



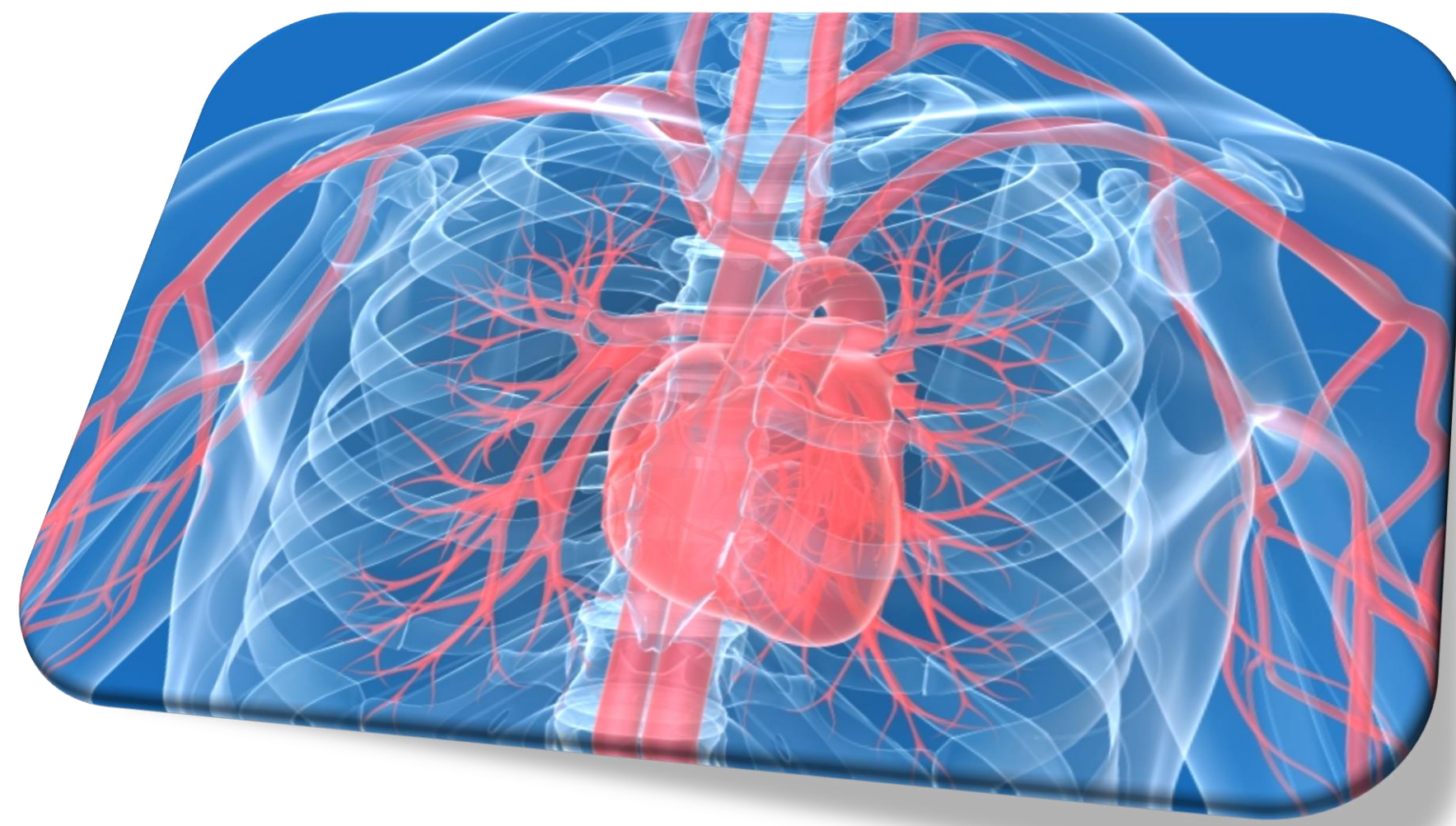
# The psychological impact of cardiovascular genotyping on traditional cardiovascular risk assessment: a feasibility study

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## Background

Universal vascular checks are being rolled out through primary care across England.



This will lead to large proportions of the population, aged 40 to 75, being advised if they are at average or above population-average risk of cardiovascular disease (CVD) based on standard epidemiological risk assessment tools, such as those based on Framingham and QRisk2 algorithms.

At the same time, the population is being enticed to purchase direct-to-consumer genetic cardiovascular risk assessment tests. This inevitably will lead to some individuals being assessed at higher risk on genetic tests than by traditional epidemiological tools and vice versa.

## Objectives

1. Compare the proportion of participants at average and above population-average cardiovascular risk using standard cardiovascular risk assessment and genetic-based assessment.
2. Explores potential anxiety associated with above-average genetic test result.

## Methods

- Before and after observational study with 10 general practices in Nottingham.
- 320 patients, who had completed standard cardiovascular risk assessment in the previous 18 months, were offered cardiovascular genetic testing.
- Eligible patients were aged 35 to 65.
- Four weeks after collecting saliva genetic sample, participants received genetic test results.
- Follow-up outcome questionnaire was distributed to participants at 8 months.
- Anxiety was assessed using Spielberger's State-Trait Anxiety Inventory (STAI).

## Results

### Recruitment rate and profile:

- Eight months follow-up completed by 119 participants (37%).
- 58% were male
- 30% had A-level or higher qualification

### Risk categorisation

- Of the 79 participants categorised at above-average cardiovascular risk on standard CVD risk assessment, 65 (82.3%) were reported as average risk on genetic testing.
- Of the 23 participants categorised at above-average risk on genetic testing, nine (39%) were average risk on standard cardiovascular risk assessment.

### Anxiety levels:

- Increased CVD risk on the genetic test results were not associated with increased anxiety on multivariate analysis, adjusted for baseline scores, age, gender, standard cardiovascular risk score and educational status (adjusted  $\beta$  3.1, 95% CI -2.1 to 8.2).
- Changes in anxiety levels, from baseline to 8 months after genetic testing, are indicated in Table. Adjusted results show no significant change in any of the specified subgroups.

Impact of standard CVD risk assessment and genotype test results on anxiety

Standard CVD Risk assessment***	Genetic test-based Risk assessment**	Change in STAI Score (SE)	Adjusted $\beta$ coefficient (95% CI)*, n=87
Average Risk	Average Risk	4.60 (2.27)	Reference
Above-average Risk	Above-average Risk	6.00 (2.89)	5.46 (-3.09 to 14.00)
Above-average Risk	Average Risk	3.89 (2.18)	-0.88 (-9.70 to 7.94)
Average Risk	Above-average Risk	0.65 (1.49)	-2.83 (-6.88 to 6.32)

\* Adjusted for outcome at baseline, age, gender and education.

\*\* Genetic-test based CVD Risk calculated based on number of CVD genotypes detected: over 6 genotypes categorised as above-average risk.

\*\*\* Standard CVD Risk calculated at greater than 10% over next 10 years categorised at above-average risk, whilst those at less than 10% categorised at average risk.

## Conclusions

A significant proportion of individuals at above-average risk on traditional cardiovascular risk assessment were at average risk on genetic test results. Although an increased risk on genetic testing did not lead to anxiety over the medium term, lower genetic risk assessment may impact on an individual's risk-reducing behaviour. This would benefit from exploration using a larger intervention study.

