## Contrast Sensitivity Visual Acuity is Deficient in Parkinson's Disease and Degrades Motor Performance Colin Swigler, Angel Martin, Freud Milice, Megan Walley, Leonard LaPointe, Charles Saunders, Gerry Maitland Tallahassee Memorial Parkinson Center

Objective: To determine the effect of deficient contrast sensitivity acuity on gait performance in Parkinsonism.

**Methodology:** Twenty Parkinson's subjects (Stage I-III) versus aged matched controls. Tests include UPDRS scores, directive & contrast sensitivity binocular visual acuity using SLOAN wall charts tested at 100%, 2.5%, and 1.25%. Gait analysis (GaitRite) in conditions of high/low illumination (>80 & <4 candela). Measurements include: functional ambulation profile (FAP), step number, velocity, normalized velocity, step length, step length differential, stride length, & cadence. Exclusion criteria: VA <20/50, known night blindness, and known comorbid neurologic or vestibular conditions.

**Results:** Compared with controls, there was significantly poorer contrast visual acuity in the Parkinson's group at 2.5% and 1.25% visual efficiency, an observation we have previously reported. Further, such visual deficiency significantly degraded motor performance. I.e. when compared to performance of controls in high illumination, PD subjects had a statistically significant difference in cadence only. In dim illumination, PD subjects displayed poorer performances in FAP, velocity, normalized velocity, cadence, step length, and stride length.

**Conclusion:** This pilot study confirms presence of contrast sensitivity deficits that significantly degrade motor performance in Parkinsonism under conditions of low illumination, presumably the result of retinal dopamine deficiency. Substandard FAP scores are particularly meaningful as there is high correlation between low FAP scoring and increased fall risk. Contrast sensitivity testing should be considered in all suspected and diagnosed Parkinson's patients since it appears that there are functional implications even in the early stages of Parkinsonism.