**THE ALSFRS @ 20: EVOLUTION OF THE ALSFRS-R, HISTORY, CLINIMETRIC PROPERTIES AND FUTURE DIRECTIONS**

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**Abstract**

The one ALSFRS question about breathing function was replaced with 3, covering dyspnea, orthopnea, and the need for ventilatory support (Cedarbaum, et al. 1990).

The sensitivity, specificity and construct validity of the original scale were retained.

Interesting, the new pulmonary item did not correlate with limb and bulbar function in the factor analysis, indicating that it measured a completely different dimension of the disease and provided information not previously captured by the ALSFRS.

**Bulbar Fine Motor Gross Motor Breathing**

7. Turning in bed
   - None
   - Slight exertion
   - Severe
   - Complete dependence

8. Dyspnea
   - None
   - Problems with shortness of breath
   - Severe
   - Complete dependence

9. Orthopnea
   - None
   - Early ambulation difficulties
   - Needs assistance
   - Complete dependence

10. Respiratory insufficiency
    - None
    - Requires frequent naps
    - Cannot talk
    - Needs ventilatory support

11. Bulbar function
    - Ability to grip pen but unable to write
    - Marked drooling; requires constant tissue or handkerchief
    - Normal speech processes
    - Needs supplemental tube feeding

12. Respiratory/Cough
    - None
    - Nighttime cough
    - Can cough alone
    - Needs assistance

**What is the ALSFRS?**

- When we were contemplating clinical trials with neurotrophic growth factors, the "in-vegal" method of assessing ALS disease status was Quantitative Muscle Testing (QMT; Andres, et al. 1987).
  - It was also recognized in ALS, like cancer, survival would be the gold standard for clinical trial outcomes in ALS.
  - However, we wanted to have a measure that would be informative about patients' abilities, could be administered to patients unable to attend clinic, and that ultimately prove to have some prognostic values.
  - Clinical rating scales available at the time, the Appel Scale (Appel et al. 1987), and the Norris Scale (Norris, et al. 1974) combined interview-based functional assessments and observational testing in ways that were not intrusive, were lengthy and required specialized equipment and testing locations.
  - Hence, a new scale was needed.

**Principles in Design of the Original ALSFRS**

- **Goals:**
  - Develop a simple, 10-item questionnaire-based scale to record ADL performance.
  - Develop a validated rating scale that would complement QMT and be easy to administer.
  - The scale was to be questionnaire-based and not mix testing modalities (i.e., it should not be a composite scale).

- **Models included the Unified Parkinson Disease Rating Scale (UPDRS; Fahn and Elton 1987) and the ALS Severity Scale (ALS5SS developed by Hiltel) et al. (1989).**

- **Features of the Scale:**
  - Each item scored uniformly from 0 (unable to do) to 4 (normal function).
  - Queries patients' current ability to perform selected ADLs, does not reference past performance.
  - Intermediate scale steps described precisely to try to avoid ambiguity in interpretation.

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**Reliability and Alternate Modes of Administration for Modern Clinical Trials**

- **Goal:**
  - Reliable and easy to administer.

- **Data was also available about patients who began using mechanical ventilation**

- **Results:**
  - Continued utility and validity demonstrated over a 9-month study, using the ALSFRS-R in a multicenter clinical trial.
  - Found little redundancy in factor analysis and logical grouping of scale items.

- **The ALSFRS-R:**
  - PredictiveSurvival: Scores Represent Clinically Meaningful Changes in Disease Status
  - Robust Over Time and Across Studies

**The ALSFRS-R Has Been Translated Into Multiple Languages, With Cultural Adaptations As Required**

**References**