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## Determining Vascular Risk Factors for Dementia and Dementia Risk Prediction Across Mid- to Later-Life: The Framingham Heart Study

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## Abstract

**Background and Objectives:** The association between vascular risk factors and dementia varies with age making generalisability of dementia risk prediction rules to individuals of different ages challenging. We determined the most important vascular risk factors for inclusion in age-specific dementia risk scores.

**Methods:** Framingham Heart Study Original and Offspring cohort participants with available data on the Framingham Stroke Risk Profile (FSRP) at mid-life(age 55; n=4899, 57% women), late-life(ages 65 or 70), or later-life(ages 75 or 80[n=2386, 62% women]) were followed for 10-year incident dementia risk from ages 65, 70, 75 and 80.

**Results:** Age- and sex-adjusted mid-life risk factors associated with 10-year risk of dementia from age 65 included FSRP (HR 1.16, 95% CI 1.06-1.26, per 1-SD increment in log-transformed score), diabetes mellitus (DM, HR 4.31, 95% CI 1.97-9.43) and systolic blood pressure (SBP, HR 1.12, 95% CI 1.02-1.24, per 10mmHg increment). Late-life risk factors associated with 10-year incident dementia from ages 65 or 70 included FSRP (age 65 only: HR 1.06, 95% CI 1.02-1.10), antihypertensive use (age 65 reported: HR 1.66, 95% CI 1.12-2.46), DM (age 65 reported: HR 1.96, 95% CI 1.09-3.52), atrial fibrillation (age 65 reported: HR 2.30, 95% CI 1.00-5.27), non-stroke cardiovascular disease (nsCVD, age 65 reported: HR 1.95, 95% CI 1.24-3.07) and stroke (age 70 only: HR 3.61, 95% CI 2.21-5.92). Later-life risk factors associated with 10-year incident dementia from ages 75 or 80 included antihypertensive use (age 80 only: HR 0.74, 95% CI 0.62-0.89), DM (age 80 reported: HR 1.40, 95% CI 1.04-1.89), atrial fibrillation (age 80 reported: HR 1.43, 95% CI 1.07-1.92) and stroke (age 80 reported: HR 1.63, 95% CI 1.13-2.35). In stepwise models, SBP and DM at age 55, nsCVD at age 65, DM and stroke at ages 70 and 75, and DM, stroke and use of antihypertensives (protective) at age 80 were the most important vascular risk factors for dementia.

**Discussion:** Our findings support the use of age-specific dementia risk scores which should prioritise including, at age 55, SBP and DM; age 65, nsCVD; ages 70 and 75, DM and stroke; and age 80, DM, stroke and antihypertensive use.

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