



A Guide to Genetic Testing

Genetic testing helps doctors and families better understand a person's health. It can give answers about current symptoms and what to expect in the future. Consider genetic testing when a diagnosis is unknown or if a patient shows any indicators such as:

PHYSICAL FEATURES	<ul style="list-style-type: none">• Distinctive facial features, skeletal differences, or organ malformations
DEVELOPMENTAL DELAYS	<ul style="list-style-type: none">• Delays in achieving milestones or a sudden loss of milestones, such as language, motor, or social skills
INTELLECTUAL DISABILITY	<ul style="list-style-type: none">• Cognitive impairment or learning difficulties• Autism
GROWTH CONCERNS	<ul style="list-style-type: none">• Failure to thrive or excessive growth
RECURRING HEALTH ISSUES	<ul style="list-style-type: none">• Immune system dysregulation, frequent infections, or other recurring symptoms
SENSORY CHALLENGES	<ul style="list-style-type: none">• Hearing loss, vision or eye problems, or other sensory issues
CANCERS	<ul style="list-style-type: none">• Early-onset of unusual cancers, or strong family history of cancer
FAMILY HISTORY	<ul style="list-style-type: none">• Family history of similar or unexplained health problems, birth defects, or developmental delays
UNEXPLAINED SYMPTOMS	<ul style="list-style-type: none">• Symptoms that cannot be explained by common or known conditions• Kidney disease without a clear cause• Heart conditions (ex: cardiomyopathy or rhythm problems)• Gastrointestinal (GI) conditions that do not respond to typical treatment

What are the benefits of genetic testing?

Genetic testing can:

- Help you understand what to expect in the future
- Help doctors find and treat related health problems earlier
- Guide genetic counseling on recurrence risk in future pregnancies
- Help doctors choose more personalized treatments
- Connect patients and families with support and resources
- Shorten the time it takes to get a diagnosis

What are the different genetic tests?

	WHAT IT LOOKS AT	WHAT IT CAN FIND	WHAT IT CAN'T FIND	WHEN TO ORDER	TURN AROUND TIME
KARYOTYPE	Whole chromosomes (large-scale view)	<ul style="list-style-type: none"> - Extra or missing chromosomes (e.g., Down syndrome) - Large rearrangements (translocations, inversions) - Aneuploidy 	<ul style="list-style-type: none"> - Small deletions/duplications - Single gene variants - Low-level mosaicism (sometimes missed) 	<ul style="list-style-type: none"> - Suspected chromosomal conditions (e.g., trisomy 21) - Infertility or recurrent pregnancy loss - Disorders of sex development 	2-4 weeks
CHROMOSOMAL MICROARRAY (CMA)	DNA copy number across all chromosomes (higher resolution than karyotype)	<ul style="list-style-type: none"> - Small deletions/duplications (copy number variants) - Aneuploidy - Some mosaicism 	<ul style="list-style-type: none"> - Balanced rearrangements (no gain/loss of DNA) - Single gene variants - Repeat expansions 	<ul style="list-style-type: none"> - Developmental delay, autism, intellectual disability - Congenital anomalies - First-tier test in many pediatric cases 	2-4 weeks
GENE PANEL	A selected group of genes related to a set of symptoms	<ul style="list-style-type: none"> - Single gene variants in targeted genes - Some small deletions/duplications 	<ul style="list-style-type: none"> - Variants in genes not included in the panel - Large chromosomal changes 	<ul style="list-style-type: none"> - When a condition is suspected (e.g., cancer panels, cardiomyopathy panels) - When symptoms point to a type of condition 	2-4 weeks
WHOLE EXOME SEQUENCING	All protein-coding regions of genes (~1-2% of genome)	<ul style="list-style-type: none"> - Single gene variants - Small insertions/deletions - Variants in many genes at once 	<ul style="list-style-type: none"> - Non-coding region variants - Some structural variants - Repeat expansions 	<ul style="list-style-type: none"> - Unclear diagnosis after panel testing - Complex or rare conditions - Multiple body systems affected 	6-8 weeks
WHOLE GENOME SEQUENCING	Entire DNA sequence (coding + non-coding regions)	<ul style="list-style-type: none"> - Single gene variants - Structural variants - Copy number changes - Non-coding variants 	<ul style="list-style-type: none"> - Some repeat expansions - Interpretation of many findings is still limited 	<ul style="list-style-type: none"> - Complex or undiagnosed cases - When WES and other tests are negative - Research or advanced clinical settings 	8-12 weeks

How do I order genetic testing?

1. **Selection:** There is no single “best” test for every patient. Providers select a test based on symptoms, medical history, and financial considerations. It is also common for people to have more than one type of genetic test, either at the same time or one after another. For example, a provider may start with a gene panel based on symptoms and then order whole exome sequencing if those results do not give a clear answer.

If your institution does not offer testing, you can find and compare tests on lab websites or the Genetic Test Registry: <https://www.ncbi.nlm.nih.gov/gtr/>

Please refer to the UDNF Clinical Genetic Testing Lab Comparison Guide for information about types of testing, costs, financial assistance, insurance coverage, and genetic counseling offered at different labs.

2. **Ordering:** Healthcare providers order genetic testing through a genetic testing lab’s online portal. Providers must submit a test requisition form, clinical notes (ICD-10 codes), and supporting documents.

3. Insurance & Billing:

- **Private Insurance:** Most testing labs check insurance and request approval before proceeding with testing.
- **Medicaid:** Coverage varies by state; often requires a referral to a geneticist or specific "medical necessity" documentation.
- **Self-pay and Financial Assistance:** Some labs offer self-pay options and financial assistance programs for underinsured patients.

4. **Sample and Lab Process:** After ordering, the testing lab reviews insurance coverage or confirms self-pay options. Once approved, the lab sends a sample collection kit to the patient’s home or clinic. If a blood draw is required, a trained phlebotomist at a local lab or clinic collects it. Both types of samples are sent back to the lab for testing, which may take several weeks to months, depending on the test.

5. **Results:** The lab sends results to the provider who ordered the test. The provider adds them to the patient’s medical record. The report includes an explanation of the results and possible next steps.

I have the test results, now what?

- **Positive Results:** Refer to a specialist and a genetic counselor. They can guide care, family testing, and next steps. Many testing companies offer post-test education and counseling to providers and patients.
- **Negative/Inconclusive (VUS) Results:** A negative result does not rule out a genetic cause. It may mean that science hasn't caught up yet. Future research may determine whether your VUS is pathogenic or benign. Additional testing and updates to your results every few years can provide more information. If you or your provider suspects a VUS may be the cause of symptoms, consult a specialist for that gene.
- **Support:** If you have questions about results, contact the lab's clinical team. Most labs offer support for both doctors and patients.

Will insurance cover genetic testing?

Health insurance often covers genetic testing when a healthcare provider recommends it. In recent years, more plans have started to cover advanced testing. One study found that **71% of U.S. private insurers cover whole exome sequencing (WES)** for children with suspected genetic conditions (Trosman et al., 2020).

Many genetic tests need approval from the insurance company before testing begins. Genetic testing labs often help with this step. They may submit approval requests or check benefits to estimate out-of-pocket costs based on your plan. Coverage for genetic testing varies between insurance plans. You can review your plan details to see what is covered. You can also contact the testing lab for help. Insurance coverage may change over time as new research becomes available.

What is the difference between clinical and DTC Testing?

Direct-to-consumer (DTC) tests are for personal use and **do not replace medical-grade genetic testing**. These tests are not intended to diagnose or guide medical decision-making. Clinical genetic testing is ordered by a healthcare provider, done in certified labs, and is used to help diagnose, manage, and care for patients with suspected genetic conditions.

- **DTC Testing:** Not diagnostic. These tests only look at small, specific spots in your DNA, rather than the whole gene. They may give false results.
- **Clinical Testing:** Certified labs perform these tests and read through entire genes. Trained professionals interpret the results.

National Society of Genetic Counselors (NSGC) statement: *“As with any genetic testing, when making decisions about preventive care, diagnosis, or medical management, consumers should **use only genetic tests that are generated by laboratories that employ validated methods** and follow regulatory guidelines whenever applicable. NSGC recommends pre-test and/or post-test genetic counseling for individuals who are concerned about whether CIGT meets their needs.”*

Testing Guidelines:

- American Heart Association: <https://www.ahajournals.org/doi/10.1161/HCG.0000000000000067>
- American College of Medical Genetics (ACMG) – cancer genetic testing referrals: <https://www.acmg.net/PDFLibrary/Cancer-Predisposition-Assessment-Referral-Indications.pdf>
- ACOG Hereditary Cancer and Risk Assessment: <https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2019/12/hereditary-cancer-syndromes-and-risk-assessment>
- American Journal of Kidney Disease – genetic testing for kidney disease: [https://www.ajkd.org/article/S0272-6386\(24\)00872-2/fulltext](https://www.ajkd.org/article/S0272-6386(24)00872-2/fulltext)
- ACMG – genetic testing for short stature: <https://www.acmg.net/PDFLibrary/Short-Stature-Genetic-Evaluation.pdf>
- ACMG – genetic testing for hearing loss: <https://www.acmg.net/PDFLibrary/Hearing-Loss-Practice-Resource.pdf>
- ACMG – genetic testing for congenital anomalies or intellectual disability: https://www.acmg.net/PDFLibrary/Exome_and_genome_sequencing_pediatric_patients.pdf
- American Academy of Pediatrics - global developmental delay and intellectual disability: <https://publications.aap.org/pediatrics/article/156/1/e2025072219/202230/Genetic-Evaluation-of-the-Child-With-Intellectual?autologincheck=redirected>
- American Academy of Ophthalmology – genetic testing for inherited retinal degenerations: <https://www.aao.org/education/clinical-statement/guidelines-on-clinical-assessment-of-patients-with>
- Cystic Fibrosis Foundation – testing for CF: <https://www.cff.org/medical-professionals/cf-diagnosis-clinical-care-guidelines>
- Genetic testing for immunodeficiency disorders: <https://pmc.ncbi.nlm.nih.gov/articles/PMC11425801/>, <https://www.uptodate.com/contents/genetic-testing-in-patients-with-a-suspected-primary-immunodeficiency-or-autoinflammatory-syndrome>
- American Academy of Allergy, Asthma, and Immunology: <https://www.aaaai.org/Aaaai/media/Media-Library-PDFs/Professional%20Education/For%20Fellows%20in%20Training/FIT-5points-genetics.pdf>
- Genetic Testing for Unexplained Epilepsy: <https://onlinelibrary.wiley.com/doi/full/10.1002/jgc4.1646>
- Diagnosing rare and undiagnosed diseases: <https://pmc.ncbi.nlm.nih.gov/articles/PMC8883622/>
- ACMG PRACTICE GUIDELINES LIST: <https://www.acmg.net/ACMG/Medical-Genetics-Practice-Resources/Practice-Guidelines.aspx>
- NSGC PRACTICE GUIDELINES LIST: <https://www.nsgc.org/Research-and-Publications/Practice-Guidelines>



Website: <https://udnf.org/>
Phone: 202-599-4465
Email: info@udnf.org