Test: Cytochrome P450 2C19

**TESTS** | **RESULT** | **FLAG** | **UNITS** | **REFERENCE INTERVAL** | **LAB**
---|---|---|---|---|---
2C19 Genotype: | *1/*1 | | 01 | |
2C19 Metabolic Activity: | Normal | | 01 | |

**Interpretation:**

The phenotype assigned is based on an FDA-cleared algorithm introduced in 2005 using the highest functioning allele to predict the enzyme activity for that individual. Emerging data suggests that, at least for some drugs such as clopidogrel, gene dosage drug response differences can be clinically significant.

**Description of Predicted Metabolic Activity Types:**

Ultrarapid metabolizers (UM) have elevated enzyme activity. For drugs that are active when administered, ultrarapid metabolizers may not reach therapeutic levels due to rapid clearance. For drugs that require activation, ultrarapid metabolizers may be at increased risk for adverse reactions due to higher than expected concentrations of active metabolite.

Normal (extensive) metabolizers (EM) are anticipated to have normal enzyme activity.

Intermediate to normal metabolizers (IM-EM) are anticipated to have a range of reduced to normal enzyme activity.

Intermediate metabolizers (IM) have reduced enzyme activity, and may experience some, or none, of the consequences similar to poor metabolizers.

Poor metabolizers (PM) have significantly reduced or absent enzyme activity. Drugs are metabolized slowly or not at all. For drugs that are active when administered, poor metabolizers may have increased concentrations of active drug with potential for serious side effects. For drugs that require activation, poor metabolizers may have lower than expected concentrations of active metabolite and limited effect of the therapy.
The metabolism of drugs is also influenced by race, ethnicity, diet and other medications and all factors should be considered prior to initiating therapy. All results must be interpreted in the context of other test results and clinical findings. This does not rule out the possibility of variant alleles in other drug metabolism pathways.

Common prescription medications that may be impacted by CYP2C19 gene variants are listed below. The following list is intended as a guide and is not inclusive of all clinically relevant drugs.

PLATELET AGGREGATION INHIBITOR: CLOPIDOGREL
Poor metabolizers (PM) and intermediate metabolizers (IM) are at risk for recurrence of cardiovascular atherosclerotic disease. Alternative antiplatelet agents are recommended for PM patients and may be considered for IM patients, if not clinically contraindicated. Ultrarapid metabolizers (UM) may have an enhanced response to clopidogrel, and may be at an increased risk of bleeding. Standard dosing may be considered for UM patients. Co-administration of clopidogrel alongside CYP2C19 inhibitors such as omeprazole, esomeprazole, lansoprazole, felbamate, fluvoxamine, oral contraceptives, and voriconazole can reduce clopidogrel's platelet inhibition.

TRI-CYCLIC ANTIDEPRESSANTS (TCA): AMITRIPTYLINE, NORTRIPTYLINE
Important Interactions: Studies suggest that PMs may benefit from a lower starting dose.

SELECTIVE SEROTONIN REUPTAKE INHIBITOR (SSRI): CITALOPRAM, SERTRALINE
Important Interactions: Mean clearance rates may be decreased in PMs as compared with EMs. Studies suggest that PMs may be at risk for SSRI related cardiotoxicity.

PROTON PUMP INHIBITORS: OMEPRAZOLE
Important Interactions: Data suggests improved cure rates for EM and PM with double or triple therapy.

ANTI-EPILEPTICS: DIAZEPAM, PHENYTOIN
Important Interactions: Diazepam half-life is significantly prolonged in 2C19 PM and may cause prolonged sedation, particularly if administered with inhibitors of 2C19.

CYP2C19 Information:
Methodology: DNA analysis of the Cytochrome P450 2C19 gene (OMIM 124020, 10q24.1-10q24.3) is performed using primer extension chemistry. Multiplex PCR amplifies DNA fragments containing the variants below. Primer extension then generates a biotin-labeled product to perform flow-sorted detection of
both normal and variant sequences. Molecular-based testing is highly accurate, but as in any laboratory test, rare diagnostic errors may occur.

Alleles Detected:
*1,*2,*3,*17

*1 represents detection of the normal sequence for the variant sites tested. This assay does not detect other variants in the CYP2C19 gene that may affect metabolic activity.

Buccal cells for CYP2C19: This test was developed and its performance characteristics determined by LabCorp. It has not been cleared or approved by the Food and Drug Administration.

References:

Director Review:
Annette K. Taylor, M.S., Ph.D., FACMG
Toni R. Prezant, Ph.D.
Samuel H. Pepkowitz, M.D., FAAP
Joseph B. Kearney, Ph.D., FACMG

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For inquiries, the physician may contact Branch: 800-222-7566 Lab: 800-282-7300
Patient Report

Specimen ID: 026-127-9665-0
Control ID: ABNORMAL, 511675

Patient Details
DOB: 01/11/1990
Age(y/m/d): 029/00/15
Gender: F
SSN: Patient ID:

Specimen Details
Date collected: 01/26/2019 0000 Local
Date received: 01/26/2019
Date entered: 01/26/2019
Date reported: 02/09/2019 0000 ET

Physician Details
Ordering: Referring:
ID:
NPI:

Ordered Items
Cytochrome P450 2C19

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<th>TESTS</th>
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<td>2C19 Genotype:</td>
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<td>2C19 Metabolic Activity:</td>
<td>Poor</td>
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