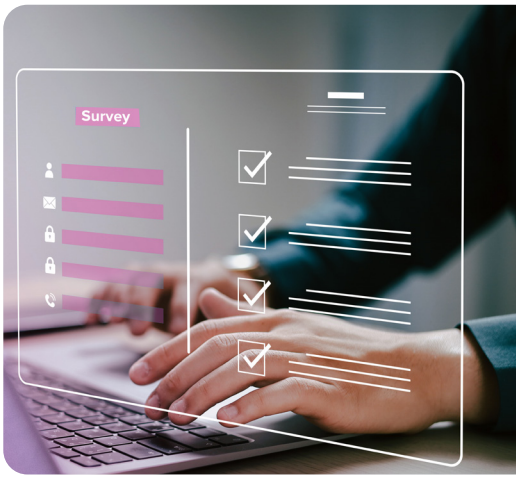
CASE STUDY

A Real-World Survey of Spinal Muscular Atrophy: Uncovering the Persistent Burden in Treated Patients

Spinal muscular atrophy (SMA) affects approximately 1 in 10,000 to 15,000 live births and is characterized by progressive degeneration of motor neurons, resulting in muscle weakness, mobility loss, and profound limitations in daily life. While survival motor neuron (SMN)-targeted therapies represent a significant advance in slowing disease progression, treatment benefits may plateau over time, and the extent to which improvements in motor function translate into meaningful reductions in muscle weakness and fatigue remains poorly understood.

For patients currently receiving SMN-targeted treatments, a critical question remains: what burden persists despite treatment? To address this gap, Precision AQ's Health Economics & Outcomes Research (HEOR) team designed two distinct but complementary, web-based surveys to assess the ongoing burden of disease and unmet needs among treated patients with SMA and their caregivers.



Study Details at a Glance

STUDY TYPE: 2 cross-sectional, complementary, web-based surveys

Survey 1: Designed for patients with SMA	**Survey 2:** Designed for caregivers of pediatric patients with SMA

POPULATION: Non-ambulant patients with SMA currently receiving risdiplam or nusinersen and their primary, informal caregivers

68 adult patients: Mean age: 37.5 years	**40 pediatric patients:** Mean age: 8.3 years, represented by caregiver proxies

METHODS:

1. Patient Survey: Designed to capture aspects related to clinical, productivity, & humanistic burden, unmet needs, and respondent backgrounds' clinical & demographic characteristics	**2. Caregiver Survey:** Included same modules as patient survey with adapted language for proxy completion & additional module to assess caregiver-specific burden
3. Patient-Reported Outcomes Measurement Information System (PROMIS) Fatigue Short Form (SF) Instrument: To characterize perceived fatigue among patients living with SMA	**4. EuroQoL Five Dimensions Five Level Scale (EQ-5D-5L):** To assess quality of life

Challenges

Despite the availability of three approved therapies for SMA that slow the natural progression of the disease and improve motor function – risdiplam, nusinersen, and onasemnogene abeparvovec – the long-term impact remains uncertain.

Key evidence gaps included:

- **No standardized measure** of remaining disease burden among treated patients
- **Limited real-world data** on how fatigue and SMA-related muscle weakness affect quality of life and functional abilities in the post-treatment era
- **No systematic assessment** of productivity loss, caregiver burden, and emotional well-being across both pediatric and adult SMA populations

The study sponsor needed credible, peer-reviewed evidence to support the value story for a next-generation SMA therapy, one grounded in the lived experience of patients, not just clinical trial endpoints.

Solutions

Precision AQ's HEOR team designed a survey for patients and caregiver proxies to capture aspects related to clinical, productivity, and humanistic burden and related unmet needs across the full spectrum of non-ambulant SMA.

Critical solutions implemented:

- **Survey instrument design** for adult patients and caregiver proxies
- **Validated patient-reported outcome measures**, including through PROMIS Fatigue SF and EQ-5D-5L to support scientific rigor, peer-reviewed publication, and payer decision-making
- **Partnership with a trusted patient advocacy organization**, to facilitate recruitment
- **Double-blinded data collection** to protect participant and sponsor identities throughout the research process
- **Rigorous statistical analysis** with findings reported separately by pediatric and adult cohorts

This approach reflects Precision AQ's comprehensive suite of HEOR capabilities, from evidence strategy and primary data collection to peer-reviewed publication.

Results

The surveys demonstrated a significant and persistent burden among patients with SMA and their caregivers, even among those receiving long-term SMN-targeted therapy.

Key findings included:

- **Muscle weakness remained widespread.** Despite most patients having received treatment for ≥2 years (83% of pediatric patients and 94% of adults), ongoing muscle weakness was reported by 95% of pediatric patients and 99% of adults.
- **Disease severity continued to affect daily life.** Nearly two-thirds of patients (63% of pediatric and 68% of adult patients) rated their muscle weakness as severe or very severe, with substantial impacts on everyday activities.
- **Fatigue contributed meaningfully to residual burden.** Higher levels of fatigue were significantly associated with poorer overall health status, as measured by the EQ-VAS ($p < 0.05$).
- **Quality of life remained compromised.** EQ-5D-5L results showed clinically meaningful impairment across multiple domains, including mobility, self-care, usual activities, and emotional well-being.
- **Mobility limitations and muscle weakness represented the greatest unmet needs.** Across both pediatric and adult cohorts, these domains were consistently identified as showing the least improvement despite treatment.
- **Caregiver burden was substantial.** Caregivers reported significant impacts on their own quality of life, well-being, and productivity.

Precision AQ's research generated robust, published real-world evidence highlighting the residual burden and unmet needs that persist despite treatment. These findings provided stakeholders with credible evidence to support payer engagement, health technology assessment (HTA) submissions, and informed healthcare decision-making.

Work With Precision AQ's HEOR Team to Turn Evidence into Access

The burden of SMA and other conditions is often underestimated by decision-makers until the right evidence makes it visible. Precision AQ's HEOR team partners with patients, caregivers, and healthcare professionals to generate stakeholder-driven evidence that quantifies burden, unmet needs, and treatment impact. By translating these insights into actionable evidence, we help clients strengthen value narratives, support payer and HTA engagement, and inform reimbursement and market access strategies. **Connect with our team** to explore our HEOR capabilities further and build the evidence that gets your therapy to the patients who need it most.

To learn more about Precision AQ, scan the QR code or visit www.precisionaq.com

PRECISION AQ®