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Atherosclerosis Risk in Communities Study

The Atherosclerosis Risk in Communities Study (ARIC) is an ongoing epidemiologic study sponsored by the National Institutes of Health (NIH). For the past 30 years, findings from ARIC have advanced the medical community's understanding of heart, kidney, and brain health. ARIC data have been used in more than 2,000 medical research articles, many in top journals!

Below are highlights of some recent findings from ARIC. Full citations are provided on the back of this page.

Prediction of cardiovascular events:

- A healthy lifestyle and controlling one's risk factors, as recommended by the American Heart Association, lowers risk of developing coronary heart disease and heart failure.^{1,2}
- More than 80% of coronary heart disease can be accounted for by traditional risk factors such as smoking, low exercise, high blood pressure, or diabetes, both in African Americans and whites.^{3,4}
- Simple computer-based equations were developed that doctors can use to identify patients more likely to develop coronary heart disease,^{5,6} stroke⁷ or atrial fibrillation.⁸

New risk factors for cardiovascular and other diseases:

- New markers of high blood sugar are strongly related to cardiovascular disease risk, and using hemoglobin A1c and fasting glucose together can improve diabetes diagnosis.^{9,10}
- Cardiac troponin is a marker of heart muscle damage, and BNP is a marker of heart muscle stretch. Both were associated with risk of developing cardiovascular disease.¹¹⁻¹⁴

Risk factors for dementia

- Cardiovascular risk factors measured during middle-age are associated with risk of developing dementia in older age.¹⁵
- Higher levels of cardiovascular risk factors are associated with deposition of beta-amyloid in the brain, a marker of Alzheimer's disease.¹⁶

Risk factors for other health outcomes

- ARIC has also worked on identifying risk factors for other diseases, such as: abdominal aortic aneurysm,¹⁷ peripheral artery disease,¹⁸ hypertension,¹⁹ chronic kidney disease,²⁰ silent stroke detected by MRI,²¹ retinopathy,²² echocardiographic findings,²³ venous thrombosis,²⁴ diabetes,²⁵ cancer,²⁶ and weight gain.²⁷

Genetic ties to health and disease

- ARIC was the first to sequence a region in the PCSK9 gene on a large population.²⁸ Based on this finding, a medication was developed to help prevent coronary heart disease.
- Among African Americans, sickle cell trait was associated with increased risk of chronic kidney disease²⁹ and pulmonary embolism risk.³⁰

Clinical practice guidelines

- ARIC data have informed many medical guidelines, which help doctors provide the best possible care for conditions such as hypertension and high cholesterol.

**To learn more about the ARIC study's most important discoveries,
visit our website at aricstudy.org.**

Literature Cited

1. Folsom AR, et al. American Heart Association's Life's Simple 7: Avoiding heart failure and preserving cardiac structure and function. *Am J Med* 2015;128(9):970-6.e2.
2. Folsom AR, et al. Community prevalence of ideal cardiovascular health, by the American Heart Association definition, and relationship with cardiovascular disease incidence. *J Am Coll Cardiol* 2011;57(16):1690-6.
3. Jones DW, et al. Risk factors for coronary heart disease in African Americans: the Atherosclerosis Risk in Communities Study, 1987-1997. *Arch Intern Med* 2002;162(22):2565-71.
4. Hozawa A, et al. Absolute and attributable risks of cardiovascular disease incidence in relation to optimal and borderline risk factors: Comparison of African American with white subjects -- Atherosclerosis Risk in Communities Study. *Arch Intern Med* 2007;167(6):573-9.
5. Chambless LE, et al. Coronary heart disease risk prediction in the Atherosclerosis Risk in Communities (ARIC) study. *J Clin Epidemiol* 2003;56(9):880-90.
6. Folsom AR, et al. Prediction of coronary heart disease in middle-aged adults with diabetes. *Diabetes Care* 2003;26(10):2777-84.
7. Chambless LE, et al. Prediction of ischemic stroke risk in the Atherosclerosis Risk in Communities Study. *Am J Epidemiol* 2004;160(3):259-69.
8. Alonso A, et al. Simple risk model predicts incidence of atrial fibrillation in a racially and geographically diverse population: the CHARGE-AF consortium. *J Am Heart Assoc* 2013;2(2):e000102.
9. Selvin E, et al. Glycated hemoglobin, diabetes, and cardiovascular risk in nondiabetic adults. *N Engl J Med* 2010;362(9):800-11.
10. Selvin E, et al. Prognostic implications of single-sample confirmatory testing for undiagnosed diabetes: A prospective cohort study. *Ann Intern Med* 2018 Jun 19. doi: 10.7326/M18-0091. [Epub ahead of print]
11. Folsom AR, et al. Troponin T, NT-proBNP, and venous thromboembolism: The Longitudinal Investigation of Thromboembolism Etiology (LITE). *Vasc Med* 2014;19(1):33-41.
12. Nambi V, et al. Troponin T and N-terminal pro-B-type natriuretic peptide: A biomarker approach to predict heart failure risk: The Atherosclerosis Risk in Communities Study. *Clin Chem* 2013;59(12):1802-10.
13. Olulaye OW, et al. Troponin T, B-type natriuretic peptide, C-reactive protein, and cause-specific mortality. *Ann Epidemiol* 2013;23(2):66-73.
14. Saunders JT, et al. Cardiac troponin T measured by a highly sensitive assay predicts coronary heart disease, heart failure, and mortality in the Atherosclerosis Risk in Communities Study. *Circulation* 2011;123(13):1367-76.
15. Gottesman RF, et al. Associations between midlife vascular risk factors and 25-year incident dementia in the Atherosclerosis Risk in Communities (ARIC) cohort. *JAMA Neurol* 2017;74(10):1246-1254.
16. Gottesman RF, et al. Association between midlife vascular risk factors and estimated brain amyloid deposition. *JAMA* 2017;317(14):1443-50.
17. Tang W, et al. Lifetime risk and risk factors for abdominal aortic aneurysm in a 24-year prospective study: The ARIC Study (Atherosclerosis Risk in Communities). *Arterioscler Thromb Vasc Biol* 2016;36(12):2468-77.
18. Ogilvie RP, et al. Dietary intake and peripheral arterial disease incidence in middle-aged adults: the Atherosclerosis Risk in Communities (ARIC) Study. *Am J Clin Nutr* 2017;105(3):651-9.
19. Diez Roux AV, et al. Socioeconomic disadvantage and change in blood pressure associated with aging. *Circulation* 2002;106(6):703-10.
20. Rebholz CM, et al. Relationship of the American Heart Association's Impact Goals (Life's Simple 7) with risk of chronic kidney disease: Results from the Atherosclerosis Risk in Communities (ARIC) cohort study. *J Am Heart Assoc* 2016;5(4):e003192.
21. Knuiiman MW, et al. Association of hemostatic variables with MRI-detected cerebral abnormalities: the Atherosclerosis Risk in Communities Study. *Neuroepidemiology* 2001;20(2):96-104.
22. Klein R, et al. The association of atherosclerosis, vascular risk factors, and retinopathy in adults with diabetes : the Atherosclerosis Risk in Communities Study. *Ophthalmology* 2002;109(7):1225-34.
23. Astor BC, et al. Association of kidney function and hemoglobin with left ventricular morphology among African Americans: the Atherosclerosis Risk in Communities (ARIC) study. *Am J Kidney Dis* 2004;43(5):836-45.
24. Bell EJ, et al. Lifetime risk of venous thromboembolism in two cohort studies. *Am J Med* 2016;129(3):339.e19-26.
25. Duncan BB, et al. Low-grade systemic inflammation and the development of type 2 diabetes: The Atherosclerosis Risk in Communities Study. *Diabetes* 2003;52(7):1799-805.
26. Prizment AE, et al. Plasma C-reactive protein, genetic risk score, and risk of common cancers in the Atherosclerosis Risk in Communities study. *Cancer Causes Control* 2013;24(12):2077-87.
27. Juhaeri, et al. Weight change among self-reported dieters and non-dieters in white and African American men and women. *Eur J Epidemiol* 2001;17(10):917-23.
28. Cohen JC, et al. Sequence variations in PCSK9, low LDL, and protection against coronary heart disease. *N Engl J Med* 2006;354(12):1264-72.
29. Naik RP, et al. Association of sickle cell trait with chronic kidney disease and albuminuria in African Americans. *JAMA* 2014;312(20):2115-25.
30. Folsom AR, et al. Prospective study of sickle cell trait and venous thromboembolism incidence. *J Thromb Haemost* 2015;13(1):2-9.



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