nicotine gum. By the time of the August 1989 APA meeting, over 2000 Lung Health study participants who began a nicotine gum smoking cessation program will have completed their one-year follow-up. Extended gum use data will be presented on these subjects.

GENDER AND AGE DIFFERENCES IN LONG-TERM USE OF NICOTINE GUM. Peggy Russell. Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, Pittsburgh, PA.

Nicotine chewing gum (nicotine polacrilex) has been demonstrated as an effective aid in the treatment of smoking. The advantages of nicotine chewing gum include its use in minimizing the withdrawal discomfort of quitting smoking and replacing the effects of nicotine from smoking. One advantage that should be of particular salience to women smokers is that proper use of the gum tends to reduce weight gain after stopping smoking. While there is substantial literature to demonstrate the effectiveness of gum in smoking cessation, there are questions which remain regarding which smokers' nicotine gum is best suited for and which smokers are most likely to continue using the gum long-term. Smokers differ in their smoking and quitting habits by gender and age. Women who smoke differ in the number of cigarettes per day and the type of cigarettes they smoke. Male smokers in older age groups tend to smoke more cigarettes per day and experience differences in discomfort levels from younger male smokers when they quit smoking. When male smokers are compared to females they differ according to age group as well. In this paper, data will be presented on gender and age differences in extended nicotine gum use in smokers enrolled in the Lung Health Study, a clinical trial designed to intervene early in smokers identified at risk for Chronic Obstructive Pulmonary Disease. When randomization is complete, 4,000 men and women smokers who have been screened for minimal lung dysfunction as shown by spirometry tests will participate in a special intervention program. Over 50% of the Lung Health Study participants were still using nicotine chewing gum at the time of their first 4-month follow-up. Initial acceptance rates and gum dose for the first 4 months of the trial show that more females than males used nicotine chewing gum at the end of 4 months. Of those who remained abstinent for the 4-month period, there were greater numbers of females who used gum than males. A current concern with long-term users of Nicorette is the potential for developing dependency on the gum. When smoking and quitting status is measured along with the number of pieces of nicotine gum used daily by 400 Lung Health Study participants, the data show that women who quit smoking used more nicotine gum at one year than men who quit smoking except for quitters classified as intermittent quitters. The role of extended nicotine gum use for women as a palliative stress management technique and as a weight control strategy will be discussed. Data will be presented on initial use of nicotine gum in the first four months of the trial on approximately 3500 participants. Differences in long-term use of nicotine gum characterized by age and gender will be presented on approximately 2000 participants.

WEIGHT GAIN AS A FUNCTION OF SMOKING CESSATION AND 2 MG NICOTINE GUM USE AT ONE-YEAR FOLLOW-UP. Mitchell A. Nides. University of California at Los Angeles, Los Angeles, CA.

Participants in the Lung Health Study smoking cessation program, a five-year, ten-site clinical trial sponsored by the National Heart, Lung and Blood Institute, who reported sustained nonsmoking for the 8 months preceding their first 12-month follow-up visit, gained a significant percentage of weight regardless of long-term 2 mg nicotine gum use ($p<0.05$, two-tailed). Males using Nicorette at 12 months (N = 72) gained an average of 5.6% of their baseline body weight while females (N = 50) gained an average of 6.0%. In contrast, males who never used or had discontinued use of Nicorette by the 12-month follow-up (N = 190) gained an average of 7.1% while females (N = 103) gained an average of 9.8%. Continued Nicorette use resulted in a significantly smaller percentage of weight gained at 12 months for females ($p<0.05$) and a nearly significant difference for males ($p=0.063$). Overall, males gained a smaller percentage of weight, but the only statistically significant difference was between males and females not currently using Nicorette ($p=0.0003$). The majority of weight was gained in the first few months following quitting smoking. Males using Nicorette at 4 months (N = 136) gained 4.7%, females (N = 94) 4.7%; males not using Nicorette (N = 145) gained 5.3%, and females (N = 57) 6.3%. The trend was for those using Nicorette to gain less weight at 4 months. Between the 4- and 12-month follow-ups only those participants who reported using Nicorette at both follow-ups did not gain a significant percentage of additional weight: Males (N = 69) gained 0.8% and females (N = 49) 0.6%. Males (N = 63) and females (N = 44) who had stopped using Nicorette between the 4th and 12th months gained 2.4% and 3.7% respectively, while males (N = 135) and females (N = 58) who were not using Nicorette at either the 4- or 12-month follow-ups gained an additional 2.0% and 3.7% respectively. These data indicate that quitting smoking resulted in significant weight gain after one year regardless of Nicorette use, although those using Nicorette gained less.

INVITED ADDRESS

Chair: *Jack E. Henningfield,* National Institute on Drug Abuse Addiction Research Center, Baltimore, MD

CHARACTERIZATION OF THE TOBACCO WITHDRAWAL SYNDROME AND IMPLICATIONS FOR TREATMENT. Dorothy K. Hatsukami. University of Minnesota, Minneapolis, MN.

This presentation will evolve around the characteristics of the tobacco withdrawal syndrome, its association with relapse to tobacco use and implications for treatment. In order for signs and symptoms to be classified as a true withdrawal syndrome, they must meet the following criteria: 1) a change in physiological, subjective and/or behavioral functioning as a result of deprivation from the drug; 2) time course of signs and symptoms that show an overshoot or rebound pattern; 3) alleviation of withdrawal symptoms when the drug is reinstated; and 4) the precipitation of withdrawal when a tobacco user is administered a drug antagonist. Studies we have conducted show a change in physiological, subjective and behavioral functioning during deprivation from cigarettes and smokeless tobacco. Furthermore, some of these signs and symptoms show an overshoot or rebound pattern. There is also evidence indicating that some of these symptoms are due specifically to nicotine (e.g., nicotine replacement and nicotine gum withdrawal studies) and are dose-related. However, the induction of withdrawal symptoms using nicotine antagonists has not been clearly demonstrated. As of yet, there are few studies which show that the tobacco withdrawal syndrome plays a significant role in relapse to tobacco. In fact, relapses have been found to occur long after the withdrawal symptoms have subsided. However, a recent study has demonstrated the occurrence of conditioned withdrawal responses which may be associated with relapse to tobacco. Furthermore, although nicotine gum has been