ARIC Manuscript Proposal # 958

PC Reviewed: 09/10/03	**Status: A**	**Priority: 2**
SC Reviewed: 09/11/03	**Status: A**	**Priority: 2**

1.a. Full Title: Electrocardiographic abnormalities and coronary heart disease occurrence among Blacks and Whites of the Atherosclerosis Risk in Communities (ARIC) Study

b. Abbreviated Title (Length 26 characters): ECG abnormalities and CHD

2. Writing Group (list individual with lead responsibility first):

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Writing group members: Daniella B. Machado, Lori Boland, Richard Crow, Aaron Folsom, Peter Hannan, and Herman Taylor (the latter invited but not confirmed yet).

3. Timeline: Submit manuscript proposal 08/03, Complete data analysis 10/03, Submit First Draft 12/03.

4. Rationale:

1. The significance of electrocardiogram (ECG) abnormalities in the prediction of coronary heart disease (CHD) is not completely established.
2. The prevalence of certain abnormal ECG findings differs by race and gender, independently of traditional risk factors among participants of the ARIC study.
3. The impact of race in predicting CHD from ECG findings is not fully understood. There are only two studies comparing Black and White men in the United States, and there is no comparison available for women.
4. Epidemiologists have argued that Race represents a social concept more than a biological one. Any differences observed will be interpreted conservatively and not necessarily construed to be biologic.

5. Main Hypothesis/Study Questions:

1. Are multiple abnormal ECG patterns associated with incident CHD in the ARIC study population?
2. Do these abnormal ECG findings predict CHD differently in Blacks and Whites of both genders?

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

From the 15,792 study participants, a subset of participants with available baseline ECG tracings and considered to be free of CHD at the beginning of the study will be included. Free from prevalent CHD at baseline is defined as having no history of myocardial infarction (MI), having no ECG evidence of old MI (major Q-wave or minor Q-wave with ST or T changes), and having not had coronary bypass surgery or angioplasty of coronary arteries. Participants taking cardiac medications and those who are not from Caucasian or African-American descent will also be excluded. ECG findings, demographic characteristics, and cardiovascular risk factors will be assessed at baseline. CHD will be assessed for the 13-15 years of follow-up. Predictor variables include the following: Minor and Moderate Q waves (Minnesota Codes 1-2-6, 1-2-8, 1-3-x), QTc interval (defined by Bazett's formula as $QTc = QT / \sqrt{(60/HR)}$), Left Ventricular Hypertrophy with strain (Minnesota Codes 3-1 or 3-3 plus any of the following: 4-3, 4-2, 4-1-2, 4-1-1 or 5-3, 5-2, 5-1), Cornell voltage (defined as R-wave amplitude in aVL + S amplitude in V3), Major Ventricular Conduction Defects (Minnesota Codes 7-1-x, 7-2-x, 7-4), Major ST depression (Minnesota Codes 4-1-1, 4-1-2, 4-2), Minor ST depression (Minnesota Codes 4-3, 4-4), ST elevation (Minnesota Code 9-2), and Major T wave inversion (Minnesota Codes 5-1, 5-2). The impact of the following covariates on CHD will be analyzed: age, gender, race, education level, blood pressure and antihypertensive medications, smoking, cholesterol, diabetes and body mass index. These covariates are probably not confounders, because they may be on the same biological pathway as ECG abnormalities and CHD; however, the "independence" of the ECG findings is of interest. The outcome of interest is incident CHD, defined as a definite or probable myocardial infarct (MI) or definite CHD death. Silent MI is not included among the incident endpoints. Proportions of ECG abnormalities across the racial and gender groups will be described. Baseline characteristics will be compared across the different ECG abnormalities. To determine the quantitatively independent contribution of ECG abnormalities to the prediction of CHD incidence, Cox proportional hazard models will be used, and traditional risk factors, race, gender, and education level will be included in the models.

7.a. Will the data be used for non-CVD analysis in this manuscript?____ Yes __ X __ **No**

b. If Yes, is the author aware that the file ICTDER02 must be used to exclude persons with a value RES_OTH = "CVD Research" for non-DNA analysis, and for DNA analysis RES_DNA = "CVD Research" would be used? **____ Yes ____ No**
(This file ICTDER02 has been distributed to ARIC PIs, and contains the responses to consent updates related to stored sample use for research.)

8.a. Will the DNA data be used in this manuscript? **____ Yes** __ X __ **No**

8.b. If yes, is the author aware that either DNA data distributed by the Coordinating Center must be used, or the file ICTDER02 must be used to exclude those with value RES_DNA = "No use/storage DNA"? **____ Yes ____ No**

9. **The lead author of this manuscript proposal has reviewed the list of existing ARIC Study manuscript proposals and has found no overlap between this proposal and previously approved manuscript proposals either published or still in active status.** ARIC Investigators have access to the publications lists under the Study Members Area of the web site at: http://bios.unc.edu/units/cscc/ARIC/stdy/studymem.html

   _____ Yes _____ X __ No

10. **What are the most related manuscript proposals in ARIC (authors are encouraged to contact lead authors of these proposals for comments on the new proposal or collaboration)?**

170: There is no overlap, as it addresses serial ECG changes, not abnormal findings in an isolated baseline ECG.

206: There is no overlap, as it addresses carotid IMT, not incident CHD.

300: There might be minimal overlap, as it addressed QTc interval and incident CHD based only in the early follow-up. QTc interval is only one of many ECG findings examined in this proposal based on more prolonged follow-up.

341: There is no overlap, as it addresses only T wave amplitude and J-point, but not isolated multiple ECG findings as we are doing in this proposal.

482: There is no overlap, as it addressed JT versus QT interval only, but not isolated multiple ECG findings as we are doing in this proposal.

766: There is no overlap, as it addresses machine coding of T wave axis, which is not examined in this proposal.

773: There is no overlap, as it addresses only QT prolongation index (not examined in this proposal) and has different aims.

839: There is no overlap, as it addresses PVCs and incident CHD, and PVCs are not being included in this proposal.

11. **Manuscript preparation is expected to be completed in one to three years. If a manuscript is not submitted for ARIC review at the end of the 3-years from the date of the approval, the manuscript proposal will expire.**