

Are there any other effects of CYP2C19?

CYP2C19 is involved in the processing of other medicines as well. Some people have types of the CYP2C19 gene that make these medicines less effective or raise the risk of side effects. Examples include amitriptyline, citalopram, escitalopram and voriconazole. This is another reason why testing for CYP2C19 is a good idea.

What should I ask my provider?

If you are tested, the next time you speak to your doctor you should ask if any of the medicines you are taking are affected by your test results.

Whenever you are prescribed a new medicine, you should also ask your doctor or pharmacist if the medicine is affected by your CYP2C19 test result.

Your CYP2C19 test results should be stored in your medical records, but it is also a good idea to have your test results with you when you visit your provider.

By knowing your results and knowing where to find them you can be a full partner in your healthcare.

Where can I find more information?

You can find more information about pharmacogenomics at the following websites:

- **National Human Genome Research Institute:**
[genome.gov/dna-day/15-ways/pharmacogenomics](https://www.genome.gov/dna-day/15-ways/pharmacogenomics)
- **Genomics & Precision Health at the Centers for Disease Control and Prevention:**
cdc.gov/genomics/disease/pharma.htm
- **National Institute of General Medicine Sciences:**
nigms.nih.gov/education/pages/factsheet-pharmacogenomics.aspx
- **Clinical Pharmacogenetics Implementation Consortium:**
cpicpgx.org



Indiana University Health



Pharmacogenomic Testing

A personalized approach to prescribing your medicine in heart and vascular care



Indiana University Health

Pharmacogenomic tests check for genes that affect how well some medicines work, or don't work, for you. These tests help your healthcare team choose the right medicine and right dose for you.

Genes are part of your DNA and affect how all parts of your body grow and work. Some genes impact how your body processes medicine.

Genes can influence:

- Whether a medicine will work for you.
- The best dose of a medicine for you.
- Your chances of having a serious side effect from a medicine.

There are many factors, other than your genes, that determine how medicines work for you.

These factors include your age, overall health, lifestyle and the other medicines you take. It is always important for you to talk with your healthcare provider (doctor, nurse or pharmacist) about whether a medicine is working for you and any side effects you are experiencing to find the medicines that are best for you.

Why is the CYP2C19 test used?

People with heart disease, individuals who have a stent or people at risk for a heart attack or stroke are often prescribed a medicine called clopidogrel. Clopidogrel is sometimes called Plavix®. Clopidogrel thins the blood to help keep blood flowing through blood vessels and stents. This test can help determine if clopidogrel is the best medicine for an individual patient.



Some people have a type of the CYP2C19 gene that slows down or stops the body from processing clopidogrel into its active form. People with this type of gene are *poor* or *intermediate metabolizers* and the medicine will not work as well for them. If doctors know that a person has this type of the gene, they can switch to another medicine that would not be affected by it.

Other people have a type of the CYP2C19 gene that speeds up how the body processes clopidogrel into its active form. People with this type of gene are *rapid* or *ultrarapid metabolizers*. They have an increased chance of side effects, such as bleeding. If doctors know that a person has this type of the gene, they will watch for these side effects or switch to a different medicine.

Many people have a type of the CYP2C19 gene that processes clopidogrel normally. People with this type of gene are *normal metabolizers*. This gene type provides some assurance that the medicine and dose is correct, though doctors will still need to watch for side effects.

What will happen with my results?

After the test, your CYP2C19 test result is recorded in your IU Health electronic health record. Your IU Health providers will review that result when they decide whether to prescribe clopidogrel to you. If you are already on clopidogrel, the result will help them decide whether to keep you on that medicine, change your dose or switch to another medicine.

Other IU Health providers can also look at your test result in the electronic health record to help them make decisions about prescribing clopidogrel or other medicines. The information remains in the IU Health electronic health record so it can be used in the future to help guide your healthcare without any need to be tested again.