

# IMPACT REPORT

# 2024





# TABLE OF CONTENTS

## 01 Pioneering Change:

### Our Mission, People and Approach

- Our Mission and Approach
- The Flywheel of ALS Innovation
- Leaders in ALS: Embracing Open Innovation
- Scientific Advisors
- Convening the Leaders: The EverythingALS Annual Digital Biomarkers and Endpoints Summit

## 02 Research Progress & Vision 2030:

### AI, Computational Biology & the Road to Curing ALS

- Research at a Glance
- All-In-One Research Access | EverythingALS App
- Vision 2030

## 03 Data Science Empowering Change:

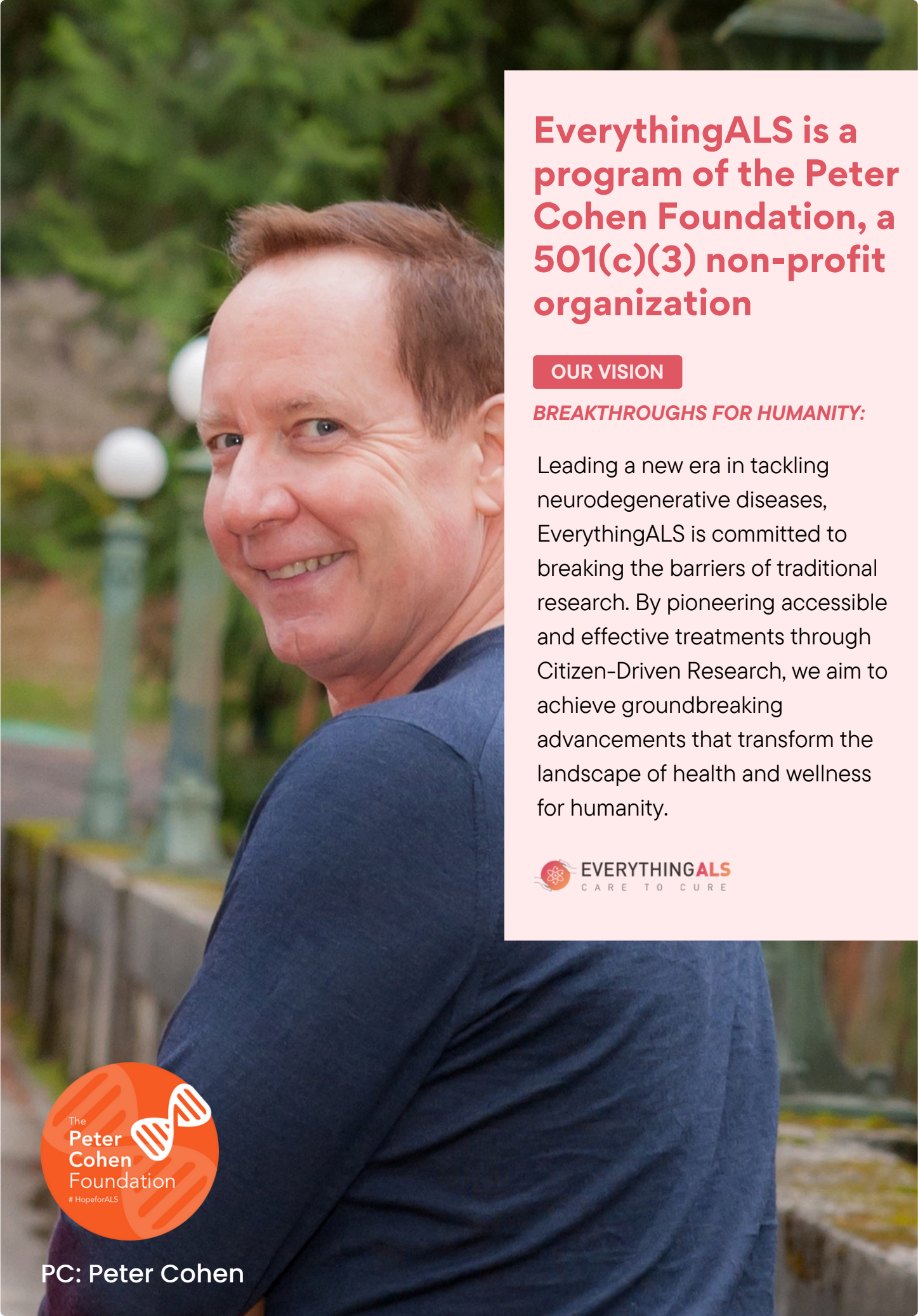
### Advancing New Measures & Endpoints via Open Innovation

- Data Science Empowering Change
- Listener Effort as a Clinical Outcome Measure for ALS Trials
- Amplifying Impact: Growth Driven by Open Innovation Platform
- Taking Observational Breakthroughs into Clinical Trials
- Re:invent 2024: Partnership with Compass UOL and AWS

## 04 Fostering Engagement & Transparency:

### Linking Care to Cure through Citizen Science, Pathfinders and Inspiring Future Professionals

- EverythingALS Portal
- Linking Citizens to Science
- Inspiring Future Professionals
- Connecting through Peers: Meet the Pathfinders
- Focus for 2025: Event Prediction, Vision 2030 and Clinical Outcome Measures



## EverythingALS is a program of the Peter Cohen Foundation, a 501(c)(3) non-profit organization

### OUR VISION

#### *BREAKTHROUGHS FOR HUMANITY:*

Leading a new era in tackling neurodegenerative diseases, EverythingALS is committed to breaking the barriers of traditional research. By pioneering accessible and effective treatments through Citizen-Driven Research, we aim to achieve groundbreaking advancements that transform the landscape of health and wellness for humanity.



PC: Peter Cohen

# A Message from our CEO & Chairman

Dear Allies on the Path to End ALS,

As we reflect on 2024, we remain deeply motivated by the urgent needs of the ALS community. Too many still face prolonged, uncertain diagnoses, limited treatment options, and insufficient support. Our mission to find a cure is at the heart of everything we do. Through **Vision 2030** and the **EverythingALS AI Hub**, we've made significant strides by leveraging cutting-edge AI to accelerate ALS cure-focused research. Central to our efforts is citizen-driven research, empowering individuals with ALS and their families to actively engage in advancing science. Looking ahead to 2025, we are unwavering in our commitment to urgent pursuit of the goals of Vision 2030—a future where innovative research, improved diagnostics, and collaborative solutions transform lives and bring us closer to a world without ALS. Together, we will continue breaking barriers and fostering hope for everyone impacted by this devastating disease.



*Bill Nuti*

Chairman, EverythingALS  
Former CEO & Chairman, NCR  
Living with ALS



*Indira Mavar*

CEO & Founder, EverythingALS  
Tech Serial Entrepreneur

# Executive Summary

Four years into championing citizen-driven research, this **2024 Impact Report** highlights **EverythingALS' progress** in aligning the ALS community's stakeholders with trust and transparency to embrace technology, innovation, and of curing ALS. This update is designed to inform the community on how we pursue this goal, what we have achieved, beginning with updates on our strategy, followed by major accomplishments such as:

## **Citizen-Driven Research:**

EverythingALS has redefined patient-centered studies, enabling individuals to contribute remotely through its app and observational studies. This approach has successfully translated into clinical applications, including in ALS trials.

## **Vision 2030 Launch:**

This groundbreaking initiative united global researchers, pharmaceutical innovators, and computational biologists to address ALS with advanced AI, data science, and regenerative medicine. Initial funding supported groundbreaking collaborations between MIT and Harvard to explore neuromuscular repair strategies.

## **Accelerating Research and Technology:**

By integrating AI and computational tools, EverythingALS expanded its research pipeline, generating over four terabytes of multi-modal data. These efforts produced actionable insights, including "Listener Effort" as a reliable speech progression measure in ALS clinical trials.

## **Community Engagement and Transparency:**

New participant portals launched in 2024 provide individuals with access to their personalized health data, ensuring transparency, data ownership and privacy protection. Initiatives like Pathfinders and Expert Talks educated and empowered thousands in the ALS community.

## **Partnerships and Open Innovation:**

Collaboration with industry leaders, academia, and regulatory bodies has scaled innovative technologies, supported regulatory adoption of new endpoints, and ensured diverse voices are included in ALS research.

## **LOOKING AHEAD**

In 2025 and beyond, EverythingALS will continue to enhance diagnostic precision with additional studies for new objective measures, incubate new potential drug development tools using DHTs and AI in the new Kapner Sensor Lab, refine predictive tools, and identify key sub-populations to improve clinical trials and personalized care. Vision 2030 will further focus on neurological repair and expand its open innovation ecosystem.

Four years of dedicated efforts have made EverythingALS a beacon of hope for those impacted by ALS. By driving innovation, fostering collaboration, and centering the ALS community on more precise disease understanding for better trials and care, the organization is accelerating progress toward a world without ALS.

# Board of Directors

*Our Board of Directors are experienced and committed leaders who help us to build a long term sustaining company while making a enormous impact in. the short term.*



## Emmet Cunningham

MD, PhD, MPH

Investor, biotech leader,  
ophthalmology innovator

Strategic Advisor advancing biotech innovation, and transformative healthcare investments.



## Jerry Newman

Healthcare advocate,  
tech investment banker,  
strategist.

Leader driving healthcare innovation, nonprofit leadership, and strategic technology investments.



## Phillip Reilly

JD, MD

Founder, CEO, Investor,  
Geneticist, Author

Senior Advisor pioneering advancements in genetics, biotech leadership, and impactful healthcare innovation.



## Willy Stiggelbout

Former Founder & CEO  
Carbon Design Group

Strategic leader, visionary, technology innovator, advisor.



## Bill Nuti

Chairman,  
EverythingALS

Technology Leader and Former CEO & Board Director in the Fortune 500



## Indu Navar

CEO & Founder,  
EverythingALS

Experienced entrepreneur, CEO, and investor driving innovative tech development.

The background features a soft, light-colored illustration of a hand holding a neuron. The neuron is depicted with a central cell body and several branching processes extending outwards. The overall aesthetic is clean and professional, with a focus on medical and scientific themes.

**01**

## **Pioneering Change:**

Our Mission, People and Approach

# Our Mission and Approach

EverythingALS empowers and unites the global community through AI and data-driven insights to tackle ALS challenges. Our Citizen-Driven Research approach places those affected at the forefront of advancing understanding and solutions. This transformation of data into actionable results accelerates the development and accessibility of effective diagnostics and treatments, directly addressing the needs of the ALS community.

We are, in essence turning a flywheel of innovation to change the future of ALS for people living today.

Despite **hundreds of clinical trials conducted over multiple decades, only two drugs have been approved**, each extending life only by a few months. However, the foundation of drug development lies much earlier in the lived experience of those with ALS. Challenges such as delayed diagnoses, inadequate progression measures, and limited tools for individuals with ALS and their caregivers to manage daily care persist. A fragmented research and community landscape continues to create unnecessary barriers, preventing a seamless approach to understanding and addressing ALS.



**OUR MISSION IS TO BRIDGE THE GAP BETWEEN PEOPLE, RESEARCH, AND TECHNOLOGY.**

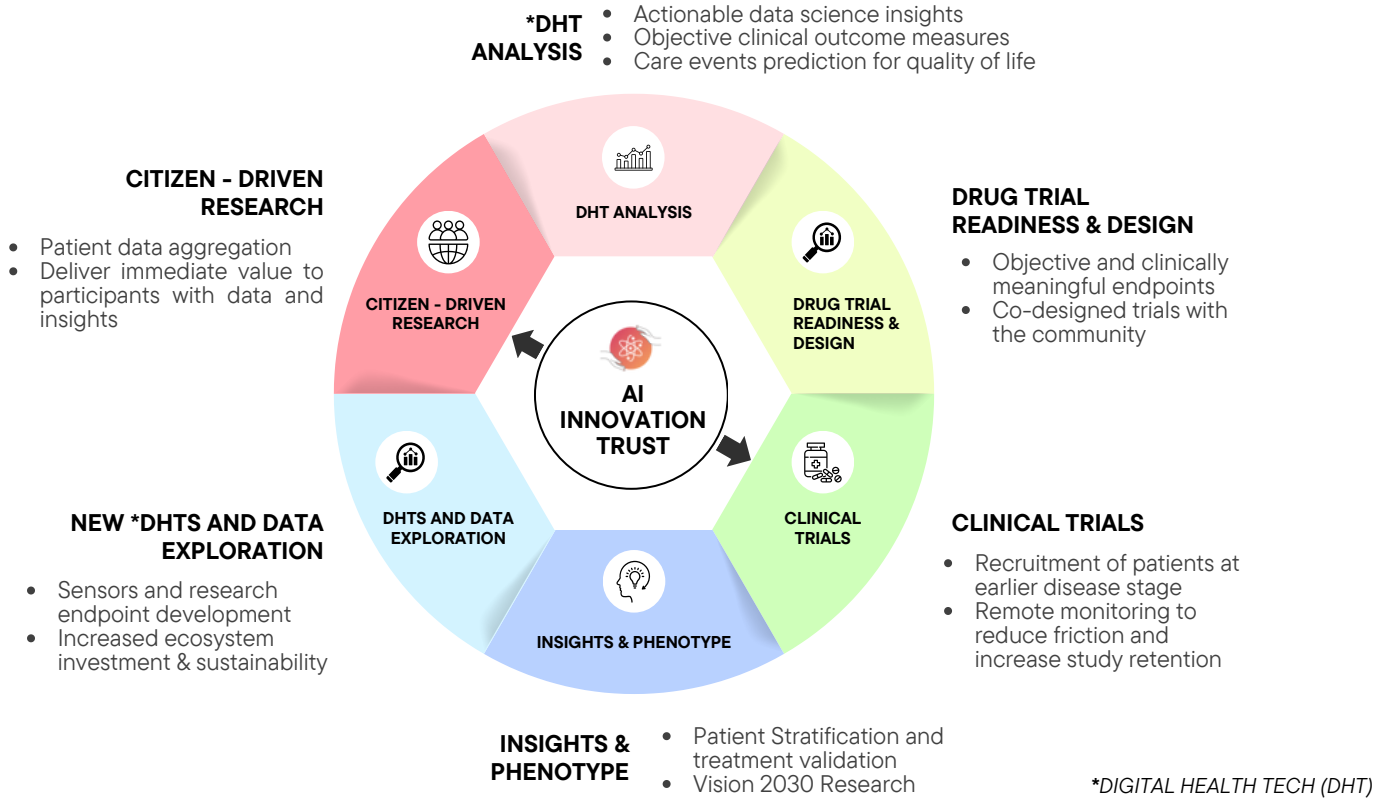
<b>EMPOWER AFFECTED CITIZENS</b>	<b>INNOVATE ON THE POWER OF DATA</b>	<b>OVERCOME UNNECESSARY BARRIERS</b>
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Our diverse team includes people affected by ALS, physicians, scientists, entrepreneurs, AI and software engineers, and students. We are dedicated to providing information to all affected by ALS, and those working toward a cure.





# Turning the Flywheel of ALS and MND Innovation to Accelerate Progress



In our flywheel, data, AI, and clinical processes reinforce each other to drive ALS innovation forward. It took us **three years to establish this flywheel**, and now, with it in place, we have progressed from data collection to the adoption of a novel, **clinically meaningful outcome measure in a Phase 2 clinical trials within just the last 18 months.**

EverythingALS leads transformative ALS research, directly engaging those affected. Our innovative, collaborative, and empathetic approach ensures full data ownership and transparency. At the core of our work is a focus on our “flywheel” — building a self-reinforcing system where data, AI, and clinical processes drive continuous learning and efficiency. A unifying force, our flywheel accelerates outcome measures development, streamlines clinical trials, and enhances therapeutic outcomes with our Vision 2030 focus by bringing together clinicians, researchers, pharma, and caregivers to advance ALS care to cure.

*Our promise to the community is to “Care to Cure”, to attract the collaborators and community members to partner with us on*

**WE CALL THIS VALUE ALIGNMENT “OPEN INNOVATION TRUST” THAT IS ROOTED IN TRANSPARENCY.**

*a platform - and with a team - they can trust to move with urgency to accelerate the development and accessibility of effective treatments, for the ALS community.*

# Leaders in ALS: Embracing Open Innovation

We extend our gratitude to the leaders of our biopharmaceutical pre-competitive Consortium for their invaluable collaborations and support in advancing clinically meaningful endpoints through our digital health technology studies and engagement through our insight-rich study portals. They demonstrate a shared commitment to reducing barriers in clinical trials and honor the efforts of patients, caregivers giving their energy to these studies.

We also thank the global community of ALS clinics, institutions, and forward-thinking technology partners who are supporting our work. As we broaden our study support and clinical engagement worldwide in 2025 and beyond, we look forward to continued progress through open innovation, insight capture and knowledge sharing through this platform.

## Data insight portal for our Consortium partners

- Access detailed **research** data & insights
- Suggest and vote on **new priority areas**
- View **real-time summaries** of study statuses, participant numbers, and demographics
- Find publications and ALS Expert Talk recordings in our **Content Library**
- Collaborative space** to share updates and Consortia outputs

### OUR PHARMA AND BIOTECH CONSORTIA



<b>17</b> PHARMA & BIOTECH CONSORTIA PARTNERS	<b>18</b> ACADEMIC & TECHNOLOGY PARTNERS	<b>05</b> ONGOING OBSERVATIONAL TRIALS	<b>03</b> DRUG TRIALS UTILIZING OUR ENDPOINT	<b>25</b> OBSERVATIONAL TRIALS TO LAUNCH IN 2025 (SENSOR LAB)
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### OUR ACADEMIC PARTNERS



### OUR TECHNOLOGY PARTNERS



### INCLUDING FOUNDING ORGANIZATIONS:



# SCIENTIFIC ADVISORS

*We thank our **Scientific Advisors** - Recognized, committed leaders who work with transparency and urgency in their commitment to transforming ALS research and care.*



**James Berry**  
MD, MPH

JAMES BERRY, MD, MPH, is a Winthrop Family Scholar in ALS Sciences at Massachusetts General Hospital (MGH); Director, MGH Neurological Clinical Research Institute; and Chief, Division of ALS and Motor Neuron Diseases. He provides care for people with ALS and works as an ALS researcher designing, overseeing and implementing trials focused on the identification of markers of ALS in digital, blood and spinal fluid. He also collaborates broadly with researchers around the globe on these biomarker efforts.



**Lyle Ostrow**  
MD, PhD

LYLE OSTROW, MD, PHD, is a Neurologist and ALS researcher at Temple University's Lewis Katz School of Medicine. He directs the Temple ALS Postmortem Core and Nerve and Muscle Biopsy Service and chairs the Department of Defense ALS Research Program, driving funding for therapeutic discovery, biomarker development, and open data sharing. He serves on multiple ALS advisory boards and leads efforts to harmonize multicenter research and core resources.



**Ernest Fraenkel**  
PhD

ERNEST FRAENKEL, PHD, is a Professor of Biological Engineering at MIT, where he leads a laboratory pioneering computational and experimental methods to uncover therapeutic strategies for diseases, with a focus on central nervous system disorders. His team leverages machine learning, AI, and bioinformatics to integrate molecular, clinical, and behavioral data, aiming to unravel disease mechanisms and identify novel drug development opportunities.



**Merit Cudkowicz**  
MD, MSC

MERIT CUDKOWICZ, MD is Director of the Sean M. Healey & AMG Center for ALS, Chair of Neurology at Massachusetts General Hospital (MGH), and the Julieanne Dorn Professor of Neurology at Harvard Medical School. A leader in ALS research and care, she has pioneered innovative approaches to accelerate therapy development, including the HEALEY ALS Platform Trial and adaptive trial designs. She also co-founded the Northeast ALS Consortium (NEALS) and serves as Principal Investigator for NeuroNEXT's Clinical Coordination Center.



**Mark Garret**  
MD

MARK GARRET, MD is an Assistant Professor of Neurology at Dartmouth Hitchcock Medical Center, Geisel School of Medicine at Dartmouth. He specializes in genetic ALS and presymptomatic disease states. Previously, he led the Dominantly Inherited ALS (DIALS) Network and PREVENT ALS studies at MGH, advancing global efforts to study asymptomatic ALS gene carriers. His work focuses on biomarker research for early detection and prevention of ALS. He also serves as co-PI for our multi-modal gene carrier study.



**Terry Heiman-Patterson**  
MD

TERRY HEIMAN-PATTERSON, MD is Director of the Center for Neurodegenerative Disorders and Professor of Neurology at Temple University. She leads the MDA/ALS Center of Hope, advancing ALS care, research, and technologies like home-based brain-computer interfaces (BCI). She is Co-Chair of the Northeast ALS Consortium (NEALS) and a member of the ALS Research Group (ALS RG).

# Convening the Leaders: The EverythingALS Annual Digital Biomarkers and Endpoints Summit

We were excited to host our second annual Digital Biomarkers and Endpoints Summit in Cambridge, MA on August 26, 2024. The event brought together over 60 participants from industry, clinical, research, and drug development sectors, pALS, cALS and advocates to help inform, challenge and fill gaps in the work to include more DHTs in clinical trials and the care paradigm.

## THIS YEAR'S SUMMIT FOCUSED ON:

Accelerating the validation of ALS digital endpoints as **must-haves in all ALS trials**

Studying past clinical trial results by modality with **deep AI to detect potential sub-populations for future trials**



Setting a **regulatory strategy** to advance objective measures

**Establishing a first-of-its-kind site-less sensor lab** to re-interpret and advance measures that can lead to predictive indicators of progression for clinical trials

**Aligning** clinical trial data **with patient care**

# Convening the Community: The EverythingALS Annual Digital Biomarkers and Endpoints Summit

## KEY RESULTS INCLUDED



**Listener Effort** is a recognized tool for bulbar and speech progression measurement in the clinical trials.

**Multi-Modal Studies** monitoring proved high quality, longitudinal data can be collected remotely and validated with high fidelity.



Leveraging achievements in Bulbar measurement, additional streams of data from Movement, Respiratory and Cognition are advancing new measures to **predict progression for gross motor, fine motor, breathing, cognition** as clinical end point tools.

A background illustration featuring a hand holding a neuron. The hand is rendered in a light, semi-transparent style, with fingers gently grasping a single, detailed neuron. The neuron is colored in a vibrant red and has a central cell body with several branching processes extending outwards. The overall scene is set against a soft, light-colored background, creating a sense of care and scientific focus.

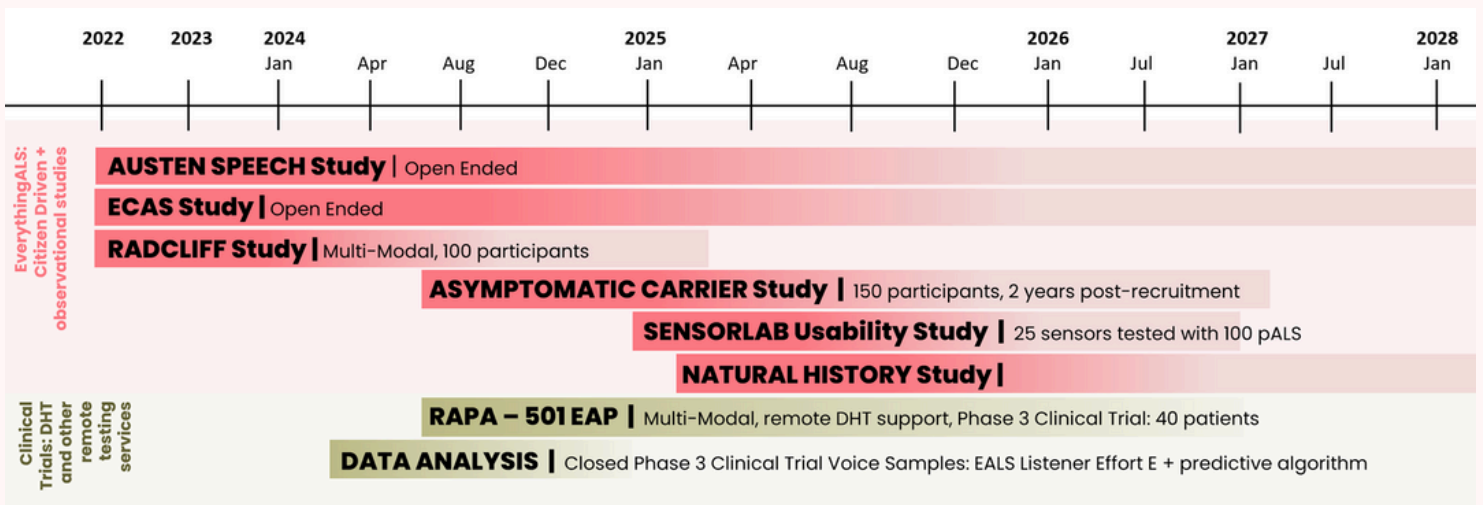
02

**Research Progress & Vision 2030:**  
AI, Computational Biology & the  
Road to Curing ALS

# Research at a Glance

## PROGRAM GROWTH

In 2024, EverythingALS tripled its study pipeline, **expanding from three pre-existing observational studies to launch and support nine additional studies**, including providing remote monitoring for RAPA Therapeutics' Expanded Access Program to follow our multi-modal research methodology, and multiple end-of-phase clinical trial data analyses.



### DATA FOR INSIGHTS AT SCALE

- +4TB** MULTI-MODAL DATA
- 13.4K** TOTAL RECORDED RESEARCH SESSIONS
- \$2.5M** RESEARCH & VISION2030 FUNDING
- \$1.1M** DATA SCIENCE, RESEARCH & TECHNOLOGY INVESTMENTS

At EverythingALS, our research and data science teams are on a mission to generate the most valuable, **content-rich data set for ALS in the world**. With the more-than 4 terabytes (TB) of data now generated as the additional studies begin expand, the team developed AI and machine learning algorithms to process and score.

### VALUE ALIGNMENT: RESEARCH COLLABORATIONS

As a recognized leader in research collaboration in digital health data collection and analysis, we continued pursuit of building the world's largest, most meaningful data set of digital health markers and endpoints through:

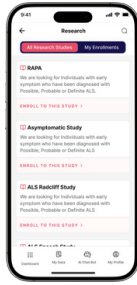
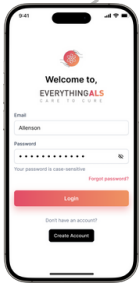
1) Data collection from ongoing and new EverythingALS observational studies;

2) Data analysis for past and ongoing clinical trial digital samples collected via EverythingALS Consortia members and the Healey Platform; and

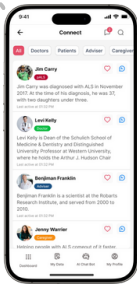
3) Implementation of data collection methodologies in pilot telehealth innovation initiatives.

REDESIGNED & REIMAGINED

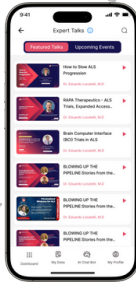
# All-In-One Research Access EverythingALS App:



**Research Access:**  
Citizen-driven approach to accelerate treatments



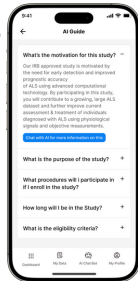
**Chat live with our knowledgeable Pathfinders within the ALS community at anytime, 24/7.**



**Live Expert Talks:** Bi-weekly virtual session topics cover care and treatment insights. Ask the ALS experts live!

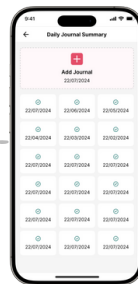


**Motor Movement Exam:**  
Log motor strength, self-care, and personalized needs

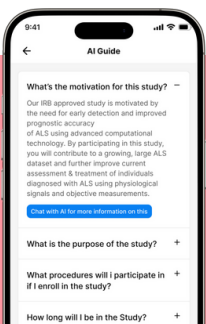
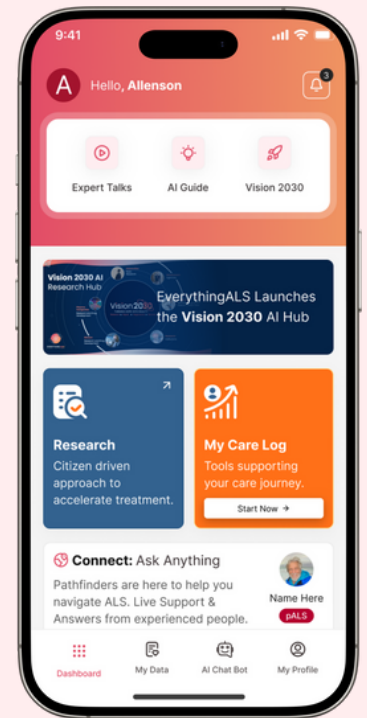


**AI Guide:** personalized AI assistant, trained on 220+ hours and 2,000 questions and answers from People with ALS from Expert Talks

**Personalized Health Tracking:** Tools to support your ALS



The **EverythingALS Mobile App** was launched to empower the global ALS community with personalized support, expert insights, a generative AI-powered chat agent to provide real-time answers about clinical trials and ALS care, research access, and health tracking—**All in One Place.**

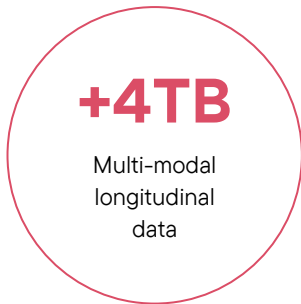


**EverythingALS' Generative AI has been trained using over 220 hours of content and more than 2,500 Q&As from the Expert Talk Series**



# Expanded Reach, Engaging Remotely, Increasing Inclusion

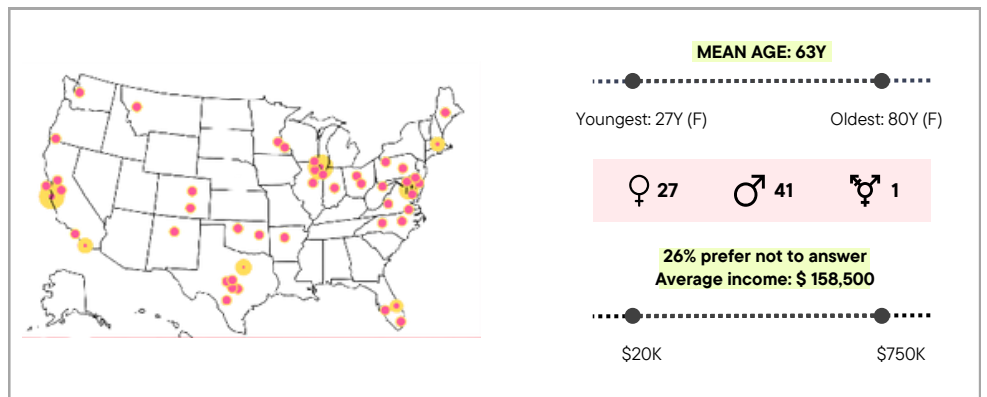
Citizen-driven research leveraging remote, proctored monitoring and high fidelity data generation, fuels our flywheel with extensive participation from people with ALS.



**BROAD GEOGRAPHIC PARTICIPATION**



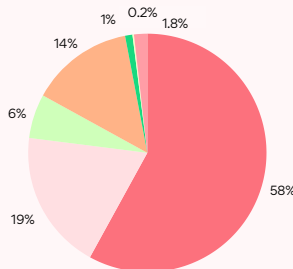
## RADCLIFF MULTI-MODAL STUDY



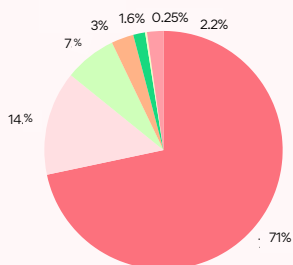
## AUSTEN SPEECH STUDY



U.S. POPULATION (%)



EVERYTHINGALS (%)



## Addressing Access Gaps with Remote Participation Increases Representation

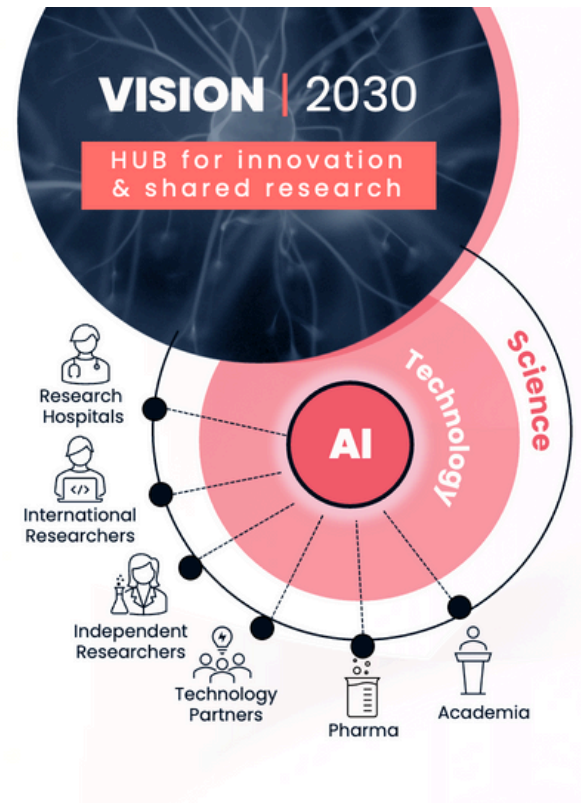
ETHNICITY/RACE	U.S. POPULATION (%)	EVERYTHINGALS (%)
White (Non-Hispanic)	58%	71%
Hispanic/Latino	19%	14%
Asian	6%	7%
Black/African American	14%	3.0%
American Indian/Alaska Native	1%	1.6%
Native Hawaiian/Other Pacific Isl.	0.20%	0.25%
Other/Prefer Not to Answer	1.80%	2.2%

# Vision 2030

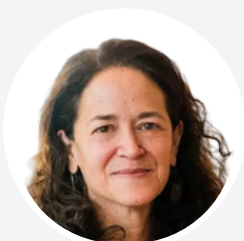
## AI HUB ACCELERATING ALS RESEARCH AND INNOVATION

### LAUNCH OF VISION 2030

The **Vision2030 AI Hub** is an innovative platform designed to focus and accelerate the ALS drug development strategy on repair and restoration of function for people living with ALS today by investing in computational biology, artificial intelligence, and data science. Our goal is to unite technologists, global researchers, pharmaceutical companies, and academic institutions to overcome historical challenges with de-siloed data and insights, providing a transparent information tool bench.



*"The **EverythingALS Vision2030 Hub** brings to life a new age in scientific and medical research. Our goal is to discover treatments and approaches that will bring repair and return of function to people living with ALS and other neurodegenerative disorders. I'm a strong believer in this kind of collaboration between institutions... in an open collaboration with investigators all over the world, and **I'm excited to be one of the inaugural hubs of Vision2030 and chair the scientific advisory board.**"*



**DR. MERIT CUDKOWICZ MD, MSC**

Director, Sean M. Healey & AMG Center for ALS,  
 Chair of Neurology, Massachusetts General Hospital (MGH),  
 Julieanne Dorn Professor of Neurology, Harvard Medical School



# Vision 2030

AI HUB ACCELERATING ALS RESEARCH AND INNOVATION

## Vision 2030 Inaugural Award:

### ACCELERATING OPEN, NOVEL RESEARCH WITH NEW DISEASE MODELING PLATFORM

**EverythingALS Vision2030's first funding** enabled a historic collaboration between our Hubs, **MIT and Harvard**, bringing their core expertise and working together to explore innovative ways to restore nerve-muscle connections damaged by ALS.

#### Investigating the Therapeutic Potential of Exercise for Promoting Mobility Recovery in ALS Funded by EverythingALS Vision 2030

Co-PIs: Ritu Raman, MIT ([ritur@mit.edu](mailto:ritur@mit.edu)) + Brian Wainger, MGH ([Brian.Wainger@mgh.harvard.edu](mailto:Brian.Wainger@mgh.harvard.edu))

The inaugural Vision2030 research in 2024 funded the launch of a joint program between MIT and MGH to develop of an innovative in-vitro platform to study the effects of exercise-like stimulation on neuromuscular junctions (NMJs) in ALS. By using cutting-edge 3D nano-printing methods and human induced pluripotent stem cells (iPSCs) to create motor neurons and muscle cells together, we can model the disease more accurately. This lab-based system provides a way to test out interventions, understand their molecular and cellular effects, and develop strategies that will be safe to test in people living with the disease. Combining expertise in neuromuscular tissue engineering and ALS modeling, we hope to identify effective therapeutic strategies to improve mobility in ALS patients.



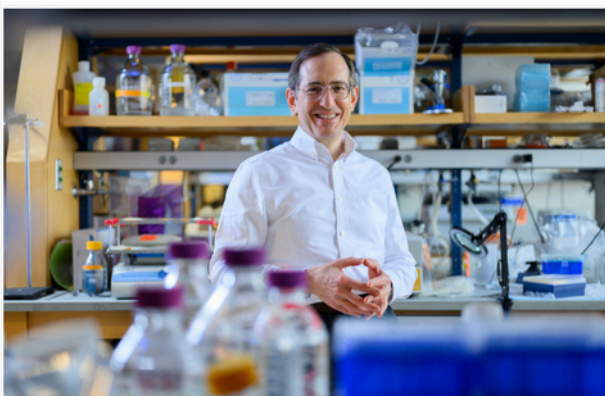
## MIT News

ON CAMPUS AND AROUND THE WORLD

### Deciphering the cellular mechanisms behind ALS

Professor Ernest Fraenkel has decoded fundamental aspects of Huntington's disease and glioblastoma, and is now using computation to better understand amyotrophic lateral sclerosis.

Michaela Jarvis | School of Engineering  
March 6, 2024



*"EverythingALS's Vision2030 project is truly **transformational**, and we at MIT are excited to be part of the founding team. Vision2030 is accelerating our search for the root causes of ALS... With its support, we've assembled a team with expertise ranging from AI to cell biology. In partnership with MGH, we launched a collaboration between Ritu Raman, an MIT engineer, and Brian Wainger, an MGH clinician scientist and ALS expert... exploring ways to restore nerve-muscle connections damaged by ALS. **This unique moment brings AI, data science, and neurologists together...** and we believe **this partnership will yield quicker results.**"*

**DR. ERNEST FRAENKEL**

Professor at Massachusetts Institute of Technology

# Vision 2030 | AI HUB ACCELERATING ALS RESEARCH AND INNOVATION

## NATIONAL LAUNCH



SEE THE FULL  
SEGMENT ON CNBC

### Mad Money: Jim Cramer Show



**MAD  
MONEY**

**TECHNOLOGY FOR GOOD**  
HOW THE LIVES OF ALS PATIENTS ARE BETTERED BY AI

@JIMCRAMER



**MAD  
MONEY**

TO LEARN MORE ABOUT EVERYTHINGALS'S  
MISSION, GO TO [V2030.ORG](http://V2030.ORG)

@JIMCRAMER



# Vision 2030

AI HUB ACCELERATING ALS RESEARCH AND INNOVATION

The new talent initiative aims to **accelerate breakthroughs** in **ALS** care and research by growing the talent pool, training, and **supporting 2,000 computational biologists and AI engineers** dedicated to understanding and combating ALS and related neurodegenerative diseases.



[READ THE FULL PRESS RELEASE](#)



A core component of Vision2030, along with funding research, is to attract the world’s technology talent into the Hub. A partnership between Compass UOL, an AI transformation services company, and EverythingALS was launched at the annual AWS re:Invent 2024 conference. The initiative aims to accelerate breakthroughs in ALS care and research by training and supporting **2,000 computational biologists and AI engineers dedicated to understanding and combating ALS** and related neurodegenerative diseases.



Achieving the vision of a world in which neurodegenerative diseases are studied, understood, and treated with medicines that can restore function and return people to the lives they previously enjoyed requires the commitment of technology companies that are actively building the infrastructure and computational capabilities needed. We are aligning these partners with Vision 2030 to fuel artificial Intelligence, coupled with quantum computing, de-centralized science and emerging techniques to individualize our understanding of the root causes of people’s diseases that will fundamentally reshape our approach to brain health.



# 03

## **Data Science Achievements:**

Advancing New Measures  
and Endpoints via Open  
Innovation



# Data Science: Empowering Change

*Citizen-Driven Science and AI are Shaping the Future of ALS Research and Development*

## PIONEERING STUDIES PRODUCED HIGH VALUE INSIGHTS

In 2024, we accelerated our multi-modal observational studies, uncovering key insights to predict speech and respiratory progression, We also tripled our research pipeline by expanding remote engagement through the EverythingALS mobile app, available on the Apple and Google Play stores, for clinical trials and natural history studies.

## CONSORTIA CO-CREATION: A ROADMAP TO INCORPORATING DIGITAL ENDPOINTS IN CLINICAL TRIALS



Authored by over 30 experts from the EverythingALS BioPharma Consortia and Scientific Advisory Board

Published [A Roadmap to Incorporating Digital Endpoints in Clinical Trials](#), a white paper advocating for the integration of digital health technologies (DHTs) into ALS trials to improve efficiency, accessibility, and patient-centricity. The paper highlights the importance of citizen-driven research, where people with ALS contribute to data collection by participating in the IRB approved studies conducted by EverythingALS, making trials more relevant and impactful. Through collaborations from our BioPharma Consortia, we are working to accelerate DHT adoption in the clinical trials to improve endpoint measurement and availability.



# Listener Effort as a Clinical Outcome Measure for ALS Trials

See the full manuscript

The paper "Listener Effort Quantifies Clinically Meaningful Progression of Dysarthria in People Living with Amyotrophic Lateral Sclerosis" has been published as a preprint and is currently in the final stages of revision for peer-reviewed publication. This study highlights listener effort as a reliable, remotely collected clinically meaningful outcome measure for ALS trials and develops and validates a machine learning algorithm to predict speech language pathologist ratings.

THE PREPRINT SERVER FOR HEALTH SCIENCES

Listener effort quantifies clinically meaningful progression of dysarthria in people living with amyotrophic lateral sclerosis

Indu Navar Bingham, Raquel Norel, Esteban G. Roitberg, Julián Peller, Marcos A Trevisan, Carla Agurto, Diego E. Shalom, Felipe Aguirre, Iair Embon, Alan Taitz, Donna Harris, Amy Wright, Katie Seaver, Stacey Sullivan, Jordan R. Green, Lyle W. Ostrow, Ernest Fraenkel, James D. Berry

doi: <https://doi.org/10.1101/2024.05.31.24308140>

## Posters Presented at the 2024 Northeast Amyotrophic Lateral Sclerosis Consortium (NEALS) and MND Conference in Montreal

Through these initiatives and ongoing research efforts, EverythingALS remains dedicated to driving breakthroughs that transform ALS care and treatment.

- Smart App-based Assessment of Motor Movement in ALS
- Machine Learning Model That Predicts Listener Effort in ALS-related Dysarthria
- Cognitive Assessments Using Speech

### A Novel, Self-Administered, App-Based Assessment of Motor Movement in ALS

Christina Fournier<sup>1</sup>, Indu Navar Bingham<sup>1</sup>, Natalia Luchkina<sup>2</sup>, Christian Rubio<sup>2</sup>, Stephanie Henz<sup>2</sup>

<sup>1</sup>Emory University, <sup>2</sup>EverythingALS

**Background**  
Progressive motor weakness is the clinical hallmark of ALS, yet objective outcome measures that formally assess overall motor movement are often lacking in clinical trials and in clinical practice.  
A simple, remotely administered motor assessment tool could improve monitoring for people living with ALS (pALS).

**Hypothesis**  
Motor movement can be feasibly tracked at home by pALS using a personalized self-guided, AI-supported app that assesses motor movement in bulbar, upper extremity, trunk, and lower extremity regions.  
Adaptive AI algorithms will detect motor loss over time and present only the relevant motor exam to patients.  
Predictive AI algorithms will map progression to assess future personalized care needs.

**Methods**  
The ALS MOTOR APP based on the ALS Motor Observational Telemedicine Objective Rasch-built assessment (ALS MOTOR), displays both a written description and an animated visual display of performance for each motor task.  
Participants select "yes" or "no" for ability to perform each task before moving to the next. A total of 46 motor tasks are assessed.  
Results are presented in real-time and stored in a central data repository for clinician or researcher review.

**Results to Date**  
The beta version has been tested and refined with clinician and pALS feedback.  
The app is now available on Google Play and the Apple Store.  
We are gathering motor assessment data and feedback from pALS for further improvements.

**Discussion**  
The ALS MOTOR APP is an innovative tool to remotely track motor movement in pALS, with potential to offer improved data granularity and quantity in an accessible format for both clinicians and participants.  
It captures extensive and diverse data, enhancing AI algorithms currently being developed at EverythingALS through longitudinal insights.  
This approach demonstrates "AI for good" by generating data that capture lived experiences beyond standard clinical measures.  
Next, we will assess the tool's construct validity compared to standardized ALS outcome measures and objective muscle strength tests and evaluate its test-retest reliability compared to the clinician-administered telemedicine exam scale.  
Future directions include developing an adaptive testing format and evaluating APP responses as predictors of clinically relevant milestones or events.

### Machine Learning Model Predicts Listener Effort in ALS-related Dysarthria

Indu Navar Bingham<sup>1</sup>, Esteban G. Roitberg<sup>2</sup>, Julian Peller<sup>1</sup>, Marcos A Trevisan<sup>1</sup>, Diego E. Shalom<sup>1</sup>, Felipe Aguirre<sup>1</sup>, Guillermo A. Cecchi<sup>1</sup>, Iair Embon<sup>1</sup>, Alan Taitz<sup>1</sup>, Raquel Norel<sup>1</sup>, Carla Agurto<sup>1</sup>, Donna Harris<sup>1</sup>, Amy Wright<sup>1</sup>, Katie Seaver<sup>1</sup>, Stacey Sullivan<sup>1</sup>, Jordan R. Green<sup>1</sup>, Lyle W. Ostrow<sup>1</sup>, Ernest Fraenkel<sup>1</sup>, James D. Berry<sup>1</sup>

<sup>1</sup>Emory University, <sup>2</sup>EverythingALS

**Background**  
The dysarthria occurring in ALS involves various deteriorating speech subsystems, challenging accurate quantification of progression. Speech-Language Pathologists (SLPs) use intelligibility ratings and Listener Effort (LE) assessments to quantify the severity of dysarthria. Recently, several Machine Learning (ML) methods have been proposed to assess patients' speech impairment, generally focusing on predicting the ALSFRS-R speech-related question. We have used ML on speech recordings to predict LE, a quantitative, clinically relevant measure of dysarthric speech.  
**Hypothesis:** Based on remote speech recordings, Listener Effort can be reliably predicted by Machine Learning models.

**Methods**  
The EverythingALS Speech Study obtained longitudinal clinical information and speech recordings from 292 participants.  
A subset of 125 participants was selected (105 pALS, 20 controls), encompassing 2104 recordings from 708 unique participant assessments.  
LE was manually rated in this subset by trained SLPs, demonstrating excellent inter-rater reliability.  
This process ensured a highly reliable dataset, on top of which various ML strategies were applied to predict LE.

**Results: Listener Effort**  
ICCHQ.92, ICCHQ.91, ICCHQ.88  
Very good-to-excellent pairwise LE inter-rater reliability.  
Lower ALSFRS-R scores and higher LE denote lower speech function.  
Months since enrollment, Years since onset  
Higher slope of decline of LE for pALS than controls in both all participants and those with onset <2yrs prior to enrollment.

**Results: Model**  
A simple Lasso regression model yielded an R<sup>2</sup> of 0.82 ± 0.07, with only two features proving relevant for making the prediction: Speaking Rate and Whisper Confidence.  
The latter feature represents the confidence of the automatic speech recognition system (Whisper) in its own transcription accuracy.  
More complex approaches, such as using an ensemble including traditional and deep learning models, achieved an R<sup>2</sup> of 0.94 ± 0.03.

**Conclusions**  
Listener Effort, as rated by Speech Language Pathologists, can be robustly estimated using a simple Machine Learning strategy, with only two speech features proving relevant for the prediction: Speaking Rate and Whisper Confidence.

### A Novel, Web App-Based Assessment of cognition in ALS using Speech

Indu Navar Bingham<sup>1</sup>, Raquel Norel<sup>1</sup>, Guillermo A. Cecchi<sup>1</sup>, Bo Wen<sup>1</sup>, Natalia Luchkina<sup>1</sup>, Stephanie Henz<sup>1</sup>, Alan Taitz<sup>1</sup>, Ahmad Al-Khaleel<sup>1</sup>, James Berry<sup>1</sup>, Sharon Abraham<sup>1</sup>, Ammar Al-Chalabi<sup>1</sup>

<sup>1</sup>King's College London, <sup>2</sup>EverythingALS, <sup>3</sup>IBM Research, <sup>4</sup>McGill, <sup>5</sup>University of Edinburgh

**Introduction**  
Amyotrophic Lateral Sclerosis (ALS) impacts motor and cognitive functions, affecting a person's quality of life.  
Researchers have found that 35-50% of people with ALS develop cognitive impairment, with 10-15% meeting the criteria for Frontotemporal Dementia (FTD). Early identification of these changes is crucial to allow interventions and provide support for individuals and their families.  
Traditional cognitive assessments face challenges with accessibility and mobility, and are often time-consuming to conduct in clinics, leading to them frequently being overlooked.  
EverythingALS created a Web App-based Assessment of Edinburgh Cognitive and Behavioral ALS Screen (ECBAS) to enhance accessibility for diverse ethnic and geographic populations, particularly those in rural areas and individuals with severe mobility limitations, while also reducing manual errors associated with traditional paper-based assessments.

**Objective:**  
#1. Validate the accuracy of online assessment of cognition against in-clinic assessments.  
#2. Infer cognitive scores based on speech analysis from picture description tasks.

**Methods**  
The Web App-based Assessment of cognition, based on the Edinburgh Cognitive and Behavioral ALS Screen (ECBAS), was used to assess language, memory, verbal fluency, executive function, and visuospatial.  
Data was collected from 108 people, including individuals with ALS and controls. Of these, 18 people completed at least two ECAS sessions spaced six months apart, totaling to 126 sessions.  
As part of the speech study, individuals described one image weekly from a pool of pictures depicting complex scenes. Speech samples from a subset of 56 people, out of the total 108, were analyzed within <240 days of the ECAS evaluation.

**Results to Date**  
Individuals' speech recordings of the picture descriptions were analyzed for acoustic features to capture elements such as prosody, voice quality, and noise measurements.  
Recordings were transcribed using Whisper Open AI and the linguistic features extracted such as Psycholinguistic metrics, intelligibility metrics, Accent words proportions and Graph-based metrics were fed to linear regression models to infer ECAS sub- and total scores.  
Modeling: Linear regression models on NLP-based features were used to infer five ECAS sub-scores and the total score on the 56 people. The model performance was evaluated using 10-fold cross-validation, achieving Spearman correlation values between R.32 and R.51(1).  
Existing ALSFRS-R scores are being mapped to Rasch-ALSFRS-R and King's scales to explore correlations between RQADRS, ECAS, and NLP scores to understand their relationship as ALS progresses.

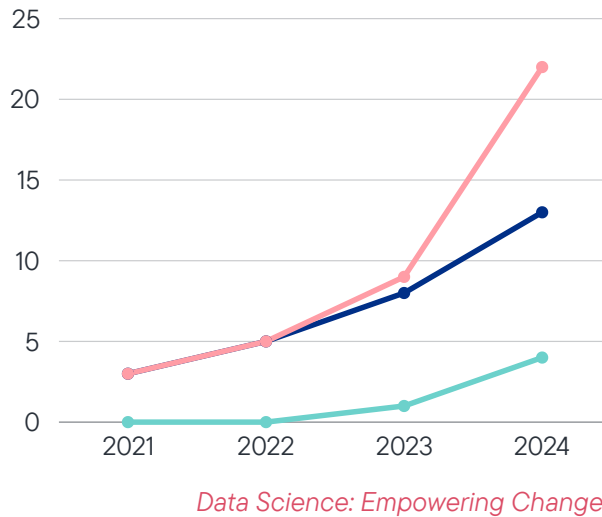
**Discussion**  
The study shows that digitized cognitive assessments using machine learning models proved useful for capturing and predicting cognitive performance.  
While the models showed promise with correlation values (between 0.32 and 0.51) for the small dataset, future efforts will focus on refining feature extraction and expanding research cohorts to improve generalizability.  
Conclusion: the digitized ECAS evaluation and NLP of speech are promising tools for remote cognitive assessment in ALS. Next step is to expand research leading to scalable solutions for monitoring cognitive health.



# Amplifying Impact: Growth driven by Open Innovation Platform

The significant growth driven by EverythingALS Open Innovation Platform is illustrated in the chart represented by publications, and patents over time.

In 2024 EverythingALS publications, and patents over increased significantly as a result of definitive findings from the Austen Speech Study. In 2024, publication references grew 144%, the organization filed 4 new patents on algorithms and methodologies, and, and we look forward to continued education and adoption of measures in 2025 and beyond.



## 22

External Publications  
leveraging our Open Data

↑ 144% in 2024

## 13

EverythingALS  
Publications & Posters

↑ 62.5% growth in 2024

## 4

Patents (3 filed)

↑ 75% in 2024

## Best Paper Award of ICDH 2024

The publication "Harnessing Remote Speech Tasks for Early ALS Biomarker Identification", awarded the prestigious Best Paper Award at the 2024 IEEE International Conference on Digital Health (ICDH), was **developed by IBM using the EverythingALS Open Innovation Platform**. This recognition underscores the transformative potential of EverythingALS' platform in enabling groundbreaking research in ALS detection through open collaboration.



EverythingALS Publications

2024 IEEE International Conference on Digital Health (ICDH)

### Harnessing Remote Speech Tasks for Early ALS Biomarker Identification

Year: 2024, Pages: 161-168  
DOI Bookmark: [10.1109/ICDH62654.2024.00036](https://doi.org/10.1109/ICDH62654.2024.00036)



# Clinical Trials Highlights

## Deploying observational studies to clinical trails

### APPLYING SPEECH ANALYSIS TO CLINICAL TRIALS

Early in 2024, our Listener's Effort methodology applied, in objective and precise manner, encouraging granular, consistent speech sample analysis to track the progression of bulbar symptoms in ALS. Of vital importance was applying this method to an outside data set to complement the Austen Speech Study, to ensure repeatability of results. We were proud to achieve high correlation of progression scoring with an even larger set of participants from the **Healey Platform Regimen D** participant pool.

We aim to continue progress with additional data sets and the FDA approval of this method as a new drug development tool (eCOA).

# 5,468

Speech samples collected from Healey platform for analysis

# +96%

Inter-rater reliability in scoring speech samples between expert reviewers

*The challenge to the landscape remains in identifying progression earlier to shorten the diagnostic odyssey, and extending the use of such measurement approaches to other modalities that will help us understand and address the underlying physiology of progression and sub-typing the disease.*

### MULTI-MODAL REMOTE ENGAGEMENT SUPPORT IN CLINICAL TRIALS

Achievements in consistent, high participant engagement and high fidelity of data capture in the Radcliff Multi-Modal Study provided the basis for remote patient monitoring of people with ALS participating in **RAPA Therapeutics' Expanded Access Program**. Additional investments in this model have led to fully operational research management portal designed to integrate people with ALS participating in clinical trials on-site with reliable remote monitoring capturing information in this hybrid model efficiently.

# 98%

Participant completion of all measurement tasks across all sessions

# 92%

Enrollment rate to the remote monitoring with EverythingALS

# 04

## **Fostering Engagement & Transparency:**

Linking Care to Cure through Citizen Science, Pathfinders and Inspiring Future Professionals

# A Promise Kept: EverythingALS Participant Portal

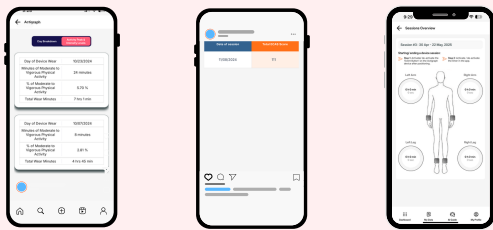
## Instant Value: Providing Return of Results (RoR)

In 2024 provided access to **750,000 data points** across all research participants, with **500 data points per participant** for personalized health tracking.

During and post studies, participants have direct access to their personalized participant portal, available to access via any media - **desktop and mobile app** - to easily review and track speech, respiratory, gait/balance, cognition and memory health records. The portal offers a wide range of features, including the ability to monitor speech metrics such as the average of puh-tuh-kuh syllables, words per minute, and loudness (in dB) across multiple timeframes—last session, last 30 days, and all time. This data is presented alongside functional ratings such as ALSFRS-R, ROADS, CPIB, ARES etc. to give participants a clear picture of their personalized health and to get appropriate care.

### PERSONALIZED HEALTH:

Tracks Speaking, Facial Video, Breathing, Walking, Muscle Strength and various metrics and share with providers for care



### ANALYZE AND TRACK:

Everyone's ALS is unique. Tracking Individualized journey is key

### PARTICIPANTS OWN THE DATA:

Download captured data instantly



In the **Radcliff multi-modal study**, participants had real-time data for their respiratory health tracked by best forced vital capacity (FVC) and slow vital capacity (SVC) efforts, as well as download speech recordings for voice banking purposes. Additionally, the portal provides detailed session breakdowns of ALSFRS, ARES, and CPIB scores over time, as well as information on fatigue and gait/balance metrics.

For participants in the **Asymptomatic cohort**, the portal includes overall physical health assessments - speech, facial metrics through videos, upper limb and lower limb activities and memory and cognition assessments.

# Expert Talks Series: Connecting Citizens to Science

The **Expert Talks Series**, hosted bi-weekly, brings together the **scientific community, people with ALS, and caregivers** to explore the latest advancements in ALS research and treatments. These sessions are followed by a Q&A, which is shared on our YouTube channel for global access. We also host **private open forum discussions**, which are not shared online, providing a safe space for participants to engage in more personal conversations.

2024 EXPERT TALK LIVE ATTENDEES	HOURS OF CONTENT	EVERYTHINGALS YOUTUBE SUBSCRIBERS	QUESTIONS ANSWERED	UNIQUE VIEWERS
3,025	220 HRS	+7.6K	2,500	496K

## 2024 EXPERT TALK SERIES TOPICS IN ALS RESEARCH, TREATMENTS, AND ADVOCACY

<p><b>PRECLINICAL RESEARCH &amp; THERAPEUTIC DISCOVERY</b></p>	<p><b>CLINICAL TRIALS, EMERGING THERAPIES &amp; RESEARCH</b></p>	<p><b>SYMPTOM MANAGEMENT AND SUPPORT SYSTEM</b></p>	<p><b>BRAIN COMPUTER INTERFACE &amp; ASSISTIVE DEVICES</b></p>	<p><b>ADVOCACY, RESOURCES AND POLICY ACTION</b></p>
<p>GENETIC INSIGHTS &amp; MECHANISMS</p>	<p>EMERGING THERAPIES &amp; TREATMENT</p>	<p>SLOWING DISEASE PROGRESSION &amp; MANAGING SYMPTOMS</p>	<p>SLOWING DISEASE PROGRESSION &amp; MANAGING SYMPTOMS</p>	<p>PATIENT ADVOCACY &amp; COMMUNITY INITIATIVES</p>
<p>MASSACHUSETTS GENERAL HOSPITAL</p> <p>Sano</p> <p>UMass Chan MEDICAL SCHOOL</p>	<p>COLUMBIA COLUMBIA UNIVERSITY IRVING MEDICAL CENTER</p> <p>prienio</p> <p>clene</p> <p>NeuroSense Therapeutics</p> <p>MASSACHUSETTS GENERAL HOSPITAL</p> <p>Duke UNIVERSITY</p> <p>Rapa Therapeutics</p>	<p>NSU</p> <p>UPSTATE</p> <p>IOWA</p>	<p>Blackrock Neurotech</p> <p>NEURALINK</p> <p>PrecisionNeuroscience</p> <p>UMC Utrecht</p> <p>synchron</p> <p>IBCI-CC</p> <p>Cognixion</p> <p>Paradromics</p> <p>MASSACHUSETTS GENERAL HOSPITAL</p> <p>UC San Diego</p>	<p>ALS Hope Foundation</p> <p>ALS ONE</p> <p>ALS</p> <p>ALS</p> <p>ALS HEROES</p> <p>TEAM GLEASON</p>
<p>MOLECULAR PATHWAYS, DISEASE MECHANISMS &amp; CONCEPTS</p>	<p>INNOVATIVE RESEARCH STRATEGIES</p>	<p>CAREGIVING &amp; SUPPORT SYSTEMS</p>	<p>TELEMEDICINE &amp; DIGITAL HEALTH SOLUTIONS</p>	<p>LEGISLATION, POLICY ACTION &amp; FUNDING</p>
<p>UNIVERSITY OF MICHIGAN</p> <p>NEUVIVO</p> <p>MILLER SCHOOL OF MEDICINE</p>	<p>TEMPLE UNIVERSITY</p> <p>CLINICAL TRIAL METHODOLOGY AND OUTCOME ASSESSMENT</p> <p>McGill UNIVERSITY</p>	<p>UCSF Weill Institute for Neurosciences</p> <p>salesforce</p>	<p>TEMPLE UNIVERSITY</p> <p>UC San Diego</p> <p>compass.uoi</p> <p>IBM</p> <p>modality.ai</p> <p>MIT</p> <p>EMORY UNIVERSITY</p> <p>SageBionetworks</p> <p>LINUS HEALTH</p>	<p>CRITICAL PATH INSTITUTE</p> <p>ALS</p>

# Inspiring Future Professionals



CASEY DUAN



BRYAN TROUNG



BELLA YARAHMADI



ANUSHA RAO



JUDY CHAE



ALEX MCKNIGHT



AASHIR RANA



KESHAV RANGAN

Our **Student Ambassador Program** offers a unique multi-year research traineeship for undergraduate and graduate students. Ambassadors receive comprehensive CITI and HIPAA training and contribute to a specific aspect of our mission. They also serve as the primary point of contact for a cohort of study participants.

Our **Fellowship Student Program** offers a year-long research internship for post-graduate and pre-med students. Fellows not only receive extensive clinical research certifications and training, but directly participate in the study operations and participant engagement.

Student Ambassadors are motivated, young champions of the community and they play a vital role in connecting the community to the ALS AI research. We hope to inspire each one to pursue a career in the life sciences and data science, but most importantly a life empathetic inquiry.



**2024 SUMMIT:** Anusha Rao (center) presented the **AI Clinical Endpoint Tool** to 60+ neurologists and executives from leading biotech and pharma companies at the EverythingALS Digital Biomarker Summit on August 26th 2024.

STUDENT FELLOWS & AMBASSADORS

# Connection Through Peers: Meet the **PATHFINDERS**

Launched in 2024, our Pathfinders program empowers individuals and families affected by ALS through a scalable and **dedicated team of Pathfinders—People with ALS and caregivers**—focused on physical empowerment, mental resilience, and overall support.



The **Pathfinders program** was covered in CBS News in Dec. Watch the clip to know more about these peer navigators who are living the ALS experience, taking the time to provide peer guidance and support. They host virtual monthly Fireside Chats - open community events held virtually - where they share insights, experiences, and valuable information to foster a sense of community and are **contactable via the EverythingALS app**. The Pathfinders come from diverse backgrounds and roles to help people from across the country and the world to connect to available research, new potential disease management resources, and support options they can trust from people who understand the journey.



# In the News



News | Drug Development

## Listen Up: Emerging Vocal Biomarker Could Aid ALS Drug Development

April 12, 2024 | 5 min read | Kate Goodwin



Featured: A smartphone analyzing sound Taylor Tades for BioSpace

Experts are hopeful that objective biomarker measures for amyotrophic lateral sclerosis, such as the ones being developed by EverythingALS, will lead to more targeted, effective treatments.

It's been a disappointing spring for the amyotrophic lateral sclerosis community, with the Phase II failure of Sanofi and Denali Therapeutics' candidate and Amylyx's decision to pull *Relytixo* from the market. But drugmakers are hopeful that the development and validation of novel biomarkers for the disease, including neurofilament, genetic markers and, more recently, speech, can help improve patient care and expedite the development of effective treatments.

## Former music exec on losing voice to ALS – and finding hope in community; rise in Islamophobia after Bourbon Street attack

By Alana Schreiber

Published January 17, 2023 at 12:28 PM CST

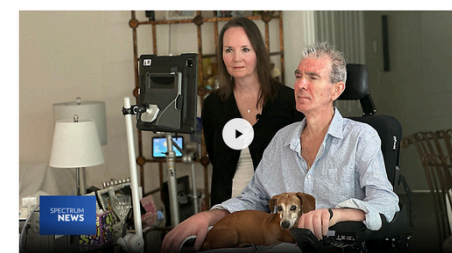


**LOCAL NEWS**  
**Minnetonka woman helping connect ALS community through app "Pathfinders"**  
 By Benet Leone  
 December 29, 2024 / 11:06 AM CST / CBS Minnesota



SPECTRUM NEWS 9

## St. Petersburg couple participate in speech study for earlier ALS diagnosis



Phil and Marina Booth, joined by their dog, Dixie, participate in the Everything ALS Speech Study. Spectrum News/Melex Estemery



## EverythingALS launches AI platform to accelerate ALS research

Goal of Vision 2030 AI Hub is restoring lost motor function to patients

by Mary Chapman | March 25, 2024



NightSide News Update  
June 27, 2024 - 38 mins

We began the program by bringing you four news segments with different guests on the stories we think you need to know about!

Indu Navar - Founder of EverythingALS on the 2024 CEO Soak Boston, which is taking place on July 12th and it is one way people are showing their support in the fight against ALS.

Ioanna Paschalidis - Director of the Hariri Institute for Computing at Boston University brought us the story of Boston scientists create AI model to "catch Alzheimer's disease early."

Ask Alexa to play WBZ NewsRadio on #HeartRadio!



Drug Discovery | AI and Machine Learning | Data Transformations

## Citizen-Driven Research Aids Development Of Digital Biomarkers For ALS

March 13, 2024

By Deborah Borfritz

March 13, 2024 | When it comes to research on amyotrophic lateral sclerosis (ALS), every stakeholder—most especially patients—knows time is of the essence. From diagnosis to death, life expectancy from the debilitating neuromuscular disease can be two years or less. "The time people give us is currency," says Indu Navar, founder of the nonprofit Peter Cohen Foundation operating as EverythingALS.

Through that lens it becomes clear the only way forward is by eliminating unnecessary repetition with open science and precompetitive collaboration. For ALS researchers, the focal point of these efforts is the creation of digital biomarkers that can shorten clinical trials and the odds of their success with fewer required participants, she says.

For tech entrepreneur Navar, this is personal. Her husband Peter Cohen died of ALS without the benefit of a speedy diagnosis, let alone access to the kind of large-scale research efforts required for making life-changing therapeutic breakthroughs.

## EverythingALS launches new app version for broader ALS community

Patients and caregivers can access resources, contribute to ALS research

by Esteban Dominguez Cerazo, MS | September 4, 2024



## Indu Navar: ALS Awareness Month

Updated: May 30, 2024 at 3:00 PM IST



**ISSUES THAT DEVELOP WITH ALS**  
 MAYO CLINIC

- BREATHING PROBLEMS
- SPEAKING PROBLEMS
- EATING PROBLEMS
- DEMENTIA



Round the Clock: Emerging Technologies in Diagnostics

## Citizen-Driven Research Aids Development Of Digital Biomarkers For ALS

By Deborah Borfritz

March 20, 2024 | When it comes to research on amyotrophic lateral sclerosis (ALS), every stakeholder—most especially patients—knows time is of the essence. From diagnosis to death, life expectancy from the debilitating neuromuscular disease can be two years or less. "The time people give us is currency," says Indu Navar, founder of the nonprofit Peter Cohen Foundation operating as EverythingALS.

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# Focus for 2025: Vision 2030, Event Prediction & Endpoint Deployment

EverythingALS is accelerating the engines that can be best addressed with a combination of citizen-driven insights on unmet needs, translating and releasing those insights into the **research and care settings of ALS:**

- 1 **Vision 2030** will fund additional Neurological Repair and Regeneration programs continue Hub institutional and technology partnership expansion
- 2 Pursue adoption of **Listener's Effort** to measure drug effectiveness and sub-typing
- 3 **Research and Develop** additional objective clinical measures for Endpoints and care Event Predictions
- 4 Address the diagnosis delay and challenges of recruitment into the **clinical trials with continued expansion into clinical practice.**

\*DHT = DIGITAL HEALTH TOOL

### CITIZEN - DRIVEN RESEARCH

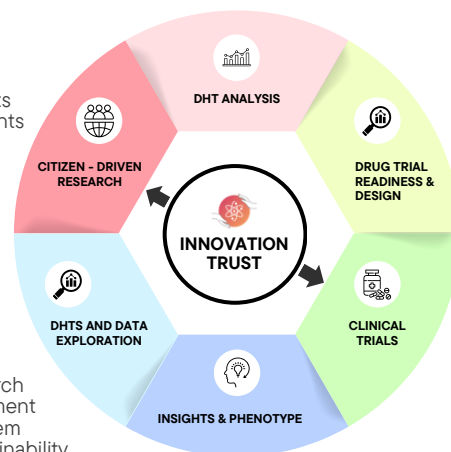
- Patient data aggregation
- Deliver immediate value to participants with data and insights

### NEW \*DHTS AND DATA EXPLORATION

- Sensors and research endpoint development
- Increased ecosystem investment & sustainability

### \*DHT ANALYSIS

- Actionable data science insights
- Objective clinical outcome measures
- Care events prediction for quality of life



### DRUG TRIAL READINESS & DESIGN

- Objective and clinically meaningful endpoints
- Co-designed trials with the community

### CLINICAL TRIALS

- Recruitment of patients at earlier disease stage
- Remote monitoring to reduce friction and increase study retention

### INSIGHTS & PHENOTYPE

- Patient Stratification and treatment validation
- Vision 2030 Research

With our clear 2025 strategic goals, we will continue expanding partnerships with organizations and communities where mutual strategic benefits drive **EverythingALS' flywheel of AI, Trust and Open Innovation**, advancing the global pursuit of improving brain health and **#CaretoCure** ALS.



# THE EVERYTHINGALS TEAM

We extend our deepest gratitude to the EverythingALS team of daily contributors—our dedicated staff, Board of Directors, and Vision 2030 advisors. Your unwavering commitment to pushing boundaries, continuously learning and adapting, and staying focused on what truly "turns the wheel" drives our collective impact of curing ALS.

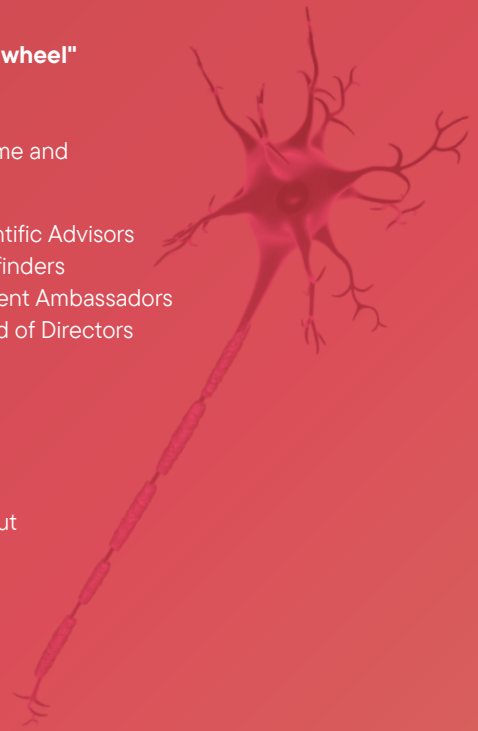
And we especially thank our community of research participants for dedicating your energy, time and positivity to advance of the pursuit of the end of ALS

Indu Navar  
Christian Rubio  
Stephanie Henze  
McFinn Lovere  
Sarita Sanjoy  
Julian Peller  
Silviya Bastola  
Natalia Luchkina  
Alan Taitz  
Madhavi Shankar  
Martha Beach  
Murray Abrahamson

Cassandra Weller  
Swapnil Harkanth  
Jon Gallagher  
Esteban Roitberg  
Marcos Trevisan  
Diego Shalom  
Felipe Aguirre  
Swati Marve  
Hrutu Swar  
Shalini Trefzer  
Elizabeth del Nido Stone  
Rohit Parekh

Shubham Patil  
Gaston Bujía  
Iair Embon  
Ty Truong  
Maria Barron  
Emma Durocher  
Sonal Banka  
Deanna Salas  
Steve Pollack  
Raquel Norel  
Jordan Green  
Karl Sillay

EverythingALS Scientific Advisors  
EverythingALS Pathfinders  
EverythingALS Student Ambassadors  
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Michele Nuti  
Geoff Green  
Shawn Kreloff  
Jerry Newman  
William Stiggelbout  
Phillip Reilly



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