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**Title:** Comparison of high intensity inspiratory muscle training by using two different training devices in COPD patients

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**Body:** Background and aim: We compared the effects of high intensity inspiratory muscle training (IMT) applied with a recently developed variable resistive loading device (POWERbreathe KH1, HaB International Ltd, UK) and a threshold loading device. Methods: Twenty COPD patients were assigned randomly to two groups and received either 8 weeks of variable resistive loading IMT, or threshold loading IMT (Threshold IMT, Respiroics, Inc. USA).

Table 1

	Variable resistive IMT (n=10)	Threshold IMT (n=10)
Age (yrs)	64±5	67±8
Gender (F/M)	5/5	5/5
BMI (kg/m <sup>2</sup> )	22.6±6.6	27.7±6.0
FEV1 (%pred.)	60±17	54±15
Pi,max (% pred.)	67±10	71±15

Baseline Characteristics

Both groups performed bi-weekly sessions under supervision and were encouraged to train at the highest tolerable intensity. Results: Two patients did not yet complete the program. Patients in the variable resistive

IMT group showed significantly larger increases in maximal inspiratory pressure, endurance time, external work of breathing and inspiratory power during a constant load breathing task.

Table 2

	Variable resistive IMT (n=10)	Threshold IMT (n=8)	p-value
Δ Pi,max (cmH <sub>2</sub> O)	+31.2±6.8	+18.1±14.7	0.013*
Δ Duration (sec)	+531.6±204.4	+187.2±284.5	0.009*
Δ Avg. Inspiratory Time (ti) (sec)	-1.1±0.8	-0.2±0.4	0.002*
Δ ti/ttot (duty cycle) (%)	-16±8	-5±7	0.014*
Δ Avg. Peak Inspiratory Flow (L/sec)	+1.4±0.6	+0.1±0.6	0.001*
Δ Avg. Mean Power/ Breath (Watt)	+2.3±1.1	+0.5±1.2	0.001*
Δ Total Work (J)	+399±194.7	+187.7±329.2	0.032*

Effects of IMT on Pi,max and constant load breathing task

Conclusion: 8 weeks of IMT with a variable resistive loading device leads to larger improvements in inspiratory muscle function.