METHYLENETETRAHYDROFOLATE REDUCTASE MUTATION (MTHFR)

SYNONYMS: MTHFR, MTHFR Thermo-labile Variant

INTENDED USE
Identify individuals at risk for thrombosis, pre-eclampsia, and neural tube defect in pregnancy

TEST INCLUDES
The Invader® MTHFR 677 test is an in vitro diagnostic test intended for the detection and genotyping of a single point mutation (677C→T) of the MTHFR gene in isolated genomic DNA obtained from whole blood potassium EDTA samples from patients with suspected thrombophilia.

METHODOLOGY
DNA whole blood extraction followed by real-time PCR and Invader Plus® Technology

SPECIMEN REQUIREMENTS

<table>
<thead>
<tr>
<th>SPECIMEN</th>
<th>VOLUME</th>
<th>CONTAINER</th>
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<tbody>
<tr>
<td>whole blood</td>
<td>5 mL</td>
<td>lavender top (EDTA) tube</td>
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Collection
Routine venipuncture

Storage
Transport specimen to the laboratory immediately at room temperature. If there is a delay in transport, specimen should be refrigerated, but never frozen.

Causes for Rejection
* missing signed Informed Consent for Genetic Testing Form*
* insufficient quantity
* wrong tube
* specimen shared for other testing

INTERFERING SUBSTANCES
Patients on heparin therapy and blood transfusion patients may have blood specimens that can potentially interfere with the PCR results and lead to invalid or erroneous results.

REFERENCE RANGE
The laboratory provides an interpretative report.

ADDITIONAL INFORMATION
MTHFR is the metabolic enzyme involved in the conversion of homocysteine to methionine. The MTHFR 677C→T mutation renders the enzyme more thermo-labile, decreasing its activity by 30% in heterozygotes and by 70% in homozygotes, and is associated with increased plasma homocysteine. Patients with homocystinuria are at elevated risk of venous thromboembolism (VTE). Homozygosity of this mutation accounts for a third of cases of hyperhomocysteinemia. Hyperhomocysteinemia interacts synergistically with coexisting Factor V Leiden to increase the relative risk of VTE 20-fold greater than individuals without either risk factor. Elevated plasma homocysteine has also been associated with an increased risk of cardiovascular disease and neural tube defects in fetuses of pregnant women.

*IMPORTANT: All genetic testing requires that a signed Genetic Consent Form (signed by both patient and physician) OR a Physician Attestation Form (signed one-time only by physician) be on file with the Molecular Pathology Department. Both forms are available online.

<table>
<thead>
<tr>
<th>MEDITECH CODE</th>
<th>MTHFR</th>
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<tbody>
<tr>
<td>CPT CODES</td>
<td>81291</td>
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<tr>
<td>LABORATORY</td>
<td>Molecular Pathology Department</td>
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<tr>
<td>AVAILABILITY</td>
<td>Monday–Friday, 7:30 AM–4:00 PM</td>
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<tr>
<td>TURNAROUND TIME</td>
<td>7–14 days from receipt of signed genetic consent form</td>
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