How do I choose patients for GeneSight® testing?

The choice for psychiatric pharmacogenomic testing is entirely at the discretion of the healthcare provider. While pharmacogenomic testing has the potential to help inform healthcare providers on treatment decisions for many patients, this white paper identifies characteristics that may make patients more or less ideal candidates for GeneSight testing.

What types of patients may be appropriate for GeneSight testing?

Patients who have failed one or more medications:

The studies that evaluated the clinical validity, clinical utility, and economic utility of the GeneSight Psychotropic test included patients who had failed at least one psychotropic medication. [1–6] Therefore, the GeneSight test is intended to help inform medication selection for this patient population.

Elderly patients and patients with liver damage:

Elderly patients[7] and patients with liver damage[8] may have impaired production of CYP450 enzymes, which can affect drug metabolism rate. This physiological impairment may exacerbate the effect of pharmacogenomic variation. Therefore, the poor metabolizer phenotype may be more extreme in elderly patients compared to younger patients. For example, a study by Waade et al. demonstrated that serum levels of venlafaxine among elderly CYP2D6 poor metabolizers were eight-fold greater than younger CYP2D6 poor metabolizers.[9] GeneSight testing may help healthcare providers by informing on which medications may require dose adjustments based on a patient's genetic makeup, which can be used in addition to their revised dosing range for elderly patients and hepatic compromised patients. Furthermore, the GeneSight test has been shown to significantly reduce polypharmacy[5], which could be especially beneficial for elderly patients who are often taking multiple medications.

Patients who are very sensitive to medications:

Side effects from medications may result from pharmacokinetic, pharmacodynamic, and psychological manifestations (i.e. nocebo effect).[10] Many healthcare providers have utilized the GeneSight test to shed light on this process. GeneSight testing might reveal a compromised pharmacokinetic or pharmacodynamic gene-drug interaction yielding side effects. Additionally, a 'normal' test might point a healthcare provider toward ruling out a pharmacokinetic or pharmacodynamic problem, suggesting a requisite look into the psychological aspects of the patient's sensitivity.[11]

When should GeneSight testing be used with caution?

Treatment-naïve patients:

While additional utility may be gained for treatment-naïve patients, this population has not been studied. Thus, the GeneSight test is intended for patients who are currently failing or have failed at least their initial prescribed behavioral health medication.

Patients who have failed numerous medications in multiple medication classes:

Difficult-to-treat patients who have failed numerous medication trials in multiple medication classes are often highly complex, with multiple medical and psychiatric comorbidities that may obscure medication response. The GeneSight test may be able to explain why the patient has failed past medication trials. This may validate patient experience for those who have struggled with medication response. The GeneSight test may also be able to identify medications that may have been prescribed at sub-optimal doses, which could lead a healthcare provider to re-try a medication at an adjusted dose.

Liver transplant patients:

A transplanted liver will have the DNA (and consequent enzyme expression) of the donor, while the GeneSight test looks at the DNA of the recipient. The pharmacodynamic portion of the GeneSight test, which includes 5 genes on GeneSight Psychotropic, will still provide accurate information for these patients. However, they will not gain useful information from the pharmacokinetic portion of the GeneSight test. Since the GeneSight algorithm depends on the outcome of both pharmacokinetic and pharmacodynamic genes, the interpretive pages of the GeneSight report, which separate medications into the green, yellow, and red categories, may not be used. Therefore, a liver transplant patient should only consider having the GeneSight test if their healthcare provider believes benefit can be gained from the results of the pharmacodynamic genes.

What types of patients are not appropriate for GeneSight testing?

Patients who are responding to their current medication regimen:

Patients who are doing well on their current medication regimen are not ideal candidates for the GeneSight test. The clinical utility of a GeneSight test is to inform on treatment decisions for patients who are not responding to their medications. Additionally, all subjects in the clinical trials that evaluated the GeneSight test were not responding to their medications at the beginning of the trial, so this characteristic reflects the studied population. *The GeneSight test should be considered at the time when a medication dose adjustment, augmentation, discontinuation, or cross-taper is being contemplated.*

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