Injuries to the Ulnar Collateral Ligament (UCL) of the elbow are common in overhead throwing athletes. A repetitive valgus force during the throwing motion places significant stress on the UCL. Some research has been conducted investigating new methods to assess potential thickening of the anterior bundle of the UCL in order to understand ligament changes that may occur throughout the season. Purpose: To examine the reliability of ultrasound imaging measurements of UCL width at 2 different anatomical locations using a free valgus stress and to determine differences in measurement agreement between experienced and inexperienced examiners. Methods: Ultrasound images were obtained of the UCL on the participant's throwing arm using a GE LOGIQ E ultrasonic unit (GE Healthcare, Chicago, IL) with a linear probe at 12 MHz. Participants were placed in a supine position with a wedge placed underneath their forearm to maintain their elbow position at a 30 degree flexion angle. A 5-Nm valgus stress was applied to 20 centimeters distal to the medial epicondyle (see Fig. 1). Measurements at the mid substance and the apex of the trochlea were taken (see Fig. 2) at the beginning of the baseball season (pretest) and then again 4 weeks later (posttest). Three images were measured during each session. RESULTS: Intra-rater reliability, as expressed by ICC (3,3) for the apex measurement site was 0.929 (SEM = 0.18 mm) for the first measurement date and 0.936 (SEM = 0.20 mm) for the second measurement date. The intra-rater reliability as expressed by ICC (3,3) for the mid substance measurement site was 0.961 (SEM = 0.32 mm) for the first measurement date, and 0.920 (SEM=±1.16 mm) for the second measurement date, indicating excellent intra-rater reliability (see Table 1). There was no significant difference between the pretest and posttest measurements (see Table 2) at both anatomical locations obtained on the two testing dates. (Apex of trochlea mean width = 2.99 mm & 2.92 mm; t = -1.55; P ≥ 0.05) (Mid-substance mean width: 4.49 mm & 4.44 mm; t = 0.51; P ≥ 0.05) (see Table 3).

Conclusions
Further research is recommended to perform multiple imaging sessions throughout the year to determine the long term physiological effects of overhead throwing on the anterior bundle of the UCL.

References