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The Reply

We want to address the issues raised by Batsis regarding the methodological rigor of our assessment of muscle mass index.

In our recent study, our clinical question was the mortality benefit of increasing levels of muscle mass index in elders in the National Health and Nutrition Examination Survey III study. The use of quartile cut points from young individuals would have resulted in few older individuals in the higher muscle mass index quartiles, and thus the clinical question would not have been answered. Further, despite the narrow categories resulting from development of the quartile cut points in older individuals, interquartile differences in mortality rate/risk in this older population was significant. Thus by definition, the cut points used did provide "…adequate discrimination with changes in… mortality…", which was the focus of our study.

Although we are well aware of studies linking muscle strength and mortality, common pathologies such as joint disease and skeletal injuries impair mobility, and thus this measure is likely to be subject to significant confounding. Further, our previous work[1] has linked muscle mass with metabolism. This underscores the biological significance of muscle mass, which we hypothesize will be noted (in future prospective studies) to play a role in alterations in mortality.

Our study aimed to define an anthropometric measure that could be as easily applied clinically as body mass index, which we found to be an ineffectual predictor of survival. Appendicular muscle mass requires measurement by dual-energy X-ray absorptiometry, and thus is certainly not amenable for "incorporation into clinical practice," given the radiation exposure and expense. Further, dual-energy X-ray absorptiometry does not discriminate between muscle and intramuscular fat mass, which leads to overestimation of effective muscle mass in conditions in which there is lipid infiltration of muscle, such as obesity and aging. By comparison, bioelectrical impedance—because it relies on electrical conductivity—does not count intramuscular fat (which does not conduct electricity) as muscle. Further, bioelectrical impedance has been validated in individuals of varying age[2] and has been noted to provide a robust estimate of smooth muscle mass. Finally, muscle mass index is as easy and inexpensive to measure as body mass index. Thus, bioelectrical impedance measurement can be incorporated easily into clinical practice.

Muscle mass has an important role in preventing both mortality and declining physical function.[3] Because measurement of muscle mass index is both robust and readily applicable in clinical practice using bioelectrical impedance, we stand by our recommendation to consider widespread adaptation of muscle mass index assessment as an important preventative health strategy.

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