INTRODUCTION
The strength of hip muscles, as well as their ability to control the motion of the femur, has major ramifications for tibiofemoral joint kinematics and the soft tissues of the knee [4]. In particular, the inability to control hip adduction and internal rotation during weight bearing activities results in dynamic knee valgus [3, 4]. This lack of control may be attributed to weak hip abductors, namely the gluteus medius, which can produce both hip internal and external rotation, in addition to abduction [3]. The purpose of this study was to test the relationship between gluteus medius strength and dynamic Q-angle during a single leg step down (SLSD). We hypothesized that an increased gluteus medius strength would result in a decreased dynamic Q-angle.

METHODS
This study had a total of 23 participants, aged 21 ± 1.3 years old. The average height was 173.2 ± 8.4 cm, and average mass was 71.8 ± 17.8 kg. All participants were recruited from Western Washington University.

Q-angle
Reflective markers were placed on the participant’s dominant limb at the anterior superior iliac spine, patella, and mid-shank in line with the tibial tuberosity. Participants then performed three SLSDs from a box (h = 17.3 cm), using the dominant limb as the stance leg. The SLSDs were video recorded at a frame rate of 30 Hz. The reflective markers were then digitized during the down-phase of the SLSDs using MaxTRAQ software, and the coordinate data was used to calculate dynamic Q-angles in Microsoft Excel. The maximum and minimum dynamic Q-angles of each down-phase were subtracted from the participant’s standing Q-angle to calculate relative Q-angles. A negative relative Q-angle was defined as relative varus, and a positive relative Q-angle was defined as relative valgus.

Gluteus Medius Strength
Gluteus medius strength of the dominant leg was tested with three five-second maximal isometric hip abduction contractions using a Biodex System 4 Pro isokinetic dynamometer. The average of the peak torques measured was recorded.

RESULTS AND DISCUSSION
No significant relationships between gluteus strength and dynamic Q-angle were observed. Both minimum and maximum relative Q-angle were weakly negatively correlated with gluteus medius strength in male subjects (Figures 1 & 2). Gluteus medius strength was weakly correlated with minimum relative Q-angle and moderately correlated with maximum relative Q-angle in females, but both correlations were positive (Figures 1 & 2).

These results are in accordance with a study by Almeida et al. [1], who also found no relationship between isometric hip strength and Q-angle with their subjects in a supine position.

CONCLUSIONS
The results of the current study showed no significant relationships between isometric strength of the gluteus medius muscle and dynamic Q-angle during SLSDs.

REFERENCES