ARIC MANUSCRIPT PROPOSAL FORM

Manuscript #547S

1. Full Title:  Sleep-Disordered Breathing in an Adult Population: The Sleep Heart Health Study  
   Abbreviated Title (length 26): Prevalence of SDB

2. Writing Group (list individual with lead responsibility first):
   (lead) Daniel J. Gottlieb, MD, MPH; Framingham Heart Study
   Boston University
   The Pulmonary Center
   715 Albany Street, R304
   Boston, MA 02118-2394
   Email: dgottlieb@bupula.bu.edu
   Phone: (617) 638-8693; Fax: (617) 638-5298
   Coauthors: Dr. William Bonekat, Dr. Barbara Howard, Dr. F. Javier Nieto, Dr. Susan Redline; Coordinating Center - to be determined.

3. Timeline:
   Anticipated start is end of PSG scoring (Nov 1998), with completion of analyses and preparation of first draft by Feb 1999.

4. Rationale:
   The SHHS provides a unique opportunity to describe the prevalence and correlates of sleep-disordered breathing in a large population of adults of diverse racial and ethnic backgrounds.

5. Main Hypothesis:
   This paper is primarily descriptive in nature. Specific hypotheses to be tested include the null hypotheses of no relation between sleep-disordered breathing and:
   a. age
   b. gender
   c. body habitus
   d. cigarette smoking
   e. alcohol consumption
   f. race or ethnicity

6. Data (variables, time window, source, inclusions/exclusions):
   Variables included in the analysis will be respiratory disturbance index (RDI4P), age, gender, BMI, waist-hip ratio, neck circumference, ethnicity, study site, snoring, smoking status, and alcohol consumption (usual and night of study).
Time window is 11/95 to 1/98 (i.e., the entire SHHS Cohort). The sources of the data are polysomnography (PSG), Sleep Habits Questionnaire, Health Interview, Morning Survey, and parent cohort data available at the SHHS Coordinating Center. Inclusion criteria: all subjects with acceptable PSG (quality of fair or better) studied as part of the SHHS, approximately 6600 subjects. In order to compare participants with non-participants and to standardize the prevalence rates to the parent study distribution of snoring status, the above (non-PSG) data will also be requested for all members of the parent cohorts who have completed the SHQ but not had a PSG study.

7. Type of Study:
Mainline Study

8. Type of Publications Journal Article; Target Journal (if known at this time):
JAMA

9. Analysis Responsibility:
Coordinating Center

10. Introduction
The Sleep Heart Health Study (SHHS) is the largest epidemiologic study yet conducted of polysomnographically measured sleep-disordered breathing (SDB) in U.S. adults. It is the first study to obtain epidemiologic data on SDB prevalence through the use of unattended, in-home polysomnography. Although the SHHS cohort is not population-based, being drawn from existing epidemiologic cohorts recruited in diverse fashions, the results of this study will provide important information on the prevalence and correlates of SDB in a well-described population of middle-aged and elderly adults selected independent of the presence of sleep disorders. Previously approved SHHS publications have included some data on the distribution of SDB in the SHHS; however, there is not yet approval for a proposal to present the overall findings on distribution of SDB in the SHHS Cohort in relation to known or suspected SDB risk factors of age (1,2), gender (1-3), body habitus (1,2), smoking status (4), alcohol consumption (5), and race/ethnicity (6).

In this paper, I propose to present the distribution of RDI and its relation to age, gender, body habitus, smoking status, alcohol consumption, and race/ethnicity, adjusting for differences in sampling frame among the participating centers (oversampling of snorers at some centers) and for differences between recruited subjects and the larger pool of eligible subjects in the parent cohorts.

11. Brief Analysis Plan
Subjects included in this analysis will be all subjects with acceptable PSG studied as part of the SHHS, approximately 6600 subjects. Variables included in the analysis will be respiratory disturbance index (RDI, using the PSG variable RDI4P), age, gender, BMI, waist-hip ratio, neck circumference, race/ethnicity, study site,
snoring, smoking status, and alcohol consumption (usual and night of study). These data will also be requested for all members of the parent cohorts who have completed the SHQ but not had a PSG study, in order to compare participants with non-participants and to standardize the prevalence rates to the parent study distribution of snoring status. Because sampling was stratified on snoring status at some sites, stratification is also necessary in analysis.

Histograms will be used to present the distribution of RDI in the SHHS participants in 1-unit/hour increments, by gender and snoring status (habitual snorer or not habitual snorer). The distribution of RDI, by gender, for the entire parent cohort, will be obtained by direct standardization to the parent cohort distribution of snoring status. The standardized prevalences of RDI will also be presented, using the RDI categories <5, 5-<15, 15-<30, 30-<60, and 60.

Gender, age, BMI, waist-hip ratio, neck circumference, smoking status, usual alcohol consumption, and acute alcohol consumption will be analyzed as univariate predictors of RDI, with analyses stratified on snoring status to reflect the stratification in sampling. Those variables which are significant predictors of RDI will be analyzed in multivariate analyses (including only the best predictor among the 3 body habitus variables).

Differences in RDI among race/ethnicity groups will be analyzed, again stratifying on snoring status. If significant differences are identified, other predictors of RDI will be included along with race/ethnicity in multivariate models, to determine whether the differences among groups are explained by these characteristics.

If there are large differences between the parent study subjects and the SHHS subjects on characteristics other than snoring status which are significantly related to RDI, consideration will be given to presenting the RDI distribution standardized on these variables as well.

12. Summary Sections:
This publication will describe the overall distribution of sleep-disordered breathing in the well-characterized population of middle-aged and elderly adults participating in the SHHS, with standardization to the parent cohort prevalence of snoring. The relation of sleep-disordered breathing to age, gender, body habitus, smoking status, alcohol consumption, and race/ethnicity will be presented.

REFERENCES:
