Essential Humidity for a successful noninvasive ventilation strategy

Noninvasive Ventilation

AMERICAN ASSOCIATION FOR RESPIRATORY CARE RECOMMENDATIONS

- Humidification is recommended on every patient receiving invasive mechanical ventilation
- Active humidification is suggested for noninvasive ventilation as it may improve adherence and comfort
- Passive humidification (HME) is not recommended for noninvasive ventilation
HUMIDITY TO OPTIMIZE PATIENT TOLERANCE

The use of humidification with noninvasive ventilation (NIV) is vital for maintaining the natural balance of heat and moisture in the airways.2 This is important as the high pressure and flow rates of gas used with NIV can cause the patient’s already compromised respiratory system to deteriorate further.3 By heating and humidifying the gas flow, airway drying is minimized and secretion clearance is improved. This reduces airway resistance and leads to improved comfort and increased tolerance to NIV, making NIV more effective.3,4

ESSENTIAL HUMIDITY

(31 °C, 32 mg/L)

MINIMIZES AIRWAY DRYING3

IMPROVES SECRETION CLEARANCE6

Reduces airway resistance4

Increases comfort and tolerance4,7

NIV more effective8

WHY IS HUMIDIFICATION ESSENTIAL?

A normal person breathing in ambient air (22 °C, 28% Relative Humidity [RH]) warms and humidifies the air to an average of 31 °C, 96% RH with nasal breathing and 27 °C, 75% RH with mouth breathing at the pharynx.10 It is often considered that patients on NIV do not require humidification as the upper airway is not bypassed. However, breathing cold dry medical gas, such as piped oxygen depletes the heat and moisture of the airway mucosa.12 Moreover, patients on NIV breathe at much higher pressures and flows than normal. They often have compromised airways, due to the nature of their respiratory failure, and are less efficient at warming and humidifying gas.13

AVOID COMPLICATIONS OF NIV THERAPY

There are several factors associated with NIV that can compromise the patient’s ability to heat and humidify inspired gas. These include:

• Secretion removal problems6,9
• Oral breathing to reduce work of breathing10,11
• Increased respiratory rate as patient is short of breath11
• Fluid depletion due to increased respiratory effort and air leaks3,11

THE RISKS OF NIV WITHOUT HUMIDITY

Complications occur in the majority of patients receiving NIV and many of these are related to a lack of humidity, leading to patient discomfort and intolerance to the therapy.14
Breathing Circuits for Noninvasive Ventilation

The RT-series breathing circuits are designed specifically for use with Fisher & Paykel Healthcare humidification systems. **Spiral heater wire technology** helps to reduce condensate in varying environments by consistent distribution of heat throughout the circuit.

**F&P RT219/319**

- Single-limb heated circuit
- Low resistance to flow
- Ideal circuit pressure
- Designed to work with noninvasive specific ventilators e.g. Respironics V60/Vision

**F&P Evaqua 2™**

- Dual limb heated circuit RT380/280

**MicroCell Technology™**

MicroCells form an insulation shield between the cool air outside and the water vapor inside.

**Evaqua Technology**

Evaqua material allows humidity to diffuse out of the breathing circuit freely. As Evaqua is only permeable to water vapor, it maintains a gas seal and reduces opportunity for pathogen transfer.

# Not all products are available in all countries.
Masks for Noninvasive Ventilation

Mask selection is critical in determining NIV success. Up to 50% of NIV failure is related to problems with the mask. The innovative shape of the FreeMotion™ mask can overcome some of the common complications of NIV therapy.

CUSHIONED FOREHEAD REST
- Easy to secure headgear
- Aids comfortable fit

BUILT-IN PORTS
- Pressure monitoring
- Supplemental oxygen
- Flexibility of therapy and flow source

DUAL-SWIVEL ELBOW
- Aids patient movement
- Allows flexibility of positioning

FLEXIFIT™ SEAL
- Reduces pressure at nasal bridge
- Comfortable
- Soft and flexible
- Maintains seal integrity

CROWN STRAP HEADGEAR
- Ease of fitting
- Prevent mask sliding down

DEAD SPACE
- Low dead space design
- Improved washout reduces CO₂ rebreathing

UNDER-CHIN SEAL
- Designed to increase patient comfort

FULL FACE MASKS

FreeMotion™ RT040
- Vented
- Single-limb circuits with no exhalation port

FreeMotion™ RT043
- Non-vented
- Single-limb circuits with an exhalation port or flow-driver CPAP

NASAL MASK

FreeMotion™ RT041
- Non-vented
- Dual-limb closed loop system

FreeMotion™ RT042
- Vented
- Single-limb circuits with no exhalation port

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Our family of products for Noninvasive Ventilation

The F&P 850™ System has been designed to comfortably deliver Essential Humidity to patients receiving noninvasive ventilation. The system, comprising of the MR850 humidifier, MR290 auto-filled humidification chamber and RT-series breathing circuit, delivers Essential Humidity to one of four versions of the FreeMotion™ mask.

Using Optiflow™ as rest therapy from NIV

- Low flow oxygen is routinely used for NIV rest therapy
- Optiflow™ should be considered during NIV breaks
- During NIV rest therapy, Optiflow™ provides:
  - Humidification to improve mucus clearance
  - Low pressure respiratory support
- As the duration of rest therapy increases, Optiflow™ assists in weaning from NIV.
In 1969, in response to high incidences of respiratory infections caused by dry ventilation, one of the founding fathers of Intensive Care in New Zealand and Australia, Dr. Matt Spence, partnered with Fisher & Paykel to develop one of the first heated passover humidifiers.

Today, as a pioneer in respiratory humidification with over 40 years of innovations, Fisher & Paykel Healthcare is a leader that you can trust.

Fisher & Paykel Healthcare is committed to advancing our capabilities as a world leader in humidified therapy systems with a comprehensive family of solutions that restore natural balance.

We call this our F&P Adult Respiratory Care Continuum. At every point of the continuum are high-performance systems that aim to deliver optimal patient and clinician outcomes – extending the boundaries of adult respiratory care.

REFERENCES