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AUTHORS' RESPONSE TO LETTER TO THE EDITOR: INTEGRATED  
APPROACH TO CORRECTING THE HIGH-BAR BACK SQUAT FROM  
"EXCESSIVE FORWARD LEANING" BY BISHOP AND TURNER, (2017)

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## **Letter to the Editor:**

The authors would like to thank Dan Cleather for his interest in our article entitled: Integrated Approach to Correcting the High-bar Back Squat from “Excessive Forward Leaning” (3). The aim of our review article was to provide practitioners with some suggestions on a multi-faceted approach to correcting a common flaw in technique often seen during the high-bar back squat exercise. Given that this was the primary focal point of our article and not a critical analysis of the back squat (or even a proposed technical model); it seems odd that such a small point has been drawn upon given the larger context of the review. Regardless, we have outlined a response below.

As you correctly pointed out, the purpose of the statement pertaining to tibia and trunk angles was to provide a reference point for coaches when analysing squat patterns either in real-time or retrospectively. Whilst minimal evidence may exist highlighting this to be the most favourable or advantageous position during the back squat (4,5), the authors would argue that the use of this reference is reasonably common amongst guidelines when coaching this exercise. We of course, do recognise that discrepancies to this rule will exist given the different anthropometry of each athlete. Furthermore, we did not make any argument that a more upright torso was indicative of ‘bad squatting technique’ or that a purposeful constraint should be placed on ankle dorsiflexion to facilitate the parallel position of the tibia and trunk. Rather, the guidelines merely act as a suggested reference point for coaches and naturally its use will vary from athlete to athlete depending on a range of factors.

Cleather (6) states that they have “previously shown how trunk lean is required to keep the center of mass of the athlete over their base of support in order for the athlete to remain balanced.” We would argue that this has not actually been “shown” given this too was published as a narrative review article; thus, represents the opposing author’s opinions only. We do not contend with this statement; however, the fact that no primary research was undertaken in the cited review article would indicate it is a matter of opinion, rather than scientific proof.

In relation to the alternative squatting variations, the authors feel that the point was made quite clear in respect to the low-bar version of the back squat. The lower bar position is accompanied by a change in center of mass; thus, the change in body positioning may be

attributable to the variation in bar position rather than a conscious alteration from the lifter. Again, this may in part be down to athlete anthropometry as well, but competitive powerlifters commonly utilise the low bar position (7) and are often seen to squat with an increased forward lean relative to our proposed guideline. We also acknowledged that this may be desirable in that instance; thus, our proposed guidelines were not related to the low-bar back squat (which was clearly stated). As for additional variations such as the front or overhead squat, this was also not the focal point of our article (which again was clearly stated in the title). However, we do acknowledge and agree that altered joint or torso positioning is likely during these variations, which again is in part down to the change in bar position, rather than a conscious strategy by the athlete.

Finally, we don't "need a guideline to establish if an athlete is sufficiently upright." However, the authors would like to state that this was a review article and acts to serve as suggestions only and was merely part of a much bigger message; which was how to correct excessive forward leaning. Although somewhat anecdotal, this may assist developing coaches as they learn what to look out for when assessing movement competency during squat patterns in real-time (2), noting that articles of a practically applied message are key for SCJ. Given that assessing movement competency (in real-time) has been shown to have poor levels of agreement with criterion-based methods (8) and kinematic errors of 10-15° have been reported with the naked eye (1), it seems logical (and hopefully helpful) to developing coaches to offer suggestions on what the authors may consider common guidance in practice. In addition, after questioning the need for a guideline in the first place, you went on to suggest your own; thus, providing an inconsistent message on the matter yourself.

In summary, we agree that athlete cueing often relies on empirical evidence and welcome the continued discussion and efforts to gain evidence and optimize coaching strategies for teaching squat technique.

## REFERENCES

1. Banskota B, Lewis J, Hossain M, Irvine A, and Jones M. Estimation of the accuracy of joint mobility assessment in a group of health professionals. *Eur J Orthop Surg Traumatol* 18: 287-289, 2008.
2. Bishop C, Edwards M, and Turner A. Screening movement dysfunctions using the overhead squat. *Prof Strength Cond J* 42: 22-30, 2016.
3. Bishop C and Turner A. Integrated approach to correcting the high-bar back squat from “excessive forward leaning.” *Strength Cond J* 39: 46-53, 2017.
4. Clark M, Lucett S, and Sutton B. Fitness Assessment in NASM Essentials of Personal Fitness Training (4<sup>th</sup> ed.). Philadelphia, PA: Lippincott Williams & Wilkins, 2012. pp. 99-148.
5. Clark M, Lucett S, and Sutton B. Movement Assessments in NASM Essentials of Corrective Exercise Training (1st ed.). Philadelphia, PA: Lippincott Williams & Wilkins, 2011. pp. 24-30.
6. Cleather D. Squatting is a balance skill: An alternative technical model. *Prof Strength Cond J* 25: 17-21, 2012.
7. Glassbrook D, Helms E, Brown S, and Storey A. A review of the biomechanical differences of the high-bar and low-bar back squat. *J Strength Cond Res* 31: 2618-2634, 2013.
8. Whiteside D, Deneweth J, Pohorence M, Sandoval B, Russell J, McLean S, Zernicke R, and Goulet G. Grading the Functional Movement Screen: A comparison of manual (real-time) and objective methods. *J Strength Cond Res* 30: 924-933, 2014.