

04 SERVICE FLOW

STEP 1

A specimen of 3ml EDTA anticoagulant blood or saliva is collected*



STEP 2

The specimen will be delivered directly to our testing centre for genetic testing



STEP 3

Your health report will be completed in 22 working days



STEP 4

If a disease-causing mutation is found, your family members can undergo genetic testing at a special rate to confirm whether they carry the same mutation^

* Please check with your doctor or our service provider for sampling arrangements

^ Please refer to the terms and conditions on page 3

05 ABOUT US

GemVCare - committed to helping the public prevent chronic diseases and improving the health of patients.

With professional genetic testing technology for chronic diseases, medical professionals can customize precise treatments and management models according to your personal genetic profile and health conditions so that you can live your best life.

OUR PARTNERS

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General Disclaimer:

Gemomic® Technology is a patented technology adopted by GemVCare® Ltd. (GemVCare) to assess the risks of diabetes & chronic diseases and its complications.

As the causes of metabolic diseases and its complications are complex, all related tests require professional interpretation. The Gemomic® Technology and any other GemVCare services mentioned in this document (collectively 'services') shall be used for reference purpose only. The service is not medical advice, diagnosis, therapeutic or prophylactic in general or for any particular individual case or patient and should not be treated as a substitute for professional medical diagnosis, advice, therapeutic or prophylactic. Users are reminded to seek professional advice and shall rely or make decisions based on the Service at their own risk.

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GemVCare
Your Genes • Your Gem • Your Health

FH9

FAMILIAL HYPERCHOLESTEROLEMIA TEST

Are all high cholesterol the same condition?



01 EFFECTS OF FAMILIAL HYPERCHOLESTEROLEMIA (FH)

- ✦ **20 times** more likely to have **sudden heart attacks** and develop **coronary arterial disease 20 years earlier** ^{1, 2}
- ✦ Your children have a **50% chance** of inheriting the same condition
- ✦ **1 in 200 people** has FH ²



At present, the **traditional diagnosis of FH** is based on testing blood lipid levels, observing physical symptoms and checking the family history. However, this method **may not be accurate**, and can lead to **misdiagnosis**. **80%** of affected individuals only learn that they have FH after experiencing a serious cardiac event. ¹

02 GENETIC TESTING CAN DETERMINE WHETHER YOU HAVE FH

Please pay attention if you meet the following criteria:

<p>Children with persistent LDL-C levels ≥ 4.1mmol/L</p>	<p>Adults with persistent LDL-C levels ≥ 4.9mmol/L</p>	<p>Family history of high cholesterol or premature coronary arterial disease</p>
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Early detection and treatment can reduce cholesterol and risk of cardiovascular disease. The new generation **inclisiran** small interfering RNA (Si-RNA) drug **can reduce LDL-C levels by ~50%**², and the **PCSK9** (Proprotein convertase subtilisin/kexin type 9) **inhibitor can reduce cardiovascular disease by up to 60%** compared with traditional drugs. ³

Sources:

1. Brumit, M. L. (2013, January 21). Familial Hypercholesterolemia Often Misdiagnosed. Retrieved from <https://thehfoundation.org/familial-hypercholesterolemia-is-often-misdiagnosed-by-physicians-unaware-of-family-medical-histories>
2. Raul T.J, Kallend D, Ray KK, Turner T, Koenig W, Wright RS, Wijngaard PLJ, Curcio D, Jaros M.J, Leiter LA, Kastelein JJP, ORION-9 Investigators. Inclisiran for the Treatment of Heterozygous Familial Hypercholesterolemia. N Engl J Med. 2020 Apr 16;382(16):1520-1530. doi: 10.1056/NEJMoa1913805. Epub 2020 Mar 18. PMID: 32197277.
3. PCSK9 Inhibitors. (2020, June 02). Retrieved from <https://thehfoundation.org/fh-treatments/pcsk9-inhibitors-for-familial-hypercholesterolemia>

03 GEMVCARE GENETIC TESTING



Test 9 up-to-date genes related to FH
(APOB, APOE, LDLR, LDLRAP1, PCSK9, ABCG5, ABCG8, STAP1, LIPA)



Comprehensive detection of disease-causing genes: **Mutations in genetic sequences and major LDLR gene copy-number variations**



Double verification of results



Technical Accuracy - confirmed by a local university



Quality Assurance-GemVCare is a participant of the EMQN* programme



If a disease-causing mutation is found, your family members can undergo genetic testing at a special rate to confirm whether they carry the same mutation[^]

* EMQN: The European Molecular Genetics Quality Network

[^] Terms and conditions:

1. This test only includes the specific likely pathogenic genetic mutation of the first patient, must be confirmed and referred by a doctor, and does not include other fees (e.g. doctor consultation fee).
2. The patient must provide a copy of the first patient's report and a doctor's referral letter to verify the need for testing.
3. All family members receiving the test must be referred by the same clinic or hospital as the first patient.
4. The company reserves the right to make the final decision on the offer and any disputes and can change the terms and conditions of this offer without prior notice.

General High Cholesterol VS Familial Hypercholesterolaemia

Cause of disease...

Acquired Factors
(E.g. Unhealthy lifestyle)



Congenital gene mutation
(Born with high cholesterol levels)

Life expectancy...

Reduced by 10-15 years ³
(If there are additional risks such as smoking and high blood pressure)



Reduced by 20-30 years ⁴
(Even without additional risks)

Risk of heart disease...

Between ages 35-55, risk increases by 40% every 10 years ⁵



20 times higher than a healthy person ⁶

How is the disease controlled...

For some patients, it can be controlled by diet and exercise



Most patients need **medication**

Sources:

1. What Are the Risks with FH? March 27, 2020. <https://thehfoundation.org/familial-hypercholesterolemia/what-are-the-risks-with-fh/>
2. Familial Hypercholesterolemia (FH). (n.d.). Retrieved from <https://www.heart.org/en/health-topics/cholesterol/causes-of-high-cholesterol/familial-hypercholesterolemia-fh>
3. Clarke, R., Emberson, J., Fletcher, A., Breeze, E., Marmot, M. J. (2009). Life expectancy in relation to cardiovascular risk factors: 38 year follow-up of 19 000 men in the Whitehall study. *Bmj*, 339(Sep16 3).
4. Mortensen, G. L., Madsen, I. B., Kruse, C., & Bundgaard, H. (2016). Familial hypercholesterolaemia reduces the quality of life of patients not reaching treatment targets. *Danish medical journal*, 63(5), A5224.
5. Ann Marie Navar-Boggan, Eric D. Peterson, Ralph B. D'Agostino, Benjamin Neely, Allan D. Sniderman, and Michael J. Pencina. Hyperlipidemia in Early Adulthood Increases Long-Term Risk of Coronary Heart Disease. *Circulation*, January 2015 DOI: 10.1161/CIRCULATIONAHA.114.012477
6. Kim, Y. R., & Han, K. H. (2013). Familial hypercholesterolemia and the atherosclerotic disease. *Korean circulation journal*, 43(6), 363-367. <https://doi.org/10.4070/kcj.2013.43.6.36>