

# Family history of cardiovascular disease

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### Clinical question

What risks do different family histories of cardiovascular disease (CVD) carry?

### Bottom line

Family history of CVD modifies future CVD risk depending on the number and age of affected first-degree relatives. Siblings of patients with CVD have about a 40% risk increase, while offspring of parents with premature CVD have a 60% to 75% risk increase. Consistent definitions of premature CVD would allow a better estimate of the true attributable risk.

### Evidence

Where possible, odds ratios (ORs) have been converted to relative risks (RRs).

- A total of 2302 male and female Framingham offspring study participants with parental history of premature CVD (father <55 years, mother <65 years) were analyzed for CVD risk.<sup>1</sup> After 8 years of follow-up, CVD increased 75% with paternal and about 60% with maternal history of premature CVD.
- Using the same cohort for 8 years, CVD increased about 40% in those whose siblings had CVD.<sup>2</sup>
- In identical (or monozygotic) twins, the hazard ratio of death from coronary artery disease (CAD) increased 3.8 to 15 times if an identical sibling died of CAD before age 75.<sup>3</sup>
  - Risk was 3 times higher for identical than for non-identical twins.
  - Risk was greater the earlier the other twin died.
- More than 49000 primarily white men in the United States were analyzed for CAD in their extended families (sibling, aunt or uncle, parent, or grandparent) and the risk of future CVD.<sup>4</sup>
  - After 16 years, a family history of premature CAD (age <50) conferred a 44% increased risk of CVD mortality.
- A large international case-control study<sup>5</sup> found an increased risk of myocardial infarction (MI) if
  - one parent had MI (OR=1.67);
  - one parent had MI before age 50 (OR=2.36);
  - both parents had MI (OR=2.90); and
  - both parents had MI before age 50 (OR=6.56).—Results were similar when adjusted for CVD risk factors across socioeconomic status of household or country, and for maternal or paternal MI history.

### Context

- Current guidelines use different definitions of and adjustments for family history of premature CVD.<sup>6-9</sup>

- Family history of premature CVD can convey an RR increase similar to that of smoking.<sup>10</sup>

### Implementation

Only a few risk calculators (eg, QRISK2, JBS3, Reynolds) include family history of CVD in calculating a patient's risk. Unfortunately, the definition of a family history of CVD is either not explicit or differs among these calculators. Risk from family history depends on the number of first-degree relatives affected and the age CVD developed. A reasonable approach might be to use baseline risk estimation (without family history) from a validated risk calculator (like Framingham) and then adjust the additional family history risk with the ORs and RRs given above. In some cases, family history might increase the estimated CVD risk to a level where statin therapy could be offered. 🌿

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### References

1. Lloyd-Jones DM, Nam BH, D'Agostino RB Sr, Levy D, Murabito JM, Wang TJ, et al. Parental cardiovascular disease as a risk factor for cardiovascular disease in middle-aged adults: a prospective study of parents and offspring. *JAMA* 2004;291(18):2204-11.
2. Murabito JM, Pencina MJ, Nam BH, D'Agostino RB Sr, Wang TJ, Lloyd-Jones D, et al. Sibling cardiovascular disease as a risk factor for cardiovascular disease in middle-aged adults. *JAMA* 2005;294(24):3117-23.
3. Marenberg ME, Risch N, Berkman LF, Floderus B, de Faire U. Genetic susceptibility to death from coronary heart disease in a study of twins. *N Engl J Med* 1994;330(15):1041-6.
4. Bachmann JM, Willis BL, Ayers CR, Khera A, Berry JD. Association between family history and coronary heart disease death across long-term follow-up in men: the Cooper Center Longitudinal Study. *Circulation* 2012;125(25):3092-8. Epub 2012 May 23.
5. Chow CK, Islam S, Bautista L, Rumboldt Z, Yusufali A, Xie C, et al. Parental history and myocardial infarction risk across the world: the INTERHEART study. *J Am Coll Cardiol* 2011;57(5):619-27.
6. Anderson TJ, Grégoire J, Hegele RA, Couture P, Mancini GBJ, McPherson R, et al. 2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. *Can J Cardiol* 2013;29(2):151-67.
7. Goff DC Jr, Lloyd-Jones DM, Bennett G, Coady S, D'Agostino RB, Gibbons R, et al. 2013 ACC/AHA guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation* 2014;129(25 Suppl 2):S49-73. Epub 2013 Nov 12. Erratum in: *Circulation* 2014;129(25 Suppl 2):S74-5.
8. Reiner Z, Catapano AL, De Backer G, Graham I, Taskiran MR, Wiklund O, et al. ESC/EAS guidelines for the management of dyslipidaemias. *Eur Heart J* 2011;32(14):1769-818. Epub 2011 Jun 28.
9. National Institute for Health and Care Excellence. *Lipid modification: cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease. NICE clinical guideline 181*. London, UK: Royal College of General Practitioners; 2014.
10. Hippisley-Cox J, Coupland C, Robson J, Brindle P. Derivation, validation, and evaluation of a new QRISK model to estimate lifetime risk of cardiovascular disease: cohort study using QResearch database. *BMJ* 2010;341:c6624.



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