



PARAMOUNT

ADVANTAGE | ELITE | HMO  
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PROMEDICA MEDICARE  
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# Genetic Testing for Spinal Muscular Atrophy

Policy Number: PG0398  
Last Review: 10/22/2020

## GUIDELINES

**This policy does not certify benefits or authorization of benefits, which is designated by each individual policyholder contract. Paramount applies coding edits to all medical claims through coding logic software to evaluate the accuracy and adherence to accepted national standards. This guideline is solely for explaining correct procedure reporting and does not imply coverage and reimbursement.**

## SCOPE

Professional  
 Facility

## DESCRIPTION

Spinal muscular atrophy (SMA) is a severe neurodegenerative disorder characterized by a loss of anterior horn cells in the spinal cord. Subsequently, patients with SMA experience significant hypotonia, proximal muscle weakness, and muscular atrophy. Reflexes are typically diminished or absent while sensation is preserved. SMA is classified based on the age of onset and severity of clinical symptoms. The most severe form is SMA type 0 in which the onset occurs prenatally. Individuals with this condition experience severe neonatal hypotonia, weakness, early respiratory failure, and facial diplegia. Typically, babies with SMA type 0 live less than 6 months. SMA type I, also called Werdnig-Hoffman disease, is associated with severe, generalized muscle weakness and loss of muscle tone at birth or within the first six months of life. Respiratory failure and subsequent death usually occurs by the age of two. This type accounts for 60% to 70% of the cases. Children with SMA type II, or Dubowitz disease, is diagnosed between 6 and 18 months of age, may be able to sit but are unable to stand or walk without assistance. Scoliosis and problems with swallowing and coughing are common. 70% of individuals with SMA type II are alive at 25 years of age. SMA type III, also known as Kugelberg-Welander disease, is characterized by proximal muscle weakness that manifests after 18 months. SMA type III may also be subdivided into types IIIa (with onset before age 3) and IIIb (with onset after age 3). Individuals with SMA type III learn to walk independently but eventually experience frequent falls and difficulty with stairs; disease progression may also result in the need for a wheelchair in adulthood. Finally, some clinicians will diagnose patients with SMA type IV, if the onset of symptoms is in the second or third decade of life. The muscle weakness is mild, and the respiratory system is not involved. Individuals with SMA type IV have a normal life expectancy.

SMA is inherited in an autosomal recessive manner and is caused by alterations in the survival motor neuron 1 (SMN1) gene located on chromosome 5 at band q12.2 to q13.3. Approximately 95% of SMA patients have the condition as a result of a homozygous deletion involving at least exon 7 of SMN1. SMN2, a gene nearly identical in sequence to SMN1, is located in the same highly repetitive region on chromosome 5. Although it does not cause SMA, it has been shown to modify the phenotype of the condition; those with the milder SMA types II or III tend to have more copies of SMN2 than those with the severe type I.

The American College of Obstetricians and Gynecologists (ACOG, 2017) recommends that "Screening for spinal muscular atrophy should be offered to all women who are considering pregnancy or are currently pregnant." The guidelines state that, "in patients with a family history of spinal muscular atrophy, molecular testing reports of the affected individual and carrier testing of the related parent should be reviewed, if possible, before testing. If the reports are not available, SMN1 deletion testing should be recommended for the low-risk partner."

The American College of Medical Genetics (ACMG, 2008) states that "because SMA is present in all populations, carrier testing should be offered to all couples regardless of race or ethnicity. Ideally, this testing

should be offered before conception or early in pregnancy. The primary goal is to allow carriers to make informed reproductive choices.”

## POLICY

**Genetic testing for spinal muscular atrophy (SMA) requires prior authorization for all product lines.**

## COVERAGE CRITERIA

### HMO, PPO, Individual Marketplace, Elite/ProMedica Medicare Plan , Advantage

Pre-test genetic counseling (as well as post-test genetic counseling) is recommended when considering genetic testing related to carrier status. Documentation of pre-test genetic counseling is required for coverage of carrier screening.

Pre-test genetic counseling should address the following topics (ACMG, 2008):

- A general description of the disorder(s) offered in the carrier screen
- Discussion of variable expressivity and incomplete penetrance if applicable
- Discussion of residual risk in light of a negative screening result
- A description of what it means to be a “carrier”
- Carrier screening is voluntary; Informed consent must be obtained.
  - Informed consent includes discussion of confidentiality, discrimination (i.e. discussion of the Genetic Information Non-Discrimination Act, and applicable state laws), potential psychosocial issues, and economic considerations.

Post-test genetic counseling should address the following topics with a positive carrier screening result:

- Discussion of findings- what the individual is a carrier of, description of the condition, and discussion of risk to fetus or future pregnancies
- Possible reproductive options
- Implications for family members; encouragement to share information with family members

Post-test genetic counseling should address residual risk after a negative carrier screening test.

If obstetric care providers are uncomfortable providing genetic counseling related to carrier screening, referral to a certified genetics professional (such as a genetic counselor) is warranted.

Paramount considers genetic testing for SMN1 medically necessary for the following indications:

- Individual to be tested exhibits symptoms of SMA (eg, symmetrical proximal muscle weakness, absent or markedly decreased deep tendon reflexes); *or*
- Carrier screening when the individual to be tested is asymptomatic and any of the following criteria are met:
  - Individual is a parent or prospective parent`
  - Individual has a family history of SMA or SMA-like disease\*; *or*
  - Individual has an affected or carrier blood relative in whom a disease-causing SMA mutation has been identified. (Testing Strategy: Test for familial mutation); *or*
  - Individual is the reproductive partner of an individual affected with or carrier of SMA or SMA-like disease; *or*
- The prenatal diagnosis or preimplantation genetic diagnosis of SMA in the pregnancy of two known carriers.

\*Note: SMA includes arthrogryposis multiplex congenita-SMA (AMC-SMA), congenital axonal neuropathy (CAN), SMA0, SMA I (Werdnig-Hoffmann disease), SMA II, SMA III (Kugelberg-Welander disease) and SMA IV.

Paramount considers SMN1, SMN2 gene testing medically necessary when ALL of the following criteria are met:

- Individual to be tested exhibits onset of clinical signs and symptoms consistent with SMA at six months of age or younger; AND
- Referral request for authorization of pharmacogenetic testing, to include ALL of the following:
  - Documentation of specific genetic test to be ordered and which drug the provider is considering.
  - Statement about how the results of the testing will lead to specific changes in the patient's management.
  - Statement reflecting the expected clinical improvement in patient outcomes based on the requested test.
    - The patient is a candidate for a targeted drug therapy associated with a specific gene biomarker gene mutation; and
    - The results of the pharmacogenetic tests will directly impact clinical decision-making and clinical outcome for the patient; and
    - The testing method is considered to be scientifically valid to identify the specific gene biomarker or gene mutation; and
    - Use of the testing method has been scientifically proven to improve the patient's care.

Paramount considers genetic testing for spinal muscular atrophy (SMA) experimental and investigational in the general population and for all other indications because there is inadequate evidence in the published peer-reviewed clinical literature regarding its effectiveness, including but not all-inclusive:

- Genetic testing is not approved for SMN2 gene copy analysis for the purpose of predicting SMA prognosis because it is currently considered experimental, investigational, or is unproven.
- Genetic testing is not approved for c.859G>C analysis only for the purpose of predicting SMA prognosis because it is currently considered experimental, investigational, or is unproven.

#### **CODING/BILLING INFORMATION**

The appearance of a code in this section does not necessarily indicate coverage. Codes that are covered may have selection criteria that must be met. Payment for supplies may be included in payment for other services rendered.

<b>CPT CODES</b>	
<b>81329</b>	<i>SMN1</i> (survival of motor neuron 1, telomeric) (eg, spinal muscular atrophy) gene analysis; dosage/deletion analysis (eg, carrier testing), includes SMN2 (survival of motor neuron 2, centromeric) analysis , if performed
<b>81336</b>	<i>SMN1</i> (survival of motor neuron 1, telomeric) (eg, spinal muscular atrophy) gene analysis; full gene sequence
<b>81337</b>	<i>SMN1</i> (survival of motor neuron 1, telomeric) (eg, spinal muscular atrophy) gene analysis; known familial sequence variant(s)
<b>ICD-10 CODES</b>	
<b>G12.0</b>	Infantile spinal muscular atrophy, type I [Werdnig-Hoffmann]
<b>G12.1</b>	Other inherited spinal muscular atrophy

#### **REVISION HISTORY EXPLANATION**

##### **ORIGINAL EFFECTIVE DATE: 04/21/2017**

**04/21/17:** Policy created to reflect most current clinical evidence per The Technology Assessment Working Group (TAWG).

**04/26/18:** Removed codes 81404, 81406, 81408, & 81479. Added ICD-10 codes G12.0 & G12.1. Policy reviewed and updated to reflect most current clinical evidence per The Technology Assessment Working Group (TAWG).

**6/26/19:** Policy reviewed and updated to reflect most current clinical evidence per The Technology Assessment Working Group (TAWG). Added additional testing criteria and updated CPT codes.

**7/9/19:** Information clarified regarding SMA type 0 and I. Added pre-test and post-test genetic counseling information regarding carrier screening. Added requirement of submitting pre-test genetic counseling documentation. Updated carrier testing criteria to reflect recommendations from ACMG and ACOG; updated

criteria to off SMA screening to any parent/prospective parent. Updated CPT codes. Added references.

**10/22/20:** Added documentation supporting pharmacogenetic testing.

**12/28/2020:** Medical policy placed on the new Paramount Medical policy format

## **REFERENCES/RESOURCES**

Centers for Medicare and Medicaid Services, CMS Manual System and other CMS publications and services

Ohio Department of Medicaid

American Medical Association, *Current Procedural Terminology (CPT®)* and associated publications and services

Centers for Medicare and Medicaid Services, Healthcare Common Procedure Coding System, HCPCS Release and Code Sets

Industry Standard Review

Hayes, Inc.

The American College of Obstetricians and Gynecologists (ACOG), Committee Opinion Number 691, March 2017, Carrier Screening for Genetic Conditions

The American College of Genetics, Practice Guidelines: Carrier Screening for Spinal Muscular Atrophy, November 2008 Prior, TW, et al, GeneReviews®, Spinal Muscular Atrophy, <https://www.ncbi.nlm.nih.gov/books/NBK1352/>,