Background

Stroke is a leading cause of serious, adult, long-term disability with hemiparesis being the most common motor impairment.1

The purpose of this study is to better understand the motor planning and coding of arm movements within controls and stroke patients.

In a previous study, we have demonstrated 2 motor planning systems.2

1. Common Endpoint

Encode the endpoint to which you want the limb to move.

2. Common Vector

Encode direction and extent to which you want the limb to move.

Methods

Subjects: 12 controls, 13 stroke subjects on their less-affected arm, and 10 stroke subjects on their more-affected arm.

Task: Subjects performed many repetitions of reaches on a tabletop as instructed on a display monitor with alternating blocks of trials grouped by common endpoint and common vector.

3D finger position recorded by an Optotrak at 200 Hz

Results

Variance Ratio (VR) among control subjects for vector-grouped data is > 1 and for endpoint-grouped data = 1

VR among stroke subjects for both vector- and endpoint-grouped data ≈ 1 for both more-affected and less-affected arms.

Conclusions

Vector-coded planning is not evident among stroke subjects and, surprisingly, it is not evident in both their more-affected and less-affected arms.

Our findings have implications for designing therapeutic strategies that aim to improve motor function in stroke victims.

References:


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