

# Oxygen & Aerosol Therapy

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# Oxygen Therapy

## Unomedical Oxygen Delivery System

Different disease patterns and different types of applications require different levels of oxygenation.

The **Unomedical Oxygen Delivery System** represents a complete range of products to meet virtually any situation, where oxygen supply is required.

The **oxygen staircase** below illustrates the level of oxygenation which can be achieved by the different devices and moreover gives examples of the disease patterns.



[1] AARC Guideline - Oxygen Therapy for Adults in the Acute Facility 2002  
 $FiO_2$ : Fraction of inspired oxygen

# Oxygen Therapy

## Low Concentration



### Nasal Oxygen Cannulas

Nasal oxygen cannulas are used in the delivery of lower flows of oxygen (up to 6 liter/ minute).

The oxygen concentration achieved is proportional to:

- The flow rate of oxygen
- The patient tidal volume
- Inspiratory flow rate
- Naso-pharyngeal volume

### Sof-Touch Cannulas

#### Increased patient comfort and safety

The Unomedical Sof-Touch nasal oxygen cannulas offer a broad range of solutions for all demands.

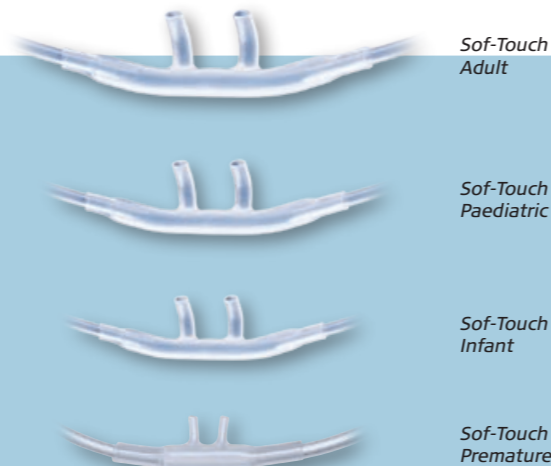
- Adult, Infant, Paediatric and Premature sizes
- Perfect fit by adaption to anatomical requirements
- Light-weight design
- Exceptionally flexible and soft nasal prongs
- DEHP free nasal part
- No-Crush Oxygen tubing
- Optional with Fits-All Connector for direct connection to the Flow Meter

### Oxygen Catheters

- Mono-nasal oxygen catheters
- Blue coloured material helps to prevent potential mix-up with nasal feeding tubes
- Soft rounded distal tip
- Atraumatic lateral eyes
- With compress (fixed or adjustable) for placement in the nostrils
- Without compress for placement in the naso-pharynx

FiO<sub>2</sub>: 24 - 44%

Flow rate Guide Nasal Oxygen Cannulas/Oxygen Catheters	
Flow (LPM)	FiO <sub>2</sub>
1	24%
2	28%
3	32%
4	36%
5	40%
6	44%



### Sof-Touch Low Flow

- For low-flow oxygen therapy (up to 3 liter/minute)
- Extra small prongs
- Discrete and extremely light-weight design
- Drastically increases patient's comfort, permitting higher freedom and an active lifestyle

### Naso-Fix

Securement tape for nasal tubes & catheters



- **Secure fixation of nasal tubes**  
Prevents displacement/saves time on re-introduction
- **Optimum patient comfort**  
Skin friendly fixation at optimum angle
- **Discrete appearance**  
Skin coloured / Available in 3 different sizes
- **Easy application and removal**  
Efficient securement with minimum time consumption

Please ask us for detailed information on our complete securement device programme

# Oxygen Therapy

## Medium Concentration



### Sof-Touch High Flow

#### High-flow oxygen supply with increased patient comfort

The Unomedical Sof-Touch High Flow nasal oxygen cannula is able to deliver high oxygen flows from 6 to 15 liter/minute, archiving FiO<sub>2</sub> rates of medium concentration oxygen masks.

Continuous oxygen supply can be provided even during medication application, eating, drinking and talking. Patient compliance can be drastically improved.

The Sof-Touch High Flow cannula is part of the Sof-Touch product family, providing:

- Exceptionally flexible and soft curved nasal prongs
- Perfect anatomical fit
- Light weight design
- DEHP-free nasal part
- No-Crush Oxygen tubing

### Medium Concentration Oxygen Masks

Medium concentration masks are designed for use when precise control of inspired oxygen concentration is not mandatory.

During inspiration, the patient draws gases both from oxygen flowing into the mask through the tubing, as well as from room air via ports on the sides of the mask. Oxygen concentration delivered is 40 - 60% depending on the patients breathing rate and tidal volume.

### Unomedical Oxygen Masks

- Quick and easy to set up and apply to the patient
- Easy fit and excellent seal ensuring patient comfort
- Under-the-chin design eases patient acceptance and compliance
- Transparent mask enables observation of face colour and vital signs
- Adjustable nose clip assures comfortable fit
- Latex free mask and elastic strap eliminates the risk of allergic reactions



Sof-Touch High Flow cannula

FiO<sub>2</sub>: 40 - 60%

Flow rate Guide Medium Concentration Masks	
Flow (LPM)	FiO <sub>2</sub>
5 - 6	40%
6 - 7	50%
7 - 8	60%

# Oxygen Therapy

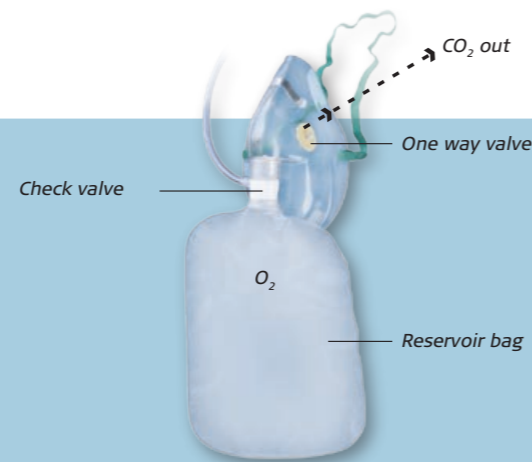
## High/Fixed Concentration



### High Concentration Oxygen Masks

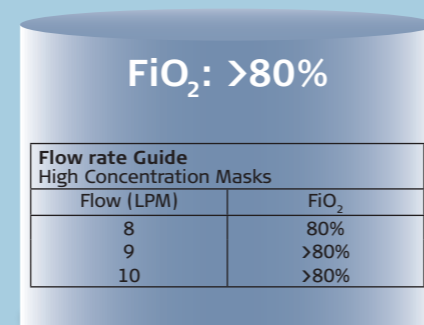
High concentration oxygen masks are equipped with a reservoir bag allowing an adequate amount of oxygen to be available to meet unpredictable breathing patterns and tidal volumes.

One way valves located at the exhalation ports prevent air from entering the mask during inhalation and allow the exhaled gases to exit the mask on exhalation, maintaining a high concentration of oxygen.



### Non-rebreathing masks

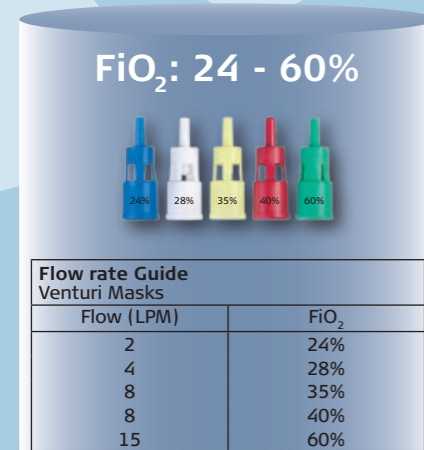
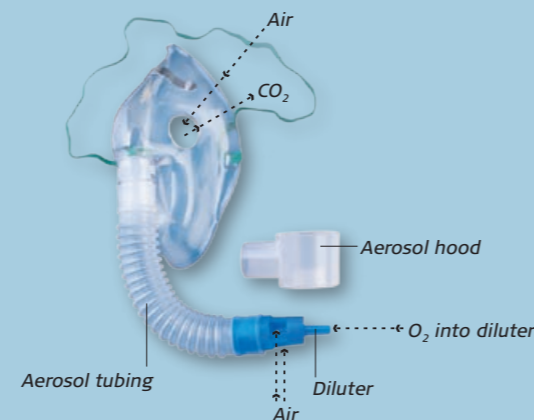
An additional check valve located between the mask and the reservoir bag prevents the patient from rebreathing his exhaled gas. Oxygen concentration delivered is 80 - 100% depending on the patients breathing rate and tidal volume.



According to: Clinical application of respiratory care. Shapiro BA et al. Ed. 4, St. Louis. 1991. Mosby.

### Unomedical Oxygen/ Venturi Masks

- Quick and easy to set up and apply to patient
- Easy fit and excellent seal ensuring patient comfort
- Under-the-chin design eases patient acceptance and compliance
- Transparent mask enables observation of face colour and vital signs
- Adjustable nose clip assures comfortable fit
- The aerosol hood of the Venturi Masks enables optional humidification



### Fixed Concentration Venturi Masks

The principle of the venturi mask is to deliver a predetermined concentration of oxygen regardless of the patient's respiratory pattern. Oxygen flows through the diluter dragging in air through the air-entrainment ports.

Venturi masks create a constant proportion of air/oxygen mixture in excess of patients inspiratory flow rate. With gas flow constantly in excess of patient demands and with enhanced CO<sub>2</sub> washout, rebreathing is nearly eliminated.

Flow rate 2 - 15 l/min. Oxygen concentration delivered is 24 - 60% depending on the choice of the diluter.

According to: Clinical application of respiratory care. Shapiro BA et al. Ed. 4, St. Louis. 1991. Mosby.

# Oxygen Therapy

## End-Tidal Carbon-Dioxide Measurement

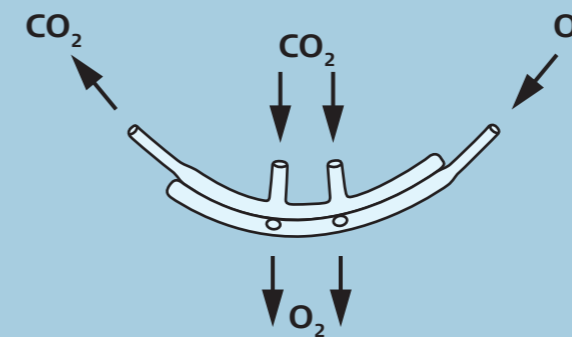


### MacSafe Cannula

The MacSafe nasal oxygen cannula is designed to provide oxygen whilst simultaneously monitoring end-tidal carbon-dioxide (etCO<sub>2</sub>), for monitoring of non-intubated patients.

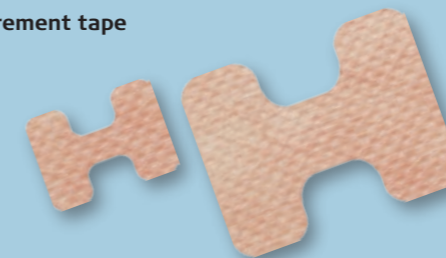
### Constant Measuring Efficiency

The special design of the cannula provides oxygen through two bottom ports, while the nasal tips solely collect expired CO<sub>2</sub> through the gas sampling line.



This design provides two completely independent pathways for oxygen and carbon-dioxide, permitting an undiluted etCO<sub>2</sub> sampling even with higher Oxygen flow rates for increased measurement accuracy <sup>[1]</sup>.

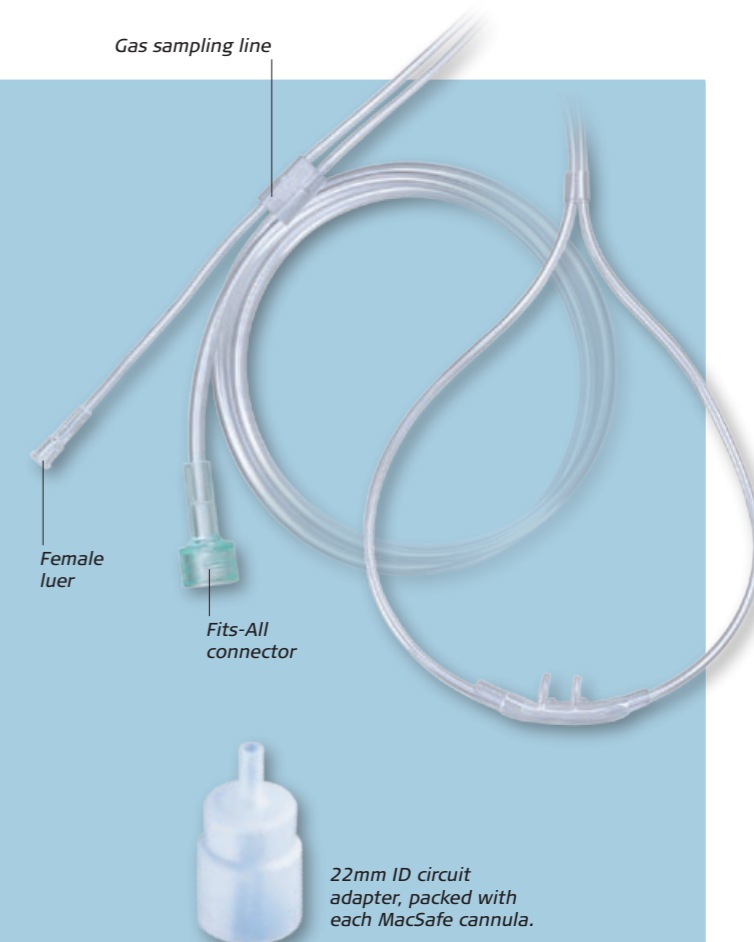
### Cath-Fix Securement tape



Cath-Fix is a skin-friendly securement tape made from non-woven polypropylene material with a medical grade allergy tested adhesive.

Using Cath-Fix together with MacSafe, helps to keep the tubing of the cannula out of the surgical field (e.g. during ophthalmic operations).

Please ask us for detailed information on our complete securement device programme



### Increased patient comfort and safety

The MacSafe cannula is part of the Sof-Touch product family, providing:

- Exceptionally flexible and soft nasal prongs
- DEHP free nasal prongs
- Light weight design
- Perfect anatomical fit

In a controlled clinical trial, the MacSafe cannula was judged by the study population to be the most comfortable cannula <sup>[1]</sup>.

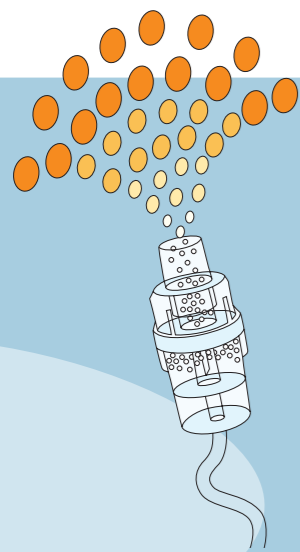
### Convenient for all clinical applications

- Adult and paediatric versions
- Male and female gas-sampling luer connector versions
- 22mm ID circuit adapter packed with each MacSafe
- Fits-All connector for attachment to humidifier or directly to the flow meter

[1] WODA ET AL Cost-benefit analysis of nasal cannulae in non-tracheally intubated subjects. Anesth Analg. 1996 Mar;82(3):506-10.

# Aerosol Therapy

## Nebuliser Performance and Areas of Application



MMAD	Particle deposition
5 - 10 µm	Pharyngeal / Laryngeal
2 - 5 µm	Tracheobronchial
0.5 - 2 µm	Alveolar
< 0.5 µm	Exhaled

### Mass Median Aerodynamic Diameter

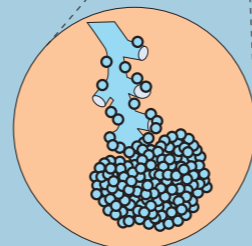
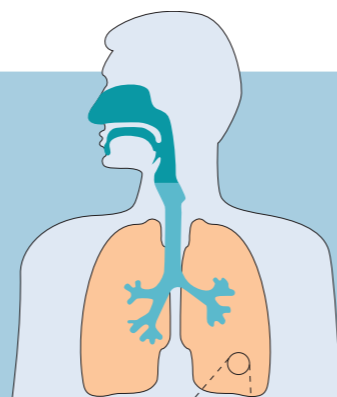
Nebulisers create a wide size spectrum of particles. In order to characterize the respirable dose provided to the patient, the mass median aerodynamic diameter (MMAD) is used.

The MMAD represents the diameter around which the mass of the aerosol is equally divided, for the population of particles produced by the nebuliser.

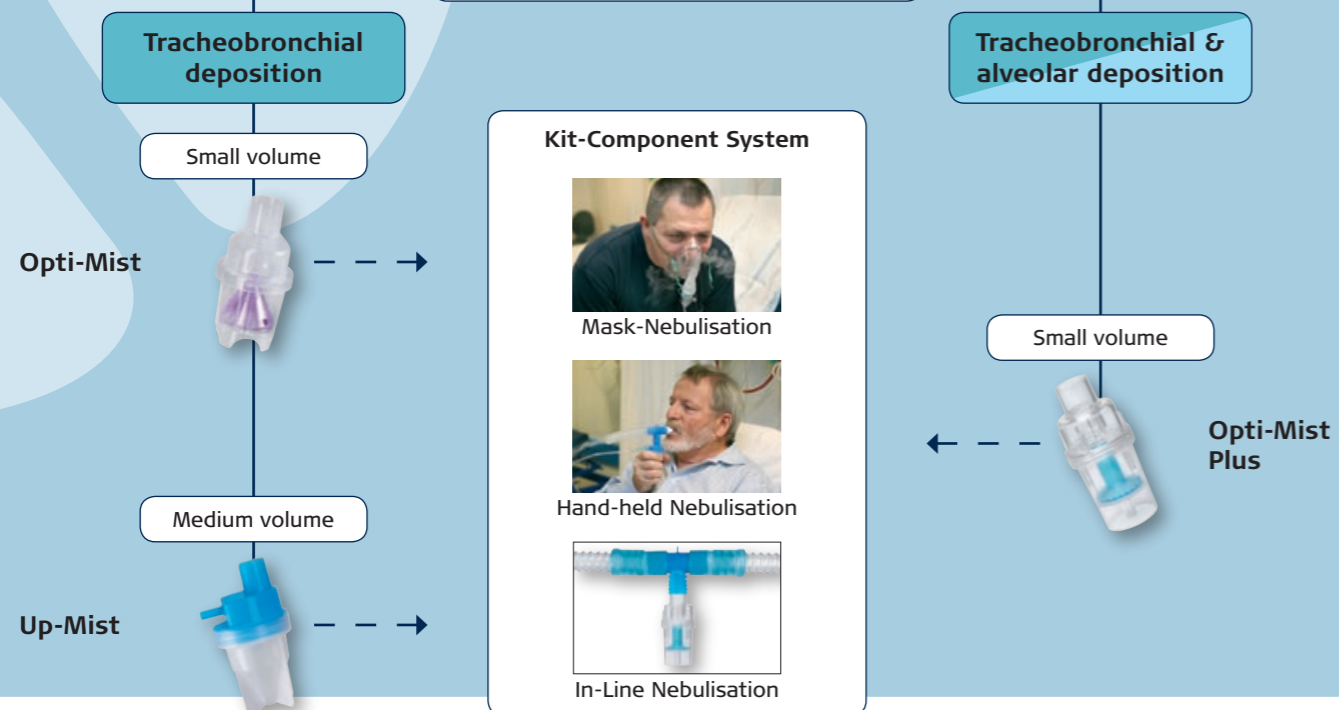
Particle sizes between 2 - 5 µm are deposited inside the tracheobronchial airways. Particle sizes smaller than 2 µm are deposited in the alveolar parenchyma, where particles smaller than 0.5 µm are too small for deposition and are exhaled again. Particles larger than 5 µm are too large and are not able to reach the lower respiratory tract.

Depending on the application, a tracheobronchial- or alveolar deposition and therefore different MMAD are required. This in turn often requires different nebulisers.

Unomedical offers a complete medication nebulisation system with three different nebulisers, either for tracheobronchial deposition, or with the **Opti-Mist Plus** Nebuliser a scalable solution for both – tracheobronchial and alveolar deposition of particles.

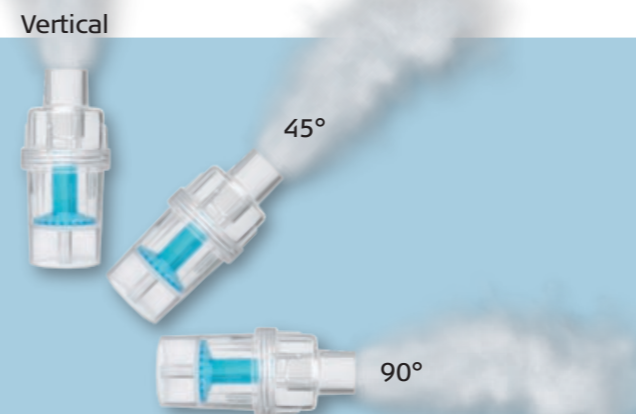


### Unomedical Nebulisation System



# Opti-Mist Plus

## The Scalable Nebulisation Solution



The **Opti-Mist Plus** provides efficient performance at any angle between 0-90°.

### Universal Application

**Opti-Mist Plus** is a nebuliser, designed for both – tracheobronchial and alveolar deposition, providing a nebulisation solution for most clinical needs.

Scalable by the gas flow, **Opti-Mist Plus** produces particles with an average MMAD\* between 3.3 and 1.3 micrometers thus eliminating the need of different nebulisers for different types of application.

**Opti-Mist Plus** represents the core of a complete nebulisation system providing virtually any configuration required by healthcare professionals today.

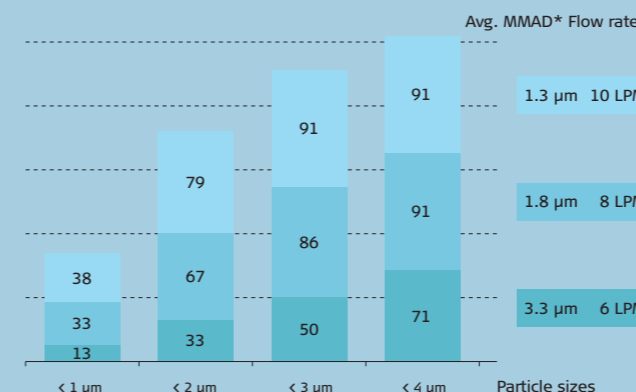
### Efficient Performance

- High nebulisation rates provide efficient nebulisation at low residual volumes, minimising medication waste.
- Usable in positions between 0 and 90°, with constant performance. allowing the patients to be in a comfortable position during the treatment.

### Easy to use

- Large grips provide an easy and quick assembly.
- **Fits-All** connector allows direct connection to flow meters.
- Conveniently packed in 10 pieces for uncomplicated distribution in hospitals.

### Particle size distribution by volume



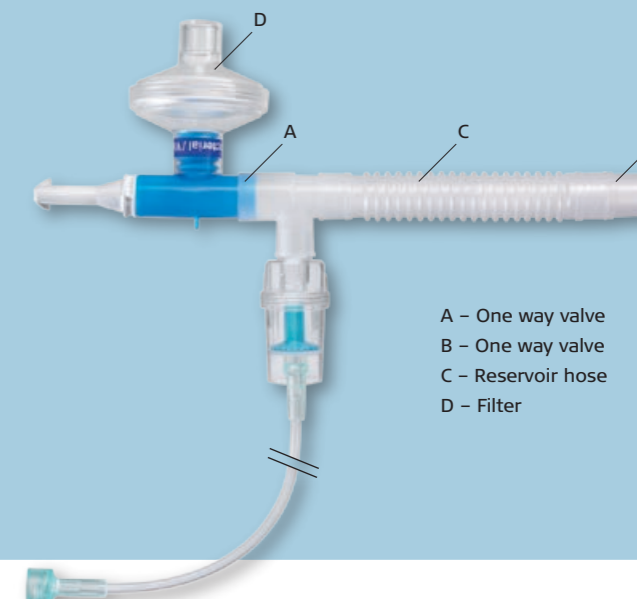
At a gas flow of 6 LPM **Opti-Mist Plus** works as a nebuliser for tracheobronchial deposition with 71% of the particles smaller than 4µm and an average MMAD\* of 3.3 µm.

With higher flow rates the average MMAD\* decreases, down to 1.3 µm (at 10 LPM), providing 79% of all particles smaller than 2 µm - ideal for alveolar deposition.

### Opti-Mist Plus Closed System Nebuliser

Especially designed for use when contamination of the ambient environment with the aerosolised drugs needs to be reduced (e.g. Pentamidine nebulisation).

- Isolation of the inspiratory and expiratory flow by one-way valves and filter
- Filter with hydrophobic membrane (bacterial/ viral filtration efficiency: 99.9999%/99.999%)
- **Opti-Mist Plus** nebuliser chamber for production of fine dense particles for alveolar deposition



\* Average MMAD of all operating angles (0-90°)  
Please ask your Unomedical representative for detailed specifications.

# Aerosol Therapy

## Unomedical Nebulisation System



Unomedical offers a complete medication nebulisation system with three different nebulisers, either for tracheobronchial deposition, or with the **Opti-Mist Plus** Nebuliser a scalable solution for both – tracheobronchial- and alveolar deposition of particles.

A complete system with pre-assembled kits and single components for mask-, hand-held and in-line nebulisation is available in order to suit any clinical application.

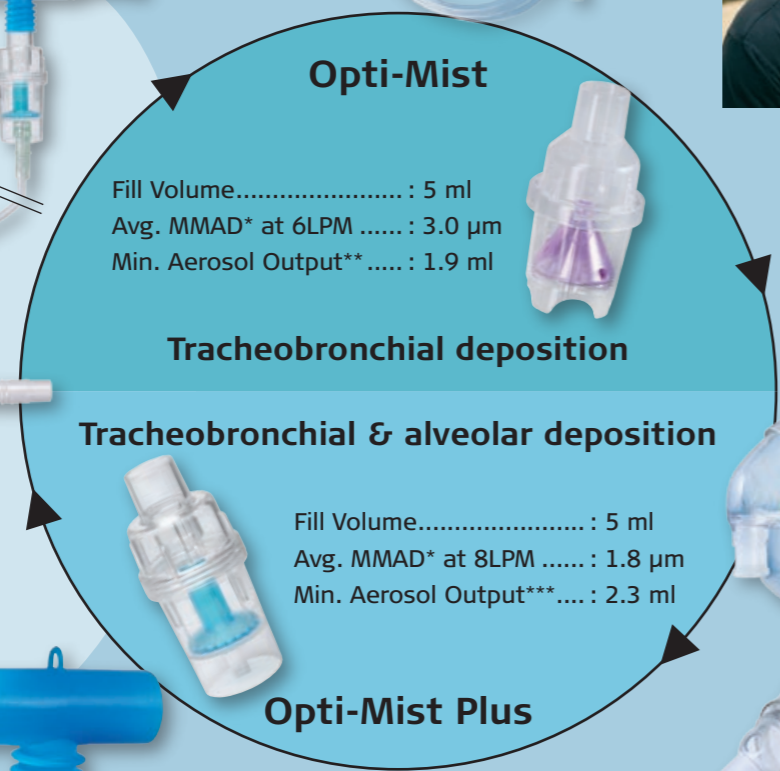
### Hand-held Nebulisation



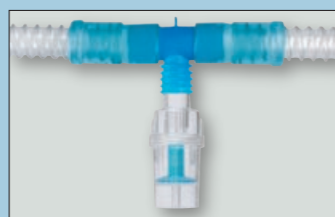
### Mask-Nebulisation



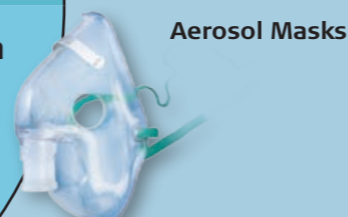
Closed System



T-Adapters



In-line Nebulisation



Aerosol Masks



Trach Masks



Face Tents

\* Average MMAD of all operating angles (0-90°), \*\* at vertical orientation, \*\*\* at 8LPM/ vertical orientation. Please ask your Unomedical representative for detailed specifications.

# Aerosol Therapy

## Lung Expansion Therapy

### Medium Volume Nebulisers/I.P.P.B. Circuits/ Incentive Spirometers



### Up-Mist

The Unomedical Up-Mist is a nebuliser for tracheobronchial deposition with a volume of 25 ml, designed especially for medium term nebulisation.

- Low residual volume minimises waste of medication
- Optimal MMAD for tracheobronchial deposition of particles
- Quick and easy to set up
- Nebulises in upright position at angles up to 45 degrees



Fill Volume..... : 25 ml  
 Avg. MMAD\* at 6LPM ..... : 3.6 µm  
 Min. Aerosol Output\*\* ..... : 2.1 ml

### I.P.P.B. Circuits

Intermittent Positive Pressure Breathing is an established therapy to deliver positive pressure breaths to a patient in such a way as to hyperinflate the lungs as well as hyperexpand the chest wall. The therapy has proven to be an effective tool in fighting chronic hypoventilation and the resultant decreasing elastance of the chest wall.

### Unomedical Universal I.P.P.B. Circuit

- Universal application (one or two drive lines) by included adapter kit
- Pre-assembled ready-to-go circuit
- Integrated Up-Mist Nebuliser for simultaneous delivery of aerosolised medication



### Incentive Spirometers\*\*\*

Respiratory insufficiency is a complication, which can be observed very often after major surgery. But also hospitalised patients with severe diseases, not directly related to the lung, can be affected. Such respiratory complications can be allayed by increasing the functional residual capacity of the lung.

Incentive Spirometry represents an effective way to help the awake patient to gently restore his respiratory parameters by performing simple breathing exercises.



### Unomedical Volumetric and Flow Controlled Exercisers

- Easy storage by compact and ergonomic design
- Increased hygiene, by an integrated container for placement and protection of the mouthpiece after washing
- Easy to use by instructional visual hints indicating optimal inhalation
- Increased patient compliance by colourful, child-oriented labelling of the paediatric exercisers



\* Average MMAD of all operating angles (0-90°), \*\* at vertical orientation, \*\*\* Available summer 2006. Please ask your Unomedical representative for detailed specifications.

