Comparison of mean concentric velocity using different cluster set protocols with the bench press exercise – A closer look at the 3/7 protocol

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**Introduction:** In the constantly evolving world of strength and conditioning, cluster sets have become increasingly popular. It is important to understand the interaction among training variables, which might include the number of sets, the velocity of the executed movement, the rest in between the sets or even between single reps. **Purpose:** Firstly, this study analyzes the difference in mean concentric velocity between three cluster set protocols. Secondly, it compares the executed repetitions between all-out- and cluster sets. **Methods:** A total of 20 male subjects [age: 29 ± 5 years; weight: 85.4 ± 6.4 kg; 1RM bench press: 121 ± 13 kg (mean ± SD)] first performed a 1RM test with the bench press movement. Before they completed three cluster sets in a randomized order, they also performed an all-out set at 65% of the 1RM. The first cluster set was a 3-4-5-6-7 ascending protocol, the second was a 5x5 constant protocol and the third was a 7-6-5-4-3 descending protocol. All cluster sets were performed at 65% of 1RM with 15 seconds of intra-set rest and mean concentric velocity was recorded. **Results:** Mean concentric velocity did not differ significantly between cluster sets. The executed repetitions during the all-out set prior to performing all three cluster set protocols were lower (18.6 repetitions ± 1.8) than the cluster sets (25 repetitions). **Discussion and conclusion:** Interestingly, no differences in mean concentric velocity between cluster set protocols were found in the present study. Given that mean concentric velocity is a direct indicator for mean power output if – as in the present experiment – movement direction and amplitude as well as displaced mass remain constant, the current results suggest that mean power output across 25 repetitions was robust against differences in cluster set protocols. Further research needs to be done in regards to the manipulation of cluster set variables, such as intra-set rest or rep schemes, in order to support the current literature. As suggested by the current literature, the inclusion of cluster set protocols is beneficial for developing power or maximizing hypertrophy. Since none of the findings in the present study were significant, all three cluster sets might be suitable for either purpose with no difference.

**Keywords:** cluster set protocol, velocity-based training, bench press, power, hypertrophy, mean concentric velocity

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