Spinal muscular atrophy — *SMN1/SMN2* Copy Number Analysis

Description:

Spinal muscular atrophy (SMA) is an autosomal recessive neuromuscular disorder characterized by anterior horn cell degeneration and progressive muscle weakness and atrophy due to impaired production of survival motor neuron (SMN) protein. Loss of both copies of the *SMN1* gene due to gene conversion or deletion comprises approximately 95% of cases of SMA. The *SMN2* gene, located adjacent to *SMN1,* produces a limited amount of SMN protein and is present at variable quantities (0-4 copies) within the general population. In the setting of SMA, *SMN2* serves as a modifier gene in that a higher number of *SMN2* copies reduces disease severity due to compensatory SMN production.

Indications:

- Confirmation of diagnosis in an individual with features of SMA
- Carrier testing for SMA

Specimen:

At least 3 mls whole blood in a lavender top (EDTA) tube. Label the tube with the patient's name, birth date, and date of collection. Alternatively, 10 mcg of DNA may be submitted.

Testing Methodology:

Testing is performed using multiplex ligation-dependent probe amplification (MLPA) to detect the presence of copy number changes (deletions/duplications) within the *SMN1* gene, as well as *SMN2* gene copy number. This test does not assess for "silent" SMA carrier status, where two copies of *SMN1* are present in cis on one allele and may thus mask carrier status.

Turn-Around Time:

- 7 days or less

CPT Code:

- 81329 x1

Please call 1-866-450-4198 for current pricing or with any billing questions.

Results:

Results will be reported to the referring physician or designee as specified on the requisition form.

Shipping Instructions:

Please enclose **test requisition** with sample.
All information must be completed before sample can be processed.

Place samples in Styrofoam mailer and ship at room temperature by overnight Federal Express to arrive Monday through Friday.

Ship to:

Laboratory of Genetics and Genomics
3333 Burnet Avenue NRB 1042
Cincinnati, OH 45229
513-636-4474

References:

Alias, L., S. Bernal, et al. (2009) Mutation update of spinal muscular atrophy in Spain: molecular characterization of 745 unrelated patients and identification of four novel mutations in the SMN1 gene. Hum Genet. 125(1):29-39.

Hendrickson, B.C., C. Donohoe, et al. (2009) Differences in SMN1 allele frequencies among ethnic groups within North America. 46(9):641-4.

Ogino, S., R. Wilson, et al. (2004) New insights on the evolution of the SMN1 and SMN2 region: simulation and meta-analysis for allele and haplotype frequency calculations. Eur J Hum Genet. 12(12):1015-23.

Verhaart, I., A. Robertson, et al. (2017) Prevalence, incidence and carrier frequency of 5q-linked spinal muscular atrophy — a literature review. Orphanet J Rare Dis. 12(1):124.

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