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ORGANIZATION NEWS

Information/Education Page

Clinical Implications of Mask Wearing During Exercise in Inpatient Rehabilitation Setting During COVID-19 Global Pandemic



Wearing a face mask offers protection against the SARS-CoV-2 infection, yet experts are unsure about the effects of mask wearing while exercising on those with health conditions who require inpatient rehabilitation (IPR). Although there is no doubt of the importance of mask wearing for the safety of both the clinician and patient, those who work with people in IPR should be aware of the physical, mental, and emotional effects of mask wearing.

Summary of Exercise and Mask Research

Current research tells us that exercise performance in healthy people is lower when wearing a mask (table 1). The effect of face masks on exercise and vital signs varies across studies, but important findings include (1) higher ratings of perceived exertion, (2) increased shortness of breath, and (3) feeling claustrophobic while wearing a face mask during exercise.

Driver et al¹ found that masks affected physical and mental outcomes at low-, moderate-, and high-intensity exercise. Presumably, people with health conditions may also experience reduced exercise performance because of mask wearing. Thus, clinicians should monitor, manage, and adapt the rehabilitation environment to enhance the patient's ability to exercise safely.²

What This Means for Populations With Neurologic Conditions

People with neurologic conditions do not have normal oxygen consumption at rest or with

exercise.^{1,3} Therefore, clinicians should expect mask wearing to affect (1) oxygen uptake during aerobic exercise, (2) fatigue levels during exercise, and (3) physiological and autonomic responses during exercise.

Clinicians should consider the effect of wearing a mask in the context of individual needs. They should keep in mind that impairments in language, cognition, and mood, as well as some medications may also affect patients' participation in IPR, which may likely be exacerbated by wearing a mask. Such impairments can affect patients' ability to accurately determine and state perceived effort at rest and with exercise.²

Considering the issues regarding mask wearing, clinicians should incorporate the following actions into standard care: (1) Routinely assess physiological markers (heart rate, respiratory rate, oxygen saturation, blood pressure) in patients before, during, and after exercise. Symptoms that do not abate within 1 hour may be a sign that the patient is unable to tolerate current exercise intensity while wearing a mask.⁴ (2) Observe tolerance to exercise through various means, such as technology, illustrations, and common gestures, to maximize communicative success and safety in mask wearers.²

Clinical Implications for the Interdisciplinary Team

Recommendations to meet these challenges have been suggested by multiple sources (fig 1). This information is based on current research and

Table 1 Summary of Face Mask Research in Healthy Populations

Authors	Study Design and Type of Mask	Participants	Age of Participants (y), mean \pm SD	Exercise Test	Results
Driver et al ¹	Randomized crossover design: cloth face mask vs no mask	N=31 (14 healthy female participants, 17 male participants)	23.2 \pm 3.1	Graded treadmill	Face masks led to reduced performance (ie, reduced exercise time) and changes in physiological (eg, reduced oxygen consumption, amount of air moved, heart rate, oxygen carried in the blood) and perceptual variables (ie, RPE, dyspnea) during low-, moderate-, and high-intensity exercise.
Epstein et al	Crossover design: surgical, N95, vs no mask	N=16 male participants	34 \pm 4	Graded bike	Face masks did not reduce performance (exercise time) or change physiological variables (heart rate, SAO ₂ , blood pressure). Partial pressure of carbon dioxide at the end of an exhaled breath during the N95 mask condition was higher than the surgical mask and no mask.
Fikenzer et al	Crossover design: surgical, N95, vs no mask	N=12 male participants	38.1 \pm 6.2	Graded bike	Face masks (surgical and N95) reduced ventilation, maximal oxygen uptake, and comfort compared with no mask.
Li et al	Randomized: surgical vs N95 mask	N=10 (5 female participants, 5 male participants)	28.0 \pm 6	Treadmill test	Participants' heart rate was lower while wearing the surgical mask, and they rated them less favorably on perceived humidity, heat, and breath resistance than N95 masks.
Shaw et al	Randomized crossover design: surgical, cloth face mask, vs no mask	N=14 (7 female participants, 7 male participants)	28.2 \pm 8.7	Graded bike	Face masks did not affect exercise time, peak power, SAO ₂ , RPE, or heart rate.

Abbreviations: RPE, rating of perceived exertion; SAO₂, arterial blood oxygen saturation.

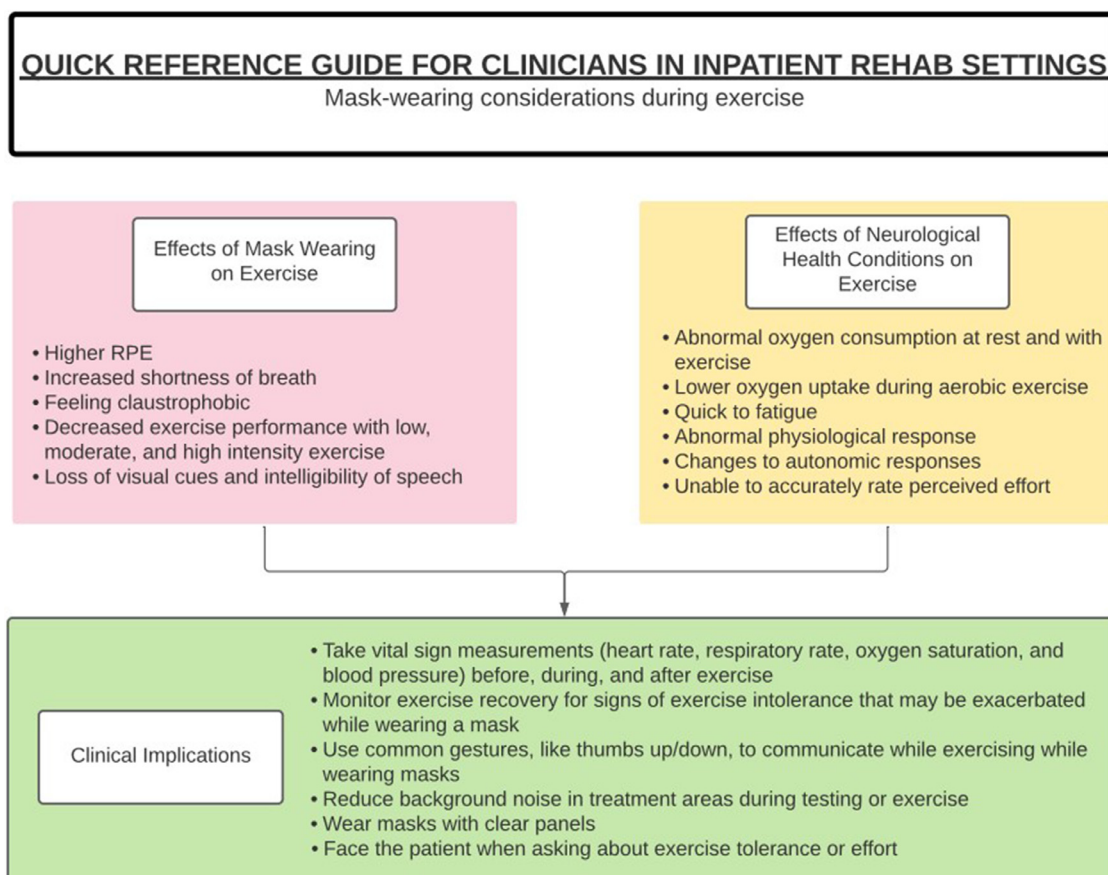


Fig 1 Quick reference guide for clinicians in inpatient rehabilitation settings.

clinical expertise because specific guidelines have not been developed for this patient population.

As guidelines from the Centers for Disease Control and Prevention evolve, it is unlikely that the practice of mask wearing in hospital settings will be eliminated soon. As such, it is up to the clinician to determine whether the mask hinders the patient's ability to safely exercise and communicate. Some examples of ways in which masks can affect treatment sessions are loss of nonverbal cues to monitor exercise tolerance, reduced intelligibility of speech to communicate perceived effort, and inability of the clinician to provide verbal cues to patients about exercise technique.⁵

Additionally, clinicians will need to use modified communication strategies for patients with impaired language and cognitive skills during exercise. Such strategies should be consistently discussed, used, and shared among the interdisciplinary team in the IPR. Modifications may include⁵ (1) use of masks with clear panels for patients and clinicians, (2) use of images or

videos for demonstration of exercise technique, (3) using thumbs up/thumbs down gestures to indicate patients' tolerance to exercise, (4) reducing background noise when conducting exercise testing or treatments, and (5) facing the patient when asking about exercise tolerance and effort.

Authorship

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