

A glowing DNA double helix structure is the central focus, rendered in a digital, futuristic style. The helix is composed of two intertwined strands, one appearing as a solid blue line and the other as a dotted blue line. Between these strands, a dense array of colorful rectangular bars (red, orange, yellow, green, and blue) represents genetic data. The entire structure is set against a dark blue background filled with soft, out-of-focus light spots (bokeh) in shades of blue, green, and yellow. A bright, glowing blue light source on the right side of the helix creates a strong lens flare and illuminates the structure, giving it a three-dimensional, ethereal appearance.

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CE Corner

Building Genetic Literacy to Help Patients Navigate Results, Risk, and Concern

BY LUCY TU

BY THE TIME she turned 30, Nancy* had spent much of her young adulthood wondering whether she might develop bipolar disorder. Her mother had been formally diagnosed in her early 30s, and Nancy knew enough about genetics to understand that family history was meaningful but not enough to understand what that history meant for her own future. When she found a direct-to-consumer genetic test that promised to estimate her likelihood of developing the condition, she paid \$199 and sent in a saliva sample.

Five weeks later, she logged on to the company's online portal to retrieve her results. A two-toned infographic loaded on screen, showing 100 human stick figures, just over three fourths shaded navy blue. Above them appeared a number: a "polygenic risk score," which, the accompanying text explained, placed Nancy in the 78th percentile for genetic risk of bipolar disorder. A footnote clarified that this did not mean Nancy was certain to develop the condition. But what did it mean? she wondered.

More than 250 companies in the United States now offer expansive genetic screening panels directly to consumers; a growing number of these companies claim to assess users' risk of developing mental health conditions or predict which treatments they are most likely to respond to (Wysocki, K., & Osier, N., *Journal of the American Association of Nurse Practitioners*, Vol. 31, No. 3, 2019; Valero, M. V., *Monitor on Psychology*, Vol. 57, No. 4, 2026). For consumers like Nancy, who was her mother's primary caregiver during her final years, these

tests have an intimate appeal. "Having seen what she went through and been by her side during a lot of her most difficult episodes, I really needed to know whether I'd end up having the same illness," Nancy said.

Yet the predictive power of commercial genetic tests like the one Nancy took is contested. The International Society of Psychiatric Genetics (ISPG) has cautioned that many companies' genetic risk estimates are unvalidated and cannot reliably predict whether any individual will develop a condition ("Genetic Testing and Psychiatric Disorders: A Statement from the International Society of Psychiatric Genetics," ISPG, 2019). Increased access to genetic assessment is a double-edged development, according to Aaron Besterman, MD, a child and adolescent psychiatrist who serves as the medical director of the Laura Rodriguez Research Institute. Although genetic testing has useful applications, "in many cases, patients are left to manage genetic information on their own, some of it very unhelpful or even harmful," he said.

Even as the validity and value of some tests remain unclear, the impacts of genetic information are poised to become more visible in psychology. Last July, Florida became the first state to launch a free, voluntary, whole-genome sequencing pilot program for newborns (Sunshine Genetics Act, Fl. Code Ann. § 1004.4211, 2025). The National Institutes of Health has also funded the nation's first multistate genomic newborn screening initiative, set to begin recruitment this year.

CE CREDITS: 1

Learning objectives

After reading this article, CE candidates will be able to:

- 1 Differentiate the clinical uses and limitations of different types of genetic testing in psychiatric and neurodevelopmental care.
- 2 Apply communication strategies to explain probabilistic genetic findings, address genetic determinism, and preserve a nuanced understanding of patient risk and prognosis.
- 3 Identify major ethical, legal, privacy, and equity considerations associated with genetic testing in mental health care.

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*Name changed at patient's request to protect privacy

KEY POINTS

1

The clinical value of genetic testing in mental health varies by test and condition. Polygenic risk scores may be useful for population-level research, while testing for rare pathogenic variants can help guide medical monitoring and support for some neurodevelopmental conditions.

2

Psychologists need sufficient genetic literacy to support patients who are impacted by genetic testing results, particularly as genetic testing becomes more common in mental health care.

3

Genetic assessment raises significant ethical, legal, and social concerns. Psychologists should recognize ancestry-related limitations in genomic data, unequal access to testing, privacy risks, the limited scope of genetic nondiscrimination laws, and the field's historical relationship with eugenics.

Alongside the expanding commercial presence of genetic testing laboratories, these public health initiatives signal that genetic assessment is moving closer to the center of medical practice, including in mental health care.

In psychology, though, a genetic panel that can reveal something biologically meaningful may have little to offer in practice. “Genetic information can be easily misinterpreted. For instance, you may have a genetic change that increases your risk of Alzheimer’s disease, but many patients will interpret that as, ‘I’m going to get Alzheimer’s.’ And that can be terrifying for patients,” Besterman said. As these genetic tests move from research labs and consumer websites into patients’

lives, psychologists will be increasingly called on to support patients grappling with the results.

Current uses and limitations of genetic testing

Genetic tests make the future feel like a document you can read. For some conditions—certain cancers, Huntington’s disease, cystic fibrosis—these results are more interpretable. For many mental health conditions, genetic testing is something closer to a weather forecast written in a language that we are still learning to translate.

The prospect of clear-cut answers sitting in a patient’s DNA may be especially appealing in psychology, a field that has long diagnosed conditions via observation and inference. However, most mental health conditions are multifactorial disorders, resulting from interactions among many genes, environmental influences, and lifestyle factors (Grotzinger, A. D., et al., *Nature*, Vol. 649, No. 8096, 2026). There is no clean cleave between the biological and the biographical; a person’s genes and their life experiences are too entangled to assign a mental health condition to one or the other. “Many traits have some kind of genetic contribution. The harder question is, Does this particular genetic finding tell me something I can use for my patient? If it doesn’t do that, you have to be careful about treating it as more meaningful than it is,” Besterman said.

One of genetic testing’s best-known uses is disease-risk prediction. In psychology, its clinical value depends heavily on the condition in question and the type of genetic information being used. Common genetic variants—the kind that direct-to-consumer tests tend to emphasize—are small, widely shared differences in DNA that nudge one’s risk of a particular disease. Each variant shifts the odds by a fraction.



Aggregate enough of them into what scientists call a “polygenic risk score” and the combined result can point to population-level patterns in disease prevalence, flag demographic groups with elevated risk, and help researchers understand the genetic architecture of complex disease.

However, for an individual patient sitting in a clinician’s office, that number’s utility has sharp limits, said Carrie Bearden, PhD, a professor of psychiatry, biobehavioral sciences, and psychology at the University of California, Los Angeles. Professional societies, including the ISPG and the American College of Medical Genetics and Genomics (ACMG), have not endorsed polygenic risk scores for routine use in individual psychiatric care. “A high score can’t diagnose a disorder, and a low score can’t rule one out,” said Bearden.

In contrast, genetic testing for rare genetic variants offers more concrete information about some neurodevelopmental conditions. Unlike common variants scattered across the genome



Psychologists do not need to interpret genetic reports themselves, but they do need enough genetic literacy to help patients separate useful information from noise.

in the thousands, these genetic mutations have stronger, more traceable effects on a person's risk of specific diseases. For example, rare pathogenic variants can be identified in a substantial share of individuals with autism spectrum disorder or intellectual disability, helping clinicians triangulate the root cause of a person's condition. For children with developmental delays, the ACMG recommends *exome sequencing*, which homes in on the small portion of DNA that contains instructions for making proteins, or *genome sequencing*, which scans the entire DNA instruction manual (Manickam, K., et al., *Genetics in Medicine*, Vol. 23, No. 11, 2021).

In these cases, genetic findings may help bring an end to the long diagnostic odyssey—years of appointments and conflicting opinions—that many families endure as they seek to understand their child's condition, said Besterman. Earlier identification can

enable earlier access to interventions like behavioral and occupational therapy or speech and language support. Many rare variants are also pleiotropic, meaning they influence multiple physiological systems. Knowing that a patient's genetic profile includes a rare variant allows health care providers to proactively monitor for associated physical health issues.

Talking about genetic findings with patients

People often view genes as powerful, even fateful, said Gabriel Lázaro-Muñoz, PhD, JD, an associate professor at Harvard Medical School who studies the ethical, legal, and social implications of emerging technologies in neuroscience and genomics. This tendency is especially fraught in psychology, where many mental health conditions are laden with social judgment or misleading stereotypes.

Many psychologists and other mental health professionals are trained to recognize this stigma and may be familiar with appropriate strategies for correcting misconceptions. However, genetic findings can exacerbate stigma by giving it a distinct and false sense of biological permanence, Lázaro-Muñoz said. Eighty-nine percent of psychiatrists surveyed in one study said they believed genomic results could lead to genetic discrimination and decreased expectations for children with high polygenic risk scores (*American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*, Vol. 189, No. 7–8, 2022).

Lázaro-Muñoz believes that addressing *genetic determinism*—the belief that a person's DNA dictates their future—requires a more purposeful vocabulary for discussing the nuanced relationship between genes and mental health, one precise enough to avoid overstating the scientific

evidence while remaining accessible to nonscientists. Rather than saying a gene “causes” a psychiatric condition, clinicians may say genes “contribute to risk” or “help explain part of the picture.”

Clinicians can also lean on evidence-based visual aids for genetic counseling, such as the jar model, to explain mental health risk and resilience (Austin, J. C., *Cold Spring Harbor Perspectives in Medicine*, Vol. 10, No. 6, 2020). In this model, inherited vulnerabilities and life experiences add contents to one's jar, while protective factors can increase the jar's capacity. To experience an active mental health episode, the jar must be full to the top. Someone with a high degree of genetic vulnerability may be more likely to develop a mental health condition than someone with less because the jar has less room before it reaches its limit. They may also develop symptoms earlier because it takes less time for the jar to fill up. But the model leaves room for uncertainty: Genetic risk can raise vulnerability without determining the outcome.

Besterman applies this nondeterministic language in his clinical practice. A genetic finding, he tells parents, is not an absolute prognosis. In the case of autism spectrum disorder, the same rare variant can manifest differently from one patient to another. One child may have substantial support needs; another may be less severely affected, for reasons that genetics alone may not explain. “Autism is a complicated clinical diagnosis, which we build from a combination of observations from parents and health care providers, family history, and many other factors,” Besterman said. Clinicians can use genetic information to guide care while preserving a fuller view of the child's development and future.

Careful explanation can also make room for relief. Besterman has worked with parents who have spent years wondering whether they caused their child's conditions—mothers who replay what they ate during pregnancy or parents who search their memories for a missed sign. “I’ve had parents say, ‘So this wasn’t something I did?’ And with a genetic finding, I can tell a parent with confidence that this was a random event and not their fault in any way,” he said. For those families, a genetic diagnosis may ease a private burden they have carried for years. A genetic finding can also challenge the common misperception that “mental illness is just a willpower issue.”

Psychologists themselves do not need to become genetic specialists or interpret genetic reports, which remain the province of geneticists and genetic counselors. But building sufficient genetic literacy is crucial to help patients separate useful information from noise, Bearden said. She likens the current moment in genetic testing to earlier waves of overclaiming around neuroimaging. Brain scans are powerful research and clinical tools, but their authority can be misused when companies or clinicians promise diagnostic certainty they cannot deliver. “If someone says, ‘This doctor said that they can look at my brain with an MRI and tell me whether I have bipolar disorder,’ we can confidently say, ‘No, they cannot,’” she said. Genetic testing, she suggested, requires similar discernment.

Longer term, Bearden believes the field needs a more structural response. Genetics education should become a more routine part of medical training and clinical psychology training, she said, because these tests are unlikely to remain confined to genetics clinics. In the immediate future, clinicians can build a baseline knowledge of genetics

through resources such as Polygenic Scores Explained, which offers accessible explanations of how polygenic scores are calculated and interpreted, and the Psychiatric Genomics Consortium, which provides guides on psychiatric genetics for patients, clinicians, and researchers.

“If patients are asking whether they should undergo some commercial testing for a psychiatric diagnosis, it’s important for clinicians to have a foundational understanding of what genetics can and can’t do, and how to communicate that to patients,” Bearden said.

Ethical, legal, and social considerations

The relationship between psychology and genetics has never been comfortable. In the early 20th century, observations that psychiatric and developmental conditions seemingly ran in families helped construct the intellectual scaffolding for *eugenics*, an ideology aimed at improving the genetic “quality” of human populations (“Historical Chronology: Examining Psychology’s Contributions to the Belief in Racial Hierarchy and Perpetuation of Inequality for People of Color in U.S.,” APA, 2021). Across the United States and Europe, eugenic ideas were used to justify forced sterilization laws and institutional policies that targeted people with intellectual disabilities, psychiatric patients in state hospitals, and others deemed socially “unfit” (Ilyes, E., *Social and Personality Psychology Compass*, Vol. 14, No. 7, 2020).

Although today’s psychiatric genetics is built on stronger ethical norms, it still must contend with inequality in the systems that produce and apply genetic knowledge, said Lázaro-Muñoz. One of the clearest examples

is the ancestry bias in genomic databases. Genome-wide association studies (GWASs), the large-scale research that supplies much of the data behind polygenic risk scores, have relied disproportionately on participants of European ancestry (Peterson, R. E., et al., *Cell*, Vol. 179, No. 3, 2019). One study found that 71.8% of participants in GWASs from 2005 to 2018 had been recruited from just three countries: the United States, the United Kingdom, and Iceland (Mills, M. C., & Rahal, C., *Communications Biology*, Vol. 2, No. 9, 2019). While large genomics initiatives are now recruiting more diverse cohorts, current tools remain significantly more predictive for people whose ancestries resemble the populations used to build them.

Equity concerns also appear in access to testing. Insurance coverage for psychiatric genetic testing is uneven, and cost barriers are among the most commonly cited reasons families do not follow through with recommended testing (Matalon, D. R., et al., *Genetics in Medicine*, Vol. 25, No. 6, 2023).

In a recent study of health care providers’ experiences with genetic testing as part of autism diagnosis, some practitioners suggested research participation as a way for patients to obtain testing they could not otherwise afford (Wang, A., et al., *PLOS One*, Vol. 19, No. 2, 2024). Enrolling in a study can allow patients to receive testing for free, avoid wait times, or access larger gene panels. But providers were clear that research participation is a stopgap, not a solution.

Lázaro-Muñoz said psychologists should also be prepared to discuss the limits of legal protection for genetic data, particularly given the field’s complicated history in the United States. Since 2008, the Genetic Information Nondiscrimination Act, known as

GINA, has prohibited employers from making job-related decisions based on genetic information and barred health insurers from using genetic data to determine eligibility or cost. However, the statute's reach is narrower than most patients realize, he said. Life, long-term care, and disability insurance fall outside GINA entirely, meaning insurers may use genetic information in coverage and premium decisions, subject to state law. GINA's employment protections also apply only to employers with 15 or more employees, and the law is silent on domains such as banking and housing, leaving individual states to enact their own piecemeal genetic-privacy protections.

"If people feel as though they'll be discriminated against by generating genetic information, and if there aren't the necessary protections for them, they won't want to participate in research studies or use genetic testing services, which can exacerbate existing inequities," Lázaro-Muñoz said. Psychologists do not need to resolve every legal uncertainty themselves, but they should be prepared to explain the basics of existing laws and refer patients for genetic counseling or legal guidance when needed.

Patient concerns around genetic privacy are already surfacing in clinical practice, Lázaro-Muñoz added. In one 2014 survey, 8% of psychiatrists said a patient had asked them to keep genetic findings out of their medical file. Five percent said they had complied (Salm, M., et al., *Journal of Genetic Counseling*, Vol. 23, No. 2, 2014). A forthcoming study by Lázaro-Muñoz and colleagues, which surveyed nearly 300 adolescent patients receiving outpatient mental health care alongside 300 of their caregivers, found similar hesitancy: 20% of adolescents and 29% of caregivers agreed

or strongly agreed that they would not want doctors to include genetic testing results in medical records.

Beyond patient privacy, the 2025 bankruptcy of consumer genetic testing company 23andMe spotlighted the potential for genetic data to be sold outright. A pharmaceutical company initially won the right to buy the company's database of more than 13 million customers' genetic profiles, prompting lawsuits from more than two dozen states and warnings from privacy advocates. Eventually, a bankruptcy judge approved a sale to a nonprofit research institute instead (LoTempio Jr., J. E., et al., *Nature Genetics*, Vol. 57, No. 12, 2025).

Genomic assessment is already reaching mental health clinicians even as the field continues to debate how much of it should be used in care. As early as 2014, 15% of practitioners said patients had asked them specifically about direct-to-consumer genomic testing (Salm, M., et al., *Journal of Genetic Counseling*, Vol. 23, No. 2, 2014). A more recent survey of U.S. child and adolescent psychiatrists found that 62.8% had been asked by a patient or family to order pharmacogenetic testing in the previous year, and 45% rated their knowledge of genetic testing practice guidelines as poor or very poor (Soda, T., et al., *Psychiatry Research*, Vol. 325, No. 115246, 2023).

The cost of genomic sequencing continues to plummet, and direct-to-consumer genetic laboratories are multiplying. As genetic assessment becomes more common, psychologists will need to know how to respond when patients bring results into the clinic and therapy room, or when they ask whether a test is worth undergoing.

That task will require confronting long-standing tensions between psychology and genomic science. For much of the history of genetic testing

in mental health, the two fields circled each other warily—genetics too easily recruited into deterministic arguments about mental health that psychology had spent decades disputing, psychology too quick to dismiss genetic explanations as mere reductionism. "We're at a moment where psychologists can either engage with genetic science or be left behind by it. Neither extreme is best for patients," said Lázaro-Muñoz. Rather than reject genetics or embrace it as a new oracle, psychologists must become the informed guides that patients navigating this information will need. ■

FURTHER READING

Psychiatric genetics in clinical practice: Essential knowledge for mental health professionals

Besterman, A. D., et al.
American Journal of Psychiatry, 2025

From basic science to clinical application of polygenic risk scores: A primer

Wray, N. R., et al.
JAMA Psychiatry, 2021

International Society of Psychiatric Genetics Ethics Committee: Issues facing us

Lázaro-Muñoz, G., et al.
American Journal of Medical Genetics Part B: Neuropsychiatric Genetics, 2019

Genetic testing drives interdisciplinary collaboration in patient care

Valero, M. V.
Monitor on Psychology, June 2026

What can we learn from our DNA?

Winerman, L.
Monitor on Psychology, March 2019