GENOME.ONE®

GENOME.ONE CARDIAC TEST

Genome.One offers a portfolio of genomic sequencing based panel tests for patients with suspected genetic cardiac conditions. The portfolio includes both disease-specific panels and broader category panels for cardiomyopathies, arrhythmias, aortopathies and RASopathies.

Disease-specific panels are designed to be flexible, offering analysis of either the complete panel or the core set of most commonly implicated genes.

All Genome.One cardiac panels can be based on either whole genome sequencing (WGS) or whole exome sequencing (WES), and use a targeted analysis approach.

Genome.One cardiac panels	NUMBER OF GENES	
	CORE PANEL	COMPLETE PANEL
All cardiomyopathies		**91**
Dilated cardiomyopathy	29	48
Hypertrophic cardiomyopathy	14	54
Arrhythmogenic right ventricular cardiomyopathy	4	9
Left ventricular noncompaction	9	10
All arrhythmias		**43**
Long QT syndrome	10	15
Short QT syndrome		4
Catecholaminergic polymorphic ventricular tachycardia		4
Atrial fibrillation	8	10
Brugada syndrome	1	25
Aortopathies		**20**
RASopathies		**15**
Congenital heart disease		**27**
Familial hypercholesterolaemia		**4**

The requesting clinician is responsible for selecting the panel to be tested.

Test specifications

Clinical accreditation	Accredited by NATA for Medical Testing to ISO 15189 requirements
Turnaround time	8 – 12 weeks
Cost	Contact Genome.One for a quote
Sample requirements	Whole blood 5mL adults, 2mL paediatrics or DNA (100 µL at 10 – 100 ng/µL for WGS, or 10 - 80 ng/µL for WES)
Sequencing technology	Whole genome sequencing or whole exome sequencing
Variants reported	SNVs, indels and CNVs* classified as pathogenic (ACMG class 5), likely pathogenic (ACMG class 4) and variants of uncertain significance (ACMG class 3). *CNVs only reported for whole genome sequencing
Analytical sensitivity	Whole genome sequencing: SNVs >99% Indels 1-19 bp >95% CNVs 49-500 bp >84% CNVs >500 bp >98% Whole exome sequencing: SNVs >98.5% Indels 1-19 bp >89%
Average coverage	>30x for whole genome sequencing >75x for whole exome sequencing
Confirmatory testing	Sanger or MLPA confirmation performed for all reported variants
Reflex testing	If a pathogenic variant (Class 4/5) is not found in the panel, Genome.One offers the option to expand testing to all genes. Contact us for more information, including costs
Predictive genetic testing in relatives	Contact Genome.One for further information
Genetic counselling	Recommended for patients before and after genetic testing. Genome.One offers specialist genetic counselling services at no additional cost
Secondary analysis	Secondary analyses available for pharmacogenomics and ACMG59 genes at extra cost, $400 each. Contact Genome.One for further information

Indications for genetic testing

Genetic testing using Genome.One cardiac panels is recommended in patients:

- With a clinical or suspected diagnosis of a genetic cardiac condition, with or without a family history
- Where no prior genetic testing has been performed
- When a genetic diagnosis of a genetic cardiac condition has not yet been made in an accredited laboratory

How to arrange a test

Discuss the testing options with the patient and complete the patient consent form. Alternatively, contact us to arrange a pre-test consultation and consent with a Genome.One genetic counsellor. Contact details can be found on the back of this sheet.

Determine whether the costs of the test will be covered by your institution or privately paid for by the patient. Private patients will be sent an invoice by Genome.One for payment.

Complete either our online or paper test request form.

Give a copy of the completed request form to the patient for a whole blood sample collection (5 mL for adults, 2 mL for paediatrics).

You will receive a report detailing the results 8-12 weeks after the specimen reaches Genome.One.

Benefits of genetic testing for cardiac conditions

- The potential for earlier, more accurate diagnosis
- Identification of an existing genetic cause to support a suspected diagnosis
- More informed management and treatment options
- Predictive testing or pre-symptomatic screening for at-risk relatives, with ongoing management for people who are affected or at-risk
- Guidance for family planning (Genome.One does not offer preimplantation genetic testing

What Genome.One offers

- Whole genome sequencing and whole exome sequencing-based panel tests with gene lists regularly maintained based on current evidence
- The ability to start with the most commonly implicated genes (core panel) and expand to a larger extended panel if no variants are found
- Expert pathology and genetic counselling support, with in-house genetic counselling services available to patients both before and after testing, at no additional cost
- Optional reanalysis of data in the future to answer clinical questions that may arise*
- Streamlined ordering process through **www.genome.one**

*additional fees may apply

Genetic counselling for cardiac conditions

The Human Genetics Society of Australasia recommends genetic counselling for all patients considering or undergoing genetic testing for cardiac conditions.

Genetic counselling aims to provide individuals and their families with information and support when there is a suspected genetic condition in the family. Genetic counselling is usually performed pre- and post-genetic testing to help patients understand the implications of genetic information for themselves and their family.

Genome.One offers genetic counselling to individuals undergoing genetic testing with our laboratory at no additional cost. You can refer your patient to our genetic counselling services using the contact details on the back.

Alternatively, a list of Australian genetic counselling services can be found on the Centre for Genetics Education website at:
www.genetics.edu.au/genetics-services/genetic-counselling-services

Insurance information

Under current Australian law, a person's private health insurance will not be affected by their decision to have genetic testing, or by the result of genetic testing. However, genetic testing can have implications for a person's ability to obtain risk-rated insurance policies, including life insurance, disability insurance and income protection insurance. This could include denial of cover, exclusion from cover or increased premiums.

Patients outside of Australia should obtain advice about the implications of genetic

Genome.One cardiac panels

Dilated cardiomyopathy

Complete

Core
ACTC1, BAG3, CRYAB, CSRP3, DES, DMD, DSG2, DSP, FLNC, HFE, ILK, LAMA4, LAMP2, LDB3, LMNA, MYBPC3, MYH7, NEXN, NKX2-5, PLN, RBM20, SCN5A, TAZ, TNNC1, TNNI3, TNNT2, TPM1, TTN, VCL

Extended
ACTN2, ALMS1, ANKRD1, DNAJC19, DOLK, EMD, EYA4, FKTN, GATAD1, JUP, MYH6, MYPN, OBSCN, SDHA, SGCB, SGCD, SYNE1, SYNE2, TCAP

Hypertrophic cardiomyopathy

Complete

Core
ACTC1, ACTN2, CSRP3, GLA, LAMP2, MYBPC3, MYH7, MYL2, MYL3, PLN, PRKAG2, TNNI3, TNNT2, TPM1

Extended
ACADVL, ACTA1, ATP5E, BRAF, CACNA1C, CALR3, CAV3, CBL, CRYAB, FHL1, FLNC, FXN, GAA, HRAS, JPH2, KRAS, LDB3, LMNA, MAP2K1, MAP2K2, MYH6, MYLK2, MYOZ2, MYPN, NEXN, NF1, NRAS, PTPN11, RAF1, RASA1, RIT1, SHOC2, SLC25A4, SOS1, SPRED1, TCAP, TNNC1, TSFM, TTR, VCL

Arrhythmogenic right ventricular cardiomyopathy

Complete

Core
DSC2, DSG2, DSP, PKP2

Extended
CTNNA3, JUP, RYR2, TGFB3, TMEM43

Left ventricular noncompaction

Complete

Core
ACTC1, DTNA, LDB3, MYBPC3, MYH7, PRDM16, TAZ, TNNT2, TPM1

Extended
MIB1

All cardiomyopathies

Complete

ALL GENES AS ABOVE

Long QT syndrome

Complete

Core
ANK2, CACNA1C, CALM1, CALM2, KCNE1, KCNE2, KCNH2, KCNJ2, KCNQ1, SCN5A

Extended
AKAP9, CAV3, KCNJ5, SCN4B, SNTA1

Short QT syndrome

Complete

CACNA2D1, KCNH2, KCNJ2, KCNQ1

Catecholaminergic polymorphic ventricular tachycardia

Complete

CALM1, CASQ2, RYR2, TRDN

Atrial fibrillation

Complete

Core
EMD, GJA5, KCNA5, NPPA, NUP155, SCN3B, SCN4B, SCN5A

Extended
SCN1B, SCN2B

Brugada syndrome

Complete

Core
SCN5A

Extended
ABCC9, AKAP9, ANK2, CACNA1C, CACNA2D1, CACNB2, FGF12, GPD1L, HCN4, KCND2, KCND3, KCNE1L, KCNE3, KCNH2, KCNJ8, PKP2, RANGRF, SCN10A, SCN1B, SCN2B, SCN3B, SEMA3A, SLMAP, TRPM4

All arrhythmias

Complete

ALL GENES AS ABOVE

Aortopathies

Complete

ACTA2, COL3A1, COL5A1, COL5A2, EFEMP2, FBN1, FBN2, FLNA, MFAP5, MYH11, MYLK, PLOD1, PLOD3, PRKG1, SLC2A10, SMAD3, TGFB2, TGFB3, TGFBR1, TGFBR2

RASopathies

Complete

BRAF, CBL, HRAS, KRAS, MAP2K1, MAP2K2, NF1, NRAS, PTPN11, RAF1, RASA1, RIT1, SHOC2, SOS1, SPRED1

Congenital heart disease

Complete

ACTC1, CFC1, CITED2, CRELD1, ELN, FOXH1, GATA4, GATA6, GJA1, GJA5, HAND1, JAG1, MYH11, MYH6, MYH7, NKX2-5, NKX2-6, NODAL, NOTCH1, TBX1, TBX20, TBX3, TBX5, TFAP2B, VEGFA, ZFPM2, ZIC3

Familial hypercholesterolaemia

Complete

APOB, LDLR, LDLRAP1, PCSK9

Please visit **www.genome.one** for any updates to the gene compositions of our cardiac panels.

Privacy

Blood or saliva samples are held securely in the Genome.One laboratory in accordance with applicable law and standard laboratory practice.

Patient personal information will be securely stored in paper-based and electronic records in the Genome.One laboratory in accordance with the Genome.One privacy policy and applicable law. Genomic data is held on servers in the United States of America for the purposes of storage and highly specialised data processing and analysis. However, before any genomic data is transmitted to the USA, information identifying the patient is removed and replaced with a secure code. Only staff at Genome.One have the ability to link the code with the patient's personal information.

Information from WGS screening will not be shared with other people without the patient's permission, except where this is required or permitted by law. Information from WGS is important for medical research about the genetic causes of disease. When providing consent, the patient has a choice whether their deidentified genomic information can also be shared with researchers or included in research data banks.

The full Genome.One privacy policy is available at
www.genome.one/privacy-policy

Contact us for an example report or for any further information about the cardiac testing process.

Contact details

Genome.One

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E **clinical@genome.one**

Genome.One mission statement

Genome.One is a pioneering health information company providing genetic answers to health questions, enhancing the lives of patients, families and communities across the world.

As a wholly-owned subsidiary of the Garvan Institute of Medical Research, we're backed by pioneering clinical discovery and translational medicine research excellence. Our laboratory is accredited by NATA for Medical Testing and meets ISO 15189 requirements.

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