Genetic Testing to Predict Disease Risk

MOL.CU.115.A
v1.0.2025

Description

Predictive genetic testing is performed in people known to be at increased risk of developing an inherited non-cancer condition (for the purposes of this guideline) based on their family history. According to the Genetics Home Reference, presymptomatic testing "can determine whether a person will develop a genetic disorder," while predictive testing "can identify mutations that increase a person's risk of developing disorders with a genetic basis."[1] Predictive testing should be limited to disorders for which the genetic contribution is strong. A positive test result may improve medical management through improved screening, preventive measures, prophylactic medication, and other means. A negative result may rule out a condition, or lower the risk significantly, and may also lead to changes in recommended medical management.

Predictive testing is often performed only in adult individuals (age 18 and over).[2-4] Some adult-onset conditions have surveillance or medical intervention recommendations that are initiated in childhood, while for others there is no change in medical management. The National Society of Genetic Counselors (NSGC) states that individuals should be able to make the decision to have testing for themselves, after understanding and assessing the risks, benefits, and limitations of the test. In their 2018 position statement entitled "Genetic Testing of Minors for Adult-Onset Conditions," NSGC "encourages deferring predictive genetic testing of minors for adult-onset conditions when results will not impact childhood medical management or significantly benefit the child."[5]

- For information on testing a symptomatic individual, please refer to the guideline *Genetic Testing to Diagnose Non-Cancer Conditions* or the appropriate EviCore test-specific guideline.
- For information on predictive testing for hereditary cancer syndromes, please refer to the guideline *Genetic Testing for Cancer Susceptibility and Hereditary Cancer Syndromes* or the appropriate EviCore test-specific guideline.

Note This benefit/harm statement only applies to those jurisdictions that do not have Medicare guidance. Based upon the clinical policy, following EviCore's criteria for genetic testing to predict disease risk will ensure that testing will be available to those members most likely to benefit from a genetic diagnosis. For those not meeting criteria, it ensures alternate diagnostic/management strategies are considered. However, it is possible that some members who would benefit from the testing, but do not meet criteria, will not receive an immediate approval for testing.

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Criteria

Criteria: General Coverage Guidance

Predictive genetic testing is medically necessary when **ALL** of the following conditions are met:

- The individual is **known to be at-risk** for developing inherited condition because a parent, sibling, or child is affected by or known to be a carrier of a genetic disease.
- **Technical and clinical validity**: The test must be accurate, sensitive and specific, based on sufficient, quality scientific evidence to support the claims of the test.
- **Clinical utility**: Healthcare providers can use the test results to provide significantly better medical care for the individual.
- **Reasonable use**: The usefulness of the test is not significantly offset by negative factors, such as expense, clinical risk, or social or ethical challenges.

Criteria: Special circumstances

Testing for Known Familial Mutations

The genetic mutation(s) associated with a genetic disease can often be defined in an affected family member, allowing for testing of at-risk relatives for those specific mutations. Testing for known familial mutations (KFM) is medically necessary when the following conditions are met:

- Genetic Counseling:
  - Pre- and post-test genetic counseling by an appropriate provider (as deemed by the Health Plan policy), AND
- Previous Testing:
  - No previous genetic testing of the requested gene that would have included the KFM, and
  - KFM is disease-causing (classified as pathogenic or likely pathogenic), AND
- Predictive Testing for Asymptomatic Individuals:
  - Member is a 1st, 2nd, or 3rd degree biological relative of the family member with the KFM, and
  - Member is at risk based on the inheritance pattern of the disorder in question, and
  - Member is 18 years of age or older (see Predictive Testing in Minors for specific exceptions), and
  - Healthcare providers can use the test results to provide significantly better medical care for the individual, AND

- Rendering laboratory is a qualified provider of service per the Health Plan policy.

Predictive Testing in Minors

Predictive molecular testing of minors (members under the age of 18 years) for X-linked or autosomal dominant disorders is medically necessary when the following criteria have been met:

- Genetic Counseling:
  - Pre- and post-test genetic counseling by an appropriate provider (as deemed by the Health Plan policy), AND
- Previous Testing:
  - No previous testing for the condition, and
  - A familial disease-causing mutation has been identified in a 1st or 2nd degree biological relative who is affected with an adult-onset autosomal dominant or X-linked condition, AND
- Predictive Testing for Asymptomatic Individuals:
  - The minor is at risk for inheriting the familial disease-causing mutation, and
  - The condition may have either symptom onset or recommendations for medical management that begin in childhood, AND
- Rendering laboratory is a qualified provider of service per the Health Plan policy.

Note Testing of any minor who is symptomatic for a condition, regardless of typical circumstances of onset, is considered diagnostic testing and should be reviewed using *Genetic Testing to Diagnose Non-Cancer Conditions* or the appropriate EviCore test-specific guideline, when available. Certain circumstances not related to medical management (such as consideration of a minor for organ/tissue donation or pregnancy in a minor with a family history of adult-onset disease) may present sufficient clinical utility to outweigh the criteria presented in this guideline. Such rare cases should be carefully considered on an individual basis

Criteria: Test-specific Guidelines

EviCore test-specific guidelines are available for some tests designed to predict disease risk. For tests without a specific guideline, use the General Coverage Guidance above.

Limitations and Exclusions

- Testing will be considered only for known familial mutations when clinically possible.

- Testing will be considered only for the number of genes or tests necessary to establish carrier status. A tiered approach to testing, with reflex to more detailed testing and/or different genes, will be required when clinically possible.
- Predictive genetic testing is medically necessary once per lifetime per condition. Exceptions may be considered if technical advances in testing demonstrate significant advantages that would support a medical need to retest.
- Testing for genetic variants that are not causative of inherited disease is not medically necessary; and therefore, is not reimbursable. Examples of mutations or variants that are not causative include:
    - Variants assessed by a testing laboratory to be of uncertain clinical significance, except as addressed in the guideline *Genetic Testing for Variants of Uncertain Clinical Significance*
    - Variants in genes of uncertain clinical significance
    - Variants deemed to be associated with but not causative of a disorder (e.g.: variants identified in genome-wide association studies (GWAS) or risk alleles for common disorders)

References

1. What are the types of genetic tests? (Last Updated July 2021). In: MedlinePlus Genetics US National Library of Medicine (database online). Copyright, National Institutes of Health. 1993-2024. Available at: https://medlineplus.gov/genetics/understanding/testing/uses/

2. Ross LF, Saal HM, David KL, Anderson RR. Technical report: ethical and policy issues in genetic testing and screening of children. *Genet Med* 2013;15: 234–245. doi: 10.1038/gim.2012.176

3. National Society of Genetic Counselors Position Statement. Genetic testing of minors for adult-onset conditions. Adopted 2012. Updated 2018. Available at: https://www.nsgc.org/Policy-Research-and-Publications/Position-Statements/Position-Statements/Post/genetic-testing-of-minors-for-adult-onset-conditions

4. Botkin, JR, Belmont JW, Berg JS, et al. Points to consider: ethical, legal, and psychosocial implications of genetic testing in children and adolescents. *Am J Hum Genet*. 2015;97:6-21. doi: 10.1016/j.ajhg.2015.05.022

5. National Society of Genetic Counselors. Genetic testing of minors for adult-onset conditions. Adopted 2012; Updated: 2018. Available at: https://www.nsgc.org/Policy-Research-and-Publications/Position-Statements/Position-Statements/Post/genetic-testing-of-minors-for-adult-onset-conditions

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