Chromosome Breakage for Fanconi Anemia

TEST DESCRIPTION:
Blood is exposed to Mitomycin C (MMC) and/or Diepoxybutane (DEB) which leads to an increased rate of chromosome breakage in patients with Fanconi anemia (FA). Chromosome breakage after exposure to MMC and/or DEB is diagnostic for FA but cannot determine the Fanconi anemia complementation group. Additional send-out testing would be necessary to determine a specific gene associated with the specific complementation group; there are at least 16 different genes known to be associated with FA.

TEST DETAILS and COMPLEMENTARY TESTING:
Our laboratory currently offers two methods of inducing chromosome breakage in lymphocyte cultures for the diagnosis of Fanconi anemia: MMC-induced and DEB-induced Breakage Study.

- Three cultures are initiated for each patient: 1) 72-hour PHA-stimulated culture with MMC, 2) 72-hour PHA-stimulated culture with DEB, and 3) 72-hour PHA-stimulated culture. The 72-hour culture without MMC or DEB is used to measure spontaneous breakage as opposed to chemically induced breakage. Non-Fanconi anemia controls for each method used must also be set up to establish a base-line of chromosome breakage for the laboratory. Each of the above cultures must be scored for any chromosome aberrations.

- While chromosome breakage studies are critical in the diagnosis of Fanconi anemia in the affected patient, testing for other at-risk family members requires knowledge of the specific disease-causing mutations in the family. These mutations cannot be identified using the chromosome breakage or other studies performed in our laboratory. Please contact a Laboratory Director or Genetic Counselor should you have questions.

INDICATIONS FOR TESTING: Chromosomal breakage studies are performed for patients with a suspected diagnosis of Fanconi anemia (FA), a disorder characterized by pancytopenia, a variety of congenital anomalies, and spontaneous chromosome instability. Symptoms that may include hematologic conditions such as AML and solid tumors, growth retardation, thumb abnormalities and/or radial aplasia, hyperpigmentary skin changes, cardiac, genitourinary, and/or kidney abnormalities.

SPECIMEN COLLECTION & TRANSPORT:
Complimentary test kits are available upon request, but are not required.

SAMPLE TYPE and REQUIREMENTS:
- **blood, > 3 months of age:** 2-3 ml whole blood in a sodium heparin tube (green top)
- **blood, newborn:** 1.5 ml whole blood in a sodium heparin tube (green top)

SHIPPING:
- Maintain and ship samples at room temperature.
- When possible, please notify our laboratory 24-48 hours in advance of sending a sample for this test.
- Coordinate transport for sample to be received in our laboratory within 24-48 hours of collection.
  - **LOCAL:** Call 402-559-5070 (option 1)
  - **OUT OF AREA:** Prior to shipment, please fax the completed test request form to 402-559-7248, including the FedEx® airbill tracking number.
    - Saturday delivery MUST be checked when sending FedEx® on Friday.
    - Please include Internal Billing Reference # 3155070600 on the FedEx® airbill.
  - **Ship To:** Human Genetics Laboratory – Zip 5440
    UNMC Shipping & Receiving Dock
    601 S. Saddle Creek Road
    Omaha, NE 68106
REQUIRED FORM: The following form can be downloaded via our website.
- Postnatal Test Request Form

OPTIONAL FORM:
- Informed Consent for Genetic Testing

POTENTIAL TEST RESULTS:

NORMAL:
- A normal result indicates no clinically-significant increased incidence of spontaneous, MMC-induced or DEB-induced chromosomal breakage.

ABNORMAL:
- An abnormal result indicates an increased incidence of spontaneous, MMC-induced and DEB-induced chromosomal breakage which likely provides an explanation for the clinical indications.

TURN-AROUND-TIMES: Results are typically available in 7-14 days for routine studies; 5-7 days for newborn studies.

BILLING: Our laboratory offers patient/self-pay, insurance (including Medicare/Medicaid), and client/institution billing options. Verifying coverage requirements or obtaining preauthorization PRIOR TO OR AT THE TIME OF SPECIMEN COLLECTION is often necessary. We provide preauthorization services upon request by calling 402-559-5070 (option 3); the following form is helpful for obtaining the information required by insurance providers and can be downloaded via our website.
- Request for Pre-Authorization for Genetic Testing (Postnatal Diagnoses on Peripheral Blood)

In some circumstances, a test may be warranted even though insurance coverage is denied or not guaranteed. For these situations, we request the following form be signed by the patient and submitted with the sample. This helps inform patients of their potential financial responsibility, should the costs of genetic testing not be paid by their insurance provider.
- Advanced Beneficiary Notice of Noncoverage (ABN) – required when billing Medicare

CPT CODES: 88230(x3), 88248, 88249(x2)

PRICING: Contact the laboratory billing staff for current costs.

REFERENCES: