

CYP2D6 and CYP2C19 Genotyping for Psychiatry Information for Physicians

How can cytochrome P450 testing be helpful?

Many patients do not respond well to psychiatric medications, showing limited or no response, residual symptoms, or toxicity and intolerable side effects.

Because cytochrome P450 (CYP450) enzymes metabolize many drugs, your patient's specific genotype may play a role in determining his or her blood levels of medication and affect treatment response. For some patients, awareness of their genotype can aid in prescribing medications with the greatest efficacy and least side effects.

Currently an FDA approved testing method, the AmpliChip® CYP450 Test, is available through Roche Diagnostics. This test provides genotype information about the CYP450 enzymes CYP2D6 and CYP2C19.

Why focus on CYP2D6 and CYP2C19?

The CYP2D6 and CYP2C19 enzymes are responsible for metabolizing many antidepressant and antipsychotic medications.

CYP2D6 has over 70 variants in the human population and these variations can reduce or increase its ability to break down medications.

Individuals can be classified based on their enzymatic activity of CYP2D6 as a poor metabolizer (PM), intermediate metabolizer (IM), extensive (normal) metabolizer (EM) or an ultrarapid metabolizer (UM). CYP2C19 has eight known variants and two phenotypes, PM and EM.

Antidepressant and antipsychotic medications metabolized by CYP2D6 and CYP2C19

CYP2D6: desipramine, fluoxetine, nortriptyline, paroxetine, risperidone, perphenazine, fluphenazine, aripiprazole, thioridazine, others.

CYP2C19: amitriptyline, citalopram, escitalopram, clomipramine, imipramine, others.

What is required of your patient?

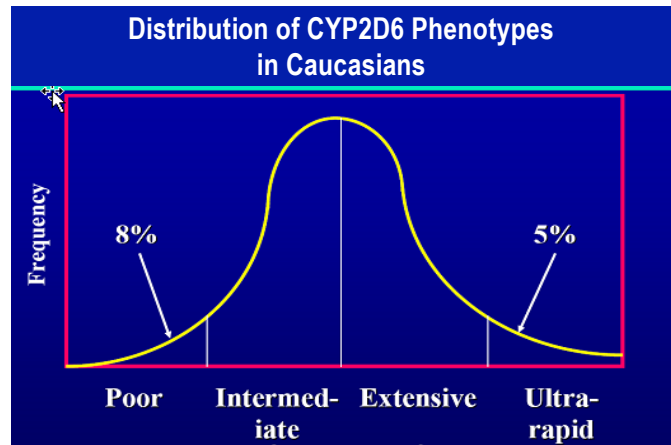
The risks and benefits of genetic testing will be explained to your patient and they will be asked to give informed consent to obtain a small sample of blood. Alternatively, a saliva sample can be used.

Patients will be assessed for their plasma drug levels, drug response and side effects while being treated with standard medication according to your (the physician's) choice. The treating physician will be, at all times, in charge of the treatment plan.

What information will the test give you?

You will be given information about the CYP2D6 and CYP2C19 variants that your patient carries and an interpretation of this genotype.

You will also be given a prediction of your patient's metabolizer status. Patients will be categorized for CYP2D6 metabolic activity as a PM, IM, EM, or UM and for CYP2C19 activity as a PM or an EM.



How should the test results be interpreted and used?

The test results will provide additional information about your patient that may be useful when choosing dosages and medications. However, this study is preliminary and the use of genetic testing to aid in the prescription of psychiatric drugs is relatively new.

Genetic information should not be valued more highly than other patient information such as age, sex, smoking habits, and liver function, and should be considered in conjunction with all other information available about your patient. Also, it should be remembered that as with all lab tests there is a small possibility of genotype error.

Example results and interpretations

For a patient with *41 and *17 variants of the CYP2D6 gene:

The *41 variant is associated with decreased activity and consistent with an IM phenotype. The *17 variant is also associated with decreased activity and consistent with an IM phenotype. Thus, this patient would be a predicted Intermediate Metabolizer for drugs metabolized by CYP2D6.

For a patient with *3 and *5 variants of the CYP2D6 gene:

The *3 and *5 variants are associated with impaired enzymatic activity and are consistent with a PM phenotype. Thus, this patient would be predicted to be a Poor Metabolizer of drugs metabolized by CYP2D6

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