Body Composition Changes across the Competitive Season by Sport among Men and Women Collegiate Athletes
Kaitlin M. Peterson, Jennifer L. Sanfilippo, Jessie Libber, Jesse Donnenwerth, Diane Kruger, Neil C. Binkley, M. Alison Brooks, Bryan C. Heiderscheit
University of Wisconsin-Madison

It is widely believed that participation in collegiate athletics can induce changes in body composition that reflect sport-specific training. However, few studies have utilized dual energy X-ray absorptiometry (DEXA) to estimate total changes in fat, lean, and bone mass in athletes throughout the season. Furthermore, previous research is often limited to a single, unspecified time point relative to training. PURPOSE: To identify sport- and gender-specific changes in body composition across the competitive season.

METHODS: 36 male and 34 female athletes participating in NCAA Division 1 athletics at the University of Wisconsin were selected. Sequential DEXA measurements were completed at 3 distinct seasonal periods: preseason, midseason, and postseason. Comparisons among changes in total fat mass, lean mass, and bone mass were made using repeated measures ANOVA with post hoc analysis. RESULTS: No gender-by-time interaction was present among swimmers for any of the body composition variables. Both genders showed an increase (p<0.001) in fat mass at post-season (14.3 ± 5.0 kg) compared to pre- (12.8 ± 4.6 kg) and mid-season (13.0 ± 4.7 kg). No gender-by-time interaction was found for hockey players for any of the body composition variables. Both genders showed an increase in bone mass (p<0.005) at mid-(3369 ± 567 g) and post-season (3368 ± 573 g) relative to pre-season (3356 ± 559 g), while fat mass increased (p=0.001) at post-season only (pre- and mid-, 14.1 ± 4.3 kg; post-, 14.6 ± 4.1 kg). A significant gender-by-time interaction was present (p=0.007) among basketball players, with women showing a post-season (13.2 ± 3.8 kg) increase in fat mass (pre-, 11.9 ± 3.8 kg; mid-, 11.5 ± 3.3 kg). Both genders showed a trend (p=0.057) toward increased bone mass from mid- (3685 ± 632 g) to post-season (3716 ± 664 g).

CONCLUSION: This abstract represents one of the first studies to utilize DEXA to address body composition changes in men and women collegiate athletes during 3 distinct seasonal periods. The measurements reported serve as sport- and gender-specific reference values for changes in total fat, lean, and bone mass. All sports showed a significant increase in fat mass post-season. Furthermore, given similar training regimens within each sport, it is noteworthy that men and women basketball players responded differently throughout the season.