Poster #105

Presented at the 2026 Northeast Amyotrophic Lateral Sclerosis (NEALS) Consortium Clearwater, FL October 27-30, 2026

At-Home Telespirometry Identifies Baseline Erect Slow Vital Capacity (eSVC) at ≤80%-Predicted as a Pivotal Benchmark Separating Rapid From Less Rapid Decline in eSVC, Supine SVC, and Amyotrophic Lateral Sclerosis Functional Rating Scale-Revised Score in Observational Study (NCT05106569)

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Background

- Respiratory (erect slow vital capacity [eSVC], supine SVC [sSVC]) and clinimetric function (Amyotrophic Lateral Sclerosis Functional Rating Scale-Revised [ALSFRS-R] total, bulbar, fine motor, gross motor, and respiratory domain scores) were evaluated cross-sectionally/longitudinally in participants with ALS (n=98) during a 24-week observational study using remote spirometry (NCT05106569)[1-3]

Objective

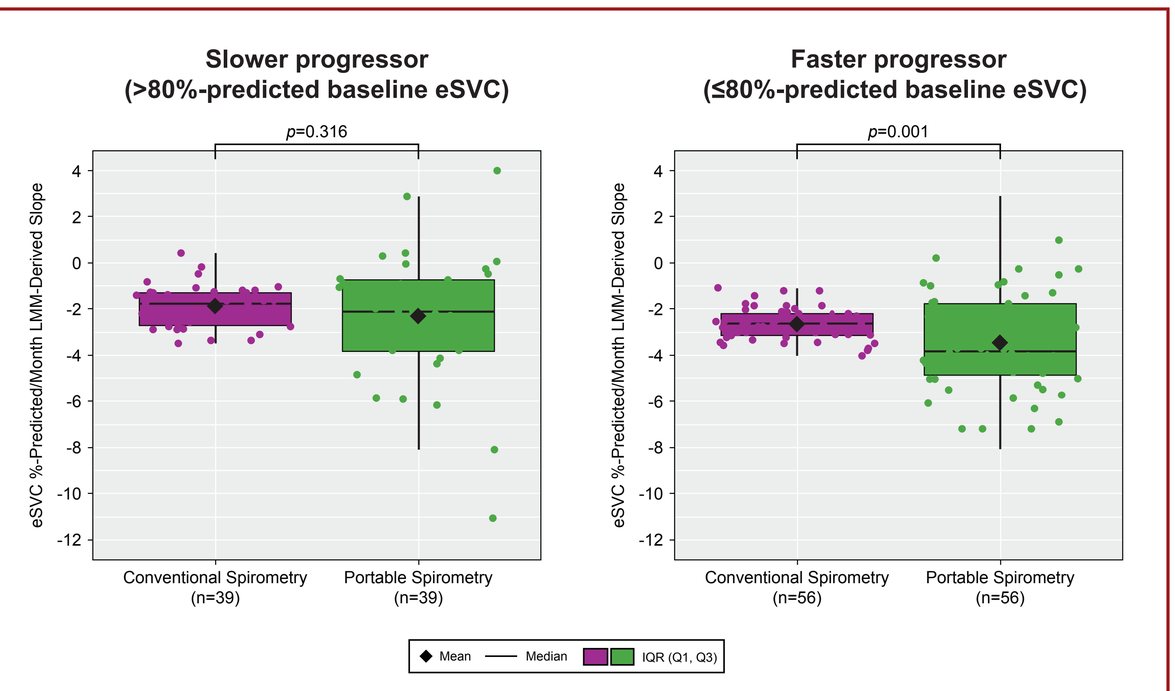
- To analyze the relationship between baseline eSVC and rate of eSVC, sSVC %-predicted, and ALSFRS-R total and domain monthly change, both cross-sectionally and longitudinally, with implementation of At-Home Telespirometry (AHT)

Methods/Implementation

- Prospective study of 98 participants scheduled to perform remote bi-weekly respiratory therapist-supervised eSVC and sSVC measurements over 24 weeks using a portable turbine spirometer (MIR, Italy) and conventional spirometer (Vyaire, USA) (1/98 participants did not initiate or complete AHT)
- Longitudinal trajectory analysis using linear mixed-effects models to derive participant-specific monthly decline rates (MDRs) for eSVC, sSVC, and ALSFRS-R total and domain scores

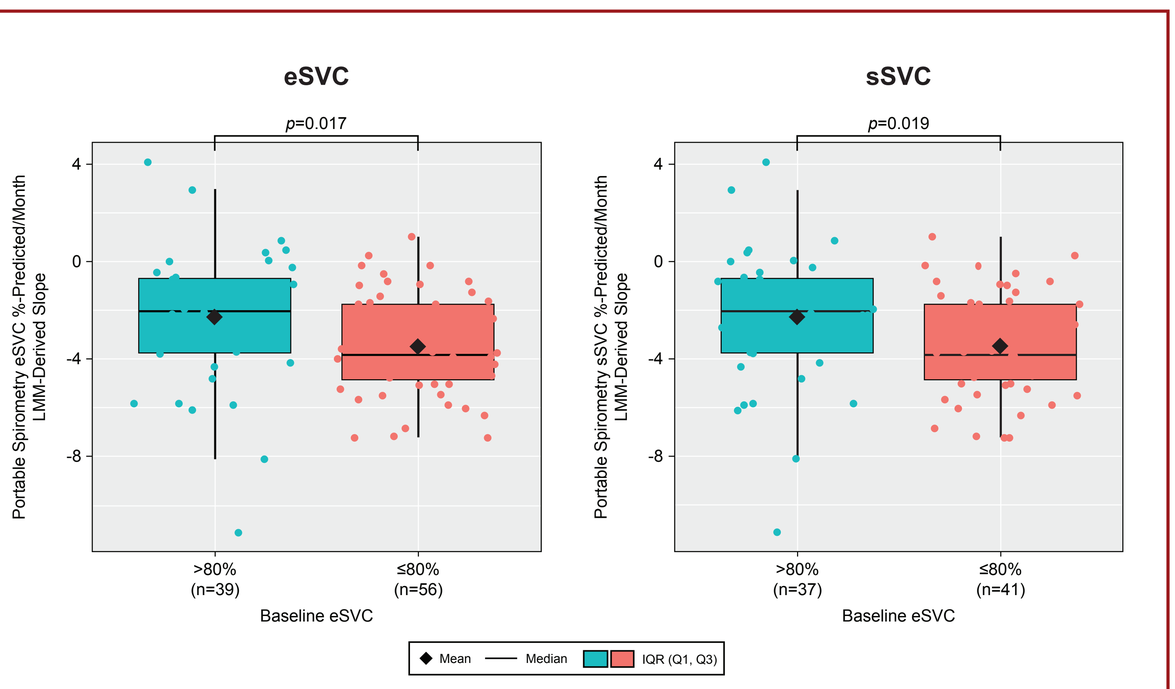
Results

- Portable spirometry (AHT) slope analysis compared with conventional (in-clinic) slope analysis confirmed faster respiratory progression in participants with ALS with eSVC baseline ≤80%-predicted



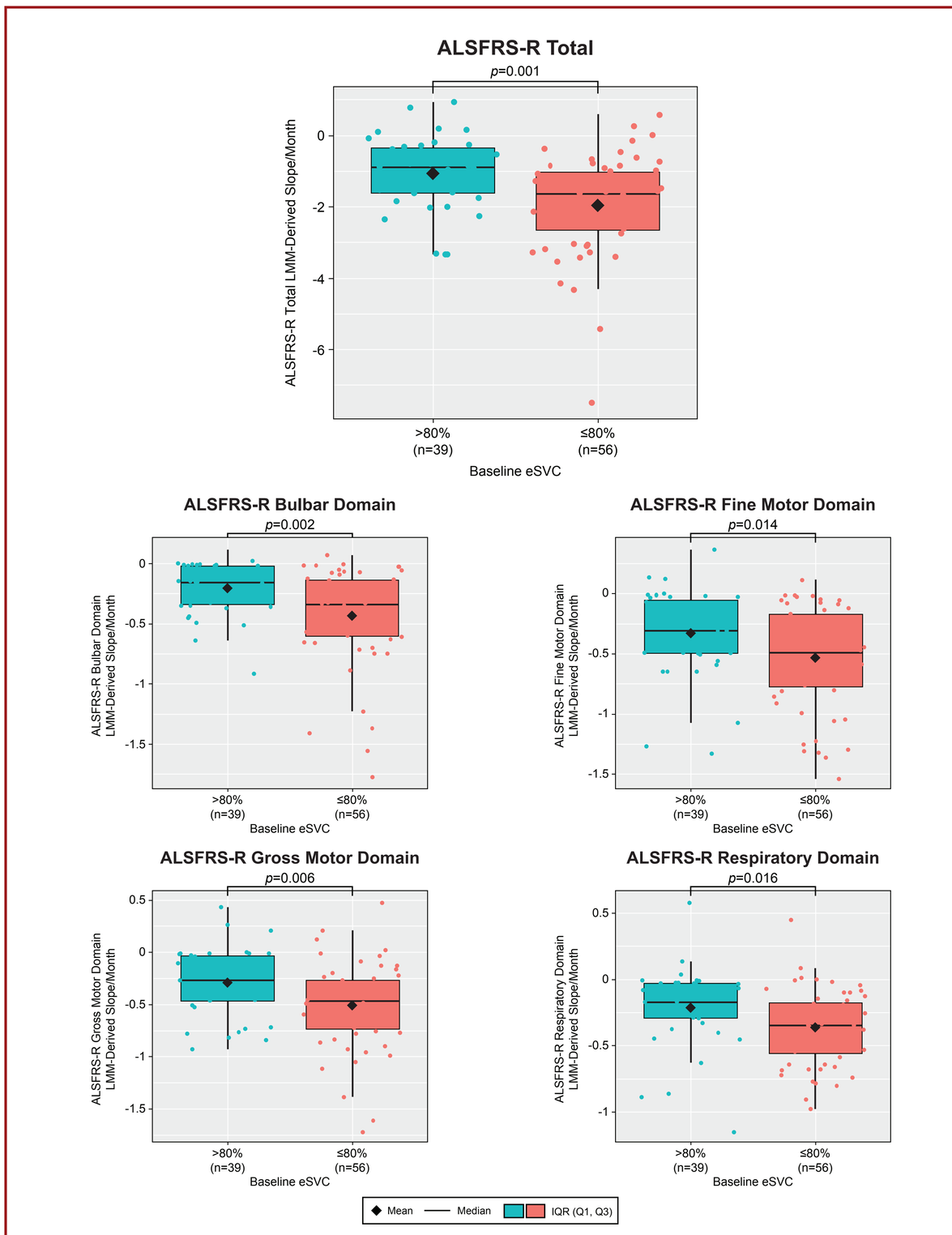
eSVC, erect slow vital capacity; IQR, interquartile range; LMM, linear mixed-effects model.

- Portable spirometry (AHT) slope analysis confirmed both faster eSVC and sSVC respiratory progression in participants with ALS with eSVC baseline ≤80%-predicted



eSVC, erect slow vital capacity; IQR, interquartile range; LMM, linear mixed-effects model; sSVC, supine SVC.

- ALSFRS-R slope analysis confirmed faster ALSFRS-R total and individual domain score progression in participants with ALS with eSVC baseline ≤80%-predicted



ALSFRS-R, Amyotrophic Lateral Sclerosis Functional Rating Scale-Revised; eSVC, erect slow vital capacity; IQR, interquartile range; LMM, linear mixed-effects model.

Conclusions

- AHT and ALSFRS-R slope analysis identified baseline eSVC at ≤80%-predicted as a pivotal benchmark separating rapidity of decline in both clinical respiratory eSVC/sSVC and functional ALSFRS-R total, bulbar, fine motor, gross motor, and respiratory domain scores in this prospective, longitudinal, observational study
- Confirmation of these findings in current natural history databases employing frequent remote telespirometry is now possible and will determine whether patients with ALS identified by baseline eSVC ≤80%-predicted may be proper subjects for more rapid treatment initiation with pharmacological and device interventions that may improve ALS outcomes

References

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Acknowledgments

The authors thank Irene Brody, VMD, PhD, of *p*-value communications, Cedar Knolls, NJ, USA, for providing medical writing support. Editorial support was also provided by *p*-value communications. This support was funded by Shionogi Inc., Florham Park, NJ, USA, in accordance with Good Publication Practice Guidelines 2022.

Disclosures

EIY has served on the Shionogi Advisory Board. **DW, GS, DM, BS, UD, LD, MP, JC, EB, JAM, RAM, GB, DV, SAb, AI,** and **PC** have no disclosures to report. **TK** is an employee of Tanabe Pharma Corporation. **KP** and **SA** are employees of Shionogi Inc. **BRB** is a consultant for Shionogi Inc. This study was sponsored by Shionogi Inc.

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MA-RC-US-0845