliance on imprecise measurement of smoking exposure. Further, as low rate smokers (i.e., <10 pack-years) are often excluded from clinical trials, lung health outcomes in this group are not well understood. Using data from the Coronary Artery Risk Development in Young Adults (CARDIA) study, we examined the impact of smoking intensity and duration on lung health outcomes over a 30 year period of follow-up.

**Methods:** We analyzed prospective data from 3140 participants who completed yearly assessments of smoking behavior and spirometry measurements at Years 0, 2, 5, 10, 20, and 30. Outcomes were loss of lung health (decline in FEV<sub>1</sub> from peak) and incident lung disease (emphysema on Year 25 thoracic CT and obstructive physiology at Year 30).

**Results:** Participants were predominantly female (57.3%), 47.7% were African American, and mean age at baseline was 25. Nearly half of participants (47.9%) endorsed lifetime smoking. We identified six smoking trajectory groups (Figure 1). After adjusting for age, sex, race, body mass index, asthma, and baseline smoking status, smoking trajectory groups were differentially associated with lung function decline and disease risk. Stable heavy smokers showed the greatest decline in FEV<sub>1</sub> (-42.2 mL/year) and disease risk relative to non-smokers, with nearly eight times the odds of obstructive disease (OR=7.7, CI 4.1-14.7) and more than twenty times the odds of emphysema (OR=24.1, CI 12.6-46.2). We next examined lung health outcomes within two low-intensity smoking groups: stable low rate smokers vs. quitters. Quitters showed

less FEV<sub>1</sub> decline than stable low rate smokers (-33.8 mL/year vs. -35.7 mL/year) and lower emphysema odds (OR=2.8, CI 1.2-6.3 vs. OR=7.7, CI 4.2-14.2), despite having greater mean pack-years at Year 25 (9.8 vs. 6.4). For both groups, number of years smoking (area-under-the-ROC curve=0.78) was superior to lifetime pack-years (area-under-the-ROC curve=0.62; p<0.0001) in predicting risk of emphysema.

**Conclusions:** In a longitudinal, population-based study, we identified a dose-response relationship between smoking exposure, lung function decline, and lung disease risk. Smoking duration was a better predictor of emphysema risk than smoking intensity, demonstrating the detrimental health effects of long-term smoking regardless of smoking amount. Results underscore that there is no safe threshold of smoking on risk to lung health.

**Figure 1.** Lifetime a) smoking trajectories by cigarettes per day annually, and b) associated incident lung disease outcomes (covariate adjusted odds ratio) at Year 30

