Make today a breakthrough.

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Written Testimony for the Record

in Support of Continued NIH Research into Spinal Muscular Atrophy

U.S. House Labor, HHS, Education and Related Agencies

FY 2023 Public Witness Hearing (May 26, 2022)

Chairwoman DeLauro, Ranking Member Cole, and Members of the Subcommittee,

As the leading national organization that represents individuals with a rare neuromuscular disease known as spinal muscular atrophy (SMA), Cure SMA is pleased to share written testimony in support of continued SMA research at the National Institutes of Health (NIH). While past NIH investments and congressional policies have led to positive changes in SMA, more research and development is needed to address significant unmet need that remains for children and adults with SMA across the country. Cure SMA requests report language be included within the U.S. Department of Health and Human Services' National Institutes of Health (Office of the Director) section of the report.

SMA affects the motor nerve cells in the spinal cord and impacts the muscles used for activities such as breathing, eating, crawling, and walking. SMA impacts approximately 1 in 11,000 births in the U.S., regardless of race or gender, and about 1 in every 50 Americans is a genetic carrier.

SMA was once the leading genetic cause of infant death. Babies born with SMA Type 1, the most common and severe form of the disease, often lost 90% of their motor neuron cells by age 6 months. Once those motor neurons are lost, they cannot be regenerated. Muscle weakness associated with lost motor neurons causes underdeveloped lungs, compromising a person's breathing, and leading to respiratory failure. Most babies born with SMA Type 1 died before reaching their second birthday.

Today, the future is brighter for children and adults with SMA, thanks to past research investments made by this Subcommittee and recent congressional policies focused on rare childhood diseases such as SMA.

There are now three U.S. Food and Drug Administration (FDA) approved treatments that are helping to slow or stop future degenerative nerve damage. When delivered early, before the onset of symptoms, these treatments can greatly improve motor and developmental gains in individuals with SMA and lead to reduced future need for intensive health care and specialized supports, such as ventilators. Noah, who was born with SMA in November 2021, has benefited from an early diagnosis through newborn screening and early access to an effective SMA treatment. He is now, at age six months, sitting without assistance, breathing normally, and

meeting other key developmental milestones, which would have been unheard of prior to treatments.

SMA is widely viewed as a research success amongst rare diseases, given that multiple treatments exist. The National Institute of Neurological Disorders and Stroke (NINDS) identified SMA as a "research highlight" in its fiscal year (FY) 2023 congressional justification and noted: "NINDS has contributed to new treatments for rare disorders, including the first gene-based, disease-modifying therapies for spinal muscular atrophy and muscular dystrophy."[1]

However, current SMA treatments do not cure the disease or eliminate all of its debilitating symptoms. Significant unmet needs remain across all ages and disease stages of SMA. Individuals with SMA report ongoing challenges related to muscle weakness and fatigue, due to degeneration that occurred prior to treatment. "Everything is difficult because depending on the day, my muscles get tired which makes me tired," said a teenage girl with SMA who responded to a Cure SMA survey of the SMA adolescent and young adult population.[2] Individuals who received treatment before the onset of clinical symptoms may also experience some challenges, such as bulbar impairment and gait abnormalities.

Unmet needs are especially great for adults with SMA, the largest segment of the SMA population. Kyle, an adult with SMA who is married and works full-time, said reversing nerve damage and regaining lost muscles would "translate to exponential gains in functional abilities." To correct scoliosis, he has rods in his back that limit his ability to bend, making eating soup or cereal independently nearly impossible. Being able to lift his arms even a few more inches off his wheelchair armrest would greatly increase his independence. "It may not sound like much, but those two inches can be life-changing," he said. "And when I look to the future, I am excited about the independence I am sure that I will gain."

The future of SMA will be decided by the decisions made today, including those made by this Subcommittee.

Cure SMA is committed to continuing the progress made in SMA by investing its own resources into new basic research for SMA, particularly focused on enhancing muscle strength and function.[3] However, as the largest single public funder of biomedical research in the world, NIH must also continue its research commitment to SMA. Cure SMA urges the Subcommittee to direct the NIH to continue new SMA research into the role and function of survival motor neuron (SMN) protein, investigation into non-SMN pathways and targets capable of modifying disease, and research into how to best combine SMN-enhancing and non-SMN approaches for optimal therapeutic outcomes.

In addition to helping the SMA community, continued NIH research into SMA will also fulfill Congress' 2021 mandate to "advance the understanding of neurodegenerative diseases" through a Public-Private Partnership for Neurodegenerative Diseases.[4] Fatigue, muscle strength, and other SMA community needs are also common across other neurological and

[1] National Institute of Neurological Disorders and Stroke, FY 2023 Congressional Justification (Page NINDS-18); https://www.ninds.nih.gov/sites/default/files/migrate-documents/ninds_fy_2023_cj_chapter_508c_0.pdf
[2] "I have SMA, SMA doesn't have me," Orphanet Journal of Rare Diseases, https://ojrd.biomedcentral.com/articles/10.1186/s13023-021-01701-y
[3] Cure SMA Launches SMA Research Project, 2022, https://www.curesma.org/cure-sma-launches-basic-rfp-request2022/
[4] Public Law 117-79, December 23, 2021, https://www.congress.gov/117/plaws/publ79/PLAW-117publ79.pdf

neuro-muscular diseases. Continued research into SMA has the potential to yield new knowledge and understanding of the nervous system and disease mechanisms that can benefit other neurological and neuro-muscular diseases.

Thank you for holding a public witness hearing and for considering the needs of children and adults with SMA as you develop your FY 2023 Labor, Health and Human Services, Education, and Related Agencies appropriations bill. Your past support has made a dramatic difference in the lives of individuals with SMA and other rare disease. We respectfully ask that you recommit your support for individuals with SMA and their families by fulfilling this research and report language request in your FY 2023 bill. Thank you for your consideration.

Cure SMA Report Language Request:
Spinal Muscular Atrophy.—The Committee commends NIH for its past research into spinal muscular atrophy (SMA) that has led to new therapies to treat SMA and also contributed toward greater knowledge and research capacity into nervous system disorders. While current SMA treatments can slow or stop future degenerative nerve damage, they are not cures and there remains significant unmet need across all ages and disease stages of SMA. Individuals with SMA, particularly adults, the largest segment of the SMA population, face significant challenges in muscle weakness and fatigue due to degeneration that occurred prior to treatment. Individuals treated prior to clinical symptoms onset may also display unmet needs, such as bulbar impairment and gait abnormalities. The Committee urges NIH to address these unmet needs, which are common across other neurological and neuro-muscular diseases, by supporting new research into the role and function of survival motor neuron (SMN) protein, investigation into non-SMN pathways and targets capable of modifying disease, and research into how to best combine SMN-enhancing and non-SMN approaches for optimal therapeutic outcomes.