

## 49. SWACSM Abstract

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### Biomechanical Changes in Running Post-Transition in a Triathlon

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#### ABSTRACT

Triathletes often complain about lower limb discomfort when running after cycling (Quigley, 1996). Several studies have found differences in muscle activation (Chapman, 2009), kinematics (Rendos et al., 2013), and kinetic cost (Millet, 2001) during the transition run. These differences were also found to be more severe in less experienced triathletes (Chapman, 2008). **PURPOSE:** This study aimed to determine the kinetic differences between baseline and transition runs of inexperienced triathletes. **METHODS:** Twelve novice triathletes age:  $29.4 \pm 12.15$  y, mass:  $71.2 \pm 10.3$  kg, weekly running mileage:  $24.4 \pm 16.7$  mi/week volunteered to participate. Athletes completed a 20 min run during session 1, and a 20 min bike followed by a 20 min run during session 2, each conducted at 75-80% effort level. Cycling sessions occurred on a stationary trainer (Wahoo Kickr snap) allowing athletes to use their own bike or have a standard bike fitted to their preferred geometry. Running sessions occurred on an outdoor loop (~370m) where subjects passed through timing gates (Brower) and over two force plates (Kistler, 1200 Hz). Sagittal view, right side video (Sony, 240 Hz) was also collected. Each running session was broken into 4 five-minute blocks. Duration of foot contact with the ground determined stance phase, while braking (-RFY) and propulsive phases (+RFY) were also defined. A two-way repeated measures ANOVA was used to determine differences between run type and time block ( $\alpha = 0.05$ ). **RESULTS:** During the stance phase, there was a main effect for time block of anterior linear impulse ( $F = 3.03$ ,  $p = 0.043$ ) and average +RFY (main effect  $F = 3.37$ ,  $p = 0.03$ ) and contact time ( $F = 3.11$ ,  $p = 0.039$ ). Similarly, there was a main effect for time of propulsive phase linear impulse ( $F = 7.94$ ,  $p < 0.001$ ) and average +RFY ( $F = 7.95$ ,  $p < 0.001$ ). Although post-hoc analysis did not reveal significant differences, it appears the later time blocks decreased anterior linear impulse as RFY decreased. **CONCLUSIONS:** Athletes displayed similar running kinetics between the baseline and transition run, however differences did occur between time blocks. This suggests that athletes fatigued similarly between the two run types. These findings may indicate that self-reported discomfort in the transition run may not be detected by measures of whole-body kinetics.