

CardioGeneScan Using Genetic Testing to Diagnose Familial Arrhythmia

Indications:

- Clinical diagnosis of Arrhythmia
- Family history of Arrhythmia
- Family history of sudden cardiac death, especially in individuals under age 45

Benefits:

Genetic testing for Familial Arrhythmia can:

- Confirm a clinical diagnosis of Arrhythmia.
- Differentiate between different forms of Arrhythmia.
- Identify family members of an index patient who harbor the familial mutation and should undergo extensive cardiac screening at regular intervals.
- Identify family members of an index patient who do not harbor the familial mutation and do not need to undergo extensive cardiac screening at regular intervals.
- Facilitate accurate genetic counseling for family members.
- In some cases, predict the type/severity of manifestations based on the exact mutation found.

Background:

- Cardiac arrhythmias are generally characterized by abnormal electrical activity in the heart, putting patients at high risk of embolic stroke and/or sudden cardiac death.^{1,2,3}
- Prevention of stroke and SCD may be achieved through treatments including administration of anti-arrhythmic and/or anti-coagulation drugs, implantable cardioverter defibrillator (ICD) therapy, and certain lifestyle changes.^{1,3}
- Familial forms of arrhythmia account for 30-60% of all cases.⁴⁻⁸ The five most common arrhythmic disorders are Atrial Fibrillation (AF), Long QT Syndrome (LQTS), Catecholaminergic Polymorphic Ventricular Tachycardia (CPVT), Arrhythmogenic Right Ventricular Dysplasia/Cardiomyopathy (ARVD/C), and Brugada Syndrome (BrS).^{2,3,9}
- Genetic testing can identify familial forms of arrhythmia and allow timely diagnosis in family members.^{2,3,9}
- Genetic causes of arrhythmias tested for in this Arrhythmia DNA sequencing evaluation account for up to 75% of familial arrhythmia cases.⁵⁻¹⁵

For References and Ordering Information: please see other side



Ordering Information for Familial Arrhythmia Testing

Indications for Testing

- Clinical diagnosis of Arrhythmia
- Family history of Arrhythmia
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Ordering Information

Test Code 190760

Test Methodology

- Protein coding regions are selectively enriched by hybridization to specific nucleic-acid probes or by PCR and sequenced using next-generation sequencing technology. All variants known or predicted to be pathogenic are confirmed by uni-directional Sanger sequencing.

Sample Requirements

- For blood samples:
 - 2 mL whole blood in EDTA tube (lavender top)
 - Samples can be stored briefly at 4°C, but should be shipped on day of collection
- For DNA samples:
 - Minimum requirement of 15 µg DNA, preferably in 10 mM TE (if different, please specify)
 - DNA concentration should be clearly indicated
- All sample types should be shipped overnight at room temperature
- For all sample types, a minimum of 2 sample identifiers are required on every sample sent to Correlagen
- To request a sample shipping kit, please call 1-617-851-5798

References

1. Zipes DP, et al. (2006) ACC/AHA/ESC 2006 Guidelines for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death. *Circulation* 114:e385-484.
2. Tzou WS, and Gerstenfeld EP (2009) Genetic testing in the management of inherited arrhythmia syndromes. *Curr Cardiol Rep* 11:343-351.
3. Fuster V, et al. (2006) A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Revise the 2001 Guidelines for the Management of Patients With Atrial Fibrillation) *JACC* 48: e149-246.
4. Tester DJ, Will ML, Haglund CM, and Ackerman MJ (2006) Effect of clinical phenotype on yield of long QT syndrome genetic testing. *J Am Coll Cardiol* 47:764-768.
5. Napolitano C, and Priori S (2009) Catecholaminergic Polymorphic Ventricular Tachycardia. In *GeneReviews*: NCBI:<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=gene&part=cvt>
6. Hamid MS, Norman M, Quraishi A, Firoozi S, Thaman R, Gimeno JR, Sachdev B, Rowland E, Elliott PM, and McKenna WJ (2002) Prospective evaluation of relatives for familial arrhythmogenic right ventricular cardiomyopathy/dysplasia reveals a need to broaden diagnostic criteria. *J Am Coll Cardiol* 40:1445-1450.
7. Darbar D, Herron KJ, Ballew JD, Jahangir A, Gersh BJ, Shen WK, Hammill SC, Packer DL, and Olson TM (2003) Familial atrial fibrillation is a genetically heterogeneous disorder. *J Am Coll Cardiol* 41:2185-2192.
8. Fox CS, Parise H, D'Agostino RB, Sr., Lloyd-Jones DM, Vasan RS, Wang TJ, Levy D, Wolf PA, and Benjamin EJ (2004) Parental atrial fibrillation as a risk factor for atrial fibrillation in offspring. *Jama* 291:2851-2855.
9. Perez MV, Wheeler M, Ho M, Pavlovic A, Wang P, Ashley EA (2008) Genetics of arrhythmia: disease pathways beyond ion channels. *J. of Cardiovasc. Trans. Res.* 1: 155-65.
10. Vincent G (2009) Romano-Ward Syndrome. In *GeneReviews*: NCBI:<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=gene&part=rws>
11. McNally E, McLeod H, and Dellafave L (2009) Arrhythmogenic Right Ventricular Dysplasia/Cardiomyopathy, Autosomal Dominant. In *GeneReviews*: NCBI:<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=gene&part=arvd>
12. Brugada R, Brugada P, Brugada J, and Hong K (2009) Brugada Syndrome. In *GeneReviews*: NIH:<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=gene&part=brugada>
13. Splawski I, Timothy K, Priori S, Napolitano C, and Bloise R (2009) Timothy Syndrome. In *Gene Reviews*:<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=gene&part=timothy>
14. Daley S, Tranebjærg L, Samson R, and Green G (2007) Jervell and Lange-Nielsen Syndrome. In *GeneReviews*: NCBI:<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=gene&part=jljln>
15. Tawil R, and Venance S (2007) Andersen-Tawil Syndrome. In *GeneReviews*: NCBI:<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=gene&part=acpp>

For more information, please contact Correlagen Diagnostics, Inc., at 1-617-577-0152 or visit us on the web at www.correlagen.com.