



WHOLE-BODY KINEMATICS DURING STAND-UP PADDLE BOARD EXERCISE

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Introduction

- Standup Paddleboarding (SUP) is a whole-body physical activity. SUP ergometers are commercially available and may represent a good fitness training tool.
- Improper stroke technique can result in injuries.
- Identifying kinematic stroke properties that reflect coordinated and metabolically efficient motion patterns can lead to improved training techniques.

Purpose

- Identify patterns of selected joint motions associated with SUP exercise and determine if these patterns are modified with increasing exercise bout time.

Methods

- Data was collected for 4 one-minute increments across an 10-minute SUP exercise bout from 10 young participants (5 females)
- Whole body kinematics collected with inertial measurement units (Xsens)
- Time series waveforms for each joint and increment were derived
- Joint motions were separated into a pull and recovery phase
- Joint range of motion (ROM) and peak velocities were calculated
- Pearson R correlations were calculated between increments for each joint time series waveform
- Spatial parameter mapping (SPM) was used to determine potential differences in mean amplitude across the entire waveform for each joint and increment

Results

- Correlations within each joint, across all increments were 0.90 or above
- SPM revealed differences in waveform amplitudes across increments, for the shoulder, knee and hip, were significantly reduced such that only slight differences remained between increments 3 and 4
- Conversely, elbow and ankle amplitude differences remained robust throughout the 10-minute exercise bout for pull and recovery phases.

Take Home Message

Despite being novices, subjects quickly established the basic kinematic coordination patterns necessary to perform the SUP stroke.

Joint amplitude differences across both the pull and recovery phases were evident initially but dissipated over time in the more proximal joints but persisted in the more distal joints.

Due to easy adoption of the basic movement and the metabolic workload required*, SUP can be recommended as an effective form of exercise.

*See Poster 17: Metabolic Responses to Stand-up Paddle Board Ergometry in Young Novices - Friday 10:30-12:00

