Dovepress

Clinicoecon Outcomes Res. 2021; 13: 637–643.
Published online 2021 Jul 7. doi: 10.2147/CEOR.S316529

PMCID: PMC8275122
PMID: 34262309

Comparison of Consistency, Feasibility, and Convenience of a Novel Compact System for Assessing Lung Volumes and Carbon Monoxide Diffusing Capacity versus Whole Body Plethysmography

Roberto W Dal Negro,[1] Paola Turco,[2] and Massimiliano Povero[3]

Author information | Article notes | Copyright and License information | Disclaimer

Correspondence: Massimiliano Povero AdRes Health Economics and Outcome Research, Torino, Italy, Email m.povero@adreshe.com

MiniBox+ PFTs are highly consistent with body box, with lower failure risk and lower testing costs

In a recently published paper describing a multi-center study conducted in Italy, the MiniBox+™ was shown to be more feasible (significantly lower failure risk) and more convenient (number of attempts needed plus lower execution costs) than whole body plethysmography ("body box"). In addition, the lung volumes (LV) and diffusion capacity (DLco) measurements taken with the MiniBox+ were shown to be highly consistent with those obtained by the body box.

The study

The aim of the study was to compare the consistency and feasibility of LV and DLco measurements between the MiniBox+ and body box, together with their economic impact. The primary objective was to compare the failure risk in LV and DLco between the two methods, with secondary objectives to compare their consistency and testing costs.

Measurements were taken in 134 patients with obstructive and restrictive respiratory disorders: 42 asthmatics (32.1%), 47 patients with COPD (35.1%), and 44 with restrictive respiratory disorders (32.8%). The body box used in this study was the Platinum DX Elite by MGC Diagnostics (MedGraphics), USA.

The number of attempts required to achieve the first reliable measurement with each method were calculated for all patients, as well as the corresponding time (in minutes) spent on each test. The cost of measurements obtained with each method was calculated by measuring the time spent by the expert nurse in explaining, demonstrating, and performing the tests, and the time spent by patients (loss of productivity) to perform the test.

The results

Measurement failure

A total of 26 patients (19.4%) experienced at least one failure with the body box, vs. 11 patients (8.21%) with the MiniBox+.

		No. failed measurements Body Box	No. failed measurements MiniBox+
Tests	DLco	69% (18)	8% (11)
	LV (TLC, FEV1, or RV)	19% (5)	0
	Both	11.5% (3)	0

Number of attempts and total time spent

The mean number of attempts and the total time spent in taking the first reliable measurements were significantly lower with the MiniBox+, both in the case of success and in the case of failure.

	Body Box	MiniBox+	Mean Difference (95% CI)
No. of attempts	2.8	1.4	-1.2
Total time (min)	13.9	7.2	-6.1

Consistency between methods

TLC and DLco values obtained by the two measurement techniques were almost equal, with clinically negligible differences.

Cost per test

The total cost per test was estimated at €87.58 for the body box and €75.11 for the MiniBox+, resulting in a cost reduction of €12.33, primarily due to the saving in productivity loss.

Read the paper

The authors' conclusions

The authors state that the complexity of the procedures plays a critical role in determining the feasibility of the two methods. They concluded that the significantly lower failure risk, as well as lower number of attempts and overall time required for first reliable measurements with the MiniBox+, make it a more feasible and convenient method for clinical practice.

PUO-DOC20066 Rev 01

PulmOne
PFT Outside The Box