

## Skeletal Dysplasia: Deletion/Duplication Panel

**Test Code:** MD170

**Turnaround time:** 2 weeks

**CPT Codes:** 81228 x1

### Condition Description

Skeletal dysplasias are a heterogeneous group of more than 450 disorders with complex mechanisms. Clinical and biochemical features continue to be used reliably to assign patients to this general disease category. Identification of the precise genetic defect is important; however, to permit carrier testing and early prenatal diagnosis. Molecular analysis is likely to expand the clinical spectrum of skeletal dysplasia and may also provide data relevant to prognosis and future therapeutic intervention.

Collectively, the incidence of skeletal dysplasia is estimated to be 1 in 5,000 births. Skeletal dysplasia is referred to as generalized disorders of cartilage and bone, frequently resulting in disproportioned short stature. These disorders can range greatly in severity, from precocious arthropathy in relatively average stature individuals to severe dwarfism with perinatal mortality. A variety of complications can be associated with skeletal dysplasia, including orthopedic, neurologic, auditory, visual, pulmonary, cardiac, renal, and psychological. Five major groups are included in this panel: proportionate short stature; disproportionate short stature; skeletal dysplasias with increased bone density; skeletal dysplasias with decreased bone density osteolysis; and limb malformations.

References:

- Alanay and Lachman. (2011), *J Clin Res Pediatr Endocrinol.* 3(4):163-78.
- Krakow and Rimoin. (2010), *Genet Med.* 12(6):327-41.
- Orioli, Castilla, and Barbosa-Neto. (1986), *J Med Genet.* 23:328-332.
- Seaver and Irons. (2009), *Genet Med.* 11(6):465-70.
- Warman et al. (2011), *Am J Med Genet A.* 155A(5):943-68.

### Genes

[ACP5](#), [ALPL](#), [ANKH](#), [ANO5](#), [ARHGAP31](#), [ATP6V0A2](#), [B3GALT6](#), [B4GALT7](#), [BMP2](#), [BMPR1B](#), [CA2](#), [CANT1](#), [CASR](#), [CC2D2A](#), [CCN6](#), [CDH3](#), [CDKN1C](#), [CEP290](#), [CHST14](#), [CHST3](#), [CHSY1](#), [CLCN5](#), [CLCN7](#), [COL10A1](#), [COL11A1](#), [COL11A2](#), [COL1A1](#), [COL1A2](#), [COL2A1](#), [COL9A1](#), [COL9A2](#), [COL9A3](#), [COMP](#), [CRTAP](#), [CTSK](#), [CUL7](#), [DDR2](#), [DHCR24](#), [DLX3](#), [DMP1](#), [DYM](#), [DYNC2H1](#), [EIF2AK3](#), [ENPP1](#), [ESCO2](#), [EVC](#), [EVC2](#), [EXT1](#), [EXT2](#), [FAM20C](#), [FBLN1](#), [FBN1](#), [FBXW4](#), [FERMT3](#), [FGF10](#), [FGF23](#), [FGFR1](#), [FGFR2](#), [FGFR3](#), [FKBP10](#), [FLNA](#), [FLNB](#), [FMN1](#), [GALNT3](#), [GDF5](#), [GLI3](#), [GNAS](#), [GORAB](#), [GPC6](#), [GREM1](#), [HDAC4](#), [HOXD13](#), [HPGD](#), [HSPG2](#), [ICK](#), [IFITM5](#), [IFT122](#), [IFT140](#), [IFT80](#), [IHH](#), [KIF22](#), [KIF7](#), [LEMD3](#), [LIFR](#), [LMBR1](#), [LMNA](#), [LRP4](#), [LRP5](#), [MAFB](#), [MATN3](#), [MGP](#), [MKS1](#), [MMP13](#), [MMP2](#), [MMP9](#), [MYCN](#), [NEK1](#), [NIPBL](#), [NKX3-2](#), [NOG](#), [NOTCH2](#), [NPR2](#), [OBSL1](#), [OSTM1](#), [P3H1](#), [PAPSS2](#), [PCNT](#), [PHEX](#), [PIGV](#), [PITX1](#), [PLOD2](#), [PPIB](#), [PRKAR1A](#), [PTH1R](#), [PTHLH](#), [PTPN11](#), [PYCR1](#), [RASGRP2](#), [RECQL4](#), [ROR2](#), [RPGRI1](#), [RUNX2](#), [SALL1](#), [SALL4](#), [SERPINH1](#), [SH3PXD2B](#), [SHH](#), [SHOX](#), [SLC26A2](#), [SLC34A3](#), [SLC35D1](#), [SLC39A13](#), [SMARCAL1](#), [SOST](#), [SOX9](#), [SP7](#), [SULF1](#), [TBCE](#), [TBX15](#), [TBX3](#), [TBX5](#), [TBXAS1](#), [TCIRG1](#), [TCTN3](#), [TGFB1](#), [THPO](#), [TMEM216](#), [TMEM67](#), [TNFRSF11A](#), [TNFRSF11B](#), [TNFSF11](#), [TP63](#), [TREM2](#), [TRIP11](#), [TRPS1](#), [TRPV4](#), [TYROBP](#), [WDR35](#), [WNT3](#), [WNT5A](#), [WNT7A](#), [ZMPSTE24](#)

### Indications

This test is indicated for:

- Confirmation of a clinical diagnosis of skeletal dysplasias.
- Carrier testing in adults with a family history of skeletal dysplasias.

### 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:** DNA, Isolated

**Specimen Requirements:**

Microtainer

3µg

Isolation using the Perkin Elmer™ Chemagen™ 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.

**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.

**Special Instructions**

Please include radiographic findings for expert review at EGL Genetics.

**Related Tests**

- Skeletal Dysplasia: Sequencing Panel