HAMILTON-HF90

ROX index

What is the ROX index?

When delivering high flow oxygen therapy (HFOT), recognizing when to escalate to noninvasive ventilation (NIV) or endotracheal intubation (EIT) is critical. The ROX index (Respiratory rate rate – OXygenation) is an easy-to-use tool that can aid clinicians in making this decision at pivotal moments during HFOT. The index relies on parameters directly linked to oxygenation (assessed by SpO2 and FiO2) and respiratory distress (assessed by RR). The respiratory rate can be monitored using Masimo RRp[1] technology.

How to calculate and interpret it

The ROX index is calculated by dividing the oxygen saturation (SpO2) by the fraction of inspired oxygen (FiO2) and then dividing the result by the respiratory rate (RR): ROX index = (SpO2 / FiO2) / RR.

To measure the ROX index, values for SpO2, FiO2, and RR are recorded and inserted into the formula. A higher ROX index indicates better respiratory function and effectiveness of high flow oxygen therapy, while a lower index signals a potential deterioration in respiratory function. However, regular monitoring and trend analysis are also crucial, as they are more informative than a single measurement.[1]

ROX index calculation	Example I		Example II		Result description
ROX index = (SpO2 / FiO2) / RR	ROX ≥ 4.88 success		ROX < 3.85 consider intubation		ROX index ≥ 4.88 after two hours of treatment, indicates a high probability that intubation will not be necessary.
	SpO2	94%	SpO2	92%	
	FiO2	0.6	FiO2	0.8	
	SpO2 / FiO2	157	SpO2 / FiO2	115	ROX index < 3.85 indicates a higher risk of treatment failure.
	Rate	25	Rate	35	
	ROX	6.27	ROX	3.29	

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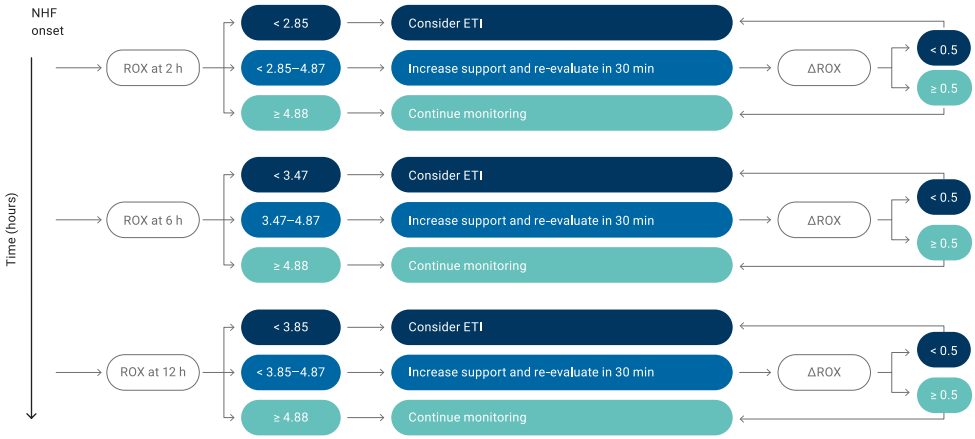
Recommendations for measuring the ROX index



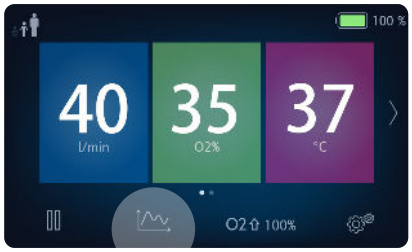
Accessing ROX monitoring on the HAMILTON-HF90

Select Trends

Tap the right arrow

Tap until ROX index appears

1



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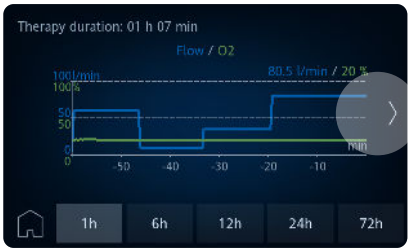

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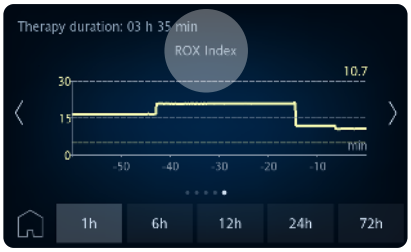

Comparative insights in non-COVID-19 and COVID-19 pneumonia

In acute hypoxemic respiratory failure due to non-COVID-19 pneumonia, the ROX index identified patients at low risk of HFOT failure with a cut-off value of 4.88 measured after 12 hours of HFOT.[1]
In COVID-19 patients, five retrospective studies[2,3,4,5,6] showed that patients with a successful outcome had a higher ROX index, but the cut-off point for values associated with success varied between 5.55 after 6 hours[4] and 3.67 after 12 hours[5].

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