ARIC MANUSCRIPT PROPOSAL FORM

Manuscript #633

1. Full Title: Pulmonary Function and Echocardiographic Characteristics in African Americans
Abbreviated Title: Pulmonary Function and Echo

2. Writing Group:
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4. Timeline:

Submit proposal to Publications Committee	December, 1998
Complete Analysis	May, 1999
Submit first draft to Publications Committee	August, 1999
Journal submission	November, 1999

5. Rationale:
Impaired pulmonary function has been associated with increased risk of cardiovascular (1) and all-cause mortality (2), although findings have been somewhat inconsistent. Lower levels of pulmonary function have also been linked with an adverse cardiovascular risk profile (3). Some studies were limited by the inability to adequately control for the potential confounding effects of smoking, while a few were able to detect significant associations among never smokers (4). However, reasons for these associations between pulmonary function and CVD remain unclear.

Relatively few studies have evaluated echocardiographic indices of cardiac structure and function in relation to pulmonary function in a population-based setting (5-8). Associations were reported between pulmonary function and LV mass (5, 6, 8), LV diastolic dimensions (5), RV area and doppler estimates of pulmonary artery pressure (9), peak flow velocity in early diastole (7), as well as LV wall thickness, left atrial dimension, LV fractional shortening and the ratio of early to late diastolic flow velocity (8).

6. Main Hypothesis:
Measures of pulmonary function (FEVI and FVC), adjusted for age, height and relevant covariates, will be inversely associated with LV mass, wall thickness and dimensions, and diastolic flow velocities. These associations will be partially, but not completely, explained by traditional CVD risk factors and will persist among never smokers.

7. Data:
Mean levels of FEV1 and FVC from Visits 1 and 2 will be used as an estimate of pulmonary function in assessing potential associations with echocardiographic indices at Visit 3 for the Jackson ARIC cohort

(analogous to the approach used in ARIC manuscript proposal #396 (PFT and MRI Abnormalities)).

Lifestyle and Clinical Variables:
Age, height and smoking information from Visits 1, 2, and 3, pulmonary function variables at Visits 1 and 2, and gender, weight, BMI, waist circumference, waist-to-hip ratio, hypertension, blood pressure level, alcohol intake, physical activity, educaiton, total cholesterol, HDL cholesterol, triglycerides, glucose, diabetes, as well as prevalent CHD, stroke, history of angioplasty and bypass grafting, reported physician diagnosis of lung disease and asthma from Visit 3.

Echo Variables:
LV mass, LV wall thickness and chamber dimensions, LA and aortic root diameter, regional wall motion abnormalities, fractional shortening, heart rate and BP at echo, cardiac output, mitral and aortic regurgitation, and LV diastolic filling indices.

References:

(1) Kannel WB, Hubert H, Lew EA. Vital capacity as a predictor of cardiovascular disease: the Framingham Study. Am Heart J 1983;105:311-315.

(2) Beaty TH, Newill CA, Cohen BH, Tockman MS, Bryant SH, Spurgeon HA. Effects of pulmonary function on mortality. J Chron Dis 1985;38:703-710

(3) Higgins M, Keller JB, Wagenknecht LE, Townsend MC, Sparrow D, Jacobs DR Jr., Hughes G. Pulmonary function and cardiovascular risk factor relationships in black and in white young men and women: the CARDIA Study. Chest 1991;99:315-322.

(4) Lange P, Nyboe J, Appleyard M, Jensen G, Schnohr P. Spirometric findings and mortality in never-smokers. J Clin Epidemiol 1990;43:867-873.

(5) Gardin JM, Arnold A, Gottdiener JS, Wong ND, Fried LP, Klopfenstein HS, O'Leary DH, Tracy R, Kronmal R. Left ventricular mass in the elderly: the Cardiovascular Health Study. Hypertension 1997;29:1095-1103.

(6) Gardin JM, Wagenknecht LE, Anton-Culver H, Flack J, Gidding S, Kurosaki T, Wond ND, Manolio TA. Relationship of cardiovascular risk factors to echocardiographic left ventricular mass in healthy young black and white adult men and women: the CARDIA Study. Circulation 1995;92:380-387.

(7) Xie X, Gidding SS, Gardin JM, Bild DE, Wong ND, Liu K. Left ventricular diastolic function in young adults: the Coronary Artery Risk Development in Young Adults Study. J Am Soc Echocardiogr 1995;8:771-779.

(8) Enright PL, Kronmal RA, Smith V-E, Gardin JM, Schenker MB, Manolio TA. Reduced vital capacity in elderly persons with hypertension, coronary heart disease, or left ventricular hypertrophy: the Cardiovascular Health Study. Chest 1995;107:28-35.

(9) Shivkumar K, Ravi K, Henry JW, Eichenhorn M, Stein PD. Right ventricular dilatation, right ventricular wall thickening, and doppler evidence of pulmonary hypertension in patients with a pure restrictive ventilatory impairment. Chest 1994;106:1649-1653.