MAYO CLINIC LABORATORIES

NEW TEST

Notification Date: September 25, 2023
Effective Date: October 26, 2023

Dihydropyrimidine Dehydrogenase, *DPYD* Full Gene Sequencing, Varies

Test ID: DPYDZ

Useful for:

- Identifying individuals at increased risk of toxicity when considering 5-fluorouracil and capecitabine chemotherapy treatment
- Identifying common and rare variants associated with decreased or absent dihydropyrimidine dehydrogenase (DPD) enzyme activity in individuals with suspected DPD deficiency

Genetics Information:

- This is a pharmacogenomics test associated with 5-fluorouracil and capecitabine drug sensitivity. Biallelic variation in the *DPYD* gene is also associated with dihydropyrimidine dehydrogenase deficiency. Individuals who have variations identified in *DPYD* may benefit from genetic consultation.
- This full gene sequencing test detects common, established *DPYD* variants known to impact enzyme activity (eg, *2A, *7, *8, *10, *13, rs67376798, rs75017182, rs115232898) as well as rare sequence variants classified as variant of uncertain significance, likely pathogenic, or pathogenic.

Methods:

Polymerase Chain Reaction (PCR) followed by DNA Sequence Analysis

Reference Values:

An interpretive report will be provided.

Specimen Requirements:

Submit only 1 of the following specimens:

Specimen Type:	**Whole blood**
Container/Tube:	Lavender top (EDTA)
Specimen Volume:	3 mL
Collection Instructions:	1. Invert several times to mix blood 2. Send whole blood specimen in original tube. **Do not aliquot.**
Specimen Stability Information:	Ambient (preferred) 9 days/Refrigerated 30 days

Minimum Volume:	0.45 mL

Specimen Type:	**Saliva**
Patient Preparation:	Patient should not eat, drink, smoke, or chew gum 30 minutes prior to collection.
Supplies:	Saliva Swab Collection Kit (T786)
Specimen Volume:	1 Swab
Collection Instructions:	Collect and send specimen per kit instructions.
Specimen Stability Information:	Ambient 30 days

Shipping Instructions:
Specimen preferred to arrive within 96 hours of collection.

Specimen Stability Information:

Specimen Type	Temperature	Time	Special Container
Varies	Varies		

Ordering Guidance:
This test and DPYDQ / Dihydropyrimidine Dehydrogenase Genotype, Varies are both used to test for genetic variants in the *DPYD* gene that are associated with fluoropyrimidine toxicity. This test can detect rare variants in addition to common variants and is the appropriate test for diagnosis of dihydropyrimidine dehydrogenase deficiency. Additionally, this test is expected to have an overall higher detection rate than DPYDQ, particularly for individuals of non-European ancestry.

Interpretation:
- Evaluation and categorization of variants is performed using the most recent published American College of Medical Genetics and Genomics recommendations as a guideline. Variants are classified based on known, predicted, or possible pathogenicity and reported with interpretive comments detailing their potential or known significance.
- Additionally variant functional status and activity score are assigned using the most recent published Clinical Pharmacogenetics Implementation Consortium (CPIC) recommendations as a guideline.
- For additional information regarding pharmacogenomic genes and their associated drugs, see the Pharmacogenomic Association Tables. This resource also includes information regarding enzyme inhibitors and inducers, as well as potential alternate drug choices.

Cautions:
- Samples may contain donor DNA if obtained from patients who received non-leukocyte reduced blood transfusions or allogeneic hematopoietic stem cell transplantation. Results from samples obtained under

these circumstances may not accurately reflect the recipient's genotype. For individuals who have received blood transfusions, the genotype usually reverts to that of the recipient within 6 weeks. For individuals who have received allogeneic hematopoietic stem cell transplantation, a pretransplant DNA specimen is recommended for testing.
- *DPYD* genetic test results in patients who have undergone liver transplantation may not accurately reflect the patient's dihydropyrimidine dehydrogenase (DPD) status.
- Rare genetic variants in the primer binding regions can affect the testing, and ultimately, the genotype assessment made, including false-negative or false-positive results.
- Test results should be interpreted in the context of clinical findings, family history, and other laboratory data. Large deletions or rearrangements are not detected by this assay, and these may affect DPD protein expression and fluoropyrimidine-related adverse effects or tumor response.
- Sometimes a genetic alteration of unknown significance may be identified. In this case, testing of appropriate family members may be useful to determine pathogenicity of the alteration.
- This test is not designed to provide specific dosing or drug selection recommendations and is to be used as an aid to clinical decision making only. Drug-label guidance should be used when dosing patients with medications regardless of the predicted phenotype.

CPT Code:
81232

Day(s) Performed: Monday through Friday **Report Available:** 5 to 10 days

Questions

Contact Michelle Raths, Laboratory Resource Coordinator at 800-533-1710.