



# Effect of CPET Facemask Use on Maximal Exercise Performance in Chronic Respiratory Failure



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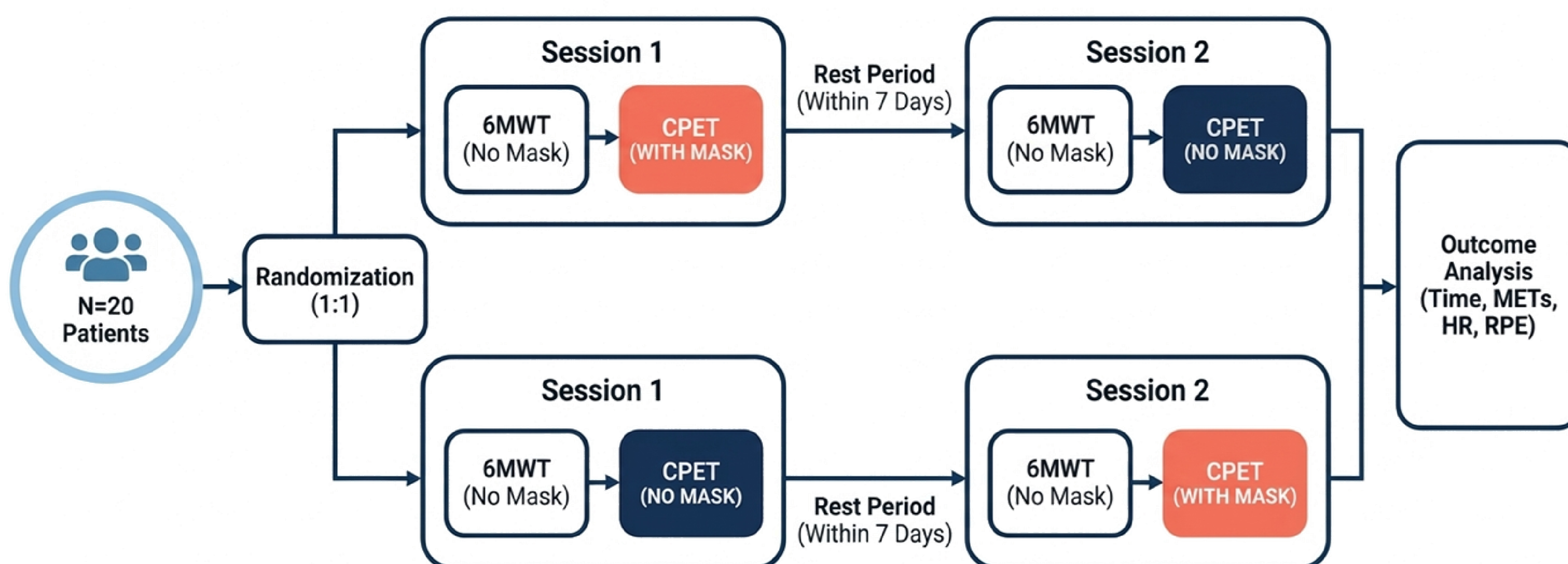
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## Background

- Pulmonary rehabilitation requires accurate assessment of exercise capacity.
- CPET is the gold standard for evaluating maximal exercise capacity.
- A facemask is required for breath-by-breath gas analysis during CPET.
- The mask may impose additional ventilatory burden and discomfort, especially in patients with chronic respiratory failure.
- However, its impact on maximal exercise performance and measurement accuracy remains unclear.

## Methods

- Study design
  - Randomized 2×2 crossover study
- Participants
  - 20 patients with chronic respiratory failure
  - Dyspnea: mMRC ≥ 2 or CAT ≥ 10
- Assessments
  - Primary outcome: Time to exhaustion
  - Secondary outcomes: METs, heart rate (HR), rating of perceived exertion (RPE)
  - 6-minute walk test (6MWT) performed before each CPET



**Figure 1.** Randomized 2×2 crossover study design. Patients underwent CPET with and without a facemask in random order, with a washout period within 7 days. A 6MWT was performed before each test, and outcomes included time to exhaustion, METs, HR, and RPE.

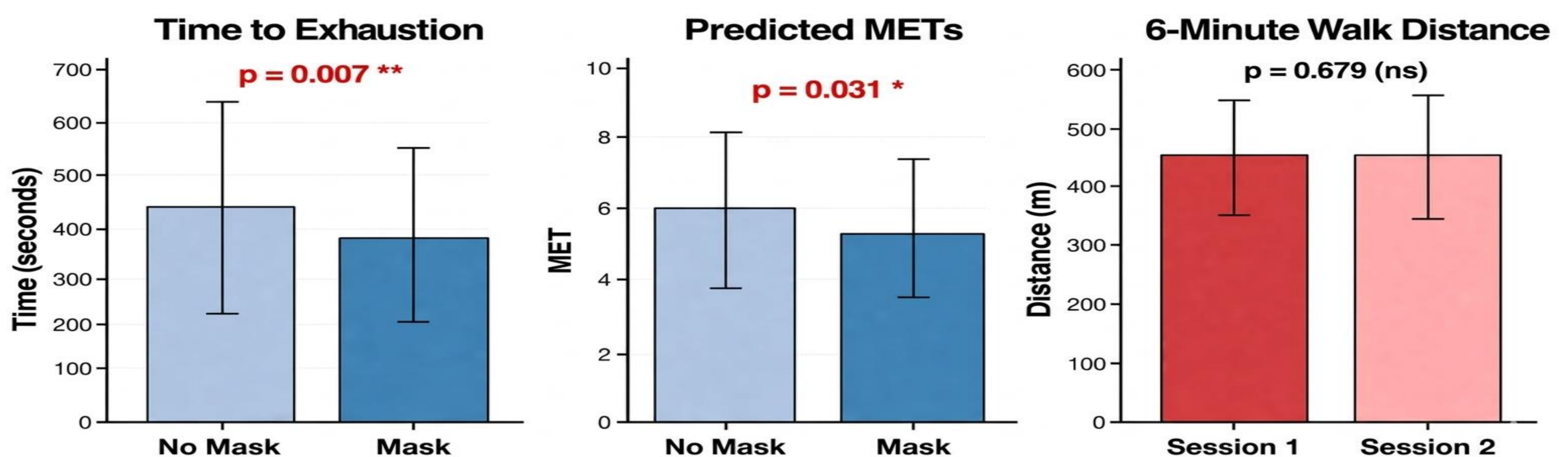
## Results

**Table 1.** Baseline Characteristics of Participants

	Total (n = 20)
Male Sex, n (%)	17(85%)
mMRC	2.05 ± 0.22
CAT score	14.74 ± 4.52
SGRQ total score	45.82 ± 15.16
Age, years	69.40 ± 8.76
COPD, n (%)	15(75%)
Lung cancer, n (%)	3(15%)
Idiopathic pulmonary fibrosis, n (%)	2(10%)

**Table 2.** Comparison of Maximal Exercise Performance

	No mask	Mask	p-value
Time to exhaustion, sec	441.3 ± 225.3	376.3 ± 208.0	<b>0.007</b>
Predicted METs	5.97 ± 2.29	5.41 ± 2.06	<b>0.031</b>
VO <sub>2</sub> max, ml/kg/min		14.24 ± 5.58	
Mask METs		4.07 ± 1.59	
Max HR, bpm	138.1 ± 24.9	138.0 ± 23.4	0.986
Peak RPE	17.55 ± 0.89	17.50 ± 1.10	1.000
6MWT, Distance (m)	464.9 ± 104.3	467.1 ± 115.0	0.679



**Figure 2.** Comparison of Exercise Performance With and Without Facemask During CPET

## Conclusion

- CPET performed with a facemask reduces maximal exercise performance.
- Predicted METs are also significantly lower with mask use.
- However, functional exercise capacity and physiological responses remain unchanged.
- CPET results should be interpreted with caution in patients with chronic respiratory failure.