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## Cut-off of the chester step test to detect functional impairment and mortality risk according to the 6MWT in ILD

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### Abstract

The chester step test (CST) might be an alternative to 6-minute walk test (6MWT) to assess functional capacity, especially in space-constraint settings. We explored its ability in distinguishing people with interstitial lung disease (ILD) with/without functional impairment and at low/high risk of mortality, according to the 6MWT.

The 6MWT and CST were collected and a receiver operating characteristics (ROC) curve analysis was performed. We determined a threshold for the CST to detect: i) functional impairment, based on the 70% predicted of the 6MWT (6MWT<sub>pp</sub><70%); and, ii) increased risk of mortality, based on different cut-offs of the 6MWT (250m, 330m and 350m). The optimal cut-off points were identified by the highest Youden index.

70 people with ILD (65 [57-75] years; 56% female; FVC<sub>pp</sub> 78.7±18.4; DLCO<sub>pp</sub> 53.7±19.7) were included. A cut-off of 40.5 steps was found to detect functional impairment (6MWT<sub>pp</sub><70%) and increased risk of mortality (6MWT<330 and 350m). For those with <250m in the 6MWT a cut-off of 39.5 steps was found. The cut-off of 40.5 compared to 39.5 steps presented higher sensitivity (92% vs 83%) and equal specificity (90%) values (Table 1).

A cut-off of 40.5 steps in the CST may be used to detect functional impairment and/or at increased risk of mortality in people with ILD. This information may now be used to design tailored and preventive interventions, even in

limited-space settings.

	Cut-off CST	AUC	95%CI	Sensitivity	Specificity
<b>Functional impairment</b>	<b>40.5</b> (6MWT <sub>pp</sub> <70%)	0.92	0.86-0.99	87%	88%
	<b>39.5</b> (6MWT<250m)	0.89	0.81-0.97	83%	90%
<b>Risk of mortality</b>	<b>40.5</b> (6MWT<330m)	0.96	0.91-1	89%	94%
	<b>40.5</b> (6MWT<350m)	0.96	0.90-1	92%	90%

**Table 1** – Cut-offs of the chester step test (CST) to detect functional impairment (based on the cut-off of the 70% predicted of the six-minute walking test - 6MWT [6MWT<sub>pp</sub>]) and mortality risk, based on different cut-offs of the 6MWT (250m, 330m and 350m), and the respective areas under the curve (AUC) and 95% Confidence Interval (95% CI), sensitivity and specificity.

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