1. Full Title: Plasma fatty acid composition and risk of coronary heart disease
   Abbreviated title (length 26): Fatty acids and CHD

2. Writing Group (list individual with lead responsibility first):
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3. Timeline:
   Analysis completed summer 1998 (Preliminary analysis in MN, final analysis at CSCC);

4. Rationale:
   The relationship between blood level of LDL and HDL cholesterol and incident coronary
   heart disease has been well documented. In metabolic studies, alterations in dietary lipid
   intake have been shown to modify blood cholesterol levels. Despite these relationships,
   studies of dietary lipid intake assessed by questionnaire and risk of CHD have been
   equivocal. There is speculation that these inconsistent findings are in part the result of the
   considerable measurement error associated with dietary assessment methods.

   Plasma fatty acid composition, to the extent that it reflects dietary lipid intake, may more
   directly address the question of whether lipid intake plays a role in the development of
   CHD.

   In previous studies of the Minnesota-ARIC cohort, the fatty acid composition of plasma
   phospholipids and cholesterol esters was shown to moderately reflect dietary intake, and
   plasma fatty acid composition was associated with established risk factors for CHD such
as LDL and HDL cholesterol and hypertension. It was also shown that carotid intima-media thickness was significantly and positively associated with saturated fatty acid composition, and inversely associated with polyunsaturated fatty acid composition and the P:S ratio. These associations were generally independent of traditional CHD risk factors such as age, smoking, cholesterol, and hypertension. To date, few studies have examined prospectively the association of plasma fatty acid composition and risk of CHD. Recently, data on fatty acid composition in total lipids has become available for a subset (n=8 15) of ARIC participants: incident CHD cases through 1991 and a random sample of the cohort.

This nested case-cohort design offers an opportunity to examine the relationship of plasma fatty acid composition to incident CHD.

5. Main Hypothesis:
Saturated, monounsaturated, and trans-fatty acid composition in plasma total lipids is positively associated with incident CHD. Polyunsaturated fatty acid composition and the P/S ratio are negatively associated with incident CHD. These associations are independent of CHD risk factors such as age, smoking, cholesterol, diabetes, and hypertension. (In addition, exploratory analysis will be conducted on the 24 individual fatty acids that were measured.)

6. Data (variables, time window, source, inclusions/exclusions):
Case-cohort dataset at CSCC. Fatty acid measures on baseline blood samples provided by Uttam Garg and John Eckfeldt.
Independent variables: 1) Saturated Fat, Monounsaturated Fat, Polyunsaturated Fat, trans-fatty acids, P:S ratio
2) 24 individual fatty acids.
Dependent variable: Incident CHD case status through 1991.
Covariates: Visit 1 demographics, lipids, BMI, diabetes, SBP, hypertension, fibrinogen, smoking.
Exclusions: prevalent CHD and/or stroke at baseline, those not fasting at least 8 hours, missing fatty acid measures.