

## Weaning Protocol for Severe COVID-19 Patients on High-Flow Nasal Cannula Oxygen Therapy

Sir,

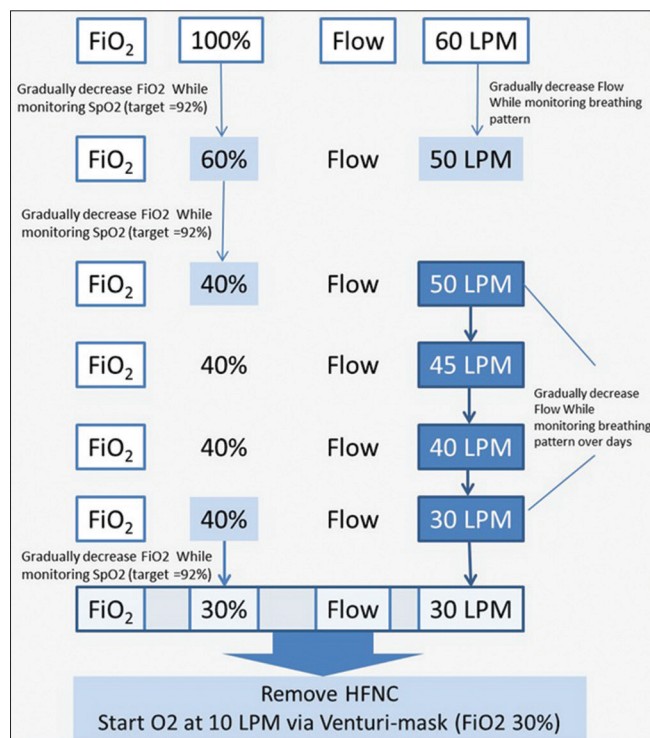
Coronavirus disease 2019 (COVID-19) remains a threat to human life, against all hopes, forecasts, and estimates. There is sound awareness regarding the current situation of how this pandemic has overburdened the healthcare system of almost all the countries. The most severe and common cause of intensive care unit (ICU) admission is acute hypoxemic respiratory failure. High-flow nasal oxygen therapy (HFNOT) has emerged as prime supportive care along with medications to arrest the disease process and modulate the host response to COVID-19. Due to the possible complications of invasive ventilation and the frequent unpleasant or life-threatening adverse effects that are created in noninvasive ventilation, the heated and humidified HFNOT has become an increasingly common therapy choice.<sup>[1]</sup> The HFNOT allows only two variables to be modified: the percentage of oxygen delivered and the rate of gas delivered.<sup>[2]</sup>

Commencing on HFNOT is well known; however, the best weaning strategy of HFNOT is still unknown. There is no published guideline. While studies are being carried out to determine both the optimum HFNOT delivery technique and the clinical context in which it is most effective, the best approach for HFNOT weaning remains unknown. There is only one review that was performed inside a pediatric ICU on weaning protocols for the HFNOT.<sup>[3]</sup> The authors proposed a “holiday” weaning protocol. This research involved only children and it makes it difficult to extrapolate HFNOT to adults. The median (interquartile range) arterial oxygen partial pressure to fraction inspired oxygen ratio ( $\text{PaO}_2/\text{FiO}_2$ ) was stated by Calligaro *et al.* to be 68 in 293 enrolled patients. Out of 293, 137 (47%) of patients ( $\text{PaO}_2/\text{FiO}_2$  76 [63–93]) were successfully weaned from HFNOT.<sup>[4]</sup> However, weaning protocol was not described.

Superfluous sluggish weaning process may prolong ICU length of stay. On the other hand, overzealous fast weaning may distress the patient deteriorating clinical status. In addition, there is a tendency among intensive care staff to keep inappropriately high saturation goal which delays the weaning process. In this letter, we describe the HFNOT weaning protocol [Figure 1], which we have developed and used in COVID-19 ICU patients and internally validated over a period of 6 months.

### PROTOCOL

Weaning may be commenced once the following criteria are met:



**Figure 1:** High-flow nasal oxygen therapy weaning protocol

1. Patient has recovered from the severe acute respiratory distress syndrome (i.e.,  $\text{PaO}_2/\text{FiO}_2 >150$ )
2.  $\text{SpO}_2 >90\%$  on  $\text{FiO}_2 \leq 0.4$
3. No signs of respiratory distress such as agitation, diaphoresis, or anxiety
4. Respiratory rate  $\leq 25/\text{min}$
5. Heart rate  $\leq 120/\text{min}$
6. Systolic blood pressure  $\geq 90$  mmHg
7. Arterial pH  $\geq 7.35$ .

In our experience, this protocol has helped faster yet optimal weaning from HFNOT, resulting in reduced ICU and hospital stay. The protocol is self-explanatory and simple to follow by naïve clinical staff who rotate in ICU every week as per the national guidelines. To achieve better outcomes, we have combined this protocol with respiratory physiotherapy, such as incentive spirometry at every four hours and self-prone positioning. Clinical investigators are encouraged to conduct a clinical trial to test the effectiveness of this protocol with a nonprotocolized tailored approach.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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