

*TACSM Abstract***Prediction of Total Body and Regional Strength Using DEXA Body Composition Measurements**

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Category: Masters

ABSTRACT

Resistance training is a valuable exercise modality but few tools exist to aid practitioners in refining resistance exercise prescriptions. **PURPOSE:** To determine if a relationship exists between strength and selected body composition variables measured by DEXA; and if so, develop equations which predict total body and regional strength. **METHODS:** Sixty-eight subjects (Male $n = 34$, Age = 35 ± 11.96 yrs, Height = 181.54 ± 6.76 cm, Weight = 97.82 ± 16.68 kg, Body Fat = $31.24 \pm 8.12\%$ | Female $n = 34$, Age = 37 ± 12.6 yrs, Height = 165.41 ± 5.64 cm, Weight = 80.55 ± 18.48 kg, Body Fat = $43.00 \pm 10.16\%$) underwent DEXA body composition testing and maximal strength testing utilizing Keiser® pneumatic resistance exercise equipment. Regional strength was assessed on seven different lifts: leg press, chest press, leg curl, lat pull-down, leg extension, triceps push-down, and biceps curl. The sum of the seven lifts was considered a measure of total body strength (TBS). Multiple linear regression (step-wise removal) was used to predict TBS and regional strength from: age, height (cm), weight (kg), lean mass (kg), fat mass (kg), and percent body fat. **RESULTS:**

	Height (cm)	Weight (kg)	Lean Mass (kg)	Body Fat (%)	Constant	Correlation Coefficient	SEE
Total Strength	-15.049		49.552		1657.592	$R^2 = .747$	293.776
Leg Press	-10.889	2.210	22.049		1291.683	$R^2 = .689$	151.146
Chest Press	-1.116	-0.658	4.974		101.797	$R^2 = .746$	25.750
Leg Curl			3.583		-17.974	$R^2 = .678$	30.461
Lat Pull-down	-0.494	-0.796	4.917		48.997	$R^2 = .780$	24.811
Leg Extension		-0.684	4.261		-17.836	$R^2 = .662$	31.388
Tri Push-down	-2.968		7.385	-2.706	495.841	$R^2 = .564$	73.997
Biceps Curl	0.291		1.233	-0.433	-51.421	$R^2 = .739$	11.981

CONCLUSION: DEXA body composition measurements are correlated with, and are shown to be significant predictors of total body and regional strength. Data obtained from DEXA body composition measurements are a useful tool which may aid practitioners and the general public when maximal strength testing is ill-advised or impractical.