

## **Predict bulbar motor involvement due to ALS: A data-mining approach**

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Amyotrophic Lateral Sclerosis (ALS) is a progressive neurological disease that often causes rapid deterioration in bulbar (speech and swallowing) functions. Although the assessment of bulbar dysfunction is largely based on clinical estimates of speech intelligibility, a small number of studies have confirmed that the rapid drop in speech intelligibility occurs long after the onset of bulbar motor signs (DePaul & Brooks, 1993; Kent et al., 1990; Mefferd & Green, 2012; Yorkston et al., 1993; Yunusova et al., 2007). Research is now needed to determine which measures of bulbar function, among a vast number of candidate measures, are the most sensitive to motor neuron deterioration. This investigation used a comprehensive, data-mining approach to identify the speech subsystem measures that optimally predict the onset and progression of bulbar dysfunction in 66 persons with ALS. We found that (1) all speech subsystems (respiratory, phonatory, articulatory, and resonatory) showed earlier onsets and faster rates of decline than did speech intelligibility; and (2) among the four subsystems, the articulatory and phonatory functions evidenced the earliest decline and fastest deterioration. The clinical implications of these findings are considered.