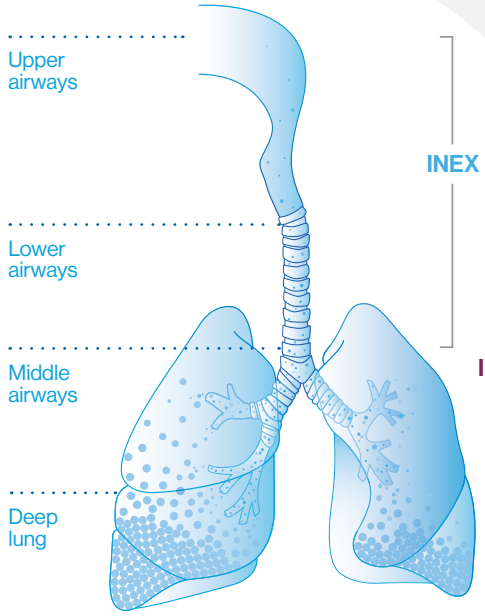
Air Liquide HEALTHCARE

EO-70

Help with **EO-70 Settings**

English

The EO-70 is a versatile device combining complementary treatments



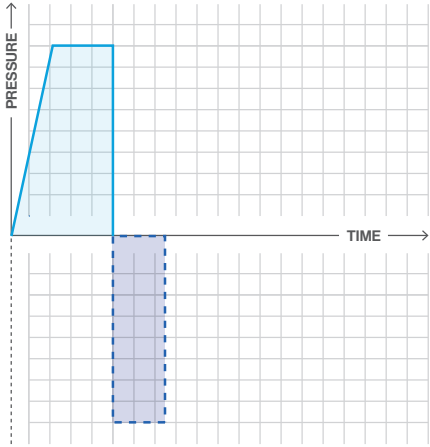
- Proximal clearance
- Optimization and maintenance of respiratory function
- Distal clearance

Mode Description

INEX

Mechanical in-exsufflation provides positive pressure, followed very quickly by negative pressure, which assists coughing.

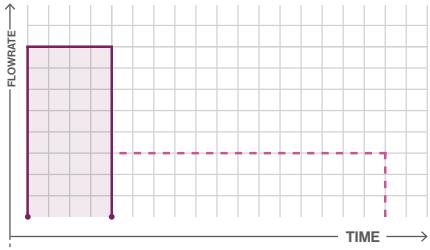
MI-E simulates coughing due to pressure variation in a non-invasive form.



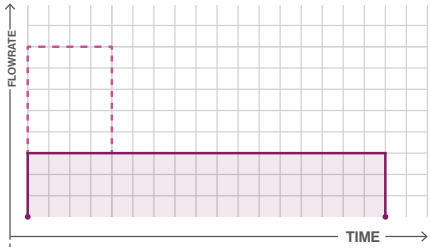
IPPB = Intermittent Positive Pressure Breathing

This *recruitment mode* delivers an air volume beyond the patient tidal volume and close to his maximum lung capacity.
It enables the patient to reach the inspiratory reserve volume. This improves pre-cough volume and mobilizes the thoracic wall.

The selected flow rate modulates **the inspiratory cycle time**
Two possible options depending on the treatment objective



The **high-flow** setting **effectively delivers** a volume of air over a reduced inspiratory time.



Slow insufflation allows **maximum intake** in all lung areas to reach the inspiratory reserve volume.

Indications

Indications INEX

It is intended in adult or pediatric patients who have difficulty removing secretions and/or inability to cough (Peak Flow <270 L/min).

Some examples of diseases that may benefit from therapy are:

- Thoracic wall diseases
- Neuromuscular diseases
- Spinal cord injuries

Indications IPPB

It is designed for adult or pediatric patients who require passive thoracic-pulmonary mobilization and for those who struggle with secretion removal due to ineffective coughing.

General contraindications to INEX and IPPB

Hemoptysis, pneumothorax, severe emphysema and recent lobectomy, increased intracranial pressure, altered consciousness, lack of cooperation, severe bulbar palsy, cardiac instability, esophageal fistula, rib fractures.

(6) Chatwin M et al., 2018.

Settings INEX

INEX Settings		Description
Operating modes Insp.	AUTO / MANUAL	The Auto Mode delivers the therapy according to the settings of: Inspiration Pressure, Exhalation Pressure, Inspiration Time, Exhalation Time, Pause Time, PEEP and Rise Time. In the Manual Mode, the operator will determine the inspiration and exhalation time by switching the touchpad to the left (triggers an inspiration) and to the right (triggers an exhalation).
Inh.Pressure (cmH_2O)	5 - 70	Positive pressure applied in mechanical inflation.
Inh. Slope	0 - 5	Speed at which the pressure will be reached: 0 (200 msec), 1 (⅕ of Ti), 2 (⅖ of Ti), 3 (⅗ of Ti), 4 (⅘ of Ti), 5 (Ti).
Inh Time (s)*	0.5 - 5	Time that positive inspiratory pressure is applied.
Oscillation Freq. (Hz)	4 - 20	Hertz (beats per sec). Higher frequency less patient sensation.
Insp. Oscillation Amp.	1 - 3	1 (2± 105% of pressure set), 2 (4± 10% of pressure set), 3 (6± 105% of pressure set). Higher oscillation stronger patient sensation.
Trigger* Not compatible with timed Pause	OFF/1 - 3	1 (3 cmH_2O), 2 (5 cmH_2O), 3 (12 cmH_2O)**
Exh. Pressure (cmH_2O)	0 to -70	Negative pressure applied in mechanical exsufflation.
Exh. Time (s)*	0.5 - 5	Time that negative expiratory pressure is applied.
Exhal. Oscillation Freq. (Hz)	4 - 20	Hertz (beats per sec). Higher frequency less patient sensation.
Exhal. Oscillation Amp.	1 - 3	1 (2± 105% of pressure set), 2 (4± 10% of pressure set), 3 (6± 105% of pressure set). Higher oscillation stronger patient sensation.
Pause (s)* Not compatible with Trigger	OFF/0.5 - 5	Pause time between each cough cycle (insufflation/exsufflation/ pause).
PEEP (cmH_2O)	OFF/1 to 20	PEEP during the Pause time.
Cycles Nb*	1 to 20	Number of cough cycles.
Treatment End*	Inspiration/ Exhalation	Determine the phase that will end the therapy (after insufflation or after exsufflation).

* Only applies in AUTO mode.

** The values could vary according to the PEEP setting and they should be considerate as a variation from the current pressure value.

Settings IPPB

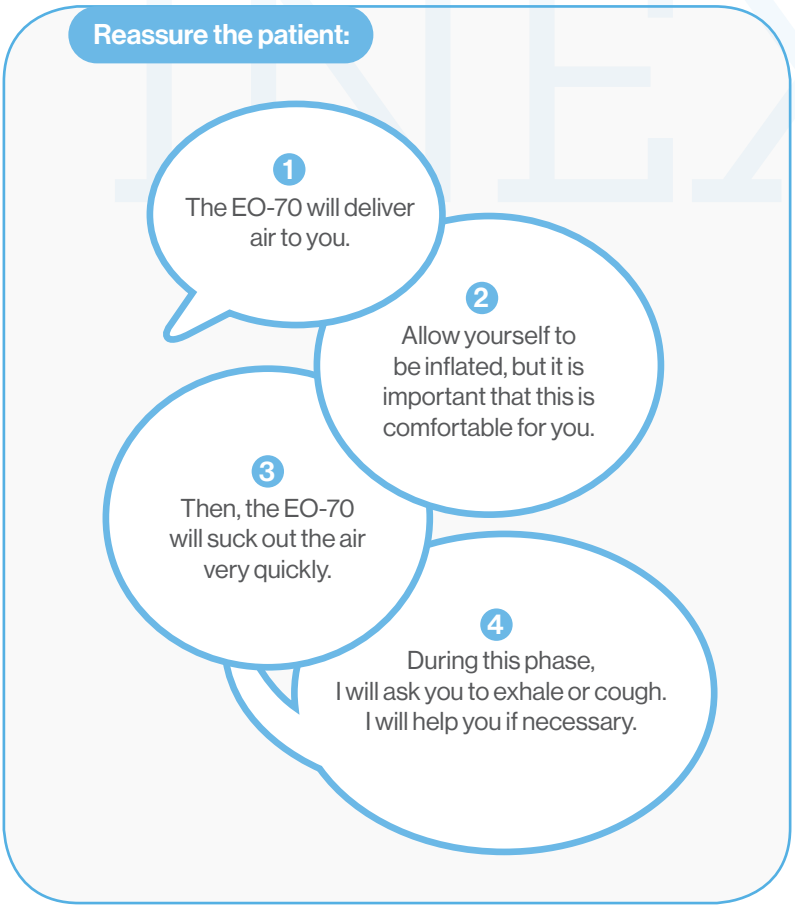
IPPB Settings		Description
Flow (L/min)	5 - 100	Insufflation speed
Inh. Slope	ON/OFF	When ON, the flow is decreasing during the inhalation phase, proportionally to the increase of the pressure until reaching 50% of the set flow when the max pressure is reached.
Pressure Max. (cmH_2O)	10 - 50	Maximum pressure that can be achieved during inhalation. Once reached, exhalation follows.
Inh. Trig.	OFF/1 - 8	1 (more sensitive) - 8 (less sensitive)
PEEP (cmH_2O)	OFF/4 - 20	Positive pressure during pause
Exh Slope	0 - 5	The time of linear reduction of Max Insp Pressure to PEEP. In the setting 0 - no resistance to exhalation. 0 (1 sec), 1 (2 sec), 2 (3 sec), 3 (4 sec), 4 (5 sec), 5 (6 sec)
Inh. Max Time (s)	0.5 - 20	Maximum inspiratory phase time. If the patient has not reached the max pressure at the end of the maximum inspiratory time, the cycle will proceed to expiration.
Treatment time (min)	OFF/5-30	Duration of therapy.

IPPB Note: For optimal adaptation, it is important to calibrate the circuit with an exhalation port, in case of failure using a mouthpiece, use a non-ventilated NIV mask, set a PEEP of 4 cmH_2O and a minimum expiratory slope of 1. It's essential to monitor the unintentional leaks during the therapy.

Start a session:
define comfort settings

INEX

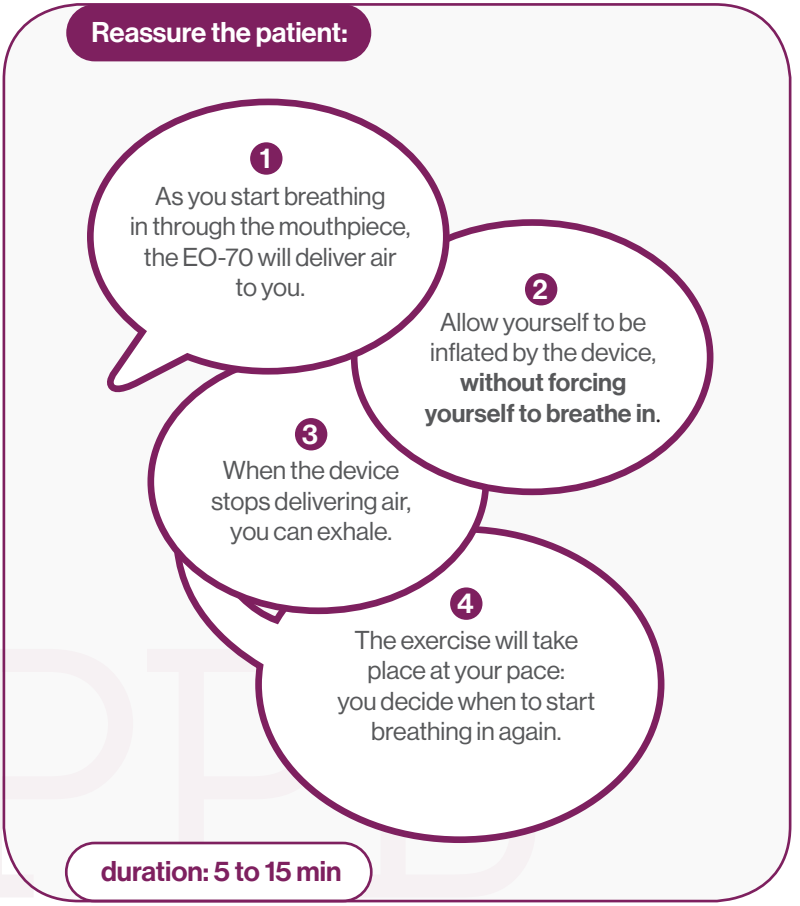
Help the patient identify the inspiratory and expiratory phases so that he/she can synchronize as much as possible.



Start a session:
define comfort settings

IPPB

Reinforce the importance of allowing passive insufflation through the flow delivered by the equipment.



Recommendations for treatment

INEX

Settle the patient into position based on their functional state:
- In a half-seated position in a bed
- Sitting in a chair

Opt for a position where the practitioner can easily apply manual coughing assistance in addition to the mechanical assistance

If necessary, choose a personalized signal with the patient to indicate when to pause the insufflations (e.g. a wink)

Ideally, use a mask that covers the nose and mouth with the INEX function

Guide the patient with clear instructions:
- Inhale or inflate
- Cough hard

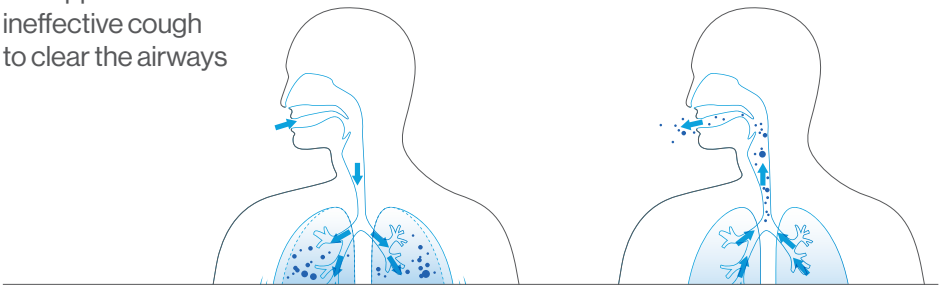
Use the Coaching Mode with the chameleon to help the patient synchronize with the device

Proximal clearance

INEX

► Objective

To support an ineffective cough to clear the airways



Settings

Recommended settings:

Installation settings	
Patient on NIV	**Patient not on NIV**
Initiate at: Pi = PIP + 5 cmH_2O Pe = -(PIP + 10 cmH_2O)	Initiate at: Pi = 15 cmH_2O Pe = - 20 cmH_2O
Ti = Te = Ti (NIV) +0.5 s Pause = 1 sec	Ti = Te = 1 sec Pause = 1 sec

Adjustment:

Inspiratory and expiratory pressures and times must be individualized and gradually increased until efficacy is achieved.
The Ti/Te ratio must be adjusted according to the disease and the context.
The Pinsp must be less than the Pexpi to favor a expiratory phase.

Dose
Depends on the extent of the congestion, **example:** 2 to 5 sets of 5 cycles each.

Post-treatment clinical assessment
Improvement of the PCF, audible secretions, secretions in the upper airways.

It could be used during a non-invasive or invasive ventilation using endotracheal tube or tracheotomy.

(1) Chatwin M and Simonds A, 2020.

Proximal clearance

IPPB

► Objective

To increase inspiratory volume to facilitate effective coughing.

IPPB enhances pre-cough volume to facilitate coughing.

High-flow inspiration | Deep inspiration | Secretion clearance

Settings

Recommended settings:

Flowrate: 30–50 L/min Max pressure: 30 to 40 cmH_2O

Adjustment:

Carried out by the physiotherapist during the session:

- The flowrate and pressure must be individualized and gradually increased until a satisfactory pre-cough volume is achieved that enables effective coughing.
- PEEP: in the absence of abdominal deficiencies, increase PEEP gradually.

Dose

1 to 4 times a day depending on the congestion
Perform 2 to 5 movements followed by a cough; pause when the patient needs a break.

Post-treatment clinical assessment

Sputum, displayed volume increased, patient clinical improvement, auscultation.

Target patients

Congested patients with neuromuscular impairment: myopathy, tetraplegia.
Any congested patient whose dyspnea and/or exhaustion makes manual drainage ineffective.

(2) Lacombe et al., 2014, (4) Dohna-Schwake C et al, 2006.

Distal clearance
Mobilize secretions

IPPB

► Objective
To mobilize secretions present in the distal parts of the lung areas.

Low-flow inspiration | Assisted inspiration | Expiration: secretion movement
Manual expiratory technics

Settings

Recommended settings:
Flowrate: 20 to 30 L/min Max pressure: 25 to 35 cmH_2O

Adjustment:
If the pressure is reached too quickly or if the current volume displayed is too low: increase the inspiratory time by decreasing the flowrate and/or by adjusting the pressure gradually.

Dose
1 to 4 times a day depending on the extent of the congestion.
Perform 2 to 5 insufflations followed by a cough; pause when the patient needs a break.

Post-treatment clinical assessment
Sputum, displayed volume increased, patient clinical improvement, auscultation.

Target patients
Congested patients with neuromuscular impairment: myopathy, tetraplegia.
Any congested patient whose dyspnea and/or exhaustion makes manual drainage ineffective.

(5) Nicolini A et al., 2014

Respiratory function optimization
Prevention of ventilation disorders

IPPB

► Objective

To maintain or develop ventilation in hypoventilated lung areas.

Slow inspiration | Assisted slow inspiration | Posture to maximize inspiration

Settings

Recommended settings:
Flowrate: 10 to 30 L/min Max pressure: 25 to 35 cmH_2O

Adjustment:
Performed according to the identified or suspected hypoventilation area:
- Flowrate: minimum
- Maximum pressure: gradual titration of the pressure in order to optimize the inspired volume.

Dose
10 to 30 minutes per day, 5 days a week

Target patients
- Neuromuscular diseases
- Multiple disabilities
- Pre-surgery, post-surgery
- Any patient whose respiratory function is severely decreased, with sustained volume reduction

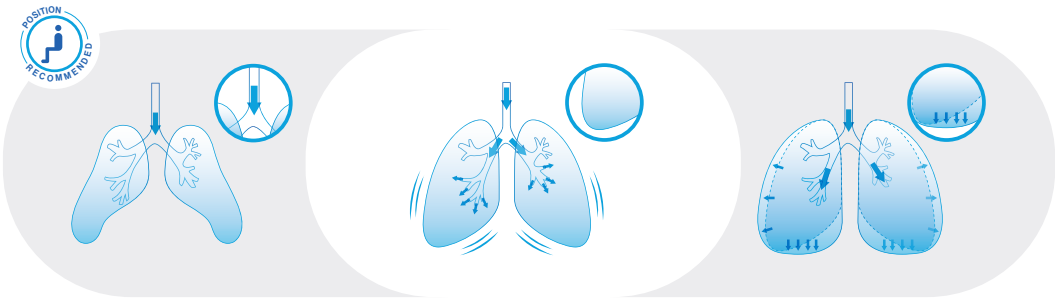
(3) Sorenson HM, Shelledy DC, 2003

Respiratory function optimization

IPPB

► Objective

To mobilize the chest cavity and let in as much air as possible.



Slow inspiration | Assisted inspiration | Posture to maximize inspiration

Settings

Recommended settings:
Flowrate: 20 to 35 L/min Max pressure: 30 to 40 cmH_2O

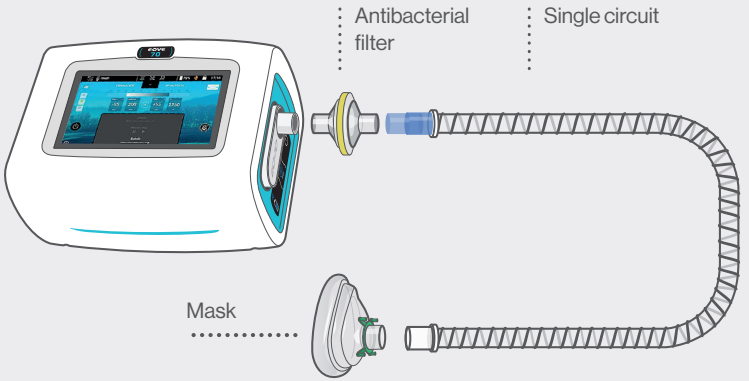
Adjustment:
Depending on the volumes measured:
- Flowrate: increase or decrease depending on how the patient feels
- Max pressure: if resistance is high, do not hesitate to significantly decrease the pressure.

Dose
10 to 30 minutes per day, 5 days a week.

Target patients
- Neuromuscular diseases
- Multiple disabilities
- Pre-surgery, post-surgery
- Any patient whose respiratory function is severely decreased, with sustained volume reduction

(4) Dohna-Schwake C et al., 2006

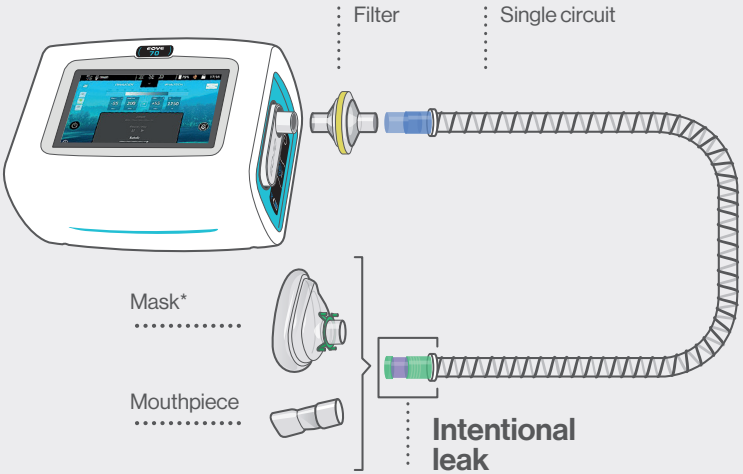
Assembly of the patient circuit



INEX mode

1. Attach the antibacterial filter to the inspiratory port of the device.
2. Connect the circuit (22 mm) to the other side of the filter.
3. Perform a circuit calibration.
4. Connect the patient interface to the other end of the circuit.

Assembly of the patient circuit



IPPB mode

1. Attach the antibacterial filter to the inspiratory port of the device.
2. Connect the circuit (22 mm) to the other side of the filter.
3. Connect the **leak port** to the other side of the patient circuit.
4. Perform a circuit calibration
5. Connect the patient interface to the other end of the circuit.

* For patient comfort, it is possible to use a non-ventilated mask.

References

1. Respir Care, 2020. Long-Term Mechanical Insufflation-Exsufflation Cough Assistance in Neuromuscular Disease: Patterns of Use and Lessons for Application. Chatwin M, Simonds A.

2. Respiration, 2014. Comparison of three cough-augmentation techniques in neuromuscular patients: mechanical insufflation combined with manually assisted cough, insufflation-exsufflation alone and insufflation-exsufflation combined with manually assisted cough. Lacombe M, Del Amo Castrillo L, Boré A, Chapeau D, Horvat E, Vaugier I, Lejaille M, Orlikowski D, Prigent H, Lafaso F.

3. AARC Clinical Practice Guideline. Intermittent Positive Pressure Breathing: 2003 Revision & Update. Sorenson HM, Shelledy DC, AARC.

4. Pediatric Pulmonology, 2006. IPPB-Assisted Coughing in Neuromuscular Disorders. Dohna-Schwake C, Ragette R, Teschler H, Voit T, Melies, U.

5. Arch. Bronconeumol., 2014. Comparison of intermittent positive pressure breathing and temporary positive expiratory pressure in patients with severe chronic obstructive pulmonary disease. Nicolini A, Mollar E, Grecchi B, Landucci N.

6. Respiratory Med, 2018. Airway clearance techniques in neuromuscular disorders: A state of the art review. Chatwin M, Toussaint M, Gonçalves M, Mellies N, Gonzales-Bermejo J, Sancho J, Fauroux B, Andersen T, Hov B, Nygren-Bonnierk M, Lacombe M, Pernet K, Kampelmacherm K, Devaux C, Kinnett K, Sheehan D, Rao F, Villanova M, Berlowitz D, Morrow B.

YN23161_IND1_2024-06_Homecare ventilation_EN_Help with EO-70 Settings_ - Non-contractual document product can be modified at any time - Photo: © ALMS - Design & illustrations CHANH TH

Manufactured by

EOVE
Helioparc
4, Boulevard Lucien Favre
64000 Pau
France
www.eove.fr

Air Liquide HEALTHCARE

EOVE