

Relationship Between Changes in Upper Body Fat-Free Mass and Bench Press Performance in American Football Players

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ABSTRACT

Horizontal pushing strength and strength endurance are relevant attributes for blocking and block shedding in American football. Since most positions in American football require the ability to either block or shed a block, and since bench press repetitions to failure (RTF) with 225 pounds is a component of the NFL draft combine, improving horizontal pushing strength and strength endurance have been key areas of emphasis for strength and conditioning coaches working with these athletes. **PURPOSE:** The purpose of this analysis was to quantify the relationship between changes in upper body fat-free mass (FFM) and metrics of bench press performance in American football players. **METHODS:** Body composition and muscular performance were assessed in NCAA Division III American football players. Upper body FFM was obtained from dual-energy X-ray absorptiometry (DXA; Hologic Horizon) before and after a seven-week offseason training period. Barbell bench press one-repetition maximum (1RM), incline barbell bench press 1RM, and RTF with 225 pounds on the barbell bench press were also determined before and after the training period. Using Spearman's rank correlations, the relationships between percent changes in upper body FFM and bench press 1RM (n=19), bench press RTF with 225 pounds (n=15), and incline bench press 1RM (n=18) were evaluated. **RESULTS:** Relative changes in bench press 1RM and DXA upper body FFM exhibited a weak, non-significant correlation ($\rho: 0.38, p: 0.11$). However, there was a moderate strength, significant correlation between relative changes in bench press RTF with 225 pounds and DXA upper body FFM ($\rho: 0.53, p: 0.04$). For relative changes in incline bench press 1RM, there was a weak, non-significant correlation with DXA upper body FFM ($\rho: 0.24, p: 0.36$). **CONCLUSION:** Of the performance tests assessed, only changes in bench press RTF with 225 pounds and changes in DXA upper body FFM were positively correlated. Therefore, strength and conditioning coaches working with athletes who plan on entering the NFL draft may want to consider dedicating time to increasing upper body FFM gains prior to the draft as it appears to be positively correlated with performance on this NFL combine test.