Neonatal and Adult Cholestasis: Deletion/Duplication Panel

**Test Code:** MD340  
**Turnaround time:** 2 weeks  
**CPT Codes:** 81405 x1, 81406 x1, 81222 x1, 81228 x1

### Condition Description

Neonatal cholestasis is often clinically defined as the prolonged occurrence of conjugated hyperbilirubinemia in the newborn period, due to impairments in the flow of bile. It is caused by a diverse group of hepatobiliary diseases with overlapping clinical presentations, supporting a need for multi-gene diagnostic panel.

The incidence of neonatal cholestasis is estimated to be 1 in 2500 live births. Genetic and metabolic causes account for at least 25-30% of all cases of neonatal cholestasis, generally due to impairments of hepatobiliary transport, intermediary metabolism, storage disorders, or bile duct dysgenesis. Several of these disorders are life-threatening and benefit from early diagnosis and intervention, yet diagnosing the specific cause via routine serum chemistries or by evaluation of liver biopsies is not as definitive as direct genetic testing. Moreover, several cholestatic entities develop in adults that are caused by variants in these same genes.

Highlights for pediatricians, internists, gastroenterologists, and hepatologists include:

- PFICs, Alagille syndrome, A1AT, bile acid synthetic disorders, CF, etc., all on one platform
- Extremely rare cholangiopathies, (nephronophthises, ARPKD) as well as causes of neonatal liver failure (DGUOK and others)
- Opportunities to diagnose adult-onset cholestatic syndromes, including BRIC, LPAC, and ICP
- Evaluation of hyperbilirubinemia: Crigler-Najjar and Dubin-Johnson syndromes

**Reference:**


### Genes

- **ABCB11**
- **ABCB4**
- **ABCG2**
- **ABCG5**
- **ABCG8**
- **AKR1D1**
- **ATP8B1**
- **BAAT**
- **CLDN1**
- **CYP27A1**
- **CYP7A1**
- **CYP7B1**
- **DGUOK**
- **DHCR7**
- **FAH**
- **HNF1B**
- **HSD3B7**
- **INVS**
- **JAG1**
- **LIPA**
- **MKS1**
- **MPV17**
- **NOTCH2**
- **NPC1**
- **NPC2**
- **NPHP1**
- **NPHP3**
- **NPHP4**
- **NR1H4**
- **PEX1**
- **PEX10**
- **PEX11B**
- **PEX12**
- **PEX13**
- **PEX14**
- **PEX16**
- **PEX19**
- **PEX2**
- **PEX26**
- **PEX3**
- **PEX5**
- **PEX6**
- **PKHD1**
- **POLG**
- **SERPINA1**
- **SLC25A13**
- **SLC27A5**
- **SMPD1**
- **TJP2**
- **TMEM216**
- **TRMU**
- **UGT1A1**
- **VIPAS39**
- **VPS33B**

### Indications

This test is indicated for:

- Newborns with chronic liver disease.

### Methodology

**Deletion/Duplication Analysis:** DNA isolated from peripheral blood is hybridized to a gene-targeted CGH array to detect deletions and duplications. The targeted CGH array has overlapping probes that cover the entire genomic region.

### Detection

**Deletion/Duplication Analysis:** Detection is limited to duplications and deletions. The CGH array will not detect point or intronic mutations. Results of molecular analysis must be interpreted in the context of the patient’s clinical and/or biochemical phenotype.

### Specimen Requirements

**Submit only 1 of the following specimen types**

**Type:** Whole Blood (EDTA)

**Specimen Requirements:**

- **EDTA (Purple Top)**  
  Infants and Young Children (2 years of age to 10 years old): 3-5 ml  
  Older Children & Adults: 5-10 ml  
  Autopsy: 2-3 ml unclotted cord or cardiac blood

**Specimen Collection and Shipping:**  
Ship sample at room temperature for receipt at EGL within 72 hours of collection. Do not freeze.
Type: DNA, Isolated

Specimen Requirements:
Microtainer
3µg
Isolation using the Perkin Elmer™Chemagen™ Automated Extraction method or Qiagen™ Puregene kit for DNA extraction is recommended.

Specimen Collection and Shipping:
Refrigerate until time of shipment in 100 ng/µL in TE buffer. Ship sample at room temperature with overnight delivery.

Related Tests

- Neonatal and Adult Cholestasis: Sequencing Panel