

DISCLAIMER

This Molina Clinical Policy (MCP) is intended to facilitate the Utilization Management process. Policies are not a supplementation or recommendation for treatment; Providers are solely responsible for the diagnosis, treatment, and clinical recommendations for the Member. It expresses Molina's determination as to whether certain services or supplies are medically necessary, experimental, investigational, or cosmetic for purposes of determining appropriateness of payment. The conclusion that a particular service or supply is medically necessary does not constitute a representation or warranty that this service or supply is covered (e.g., will be paid for by Molina) for a particular Member. The Member's benefit plan determines coverage – each benefit plan defines which services are covered, which are excluded, and which are subject to dollar caps or other limits. Members and their Providers will need to consult the Member's benefit plan to determine if there are any exclusion(s) or other benefit limitations applicable to this service or supply. If there is a discrepancy between this policy and a Member's plan of benefits, the benefits plan will govern. In addition, coverage may be mandated by applicable legal requirements of a State, the Federal government or CMS for Medicare and Medicaid Members. CMS's Coverage Database can be found on the CMS website. The coverage directive(s) and criteria from an existing National Coverage Determination (NCD) or Local Coverage Determination (LCD) will supersede the contents of this MCP and provide the directive for all Medicare members. References included were accurate at the time of policy approval and publication.

OVERVIEW

This policy reviews the use of Itvisma for the treatment of Spinal Muscular Atrophy (SMA).

SMA is a genetic disorder characterized by progressive degeneration of the spinal cord and brainstem motor neurons. Degeneration of motor neurons leads to muscle atrophy, hypotonia and in severe cases, early death (Zhang et al. 2020). SMA has an autosomal recessive inheritance pattern. It is estimated that SMA affects 1 in 8,000 to 10,000 people worldwide (Keinath et al. 2021). Severe forms of SMA are the number one genetic cause of infant mortality.

SMA is caused by a defect in the survival motor neuron 1 (*SMN1*) gene, with nearly all cases resulting from deletion, rearrangement, or mutation in the *SMN1* gene. Pathogenic changes in *SMN1* result in significantly lower levels of functional *SMN* protein, leading to loss of motor neurons. There is significant variation in SMA clinical presentation (Cure SMA, 2018). Part of this variability is due to another gene that can modify the effect of pathogenic mutations in the *SMN1* gene. The modifier gene is called the *SMN2* gene. The *SMN2* gene sequence is very similar to the *SMN1* gene and a normal *SMN* protein is occasionally made from the *SMN2* gene. That small percentage of normal *SMN* protein made from the *SMN2* gene is what modifies the effect of the loss of the *SMN1* gene function. The total number and function of *SMN2* copies present are inversely correlated with phenotypic severity; a greater number of *SMN2* copies provides protection and reduces the severity of the disease. Historically, SMA has been divided into sub-types (SMA types 0, 1, 2, 3, and 4) based on disease onset and severity. The severity correlates with the level of *SMN* protein. One of the most severe forms of SMA, Type I (Werdnig-Hoffman disease), typically results in death or the need for permanent breathing support by 2 years of age without treatment (MDA.org). An overview of the different subtypes is available in the "Supplemental Information" section of the policy (Table 1). The life expectancy of SMA patients is inversely related to the age of onset, with higher mortality rates associated with early disease onset. SMA is associated with multiple progressive clinical problems affecting respiration, nutrition, and neuromuscular function. The leading cause of morbidity and mortality in SMA types 1 and 2 is respiratory failure. Prior to approval of disease-modifying therapies, the focus of treatment has been on supportive care for symptomatic and related clinical problems (Prior et al. 2024).

Itvisma (onasemnogene abeparvovec; formerly OAV101 IT) was approved by the FDA in 2025 for the treatment of children over the age of two who have SMA and bi-allelic mutations in *SMN1*. Itvisma is the same pharmaceutical agent as Zolgensma but is administered intrathecally instead of intravenously to treat SMA.

Itvisma is a single dose treatment that targets the root cause of SMA by delivering a fully functional *SMN* gene to target motor neuron cells. This gene therapy uses a viral vector, that is a non-replicating, recombinant, adeno-associated virus, serotype 9 (AAV9). AAV9 is a naturally occurring virus and because of its presence in nature some pediatric patients may have already been exposed to AAV viruses and developed antibodies against this virus. If AAV9 antibodies are present at high levels, patients may be ineligible for Itvisma treatment due to the risk of severe immunologic reactions on repeat exposure to the AAV9 capsid (Zolgensma uses the same viral vector).

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Policy No. 478b

Last Approval: 12/17/2025

Next Review Due By: December 2026



Itivisma FDA labeling includes a **black box** warning (FDA label 2025), noting reports of acute serious liver injury, and elevated aminotransferases. Patients with preexisting liver impairment may be at high risk.

RELATED POLICIES

Molina Pharmacy Policy C20580-A: Evrysdi (risdiplam)

MCP- 293: Spinraza (nusinersen)

MCP- 348: Zolgensma (onasemnogene abeparvovec)

COVERAGE POLICY

All Gene Therapy requests require Molina Medical Director review.

Itivisma (onasemnogene abeparvovec) gene therapy for the treatment of spinal muscular atrophy (SMA) may be **considered medically necessary** when ALL the following clinical criteria are met:

1. Member age 2 to 18 years old at time of administration of Itivisma
2. Prescribed by, or in consultation with, a board-certified pediatric neurologist, neuromuscular specialist or neurologist with experience in the diagnosis and management of SMA
3. Definitive diagnosis of spinal muscular atrophy (SMA) defined by genetic testing
4. Genetic testing confirms bi-allelic mutations (chromosome 5q related deletion or point mutations) in the survival motor neuron 1 (SMN1) gene documented by the presence of ONE of the following:
 - a. Homozygous deletions of SMN1 gene (e.g., homozygous deletion of exon 7 at locus 5q13)
 - b. Homozygous mutation in the SMN1 gene (e.g., biallelic mutations of exon 7)
 - c. Compound heterozygous mutation in the SMN1 gene [e.g., deletion of SMN1 exon 7 (allele 1) and mutation of SMN1 (allele 2)]
5. Three copies of SMN2 gene identified by a laboratory assay capable of distinguishing the difference between three, four and five copies of SMN2
6. Onset of clinical signs and symptoms at $\geq$ 6 months of age
7. Documentation of complete Hammersmith Functional Motor Scale - Expanded (HFMSE) assessment (HFMSE evaluates motor function in patients with SMA who have limited ambulation)
8. Able to sit independently but has never had the ability to walk independently (Sitting is defined by sitting unassisted for 10 or more seconds)
9. Member does not require invasive ventilation, awake noninvasive ventilation for > 6 hours during a 24-hour period, noninvasive ventilation for > 12 hours during a 24-hour period or require tracheostomy
10. Confirmation/attestation of member's current and previous SMA treatments:
 - a. Member is not currently enrolled in SMA clinical trials and is ineligible for clinical trial enrollment
NOTE: Members eligible for, or currently enrolled in, SMA clinical trial enrollment will not be authorized. Individual should receive treatment and monitoring per clinical trial protocols in place by the applicable Institutional Review Board.
 - b. Member has not previously received gene therapy, or Zolgensma or Itivisma
 - c. Itivisma will not be used in combination with an investigational treatment or alternative SMA therapy (e.g., Spinraza, Evrysdi). Treatment must be discontinued prior to infusion of Itivisma

Molina Clinical Reviewer: Review clinical history and profile; terminate current authorizations for SMN modifying therapy upon approval of Itivisma.

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11. Baseline (pre-treatment) laboratory tests within normal limits. Required within 30 days of request.
 - a. Liver function: normal clinical exam, total bilirubin, and prothrombin time; AST and ALT, GGT, bilirubin levels $<2 \times$ Upper Limit of Normal
 - b. Creatinine ≤ 1.0 mg/dL
 - c. Hgb > 8 or < 18 g/dL
 - d. WBC $< 20,000$ per cm³
 - e. Documentation of baseline platelet count
12. Baseline anti-AAV9 antibody titers less than or equal to 1:50 prior to infusion, measured using an enzyme-linked immunosorbent assay (ELISA). Documentation required.
13. Absence of active infection (bacterial or viral, including human immunodeficiency virus [HIV] or positive serology for hepatitis B or C, or Zika virus)
14. Absence of known allergy or hypersensitivity to prednisolone or other glucocorticosteroids or their excipients
15. Member is not concomitantly using any of the following: drugs for treatment of myopathy or neuropathy, agents used to treat diabetes mellitus, ongoing immunosuppressive therapy, plasmapheresis, immunomodulators such as adalimumab, or immunosuppressive therapy within 3 months of planned intrathecal onasemnogene
16. Absence of contraindications to intrathecal therapy (e.g., spina bifida, meningitis, obstructive hardware)

CONTINUATION OF THERAPY

Itivisma is indicated to be dosed and infused one time only. Repeat treatment or re-administration of a dose is not supported by labeling or compendia and is considered **experimental, investigational, and unproven** due to insufficient evidence in the peer-reviewed medical literature to establish long-term safety, efficacy, and effect on net health outcomes.

The use of Itivisma in patients with advanced SMA (e.g., complete paralysis of limbs, permanent ventilator dependence) has not been evaluated (Prescribing Information 2025).

DURATION OF APPROVAL: Infusion may be performed up to ONE MONTH from time of authorization

QUANTITY LIMITATIONS: FDA approved dosing with one-time dose per lifetime. Additional infusions will not be authorized.

DOCUMENTATION REQUIREMENTS. Molina Healthcare reserves the right to require that additional documentation be made available as part of its coverage determination; quality improvement; and fraud; waste and abuse prevention processes. Documentation required may include, but is not limited to, patient records, test results and credentials of the provider ordering or performing a drug or service. Molina Healthcare may deny reimbursement or take additional appropriate action if the documentation provided does not support the initial determination that the drugs or services were medically necessary, not investigational, or experimental, and otherwise within the scope of benefits afforded to the member, and/or the documentation demonstrates a pattern of billing or other practice that is inappropriate or excessive.

SUMMARY OF MEDICAL EVIDENCE

Clinical Development Program Overview for Onasemnogene Abeparvovec-xii (Systemic and intrathecal routes)

Clinical trials for the development of Onasemnogene (intravenous) for symptomatic SMA include four prospective cohort studies. Two were phase 1 dose-finding studies (NCT02122952 & NCT03381729), two phase 3 confirmatory studies (STRIVE-US - NCT03306277; STRIVE EU-NCT03461289), and one long-term follow-up study (START - NCT03421977). All these trials were carried out with the IV formulation of onasemnogene given systemically. All showed benefit of onasemnogene. The trial summaries are below.

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FDA Approval Basis: Approval relied on pooled data from the pivotal Phase 1 trial (n=15) and STR1VE-US trial (n=21), focusing on survival and motor milestone achievement compared to natural history data for infantile-onset SMA.

Pivotal Trial (NCT02122952):

- 15 infants with SMA type 1 received a single IV dose (high or low).
- At 20 months, all were alive without permanent ventilation (vs. 8% in historical controls).
- Significant motor gains: sitting unassisted (11), oral feeding (11), rolling over (9), walking independently (2).
- Conclusion: One-time IV infusion improved survival and motor milestones, though further research is needed.

START Long-Term Follow-Up (NCT03421977):

- Ongoing 15-year safety and durability study of original Phase 1 patients.
- Findings: Milestones maintained; new milestones achieved (e.g., standing with assistance).
- All high-dose patients survived without ventilation.
- Demonstrates sustained efficacy up to 6.2 years post-treatment.

STR1VE-US & STR1VE-EU Phase 3 Trials:

- Showed high survival without permanent ventilation (91% and 97.5%) and improved motor milestones (sitting unassisted in 59% and 44%) compared to untreated controls.

SPR1NT Trial (Pre-symptomatic Infants):

- 30 infants treated before symptom onset (≤ 6 weeks old).
- No serious treatment-related adverse events.
- Motor milestones achieved within normal developmental windows:
 - Two SMN2 copies: 79% sat unsupported; 36% stood; 29% walked.
 - Three SMN2 copies: 53% stood; 40% walked.

Itvisma is the intrathecal formulation of Onasemnogene. Two trials have been conducted to date looking at the safety and efficacy of Itvisma, STRONG and STEER.

STRONG (NCT03381729) is a Phase 1, open-label, dose-comparison, multi-center trial that evaluated the safety and efficacy of a one-time intrathecal (IT) administration of onasemnogene. Patients included in the study were those with SMA type 2 and three copies of the SMN2 gene who were able to sit unassisted for 10 seconds but were unable to walk or stand. The primary endpoints were safety/tolerability, independent standing for ≥ 3 seconds in patients aged 6 to < 24 months or change in Hammersmith Functional Motor Scale-Expanded (HFMSE) score in patients aged 24 to < 60 months. Outcomes were compared with those of Pediatric Neuromuscular Clinical Research dataset (PNCr). In May 2019, reported data showed motor function gains and milestone achievements. Two serious treatment-related AEs also occurred, both transaminase elevation. However, the frequency of children with such AEs were lower than that seen with IV administration of Zolgensma. The FDA initiated a partial clinical trial hold in October 2019 in the high dose group. In August 2021, the hold was lifted, and the FDA determined that the STRONG study could proceed with IT delivery. However, despite release from clinical hold, the sponsor (Novartis) elected not to enroll more patients. This phase 1 and 2 study ended in November 2021.

The results of the Phase 1/2 STRONG study of 32 children aged ≥ 2 years and < 5 years old with SMA Type 2 were published in 2023, (Finkel et al). Treatment with onasemnogene IT was safe and well tolerated. Older patients (24 to < 60 months) treated with the medium dose had a statistically significant improvement in the Hammersmith Functional Motor Scale Expanded at month 12 and a clinically meaningful response was noted.

The **STEER trial (NCT05089656)** is a randomized, sham-controlled, double-blind, phase 3 study. The primary objective of STEER is to evaluate the clinical efficacy, safety, and tolerability of a one-time IT dose of OAV101 IT in treatment naïve children and young people with Type 2 SMA who are between 2 and 18 years of age, able to sit, but have never walked. N=126, 75 dosed with Itvisma and 51 in the sham control group. Follow-up was at 52 weeks. The STEER study results have not been published in the literature but the FDA label section for clinical trial information reports statistically significant improvement in motor function with Itvisma treatment as compared to sham controls. Trial results in table below.

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Table (from FDA label 2025): Efficacy results from STEER study (n=126)

Endpoint	ITVISMA (N = 75)	Sham (N = 51)	Treatment Difference ITVISMA-Sham (95% CI)	p-value
Mean change from baseline in HFMSE total score at the end of follow-up ^{1, 2, 3}	2.39 (0.439) ⁴	0.51 (0.532) ⁴	1.88 (0.51 – 3.25)	0.0074

National and Specialty Organizations

Itvisma has yet to be included in guidelines by national organizations.

SUPPLEMENTAL INFORMATION

Clinical Classification of SMA. SMA disease phenotypes are classified according to a scheme developed at the Muscular Dystrophy Association-sponsored International Consortium on SMA in 1991; these phenotypes were modified into five subtypes based on age of onset, inheritance pattern, and maximum motor function achieved. Table 1 adapted from Table 1 of Verhaart et al. 2017; Number of SMN2 copies based on Calucho et al. 2018.

TABLE 1: CLASSIFICATION OF SMA BY TYPE					
SMA Type (Alternative Names)	Age at Symptom Onset	Maximum Motor Function Achieved	Life Expectancy	Incidence	Affected Gene(s) (Usual # of SMN copies)
0 (Congenital, Prenatal SMA)	Prenatal (30-36 weeks)	Nil; Decreased Fetal Movement	Rarely past 6 months	<1%	SMN1 (1 SMN2 copy)
1 (Severe infantile acute; Werdnig-Hoffman disease)	Birth to 6 months	Cannot sit independently, difficulty breathing	< 2 years	60%	SMN1 (2 SMN2 copies)
2 Dubowitz disease	6 to 18 months	Sit independently, but cannot stand or walk	> 2 years; 25 years (70%)	25%	SMN1 (2-4 SMN2 copies) 80% have 3 copies
3 Kugelberg-Welander disease	After 18 months	Can stand or walk, but walking, stairclimbing become difficult. Wheelchair assistance usually needed in later life.	Normal	15%	SMN1 (3-4 SMN2 copies) 95% have ≥ 3 copies
4 Adult-onset SMA	Adult; 20-30 years	Walk during adulthood; slow decline; Mild to moderate muscle weakness, tremor, twitching in proximal muscles; difficulty breathing	Normal	<1%	SMN1 (≥ 4 copies) 4-8 SMN2 copies
<i>*Number in bold indicates the predominate copy number</i>					

Age of onset is a predictor of the severity of disease and maximal motor function as higher mortality rates associated with early disease onset (Farrar et al. 2017) Onset occurs before 6 months of age in about 60% of affected individuals; these patients usually do not live past 2 years old.

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TABLE 2: SELECT NEUROLOGICAL FUNCTION ASSESSMENTS USED IN SMA CLINICAL TRIALS

Measure	Description
Hammersmith Infant Neurologic Exam (HINE Section 2) NOTE: CL-101 did not collect HINE-2 data, and there are no published data reporting HINE-2 scores with Zolgensma treatment.	- Used for assessing various aspects of neurologic function in infants ages 2 months to 2 years 3 sections, 26 items - Section 1: Neurologic assessment - Section 2: Developmental milestone assessment - Section 3: Behavioral assessment - Section 2 may be used alone 8 items, scores of 0 to 2, 3, or 4 - Children with SMA1 may score 0 on all 8 items
Hammersmith Functional Motor Scale, Expanded (HFMSE) NOTE: The STRONG trial collected HFMSE	- Used to evaluate motor function in individuals with later-onset SMA (SMA2 and SMA3) 33 items - Total score ranges from 0 to 66; lower scores indicate poorer function - Scores in patients with SMA2 or SMA3 may decline over 12 months
Children's Hospital of Philadelphia Infant Test of Neuromuscular Disorders (CHOP INTEND)	- Used to evaluate motor skills of children with SMA ages ~4 months to 4 years - Includes 16 items to assess motor skills, each graded on a scale of 0 to 4 response (0 for no response, 1 for minimal, 2 for partial, 3 for nearly full, 4 for complete) - Total score ranges from 0 to 64; maximum total score possible is 64; lower scores indicate poorer function - Infants with SMA may score much lower than unaffected infants - A score exceeding 40 is rarely seen in infants with SMA 1 - Has been validated for use in SMA type 1 infants Informational Note: Lower CHOP-INTEND scores lower scores indicate poorer function. Total score ranges from 0 to 64; maximum total score possible is 64; lower scores indicate poorer function. The mean CHOP INTEND score at baseline was 28 (Phase 3 STRIVE-EU trial; data as of Dec 31, 2019)
Motor Function Measure-32 Item (MFM-32)	- Used to evaluate motor function in children and adults with neuromuscular diseases - Assesses 32 items in 3 dimensions (standing and transfers, axial and proximal motor function, distal motor function) - Total score ranges from 0 to 96; lower scores indicate poorer function

CODING & BILLING INFORMATION

CPT (Current Procedural Terminology)

Code	Description
96450	Chemotherapy administration, into CNS (e.g., intrathecal), requiring and including spinal puncture

HCPCS (Healthcare Common Procedure Coding System)

Code	Description
C9399	Unclassified drugs or biologicals [when specified as Itvisma (onasemnogene abeparvovec)]
J3590	Unclassified biologics [when specified as Itvisma (onasemnogene abeparvovec)]

CODING DISCLAIMER. Codes listed in this policy are for reference purposes only and may not be all-inclusive. Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement. Listing of a service or device code in this

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APPROVAL HISTORY

12/17/2025 New policy. IRO reviewed by practicing physician board certified in Neurology on December 7, 2025.

REFERENCES

1. Calucho, M., Bernal, S., Alías, L., et al. Correlation between SMA type and SMN2 copy number revisited: An analysis of 625 unrelated Spanish patients and a compilation of 2834 reported cases. *Neuromuscul Disord.* 2018 Mar;28(3):208-215. doi: 10.1016/j.nmd.2018.01.003. Epub 2018 Jan 11. PMID: 29433793.
2. ClinicalTrials.gov. Study of Intrathecal Administration of Onasemnogene Abeparvovec-xioi for Spinal Muscular Atrophy (STRONG) ClinicalTrials.gov Identifier: (NCT03381729). Last updated April 24, 2023. Accessed December 1, 2025. <https://clinicaltrials.gov/study/NCT03381729?term=NCT03381729&rank=1>
3. ClinicalTrials.gov. Efficacy and Safety of Intrathecal OAV101 (AVXS-101) in Pediatric Patients With Type 2 Spinal Muscular Atrophy (SMA) (STEER) ClinicalTrials.gov Identifier: Last updated December 8, 2025. Last accessed December 8, 2025. NCT05089656. <https://clinicaltrials.gov/study/NCT05089656?term=NCT05089656&rank=1>
4. ClinicalTrials.gov. START Long-Term Follow-up. ClinicalTrials.gov Identifier: NCT03421977. Long-term follow-up study for patients from AVXS-101-CL-101 (START). Last updated April 25, 2025. Accessed December 2, 2025. <https://clinicaltrials.gov/ct2/show/NCT03421977>.
5. ClinicalTrials.gov Identifier: NCT02122952. Gene transfer clinical trial for spinal muscular atrophy type 1. Last updated September 15, 2022. Accessed December 2, 2025. <https://clinicaltrials.gov/study/NCT02122952>.
6. ClinicalTrials.gov. STR1VE. ClinicalTrials.gov Identifier: NCT03306277. Gene replacement therapy clinical trial for patients with spinal muscular atrophy type 1. Last updated August 16, 2022. Accessed December 2, 2025. <https://clinicaltrials.gov/ct2/show/NCT03306277?term=AVXS-101&rank=5>.
7. ClinicalTrials.gov. SPR1NT. ClinicalTrials.gov Identifier: NCT03505099. Pre-symptomatic study of intravenous AVXS-101 in spinal muscular atrophy (SMA) for patients with multiple copies of SMN2. Last updated September 7, 2022. Accessed December 8, 2025. <https://clinicaltrials.gov/ct2/show/NCT03505099?term=AVXS-101&rank=1%20%20>
8. ClinicalTrials.gov. NCT02122952. Al-Zaidy et al. (2019) Study health outcomes in spinal muscular atrophy type 1 following AVXS-101 gene replacement therapy. Last updated September 15, 2022. Accessed December 2, 2025. <https://clinicaltrials.gov/ct2/show/NCT02122952>
9. ClinicalTrials.gov. NCT04851873. A Phase IIIb, open-label, single-arm, single-dose, multicenter study to evaluate the safety, tolerability and efficacy of intravenous administration of OAV101 (AVXS-101) in patients with spinal muscular atrophy (SMA) with bi-allelic mutations in the survival motor neuron 1 (SMN1) gene weighing ≥ 8.5 kg and ≤ 21 kg, over a 12 month period. Last updated October 9, 2024. Accessed December 8, 2025.
10. ClinicalTrials.gov. NCT05073133. A phase iv open-label, single-arm, single-dose, multicenter study to evaluate the safety, tolerability and efficacy of gene replacement therapy with intravenous OAV101(AVXS101) in pediatric patients from Latin America with spinal muscular atrophy (SMA) – OFELIA. Last updated October 9, 2024. Accessed December 6, 2025.
11. Day JW, Finkel RS, Chiriboga CA, et al. Onasemnogene abeparvovec gene therapy for symptomatic infantile-onset spinal muscular atrophy in patients with two copies of SMN2 (STR1VE): an open-label, single-arm, multicentre, phase 3 trial. *Lancet Neurol.* 2021 Apr;20(4):284-293. doi: 10.1016/S1474-4422(21)00001-6. Epub 2021 Mar 17. PMID: 33743238.
12. Day JW, Mendell JR, Mercuri E, et al. Clinical Trial and Post marketing Safety of Onasemnogene Abeparvovec Therapy. *Drug Saf.* 2021 Oct;44(10):1109-1119. doi: 10.1007/s40264-021-01107-6. Epub 2021 Aug 12. Erratum in: *Drug Saf.* 2022 Feb;45(2):191-192. Keinath MC, Prior DE, Prior TW. Spinal Muscular Atrophy: Mutations, Testing, and Clinical Relevance. *Appl Clin Genet.* 2021 Jan 25;14:11-25. doi: 10.2147/TACG.S239603. PMID: 33531827; PMCID: PMC7846873.
13. Finkel RS, Darras BT, Mendell JR, et al. Intrathecal Onasemnogene Abeparvovec for Sitting, Nonambulatory Patients with Spinal Muscular Atrophy: Phase I Ascending-Dose Study (STRONG). *J Neuromuscul Dis.* 2023;10(3):389-404. doi: 10.3233/JND-221560. PMID: 36911944; PMCID: PMC10200150.
14. Finkel RS, Mercuri E, Meyer OH, et al. Diagnosis and management of spinal muscular atrophy: Part 2: Pulmonary and acute care; medications, supplements and immunizations; other organ systems; and ethics. *Neuromuscul Disord.* 2018 Mar;28(3):197-207. doi: 10.1016/j.nmd.2017.11.004. Epub 2017 Nov 23. PMID: 29305137.
15. Itivisma (onasemnogene abeparvovec) [prescribing information]. Bannockburn, IL: Novartis Gene Therapies Inc; November 2025. <https://www.novartis.com>
16. Mendell JR, Al-Zaidy SA, Lehman KJ, et al. Five-Year Extension Results of the Phase 1 START Trial of Onasemnogene Abeparvovec in Spinal Muscular Atrophy. *JAMA Neurol.* 2021 Jul 1;78(7):834-841. doi: 10.1001/jamaneurol.2021.1272. PMID: 33999158; PMCID: PMC8129901.
17. Mendell JR, Al-Zaidy S, Shell R, et al. Single-Dose Gene-Replacement Therapy for Spinal Muscular Atrophy. *N Engl J Med.* 2017 Nov 2;377(18):1713-1722. doi: 10.1056/NEJMoa1706198. PMID: 29091557.
18. Mercuri E, Finkel RS, Muntoni F, et al; SMA Care Group. Diagnosis and management of spinal muscular atrophy: Part 1: Recommendations for diagnosis, rehabilitation, orthopedic and nutritional care. *Neuromuscul Disord.* 2018 Feb;28(2):103-115. doi: 10.1016/j.nmd.2017.11.005. Epub 2017 Nov 23. PMID: 29290580.
19. Mercuri E, Muntoni F, Baranello G, et al. STR1VE-EU study group. Onasemnogene abeparvovec gene therapy for symptomatic infantile-onset spinal muscular atrophy type 1 (STR1VE-EU): an open-label, single-arm, multicenter, phase 3 trial. *Lancet Neurol.* 2021 Oct;20(10):832-841. doi: 10.1016/S1474-4422(21)00251-9.

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20. Müller-Felber W, Vill K, Schwartz O, et al. Infants Diagnosed with Spinal Muscular Atrophy and 4 SMN2 Copies through Newborn Screening - Opportunity or Burden? J Neuromuscul Dis. 2020;7(2):109-117. doi: 10.3233/JND-200475. Erratum in: J Neuromuscul Dis. 2021;8(2):335-336. PMID: 32144995; PMCID: PMC7175938.
21. National Organization for Rare Disorders (NORD). Spinal Muscular Atrophy. National Organization for Rare Disorders. Danbury, CT. <https://rarediseases.org/rare-diseases/spinal-muscular-atrophy/>.
22. Prior TW, Leach ME, Finanger E. Spinal Muscular Atrophy. 2000 Feb 24 [Updated September 19, 2024]. In: Adam MP, Feldman J, Mirzaa GM, et al., editors. GeneReviews® [Internet]. Seattle (WA): University of Washington, Seattle; 1993-2023. <https://www.ncbi.nlm.nih.gov/books/NBK1352/>. Accessed December 2025.
23. Schorling DC, Becker J, Pechmann A, Langer T, Wirth B, Kirschner J. Discrepancy in redetermination of SMN2 copy numbers in children with SMA. Neurology. 2019 Aug 6;93(6):267-269. doi: 10.1212/WNL.0000000000007836. Epub 2019 Jun 24. PMID: 31235659.
24. Strauss KA, Farrar MA, Muntoni F, et al. SPR1NT trial. Onasemnogene abeparvovec for presymptomatic infants with two copies of SMN2 at risk for spinal muscular atrophy type 1: the Phase III SPR1NT trial. Nat Med. 2022 Jul;28(7):1381-1389. doi: 10.1038/s41591-022-01866-4. Epub 2022 Jun 17. PMID: 35715566; PMCID: PMC9205281.
25. Strauss KA, Farrar MA, Muntoni F, et al. SPR1NT trial. Onasemnogene abeparvovec for presymptomatic infants with three copies of SMN2 at risk for spinal muscular atrophy: the Phase III SPR1NT trial. Nat Med. 2022 Jul;28(7):1390-1397. doi: 10.1038/s41591-022-01867-3. Epub 2022 Jun 17. PMID: 35715567; PMCID: PMC9205287.
26. Tizzano EF, Quijano-Roy S, Servais L, et al. Outcomes for patients in the RESTORE registry with spinal muscular atrophy and four or more SMN2 gene copies treated with onasemnogene abeparvovec. Eur J Paediatr Neurol. 2024 Nov;53:18-24. doi: 10.1016/j.ejpn.2024.08.006. Epub 2024 Aug 27. PMID: 39260228.

Supplemental Information

Table 1 adapted from Table 1 of Verhaart et al. 2017; Number of SMN2 copies based on Calucho et al. 2018:

1. Calucho M, et al. Correlation between SMA type and SMN2 copy number revisited: An analysis of 625 unrelated Spanish patients and a compilation of 2834 reported cases. Neuromuscul Disord. 2018;28(3):208-215.
2. De Sanctis R, Pane M, Coratti G, et al. Clinical phenotypes and trajectories of disease progression in type 1 spinal muscular atrophy. Neuromuscular disorders: NMD. 2018;28(1):24-28.
3. Verhaart IEC, Robertson A, Wilson IJ, et al. Prevalence, incidence and carrier frequency of 5q-linked spinal muscular atrophy - a literature review. Orphanet J Rare Dis. 2017;12(1):124.

Table 2 Sources:

1. Farrar MA, et al. Ann Neurol. 2017;81(3):355-368.
2. Glanzman AM, Mazzone E, Main M, et al. The Children's Hospital of Philadelphia Infant Test of Neuromuscular Disorders (CHOP INTEND): test development and reliability. Neuromuscular disorders: NMD. 2010;20(3):155-161.
3. Glanzman AM, et al. The Children's Hospital of Philadelphia Infant Test of Neuromuscular Disorders (CHOP INTEND): test development and reliability. Neuromuscul Disord. 2010;20(3):155-61.
4. Glanzman AM, McDermott MP, Montes J. Validation of the Children's Hospital of Philadelphia Infant Test of Neuromuscular Disorders (CHOP INTEND). Pediatr Phys Ther. 2011;23(4):322-26. Bérard C, Payan C, Hodgkinson I, Fermanian J; MFM Collaborative Study Group. A motor function measure for neuromuscular diseases. Construction and validation study. Neuromuscul Disord. 2005;15(7):463-70.
5. Glanzman AM, et al; the Pediatric Neuromuscular Clinical Research Network for Spinal Muscular Atrophy (PNCR), and the Muscle Study Group (MSG). Validation of the Expanded Hammersmith Functional Motor Scale in spinal muscular atrophy type II and III. J Child Neurol. 2011;26(12):1499-507.
6. Haataja L, Mercuri E, Regev R, et al. Optimality score for the neurologic examination of the infant at 12 and 18 months of age. J Pediatr. 1999; 135(2 pt 1):153-61.
7. Mercuri E, Finkel R, Montes J, et al. Patterns of disease progression in type 2 and 3 SMA: implications for clinical trials. Neuromuscul Disord. 2016;26(2):123-31.
8. Romeo DM, Ricci D, Brogna C, Mercuri E. Use of the Hammersmith Infant Neurological Examination in infants with cerebral palsy: a critical review of the literature. Dev Med Child Neurol. 2016;58(3):240-45