

JEPonline
Journal of Exercise Physiologyonline

**Official Journal of The American
Society of Exercise Physiologists (ASEP)**

ISSN 1097-9751

An International Electronic Journal
Volume 7 Number 4 August 2004

Letter to the Editor

**A CRITICAL ANALYSIS OF THE ACSM POSITION STAND ON RESISTANCE
TRAINING: INSUFFICIENT EVIDENCE TO SUPPORT RECOMMENDED TRAINING
PROTOCOLS**

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We read with interest the recent critical analysis of the American College of Sports Medicine (ACSM) position stand on progression during resistance training by Carpinelli et al. (1). We would like to comment on the inherent bias in the opinion of our own work that is common to all scientists. Most of us feel that our interpretation of research is correct and others interpretation is incorrect. That is why we have a peer-review process for publishing research studies, so that we must endure the criticisms of other scientists in our area to determine whether our work is legitimate. Review papers, as the authors suggest themselves, are secondary sources and thus may be more afflicted by bias of interpretation than a single research study. So we find it interesting that the authors themselves have decided to write another review paper. A more appropriate review process for assessing research from past investigations in this area is through a statistical meta-analysis. So we have highlighted the findings of some meta-analyses performed recently in the area of resistance training.

The following meta-analyses have been performed concerning the issue of dose response for strength development (2,3) and single versus multiple sets (4,5). By providing effect size (ES) and using meta-analytic techniques, these studies have provided evidence that supports the theory of progression in resistance training program design. There appears to be clear dose-response relationships with both novice and more highly trained athletes (3). For example, Rhea et al. (4) demonstrated that three sets of an exercise increased strength more than one set, and that the magnitude of the ES was influenced by subject training status, the length of the training program and the methodological control of the study. In their quantitative review, Wolfe and colleagues (5) demonstrated that trained individuals have significantly greater gains in muscular strength when utilizing multiple sets. This does suggest that some degree of manipulation of training variables is important for an increase in strength. The findings of these analyses would seem to be contrary to what has been presented by the authors in their recommendations (p. 49).

While we agree that it is important that readers be encouraged to carefully read and scrutinize all the literature, it is also important that researchers be encouraged to continue to research these important questions in resistance training with designs with adequate statistical power and by using more trained individuals. The

scientific community as a whole can then return to a more constructive and positive environment in our pursuit of the truth. It is clear that further studies need to be conducted but we feel that based on some of the meta-analyses recently performed that the ACSM Position Stand provides recommendations that are supported by peer-reviewed resistance training studies.

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Reply to McGuigan and McBride

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We agree with McGuigan and McBride that in order to ensure the legitimacy of scientific publications, the peer-review process is essential. However, as we specifically documented in our critique (1), the publication of the ACSM's Position Stand (2) was the consequence of an absolute failure of the peer-review process.

McGuigan and McBride ignore the primary focus of our critical analysis. That is, the authors of the Position Stand and the ACSM failed to support their claims and recommendations with resistance training studies that were available to them prior to and throughout the preparation of the Position Stand.

McGuigan and McBride fail to address the unsupported claim in the Position Stand that intermediate and advanced trainees require training programs that are different from beginning programs, and that most of the so-called evidence in the Position Stand was drawn from studies involving novice trainees - not from their targeted demographics (intermediate and advanced trainees). Nor do they justify the ACSM's selective and improper reporting of data and studies, misinterpretation of studies, omission of evidence that is contrary to their claims, or the citation of references entirely irrelevant to their claims. Not one of these flaws is discussed by McGuigan and McBride. Instead, they attempt to deflect attention from these fundamental problems with the Position Stand and the defective review process at the ACSM.

McGuigan and McBride claim that there is a clear dose-response relationship for strength development (i.e., greater volumes of training produce greater responses) in both novice and highly trained athletes, which is only one of the numerous unsubstantiated claims in the Position Stand. Their inappropriate use of four recent meta-analyses (3-6) in an attempt to support their claim, and the recommendations in the Position Stand, is irrelevant because these meta-analyses (reviews) were published subsequent to the Position Stand. In addition to that critical point, a meta-analysis can only be as valid as the studies on which it is based. Hence, studies with

notable flaws, such as those cited in our critique (1) and included in these meta-analyses (3-6), render any conclusions worse than questionable, and mere speculation at best.

The relevant issue is that a highly flawed Position Stand was published, which reveals the inadequacy of the review process that allowed these flaws to go unchallenged. If McGuigan and McBride really believe that the scientific community needs to return to a more constructive and positive environment in pursuit of their so-called truth, the first step may be to completely revise the peer-review process at the ACSM and in *Medicine and Science in Sports and Exercise*. Perhaps more energy should be directed to correcting a defective review process and Position Stand, rather than distracting readers with irrelevant meta-analyses.

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