

## ARIC MANUSCRIPT PROPOSAL FORM

1. Title: Atherosclerosis/Ret Vas Abnormalities

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3. Timeline:

Analysis will begin with a set of available data from all participants evaluated in the study for both generalized narrowing of retinal arterioles using the image processor protocol and other signs of retinal vascular disease using the light box protocol. Analysis plan will include initial analyses of data in September 1995-December 1995 and writing of manuscript between January 1996 and March 1996.

4. Rationale:

Retinal microaneurysms, blot hemorrhages, cotton wool spots, and hard exudates, along with changes in retinal arteriolar caliber (generalized narrowing; and appearance, in the absence of diabetes and retinal vascular disease (e.g., retinal branch vein occlusion, central retinal vein occlusion, etc.), may be associated with elevated blood pressure or generalized atherosclerotic vascular disease. Retinopathy associated with retinal ischemia has been found in eyes of people with severe atherosclerotic vascular disease resulting in stenosis of the carotid artery. Data from one earlier population-based study done in Evans County Georgia, suggested higher frequency of these retinal lesions in blacks compared to whites. There are no population-based data which have examined the relation of signs of generalized atherosclerotic disease (abnormalities in ankle to arm indices, carotid artery wall changes, etc.) and risk factors for atherosclerosis (e.g., lipids, smoking, etc.) to the presence of retinal vascular changes as determined by grading of fundus photographs. Such information should provide a better understanding of the relation of atherosclerotic macrovascular disease to microvascular changes in the eye.

5. Main Hypothesis:

- (1) After controlling for blood pressure and hypertension, generalized arteriolar narrowing and retinopathy, in the absence of diabetes, are associated with atherosclerotic changes in larger vessels (e.g., carotid artery) and systemic risk factors for atherosclerotic disease.
- (2) After controlling for other risk factors (e.g., blood pressure, hypertension, lipids, etc.), there is a higher frequency of generalized arteriolar narrowing and retinopathy in African-Americans than whites.

6. Data (variables, time frame, source, inclusions/exclusions):

*Light box variables:* focal narrowing on disc, focal narrowing of arterioles, sheathing of arterioles, A/V crossing changes, generalized narrowing, number of microaneurysms, number of retinal hemorrhages, type of retinal hemorrhage, hemorrhage/microaneurysms, hard exudate, soft exudate, IRMA, venous beading, macular edema, papillary swelling, proliferative diabetic retinopathy, diabetic retinal severity level.

*Image processor variables:* CRAE, branch CRAE, CRVE, CRAE/CRVE, branch CRAE/CRVE, number of arterioles, number of venules, trunk/branch ratio.

*Nonocular variables:* age, sex, race, diabetes status, blood pressure (Visit 3, mean of Visits 1-3), hypertension status (controlled/uncontrolled), EKG information of LVH, body weight (Visit 3, mean of Visits 1-3), BMI (Visit 3, mean of Visits 1-3), smoking status, past and current alcohol consumption, serum lipid (Visit 3, mean of Visits 1-3 of total cholesterol, LDL, HDL, triglycerides, HDL subfractions Lp(a), Apo A1

and B), carotid intimal medial wall thickness and plaque, ankle/arm blood pressure index (visit 3, mean of Visits 1-3), serum albumin, microalbuminuria, white blood cell count, hematocrit, family history of cardiovascular disease/coronary heart disease, prevalent coronary heart disease (history, ECG, myocardial infarction history), and popliteal IMT and plaque.