

Table 1. Criterion validity of different measurement tools to measure muscle mass

Instrument	Study	Setting (n)	Criterion validity			
			Prevalence of low muscle mass	Reference standard	Meth qual*	Result (rating)**
Single-frequency BIA	Reiss (2016)	Geriatric inpatients (n=60)	30% <i>Cut-off value:</i> ASMMI - Females: <5.5 kg/m² - Males: <7.26 kg/m²	DXA	Inadequate	<i>Janssen</i> Sensitivity: 77% Specificity: 71% PPV: 54% NPV: 88% Accuracy: 73% (CI 61.7%-83.3%) $\kappa = 0.437$ (95% CI 0.218-0.653) <i>Chien</i> Sensitivity: 55% Specificity: 90% PPV: 71% NPV: 83% Accuracy: 80% (68.3%-90%) $\kappa = 0.492$ (95% CI 0.219-0.734)

	Reiter, 2019	Geriatric inpatients (n=144)	41.0% <i>Cut-off value:</i> ASMMI - Females: <5.5 kg/m² - Males: <7.26 kg/m²	DXA	Inadequate	<i>Kyle</i> Sensitivity: 36.7% Specificity: 97.9% PPV: 90% NPV: 75% <i>Sergi</i> Sensitivity: 55.1% Specificity: 96.8% PPV: 90% NPV: 80.7% <i>Scafoglieri</i> Sensitivity: 63.3% Specificity: 93.7% PPV: 83.8% NPV: 83.2% <i>Rangel P.</i> Sensitivity: 61.2% Specificity: 89.5%
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						PPV: 75% NPV: 81.7%
	Sousa-Santos, 2021	older adults aged ≥65 years (n=159)	30.8% <i>Cut-off value:</i> ASMI - Females: <5.5 kg/m² - Males: <7.0 kg/m²	DXA	Inadequate	<i>Class I:</i> Sensitivity: 100% Specificity: 69.5% PPV: 14.8% NPV: 100% Agreement: 71.1% κ = 0.19*** <i>Class II:</i> Sensitivity: 75% Specificity: 90.1% PPV: 28.6% NPV: 98.6% Agreement: 89.3% κ = 0.37***
Mid-arm muscle circumference	Carnevale, 2018	White older adults aged ≥65 years (n=148)	34.5% <i>Cut-of value</i> RSMI	DXA	Very good	<i>Females</i> Sensitivity: 89% Specificity: 84% AUC: 0.882

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			- Females: <5.5 - Males: <7.26			<i>Males</i> Sensitivity: 94% Specificity: 67% AUC: 0.878
	Sousa-Santos, 2021	older adults aged ≥65 years (n=159)	30.8% <i>Cut-off value:</i> ASMI - Females: <5.5 kg/m² - Males: <7.0 kg/m²	DXA	Inadequate	Sensitivity: 37.5% Specificity: 85.4% PPV: 12.0% NPV: 96.3% Agreement: 83% κ = 0.11
Calf circumference	Sousa-Santos, 2021	older adults aged ≥65 years (n=159)	30.8% <i>Cut-off value:</i> ASMI - Females: <5.5 kg/m² - Males: <7.0 kg/m²	DXA	Inadequate	Sensitivity: 12.5% Specificity: 94.0% PPV: 10.0% NPV: 95.3% Agreement: 89.9% κ = 0.06

Abbreviations: BIA: bioimpedance analysis; FFM: fat free mass; DXA: dual x-ray absorptiometry; ASSMI: appendicular muscle mass indices; ASMI: appendicular skeletal muscle mass index; SMI: skeletal muscle mass index; ASMI: appendicular skeletal muscle mass index; NPV: negative predictive value; PPV: positive predictive value; RSMI: relative skeletal muscle mass index.

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***Risk of bias assessment based on COSMIN risk of bias tool: lowest score counts**

****Measurement properties of each study could be rated as: sufficient (+), insufficient (–), or indeterminate (?). Lowest validity in range determines rating.**

***** $p=0.001$**