

## **Turning during single- and dual-task in patients with Parkinson's disease**

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*Introduction:* Successful turning depends on correct intersegmental coordination. This means that the head starts with the movement, followed by trunk and feet [1]. In PD, this sequence is often affected, and the body segments turn *en bloc* [2]. As gait and balance parameters in PD are affected by DT and turns are often a problem for PD patients [3,4], this study investigated intersegmental body coordination and kinematics during turning in ST and DT in PD patients.

*Objective:* To investigate turning features in single (ST) and dual task (DT) in Parkinson's disease (PD) patients.

*Methods:* Twenty-two PD patients and 22 age- and sex-matched controls (CO) performed 3 walking tasks involving 180° turns: walking up and down a 5-meter distance alone and while performing a reaction time task and a numerical Stroop test (both smartphone-based). The following parameters were extracted through a motion capture system: turn duration (TD), number of steps (NS), mean (MAV) and peak (PAV) angular velocity. Sternum turning onset latency (TOL) relative to head and the maximum angle between these two body segments (MA).

*Results:* In DT compared to ST, TD and NS were larger, and MAV and PAV were smaller for both body segments in both groups. However, PD patients turned more slowly and with a lower PAV than CO. During ST, compared to CO, PD patients showed a more *en bloc* turning in terms of TOL. In both groups MA was smaller in DT compared to ST but no difference was found between the two groups. During DT, sternum started before head in PD patients, whereas the sequence is still preserved in CO.

*Conclusions:* PD patients turn more *en bloc* than controls in ST and loose intersegmental body coordination during DT conditions. These results could explain, at least partly, increased balance deficits and risk of falls during turning in PD.

### **References:**

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