**Supplementary Digital Content 6**

**Supplementary Methods**

**Adult muscular fitness measures**

Measurements of muscular strength and power in adulthood were performed using the same protocols as those performed in childhood. Muscular endurance was not measured in adulthood.

Muscular strength was measured from five sites in adulthood; right and left grip, shoulder flexion and extension, and leg strength using isometric dynamometers (Smedley’s Dynamometer, TTM, Tokyo, Japan). The maximum of two attempts for each strength measure was used in the analysis. Right and left grip strength was measured as participants held the dynamometer with one hand, and gripped with maximum force whilst the dynamometer was supported on the opposite shoulder. Shoulder strength (flexion and extension) was measured as participants held the dynamometer in front of their chest with both hands parallel to the ground. For shoulder extension, participants pulled with maximum force, and for shoulder flexion, participants pushed with maximum force aiming to get their hands as far apart (extension) or close together (flexion) as possible. To measure leg strength, participants stood on the leg-back dynamometer base plate with their body flat against a wall behind them. A bar was held with an overhand grip, knees were flexed at an angle of 115°, at which point the bar was attached to the dynamometer by a chain. The bar was then pulled up as far as possible by moving their body upwards, maintain contact with the wall at all times during the effort. These strength measures were combined via principal component analysis. This combined adult strength measure was estimated via the first principal component of the five adult muscular strength measurements(4).

Muscular power was measured in adulthood as the distance in centimetres of a standing long jump. This test was repeated twice and required a two-footed take off. The attempt with the best resulting distance was used in the analysis.

Each adult muscular fitness phenotype (strength and power), was adjusted for total body weight (by regressing body weight on each phenotype and using the residuals) and standardised for age and sex. This was performed to create adult muscular fitness measures uncorrelated with body weight(4).

**Childhood measures of metabolic syndrome**

At baseline, a 15ml blood sample was collected from children aged 9, 12 and 15 years who had observed a 12-hour fast. From this blood sample, plasma triglycerides were determined according to the Lipids Research Clinic Program(1). HDL-C was analysed following precipitation of apolipoprotein-B containing lipoproteins with heparin-manganese(3).

Childhood resting blood pressure readings were recorded from the left brachial artery after participants had been seated quietly for 10 minutes using a mercury sphygmomanometer. Appropriately sized arm cuffs were selected. Korotkoff sounds I and IV were used to denote systolic and diastolic blood pressures respectively. This procedure was repeated twice, with the mean of the two measures taken.

**Childhood smoking status**

Childhood smoking status was ascertained from self-report in isolation from parents and teachers. Those who indicated “I don’t smoke” were classified as non-smokers and those who indicated any of the remaining responses (just started, 1-6 months, 7-12 months, 1-2 years, 2-4 years, >4 years) were defined as smokers.

**Childhood socioeconomic position**

Socioeconomic position at baseline was derived from residential postcode, using the Australian Bureau of Statistics Socio-economic Index for Areas (SEIFA) and 1981 census data; further details are described elsewhere(2). These postcodes were classified into four categories (low, medium-low, medium-high and high). In this study, the two medium categories have been combined and childhood SES is classified as either low, medium or high.

**References:**

1. Lipid Research Clinics Program. Manual of Laboratory Operations: Lipid and Lipoprotein Analysis. In. Bethesda, MD: US Dept of Health, Education and Welfare publication NIH; 1974, pp. 75-628.

2. Jose KA, Blizzard L, Dwyer T, McKercher C, Venn AJ. Childhood and adolescent predictors of leisure time physical activity during the transition from adolescence to adulthood: a population based cohort study. *Int J Behav Nutr Phys Act*. 2011;8:54.

3. Magnussen CG, Venn A, Thomson R et al. The association of pediatric low- and high-density lipoprotein cholesterol dyslipidemia classifications and change in dyslipidemia status with carotid intima-media thickness in adulthood evidence from the cardiovascular risk in Young Finns study, the Bogalusa Heart study, and the CDAH (Childhood Determinants of Adult Health) study. *J Am Coll Cardiol*. 2009;53(10):860-9.

4. Quan HL, Blizzard CL, Sharman JE et al. Resting heart rate and the association of physical fitness with carotid artery stiffness. *Am J Hypertens*. 2014;27(1):65-71.