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The Staff of the Menninger Clinic
Mind Matters from Menninger

What Is Pharmacogenetic Testing (and Who Should Get It)?

Genetic testing is a new tool for those seeking personalized mental health care.

Posted January 22, 2021



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With the rapid advances in the field of genetics and a growing understanding of the human brain and body, the past few

same symptoms or clinical diagnosis, that does not mean that they will find relief with the same medication. Nonetheless, psychiatric medicines are often marketed and understood as “one size fits all;” in clinical practice, not everyone reacts to medicine—especially psychiatric medicine—the same way. This is due in part to an individual patient’s genetics.

What is pharmacogenomics/pharmacogenetics (PGx)?

Pharmacogenetics (PGx) is a field of study combining the science of pharmacology and genomics to understand how an individual’s genetics may influence the response to drugs. PGx testing has broad implications in mental health treatment, as the Food and Drug Administration (FDA) has over 270 medicines with genetic-based guidance on their manufacturing labels. Of those, **36 are mental health-related medicines.**

PGx testing cannot determine “the perfect drug” for anyone; however, it provides valuable genetic insight to aid a clinician in the decision-making process in conjunction with reviewing the patient’s symptoms, past treatment responses, family history, and treatment goals. It can provide valuable insights by looking at the genes that could impact:

- How the person’s body may metabolize and absorb medicines.
- How sensitive a person’s body may be to certain medicines (which may increase or decrease their risk of medication-related side effects).

best help the patient.

Growing evidence supporting PGx

Though PGx has been around for several years, there has been some hesitation in the mental health community to widespread adoption of genetic testing for patients. Some clinicians believe this testing is “experimental” or “may not be ready for prime time;” others have not been sufficiently educated on how to interpret the results (and have difficulty explaining the results to their patients). As experience with this tool has grown (and the tests have become more sophisticated by including more genes of interest), PGx testing is increasingly acknowledged by accredited institutions or respected healthcare establishments. For example:

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- The **FDA has stated**, “Pharmacogenomics can play an important role in identifying responders and non-responders to medicines, avoiding adverse events, and optimizing drug dose.”

that treatment with antipsychotics “can be influenced by genetic differences and metabolic enzyme activity.”

- The **APA also acknowledged that the CYP2D6 gene** (one gene that is commonly analyzed in PGx testing) “likely has the greatest potential for impact on antipsychotic medication metabolism.”
- In a random-effects meta-analysis, (i.e., a study of studies), patients with Major Depressive Disorder tested **with PGx were 71% more likely to achieve remission** on their medication regimen compared to participants receiving treatment as usual.

Who is PGx testing best suited for?

It is important for patients to understand that pharmacogenetic testing does not yet provide clinical insights regarding an individual’s diagnosis. Rather, PGx testing is done to help streamline a person’s treatment path to the appropriate medication and dosage, potentially reducing the “trial and error” that often happens with real-world (“treatment as usual”) situations. In my experience, ideal candidates for this testing include:

- People worried about developing side effects to medicines or those who already have had significant side effects to past trials of psychiatric medicines.
- People with comorbidities (co-occurring conditions): Treating one psychiatric condition is a challenge on its own. Adding additional diagnoses can complicate treatment substantially. In addition, patients with co-occurring diagnoses often receive prescriptions for more than one

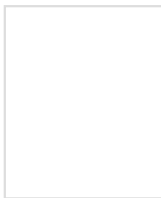
Providers should be familiar with drug-drug, as well as drug-gene interactions. With some advanced PGx tests, results are [linked to software that can help manage these complex interactions](#).

- Patients with specific lifestyle factors: Lifestyle factors, like coffee consumption or [smoking tobacco](#), may influence drug blood levels and, therefore, drug tolerability and response.
- Patients interested in learning more about themselves and their own biology: One important aspect of pharmacogenetic testing is that a person's genes do not change. This means that the results are theoretically good for life and can be used down the road for alternative conditions (or alternative medicines) as needed.

The explosion in genetics and genetic testing has had far-reaching impacts on society and medicine. Many are increasingly comfortable with sharing their genetic information to learn more about their ancestry, risk of developing disease, and—in the mental health space—one's potential response to ongoing or proposed medication. PGx testing is gaining increased acceptance in the mental health field, and perhaps the most momentum it has ever seen with expanding insurance coverage. The use of PGx testing in psychiatry is likely to increase as previous barriers (e.g., [lack of education on the part of providers and patients](#), inconsistent reimbursement, and workflow issues) are reduced.



About the Author



Mind Matters is a collaborative blog written by Menninger staff and an occasional invited guest to increase awareness about mental health. Launched in 2019, Mind Matters is curated and edited by an expert clinical team, which is led by Robyn Dotson Martin, LPC-S. Martin serves as an Outpatient Assessment team leader and staff therapist.

Online: [The Menninger Clinic, a premier mental health organization with treatment services, research & training programs, Facebook, Instagram, Twitter](#)

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