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Author response to: Clinical assessments of health status as a potential marker to identify patients who are too sick to undergo transplantation

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Dear Drs. Kim,

Thank you for your interest in our work. We intended for the clinician assessment tool to facilitate the difficult conversation between clinicians and patients about the risk of death with end-stage liver disease. This is particularly important for cirrhotics awaiting liver transplantation, many of whom are so focused on the goal of transplant that they, understandably, deny the fact that they could get *too* sick for transplant. While the MELD score can provide us with the statistics – i.e., “At your MELD score, you have a 25% risk of death in the next 90 days” – do our patients really understand that? Our sense is that what they hear is, “You have a 75% chance of being alive”, when every clinician knows that a 25% risk of death in 90 days is extraordinarily high. Instead, the clinician assessment tool can help us communicate true risk – incorporating both liver synthetic function *and* the other factors that impact mortality that are not reflected by the MELD score – to patients in ways that they may more easily comprehend. For example, we can say, “Compared to other patients with your degree of liver disease, you are much sicker than expected”.

We agree with you that the clinician assessment tool should not be incorporated into a liver allocation system, as it is not objective. This is certainly one of the advantages of sarcopenia – likely a major component of the clinician's assessment – that can be measured quantitatively by cross-sectional abdominal imaging. The challenge with CT or MRI-based muscle mass measures is that they are not practical to measure longitudinally on every cirrhotic due to cost and access issues and therefore, are not the optimal metric of muscle wasting to incorporate into risk assessment scores.

Perhaps there is a happy medium between the *subjective*, but clinically useful, clinical assessment tool and the *objective*, but logistically unfeasible, CT-/MRI-measured sarcopenia. Frailty is a distinct clinical syndrome of physiologic vulnerability to stressors

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that can be measured objectively and repeatedly through instruments such as the Fried Frailty Instrument or grip strength. These instruments demonstrate moderate overlap with CT-measured skeletal muscle index and have prognostic value in cirrhotics both at baseline and longitudinally.[1–4] These instruments of frailty may, therefore, be the ideal objective instruments to incorporate into modified risk assessment tools for cirrhotics, such as you have proposed. Our group is currently working to develop such prognostic indices incorporating this concept of frailty.

Sincerely,

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