1. Title:
Evaluation of International Classification of Diseases Codes to Identify Hospitalized Heart Attack Patients with Acute Congestive Heart Failure: The Atherosclerosis Risk in Communities Study

2. Writing Group:
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4. Timeline:
Manuscript draft by end of winter of 98/99

5. Rationale:
Congestive heart failure (CHF) is a major complication of acute MI and a growing public health problem. To date, little surveillance of CHF has taken place, in part because of difficulties in identifying CHF patients in a standardized manner. Reliance on clinical diagnosis is an attractive possibility, but needs supporting evidence concerning validity. Several codes are potentially indicative of CHR, including 428 - Heart failure; 402.x1 - Hypertensive Heart Disease with CHR; 404.x1 Hypertensive Heart and Renal Disease, with CHF; 404.x3 - Hypertensive Heart and Renal Disease, with CHF and renal failure; 415.0 Acute Cor Pulmonale; 416.9 - Chronic Pulmonary Heart Disease; 425.4 - Other primary cardiomyopathies; 429.4 - Functional Disturbances following cardiac surgery; 514 - Pulmonary congestion and hypostasis; 518.4 - Acute edema of lung, unspecified; and 786.0 - Dyspnea and respiratory abnormalities.

6. Objective/Hypotheses:
1. What are the test characteristics and performance of the 428 code compared to the following gold standards in ARIC: a) shock or cardiogenic shock (pump failure) - HRAA28a, b) CHF - HRAA28b, c) S3 Gallop - HRAA28c, d) rales (not just basilar) - HRAA28d, e) a and b combined, and f) any of the above

2. What are the test characteristics and performance of the combination of codes listed above compared to the same gold standards in ARIC.

3. What combination of the aforementioned ICD codes performs best in identifying CHF as determined by an ROC approach.

Design: Community Surveillance
Data: Test variables: Discharge diagnoses
Gold Standard Variables: a) shock or cardiogenic shock (pump failure) - HRAA28a, b) CHF - HRAA28b, c) S3 Gallop - HRAA28c, d) rales (not just basilar) - HRAA28d
Covariates: age, gender, ethnicity-community
Dataset: current maximum number of years of data for all surveillance discharges abstracted
Analysis: Calculations of sensitivity, specificity, predictive values, agreement, and extent of over(under)-estimation. Calculation of distance from 100% sensitivity and 100% specificity. The test of best performance will be based on identifying the algorithm that minimizes the aforementioned distance, calculated as the square root of the sum of the squares of (1-sensitivity) and (1-specificity). The third hypothesis will be explored using a random split sample approach. The data will be randomly partitioned into two datasets. The determination of the best algorithm will be based on one half of the data. The repeatability of the performance of the best algorithm will be examined in the second half.