Neck intermuscular coherence distinguishes normal from disordered voice production

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Recent work has indicated that individuals with vocal nodules have significantly lower mean intermuscular coherence in the beta band (15 – 35 Hz) during production of read and spontaneous speech when compared to controls, suggesting its possible use as an indicator of vocal hyperfunction, a common condition associated with many voice disorders. Here, surface electromyography (sEMG) at two anterior neck locations was used to compare the mean intermuscular coherence in the beta band of 10 individuals during naturally produced read and spontaneous speech that was recorded at an earlier time, as well as during a variety of other tasks, including: non-speech maneuvers, "clear" speech, low-attention speech, singing, and mimicked hyperfunctional speech. A two factor ANOVA showed significant effects of both individual and task ($p = 0.001$). Dunnett's Simultaneous Paired t-tests between naturally produced speech and other tasks found significantly decreased coherence values during low-attention speech, singing, and hyperfunctional speech relative to normal speech ($p_{adj} < 0.05$). This preliminary work highlights the potential of this measure for voice and speech research. Results will also be discussed relative to how vocal hyperfunction may manifest as a movement disorder.