STUDY OF BALANCE DURING WEIGHT-SHIFTING FOR STANDARD ROWING

HOPPOL S 2016
INTRODUCTION: ROWING TECHNIQUE AND MUSCLE ACTIVATION
As the old saying goes in rowing, “You only get better with experience, as no one is a prodigy in this sport”.

Hypothesis I

- If this is statement is true, then an individual who is more experienced in rowing will have decreased tendencies that detract from potential movement through weight distribution.

- In comparison between an amateur and a more experienced oarsmen, there will be less variability and a “more-centered” center of mass about their stroke in comparison to an amateur, who should have a larger variability and “less-centered” center of mass.

Hypothesis II

- If an amateur spends more time erging/rowing, then their representative mean force distribution for left/right directions will be more centered over time thanks to improvement scaling.
- Wii Balance Board (property of HOPPOLLS Lab)
- Ergometer (property of GT Rowing Club)
- Balancing mechanism for ergometer seat
- LabVIEW Software
- National Instruments Balance Script
METHOD 1

- Row for 30 seconds (restricted using ergometer programming)
  - Hold a stroke rate of 24 strokes/minute
  - Any wattage allowed for output
  - Only 1 attempt allowed
- Data recorded through Lab View and subsequently exported to Microsoft Excel for compilation and analysis.
- Used to examine differences between amateur and experienced rowers
METHOD 2

- Row for 120 seconds (restricted using ergometer programming)
  - Hold a stroke rate of 24 strokes/minute
  - Any wattage allowed for power output
  - Only 1 attempt allowed
    - Shown proper rowing technique prior to operation to allow for potential improvement in weight distribution
- Data recorded through Lab View and subsequently exported to Microsoft Excel for compilation and analysis
- Used to examine improvement in center over time in amateur rowers
RESULTS: METHOD 1 (TYLER)

- Mean Force Left/Right: -13.1727 N
- Standard Deviation Left/Right: 180.4833 N

X-axis: Negative values a represent left
Positive values represent right

Y-axis: Negative values a represent backwards/back
Positive values represent forwards/front
RESULTS: METHOD 1 (ISAAQ)

- Mean Force Left/Right: 57.53704 N
- Standard Deviation Left/Right: 272.2157 N

X-axis: Negative values represent left
Positive values represent right

Y-axis: Negative values represent backwards/back
Positive values represent forwards/front
RESULTS: METHOD 1 COMPARISON

Tyler’s (novice collegiate athlete) Distribution

Isaaq’s (amateur) Distribution
## RESULTS: METHOD 1 COMPARISON

<table>
<thead>
<tr>
<th></th>
<th>Tyler (Collegiate Rower)</th>
<th>Isaaq (Amateur Rower)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Force (L/R)</td>
<td>-13.1727</td>
<td>57.53704</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>180.4833</td>
<td>272.2157</td>
</tr>
</tbody>
</table>
RESULTS: METHOD 2

- Mean Force Left/Right: -61.000 N
- Standard Deviation Left/Right: 579.6114 N

Y-axis: Negative values represent rightward motion
Positive values represent leftward motion
CONCLUSIONS

- Method 1
  - Since Tyler (collegiate rower) had a “more-centered” center of mass (as described by the mean force L/R) and a smaller standard deviation in comparison to Isaaq (amateur rower), our hypothesis was supported.

- Method 2
  - Since Isaaq (amateur rower) had little to no improvement over time in weight distribution over the 120 seconds, no improvement was observed in the short term.
RECOMMENDATIONS

- Integrate Weight Board Circuit and plate into seat of the erg rather than constructing raised apparatus
- Contour the apparatus the correctly fit the ergometer
- Potential Experiment: recording and interpreting left versus right center of weight for rowers of equal skill but who row on different sides