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Response to “Body composition analysis via single slice computed tomography analysis — The shortcomings”

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We appreciate the opportunity to respond to Drs. Safer and Binay Safer regarding our recent study which utilized computed tomography (CT) imaging to determine the prevalence of sarcopenia in older adults with colorectal cancer. The authors inquired about the usage of single-slice CT imaging to determine total body muscle mass and our functioning definition of sarcopenia.

Three imaging techniques are commonly employed in the assessment of lean body mass—CT imaging, magnetic resonance imaging (MRI), and dual energy x-ray absorptiometry (DXA). CT and MRI are considered to be the gold-standard for estimating muscle mass given their high precision, though DXA is typically preferred in the clinical setting to minimize radiation exposure. As CT scans are frequently performed as a staging and assessment tool for patients with colorectal cancer, CT imaging represents a novel and readily available approach for identifying sarcopenia among colorectal cancer patients. Because the cross-sectional areas of tissues in single-slice lumbar CT images are associated with whole-body muscle mass in healthy patients (1) and cancer patients (2), we feel that this is a valid approach for determining muscle mass. Extensive literature exists on the use of single-slice CT images at L3 for assessment of lean body mass and a recent systematic review identified 53 studies involving 9138 patients that showed a strong relationship between the presence of sarcopenia and adverse cancer outcomes, including poorer survival, severe chemotherapy toxicity, and post-operative complications (3).

Regarding the definition of sarcopenia, the European Working Group on Sarcopenia in Older People (EWGSOP) recommends “using the presence of both low muscle mass and low muscle function (strength or performance)” for the diagnosis of sarcopenia (4). While the authors correctly state that we did not measure muscle function, our intent was to identify elderly cancer patients with clinically significant muscle-loss using readily available CT imaging. For this aim, we were successful. Of note, multiple definitions of the term “sarcopenia” remain in common use in the literature. Our definition of sarcopenia was derived from the largest analysis of skeletal muscle in cancer patients to date, incorporated

both sex-specific and BMI thresholds, and was associated with poor prognosis (5). The intent of our study was not simply to identify patients as sarcopenic versus not sarcopenic, but rather to identify patients with low muscle mass, a known poor prognostic indicator. Further work is needed to evaluate the association between low muscle mass as defined by single-slice CT imaging and physical function in adults with cancer.

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