Introduction/aim: Optic flow (the pattern of motion at the eye) controls human walking. Perception of the focus of expansion (FOE) of a radially expanding pattern of moving dots (radial optic flow or ROF) is impaired in AD, but has not been investigated in PD. In the ROF illusion (ROFI), the FOE is perceived as shifted in the direction of a superimposed planar motion pattern (similar motion created by pursuit eye movements). The magnitude of the shift is dependent on the depth of the planar motion relative to the FOE: decreased significantly for crossed disparity (in front) and nearly unchanged for uncrossed disparity (behind). Effects of aging and disease on the ROFI are unknown. We assessed perception of the ROFI in healthy older, AD, and pre-DBS-PD subjects.

Methods: Healthy (n=26), mild AD (n=13), and non-demented, pre-DBS-PD (n=7) subjects with good stereoacuity participated. The ROFI was displayed in a 3D virtual environment with planar motion at 3 depths: same(0˚), front(+1.2˚), behind(-1.5˚).

Results: AD was more likely than PD* and healthy* to not perceive an illusory shift in the FOE. A significant effect of depth was observed for healthy* and PD*, but not AD. Unlike healthy and published reports for young subjects, the magnitude of FOE shift for PD subjects was not significantly different between crossed and uncrossed disparities. (*p< 0.05).

Conclusions: This study indicates that AD and PD could potentially disrupt visually-driven neuronal networks involved in the control of human walking and ROFI processing in AD and PD warrants further study.