



ALL YOUR HEALTH & HEART  
SOLUTIONS UNDER ONE ROOF

# VALIDATION OF **A GENOME**



HOW CAN I OFFER THIS  
TEST TO MY PATIENTS?

Get in touch with us at:  
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Our representative will get in touch with you within 24 hours to help you with the registration. You can start prescribing the test right away and help your patients gain clarity about their genetic health.

# CORONARY ARTERY DISEASE

Coronary Artery Disease (CAD) is a heart condition that affects the blood vessels that supply oxygenated blood to the heart, the coronary artery, and its branches. These arteries are blocked due to deposition of plaque preventing oxygenated blood supply to the heart. A partial or complete block leads to an Acute Coronary Syndrome (ACS) .e.g heart attack/angina /MI, all which can be fatal.

## PREVALENCE IN INDIA

- There has been a recent, exponential rise in the number of CAD cases and earlier onset of the disease (years of age) in India.
- 54.4 million people are affected by Cardiovascular disease in India
- The risk of CAD in Indians is nearly 3-4times higher than Caucasians
- Risks in the Indian populations is 11% FOR non-diabetic patients and 21.4% for diabetic patients

CAD is a complex disorder caused by inherited genetic risk, environmental factors and lifestyle. Strong family history, distinctive disease patterns, higher prevalence of comorbidities, such as diabetes and hypertension, at a much younger age have been some of the noteworthy features of CAD in the Indian population.

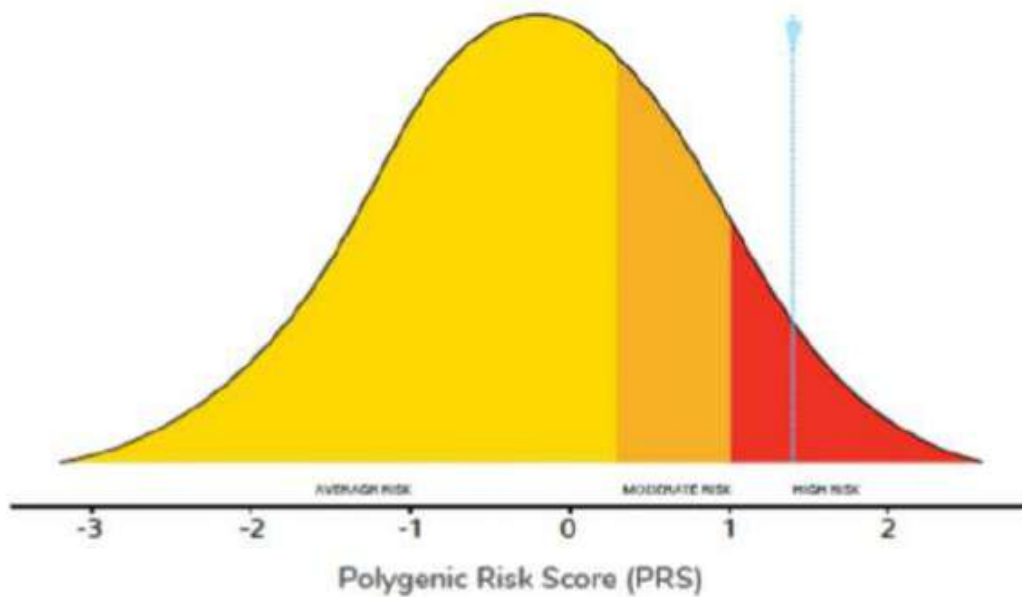
Young onset CAD, which affects people who are less than 45 years of age, is getting more and more common. Especially in South Asians. Recent studies show about 1.2% of CAD cases are young onset, whereas in South Asians/Indians 5% to 10% of CAD cases are young onset. Together it is conducted that Indians are more vulnerable to have CAD in young age group.

**GIVEN THE HIGH DISEASE BURDEN AND INCREASED RISK OF CAD IN THE INDIA POPULATION, EFFECTIVE STRATEGIES ARE NEEDED TO PREDICT THE RISK OF CAD IN PATIENT MUCH BEFORE SYMPTOMS OCCUR.**



# What is the **MedGenome Polygenic Risk Score Test**?

- It is a screening test that helps estimate the genetic predisposition of an individual to develop Coronary Artery Disease.
- The risk is calculated from >6 million<sup>3</sup> genetic markers implicated in the disease and is given as a validated Polygenic Risk Score (PRS) .
- The score indicates if the individual is at high and moderate genetic risk.
- MedGenome's test is validated for the South Asian population<sup>4</sup>.



## What is **Polygenic Risk Score**?

Genetic research over the past decade has realized that our risk for many common conditions such as heart disease and diabetes are not influenced by just one gene, or even a handful of them. Instead, multiple genes work in tandem to influence our risk for diseases.

Many small-effect genetic variations contribute to a person's susceptibility to CAD. Polygenic Risk Score prediction quantifies the contributing effects into a score and estimates whether the tested individual is at a high and moderate risk of CAD.

## How accurate is the test in **Predicting CAD**?

- In South Asians/Indians young onset CAD is seen in 5% to 10% of the population compared to global average of 1.2%
- CAD PRS is highly sensitive to picking up young onset CAD with ~90% positive predictive value.<sup>4</sup> This means 90% of times the test was able to predict high risk for individuals who had a coronary event before 45 years of age.
- CAD PRS has a 29% sensitivity rate for young onset CAD.<sup>4</sup>

# Who should take the **CAD-PRS** test?

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- MedGenome's test is validated for the South Asian population<sup>4</sup>.

## Why should you take this **test compared to existing test options?**

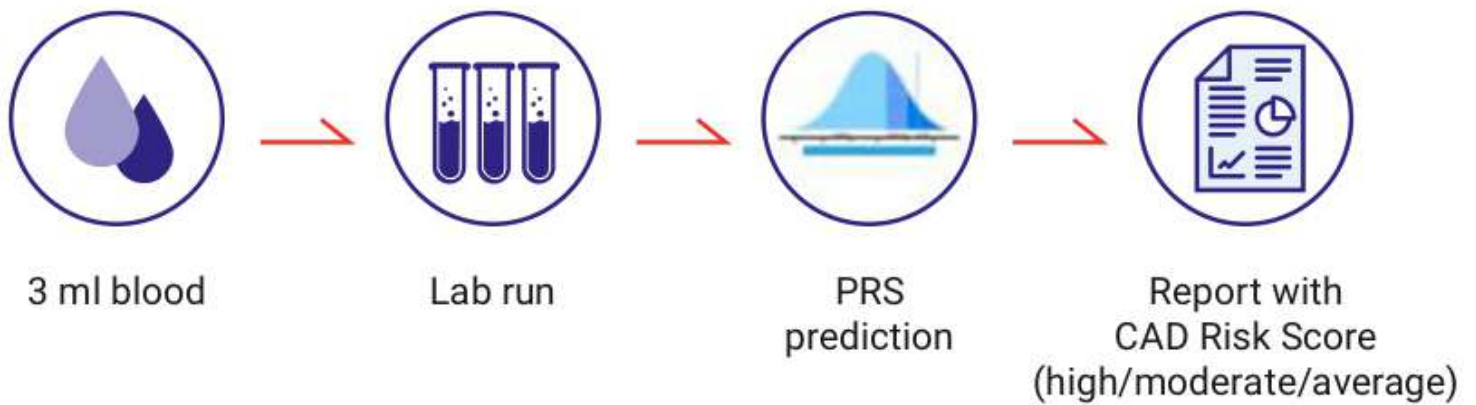
Existing risk predictions are based on modifiable factors like a person's health conditions, blood profiles and self-reported family history. The variability in this information contributes to the ambiguity of the risk prediction

CAD PRS is an independent genetic predictor and is free from ambiguities. The test is based on a person's genetic makeup and predicts their risk profile.

Knowing a person's risk can help in timely life style changes, health monitoring and disease management.



## What is the **test process**?



Abstract: genomewide polygenic scores(gps) integrate information from many common dna variants into a single number. Because rates of coronary artery disease(CAD) are substantially higher among South Asians, a GPS to identify high risk individuals may be particularly useful in this population.

Cad Risk Profile	What it means?	Action
High	You are at a higher genetic risk (3 times) of getting CAD than a average risk counterpart.	Take a comprehensive heart check up and consult your doctor for an invasive procedure
Moderate	You are at a moderate genetic risk (~1.5 times) towards CAD than a average risk counterpart	Avoid all lifestyle risks such as smoking, stress, etc. Maintain normal blood pressure and blood sugar levels with regular monitoring. Medication, such as blood thinners can be considered.
Average	You are at a not high genetic risk towards coronary events.	Maintain a healthy lifestyle and get routine health checkups.

# GENETIC RISK PROFILING THROUGH POLYGENIC RISK SCORE TEST

**Abstract:** genomewide polygenic scores(gps) integrate information from many common dna variants into a single number. Because rates of coronary artery disease(CAD) are substantially higher among **South Asians, a GPS** to identify high risk individuals may be particularly useful in this population.

## OBJECTIVES:

This analysis used summary statistics from a prior genome-wide association study to derive a new gps cad for south Asians.

## METHODS:

This gpscad was validated in 7244 south asianuk biobank participants and tested in 491 individuals from a case-control study in Bangladesh. Next, a static ancestry and gps cad reference distribution was built using whole – genome sequencing from 1522 indian individuals, and a framework was tested for projecting individuals onto this static ancestry and gpd cad reference distribution using 1800 cad cases and 1,163 control subjects newly recruited in india. Thegpscad containing 6630150 common dna variants , had an odds

ratio(or) per sd of 1.58 in south asianuk biobank participants and 1.60 in the Bangladeshi study ( $p < 0.001$  for each ). Next, individuals of the Indian case –control study were projected onto static reference distributions, observing an or/sd of 1.66( $p < 0.0001$ ). compared with the middle quintile, risk for cad was most pronounced for those in the top 5% of the gps cad distribution-ors f 4.16, 2.46 7 3.22 in the south asianuk biobank, Bangladeshi, and Indian studies, respectively ( $p < 0.05$  for each).

## CONCLUSIONS:

The new gpscad has been developed and tested using 3 distinct south asian studies, and provides a generalizable framework for ancestry-specific gpsassessment. (j am collcardiol 2020;76:703-14)c 2020 by the american college of cardiology foundation.

## COMPETENCY IN MEDICAL KNOWLEDGE:

A genome –wide polygenic score to identify patients at risk of coronary artery disease integrates information from common dna variants into a single measure of inherited risk that is available from birth .because these vary with race and ethnicity, adjustment based on data from ancestry matched individuals is needed to improve predictive accuracy.

## TRANSLATIONAL OUTLOOK:

Additional research is needed to improve the transferability of genome wide polygenic scores across various racial and ethnic groups , and facilities their integration into clinical practice.

# WHAT DOES ONE DO AFTER **RECEIVING THE CAD SCORE?**



Modification  
of life style



Diet planning



Exercise planning



Stop smoking and  
alcohol if consuming



Lipids to be kept  
under control.

**YOU WILL GET DIETICIAN & PHYSIOTHERAPY CONSULT.**

