# Pulmonary Hypertension: Deletion/Duplication Panel

**Test Code:** MD098  
**Turnaround time:** 2 weeks  
**CPT Codes:** 81228 x1, 81405 x1

## Condition Description

Pulmonary hypertension (PH) is increased pulmonary pressure in the absence of common causes such as lung, heart, or thromboembolic chronic diseases. It is thought that both genetic and environmental factors that alter vascular structure and function contribute to the pathogenesis of PH.

Familial cases of PH are usually inherited in an autosomal dominant manner. With the identification of pathogenic variants in genes known to cause PH, what was previously thought to be idiopathic PH is now known to be genetic. A pathogenic variant in the B*MPR2* gene causes ~70% of hereditary cases of pulmonary arterial hypertension (PAH) and in 10-40% of idiopathic PAH. Other genes with pathogenic variants implicated in PH include: CAV1, GDF2, RASA1, SMAD4, and SMAD9.

Heterozygous pathogenic variants in the ENG and ACVRL1 (previously known as ALK1) genes cause hereditary hemorrhagic telangiectasia (HHT). HHT is an autosomal dominant vascular disorder characterized by acquired cutaneous telangiectasias and arteriovenous malformations that can lead to the development of PAH.

**References:**
- OMIM

## Genes

ACVRL1, B*MPR2*, CAV1, ENG, GDF2, RASA1, SMAD4, SMAD9

## Indications

This test is indicated for:
- Confirmation of a clinical diagnosis of pulmonary hypertension.
- Carrier testing in adults with a family history of pulmonary hypertension.

## Methodology

**Deletion/Duplication Analysis:** DNA isolated from peripheral blood is hybridized to a CGH array to detect deletions and duplications. The targeted CGH array has overlapping probes which cover the entire genomic region. Please note that a “backbone” of probes across the entire genome are included on the array for analytical and quality control purposes. Rarely, off-target copy number variants causative of disease may be identified that may or may not be related to the patient's phenotype. Only known pathogenic off-target copy number variants will be reported. Off-target copy number variants of unknown clinical significance will not be reported.

**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**

Specimen Requirements:
- In EDTA (purple top) tube:  
  - Infants (2 years): 3-5 ml  
  - Older Children & Adults: 5-10 ml
Specimen Collection and Shipping: Ship sample at room temperature with overnight delivery.

**Type: Isolated DNA**

Specimen Requirements:

In microtainer: 60 ug

Isolation using the Qiagen™ Puregene kit for DNA extraction is recommended.

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

**Related Tests**

- Pulmonary Hypertension: Sequencing Panel
- Comprehensive cardiomyopathy panel