

Titration instruction for TNI *softFlow* in patients with COPD

1. Nasal insufflation is mostly recommended in combination with oxygen.
2. The original oxygen content is maintained, i.e. if the patient is typically administered 2-4 l/min O₂ during LTOT, the same amount of oxygen is added when using TNI *softFlow*.
3. For getting acquainted with the therapy, the patient should be treated at a low flowrate, 10-12 l/min air/O₂ mixture, for about 5-10 minutes.
4. For this, the system should be filled with warm water or have been warmed up for about 5 minutes so that a sufficiently humidified and warmed air/O₂ mixture can be applied.
5. The best benefit for COPD patients is achieved at a flowrate of the air/O₂ mixture of 15 to 25 l/min.

The display of the TNI *softFlow* always shows the summed flowrate of the air/O₂ mixture and automatically controls the added air, in dependence of the added O₂. The applied O₂ rate in l/min. and the resulting FiO₂ value in % is also shown in the display.

6. In order to get the best results possible, the patient should be requested to breathe through his nose as steadily as possible during the application.
7. The trend should show positively changed, measurable SaO₂, paO₂ und paCO₂ results after 30-60 minutes, after 3-8 hours of therapy stabilization should occur in individual cases.
 - a. Titration recommendation to reduce Hypercapnia:
 - i. Titration recommendation refers to titration of responsive patients suffering from a stable or increasing hypercapnia (but not directly exacerbated patients).
 - ii. If no positive elevated paCO₂ change is shown after 30-60 minutes therapeutic application with a flowrate of 20l/min, increase the flowrate by 3 l/min.

The patient has to be interviewed regarding therapy acceptance and paCO_2 has to be measured at 10 – 15 minute intervals.

If paCO_2 value remains unchanged, increase the flowrate by respectively 3 l/min up to a flowrate of 45 l/min.

- iii. The therapy should not be considered as suitable for this patient, if no positive paCO_2 reduction value can be noticed after these procedures, additionally by applying high flowrates. If the patient refuses a further increase of flowrate during the procedures, the therapy should also be considered as not suitable for the patient.

b. Titration recommendation to improve oxygenation,

Interaction and effect FiO_2 ; SaO_2 and paO_2 :

- i. In the treatment of LTOT it is considered, that a FiO_2 of around 28% is generated giving 2 l/min O_2 . It is not possible to determine FiO_2 exactly during LTOT.
- ii. During LTOT-titration monitoring will be performed via SaO_2 measurement, a very rapid, direct oxygen content parameter, and via paO_2 measurement. This practise should also be maintained during application of TNI.
- iii. SaO_2 or paO_2 should not decrease during the patient is treated with TNI and a flowrate is applied, consisting of air- O_2 mixture. Studies have shown that SaO_2 or paO_2 value is reached more quickly during TNI compared to LTOT.
- iv. If, nevertheless, a negative oxygenation trend is shown, increase the admixture of oxygen.
- v. Similar to LTOT procedures, increase systematically the O_2 rate with a constant flowrate as well as a regular monitoring and measurement is recommended.
- vi. The objective is to improve oxygenation measured via SaO_2 or paO_2 .
- vii. The display of TNI **softFlow** always shows the applied FiO_2 -concentration.

8. The patient's state is optimized by titrating the air/ O_2 mixture, using the optimum amount of added O_2 in combination with the flowrate.

9. The procedures are consistent with the procedures concerning initiation of NIV and are the responsibility of the applying physician.

10. It is recommended to monitor the patient during application by means of

- Continuously measuring the oxygen saturation
- Continuously measuring the transcutaneous CO_2 value, tCO_2
- BGA in short intervals