Short human genetics opinion for a health insurer

Familial hypercholesterolaemia – testing a child

Medical necessity of targeted testing for the familial LDLR variant in an eight-year-old girl with mildly elevated LDL cholesterol

Fictitious sample case – case, persons, events and instruction are simulated, not a real expert opinion. Cited sources are real.

Instructed by	Private health insurer (private Krankenversicherung) [fictitious], Outpatient Benefits Department	Reference	KV-2026-09256 [fictitious]
Insured person	L. H. [fictitious], born 2018	Date	8 November 2026

Result in brief

Targeted testing for the *LDLR* variant confirmed in the father corresponds to the current consensus recommendation of the European Atherosclerosis Society (2026). The child's LDL cholesterol already meets the clinical criterion, but the diagnosis is only confirmed by the genetic test. A positive result does not automatically lead to statin therapy but to a structured risk assessment and follow-up. A negative result excludes the familial variant, not every other lipid disorder.

1. Instruction and question

The insurer requests a human genetics opinion on reimbursement of a targeted molecular genetic test for the insured daughter of a patient with familial hypercholesterolaemia. It considers repeated measurement of blood lipids to be sufficient. The question concerns the medical necessity of the genetic test. Whether the requirements of § 14 GenDG (German Genetic Diagnostics Act) for a genetic test in a person unable to consent are met must be examined medically and legally in the individual case and is not the subject of this opinion.

2. Records

The following applies to this fictitious sample case: the 46-year-old father had a myocardial infarction at the age of 44. A pathogenic variant in the *LDLR* gene was detected in him. The specific variant is not named in the fictitious files, and its classification as pathogenic is taken as an assumption of the sample case. The eight-year-old daughter is clinically unremarkable and of normal weight. Her LDL cholesterol was 3.1 and 3.3 mmol/l (121 and 128 mg/dl) in two measurements three months apart. Lipoprotein(a) has not yet been measured. The mother has normal blood lipids. The paediatrician arranged the targeted test after human genetic counselling of the parents.

3. Assessment

Mode of inheritance and risk. Heterozygous familial hypercholesterolaemia is inherited in an autosomal dominant manner. The daughter has inherited the paternal variant with a probability of 50%. The condition leads to elevated LDL cholesterol from birth and, if untreated, to premature coronary heart disease [1].

Diagnostic criteria. According to the 2026 consensus of the European Atherosclerosis Society, an LDL cholesterol above 3.0 mmol/l (above 115 mg/dl) in a child with a genetically diagnosed parent is regarded as a clinical criterion. The diagnosis is regarded as confirmed when a disease-causing variant is detected. The consensus recommends offering genetic testing to every child with suspected familial hypercholesterolaemia. If the familial variant is known, targeted testing is sufficient [2]. The insured girl's values narrowly meet the clinical criterion. However, they lie in a range in which children without the variant may also lie.

What the result decides. With a positive result, the diagnosis is confirmed. The consensus envisages starting drug therapy in the window from 6 to under 10 years, ideally from 6 years. For this age group it gives an LDL target of at most 3.5 mmol/l (135 mg/dl), and at most 3.0 mmol/l (115 mg/dl) in the presence of a major risk enhancer such as lipoprotein(a) of at least 250 nmol/l [2]. The insured girl's values are currently below the general target. A positive result therefore does not lead to an automatic indication for

statins but to referral to a lipid clinic, measurement of lipoprotein(a), assessment of further risk enhancers and follow-up with an individual treatment decision. Long-term data show the benefit of statin therapy started in childhood [3].

Negative result. A negative result excludes the familial *LDLR* variant. It does not exclude any other genetic, polygenic or acquired lipid disorder. The mildly elevated LDL cholesterol would then still need to be investigated, for example by measuring lipoprotein(a) and excluding secondary causes [2]. What would no longer apply is the classification as familial hypercholesterolaemia with its consequences for treatment targets and frequency of monitoring.

Assessment. Targeted testing is the only method that confirms the diagnosis or excludes the familial cause. Repeating the lipid measurement alone cannot answer this question. Testing of relatives of a genetically confirmed index patient is also recommended as standard by an international expert panel [4].

4. Answers to the questions

Question 1: Is the targeted genetic test medically necessary?

> **Answer:** From a medical point of view, yes. It corresponds to the current consensus recommendation and is the professionally indicated method for confirming the diagnosis or excluding the familial cause. The contractual assessment is reserved to the insurer.

Question 2: Is repeated monitoring of blood lipids sufficient?

> **Answer:** No. It does not allow reliable attribution to the familial disorder. Irrespective of the genetic test, however, lipid monitoring remains part of further care.

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References

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