



HỘI HÔ HẤP  
THÀNH PHỐ HỒ CHÍ MINH

**HỘI NGHỊ THƯỜNG NIÊN HỘI HÔ HẤP - HRS 2026**  
THE ANNUAL CONFERENCE OF THE HO CHI MINH RESPIRATORY SOCIETY

# ẨM ẨM KHÍ THỞ TRONG HỖ TRỢ HÔ HẤP - TẠI SAO VÀ NHƯ THẾ NÀO

**ThS. BS Nguyễn Hồng Trường**  
**Bộ môn Cấp cứu Hồi sức Chống độc – Đại học Y khoa Phạm Ngọc Thạch**

**VŨNG TÀU, TP.HCM - NGÀY 21 THÁNG 3 NĂM 2026**

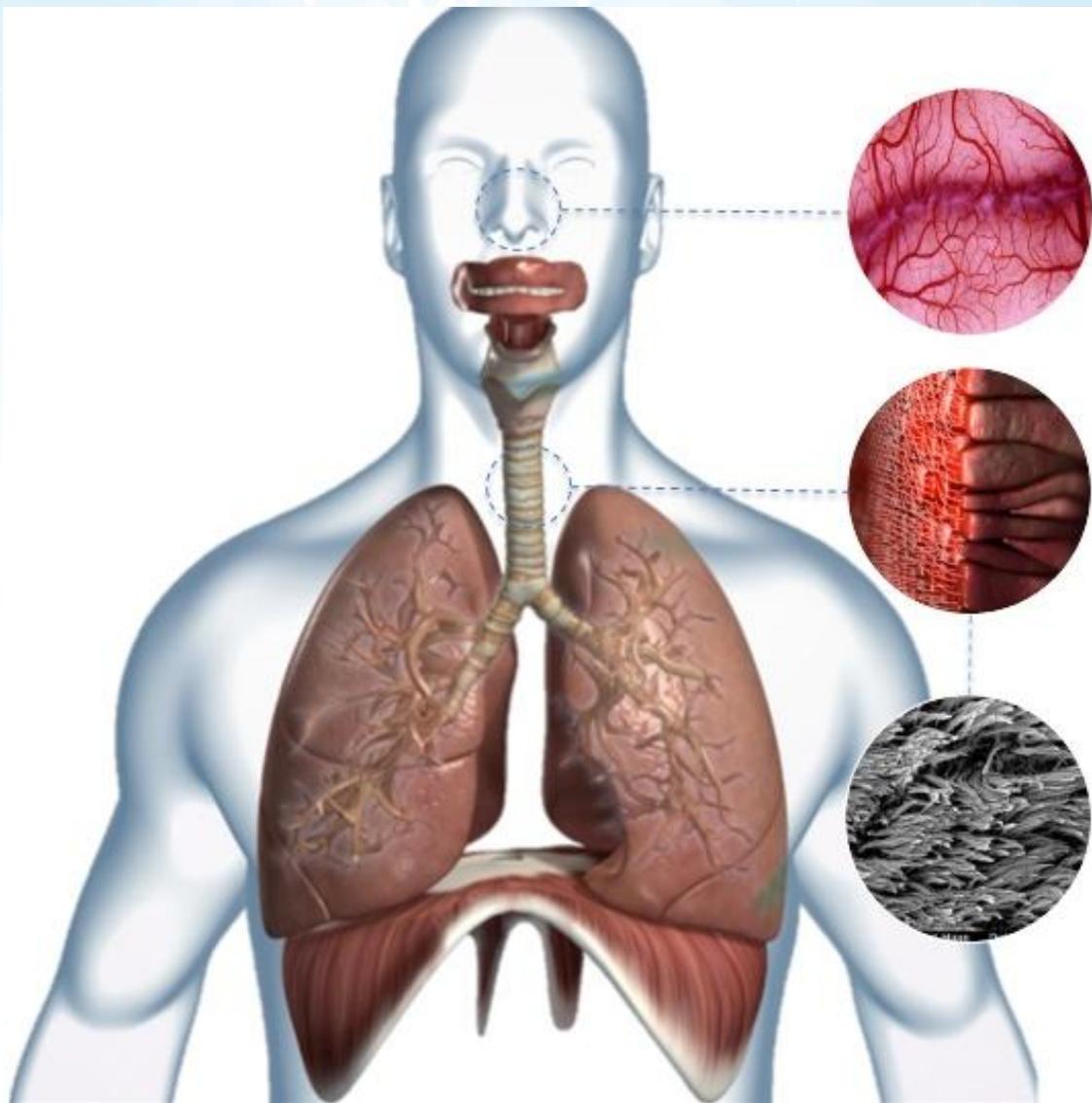
# **NỘI DUNG CHÍNH**

**1** Cơ chế phòng vệ hô hấp

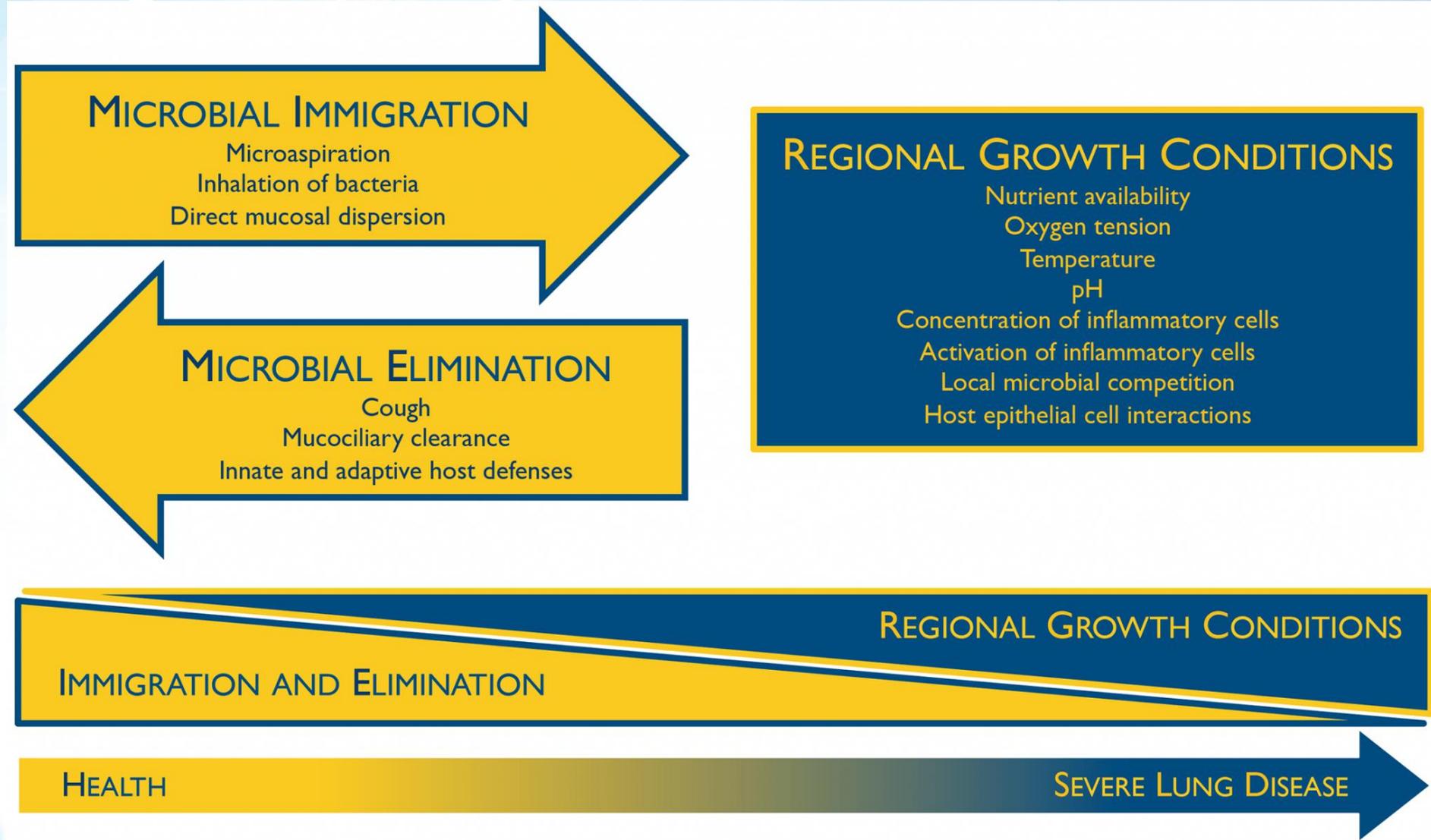
**2** Tổn thương cơ chế phòng vệ

**3** Làm ấm ẩm khí thở

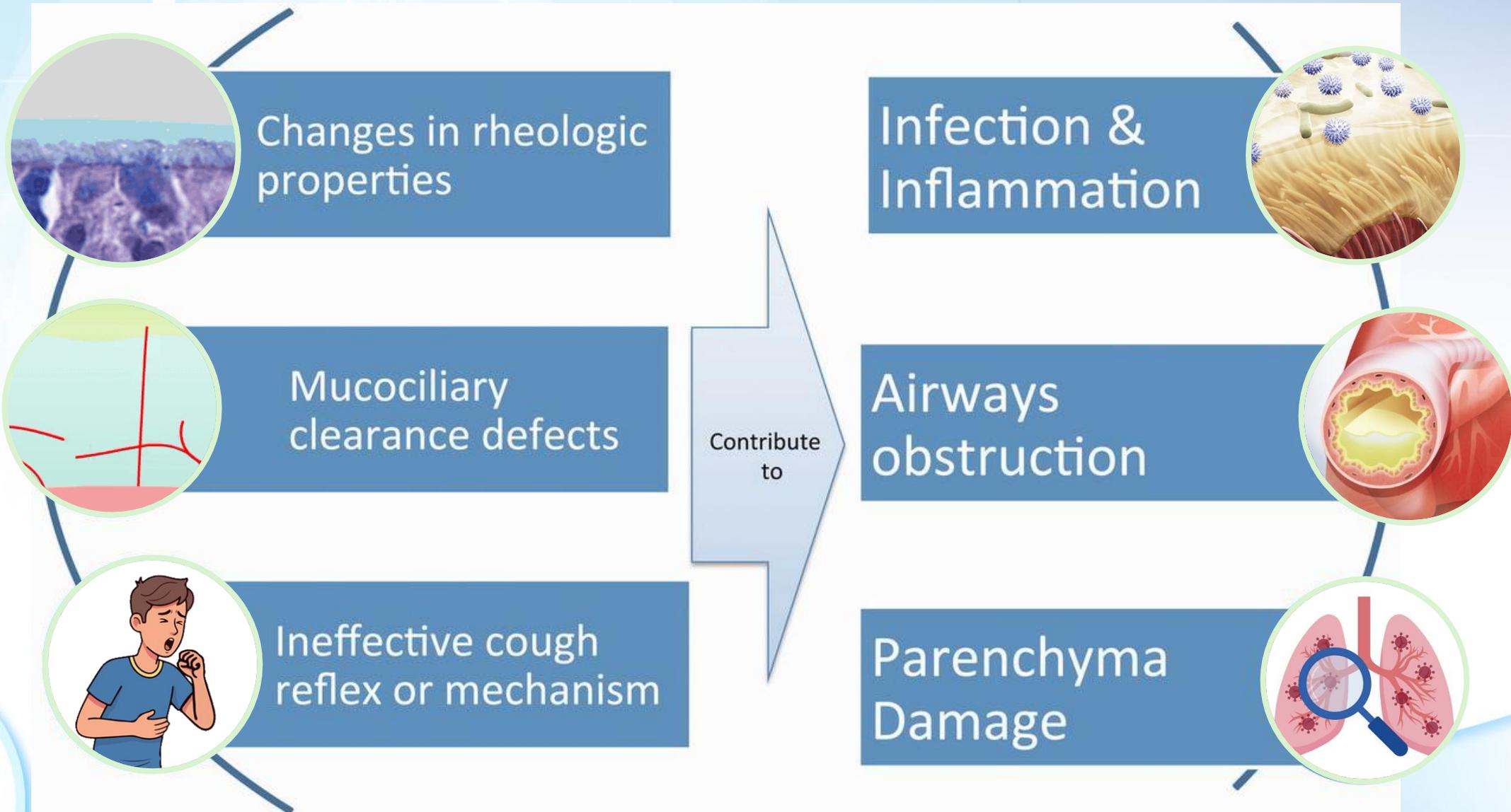
# CƠ CHẾ PHÒNG VỆ HÔ HẤP



# CƠ CHẾ PHÒNG VỆ HÔ HẤP

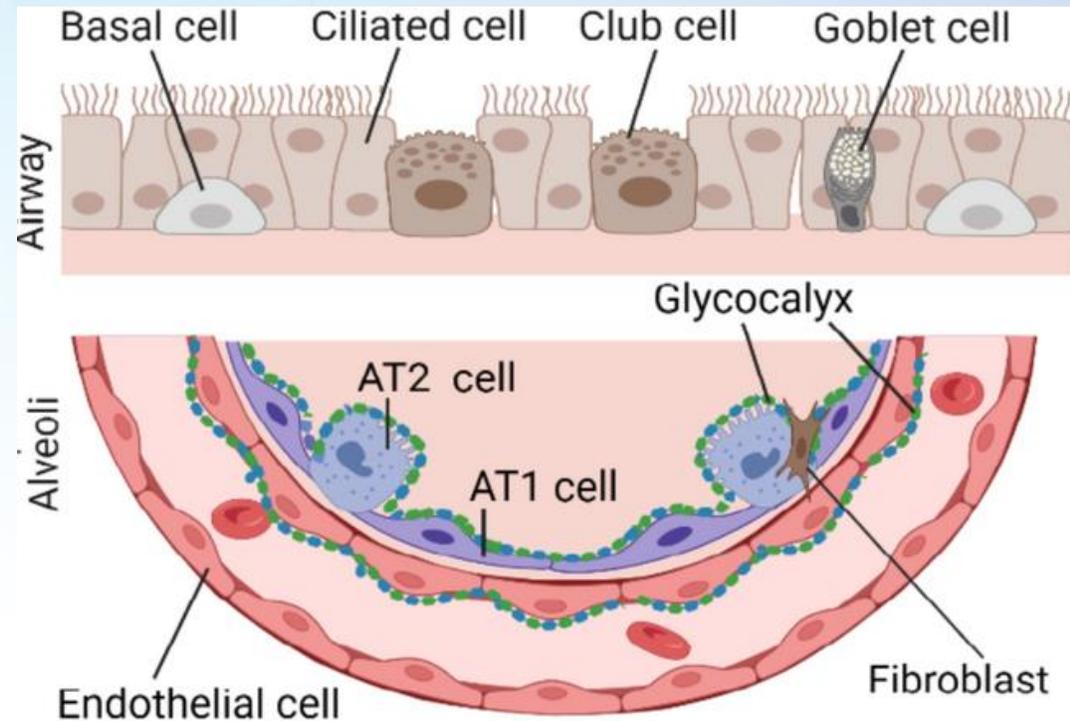


# TỒN THƯƠNG CƠ CHẾ PHÒNG VỆ

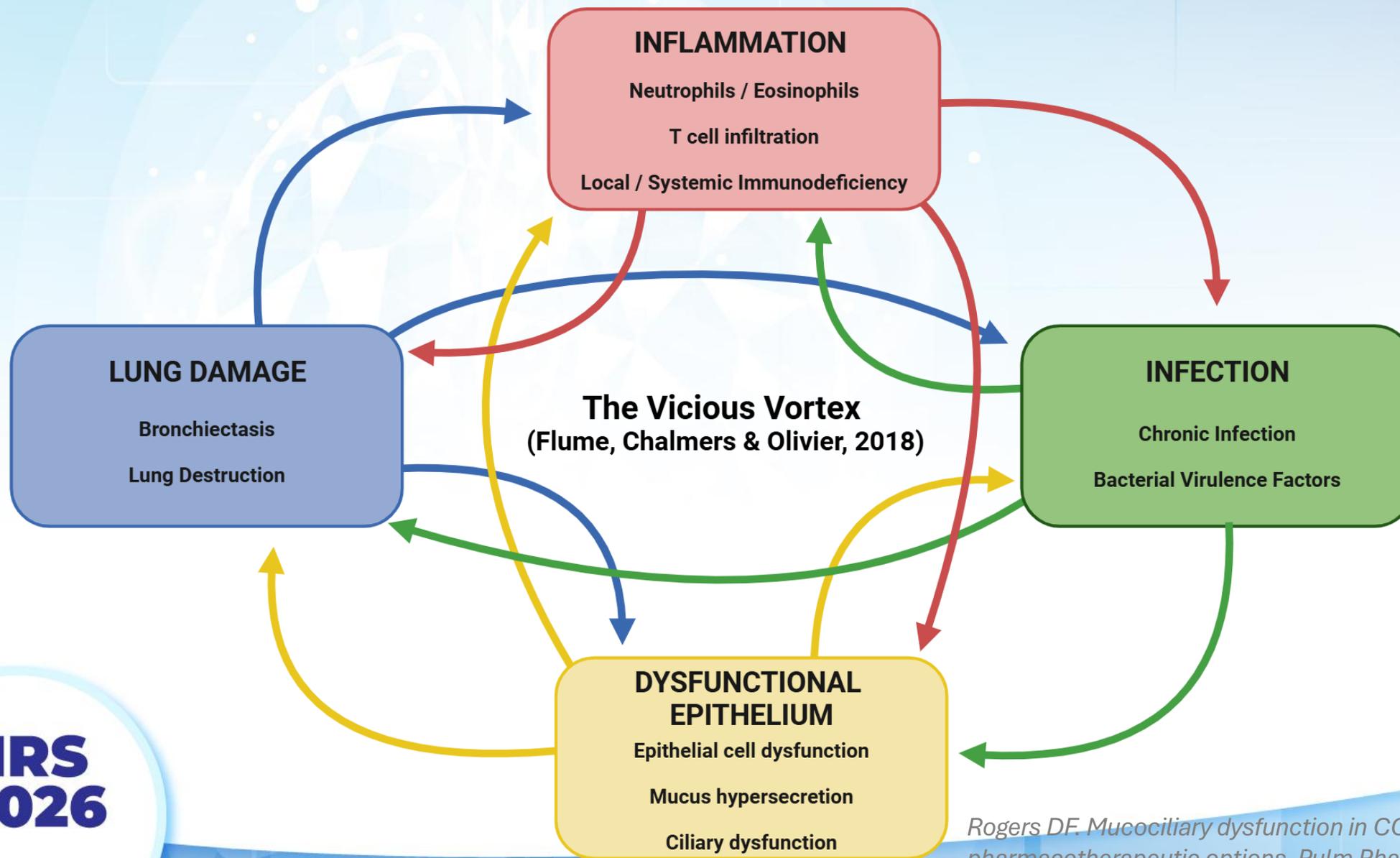


# TỒN THƯƠNG CƠ CHẾ PHÒNG VỆ

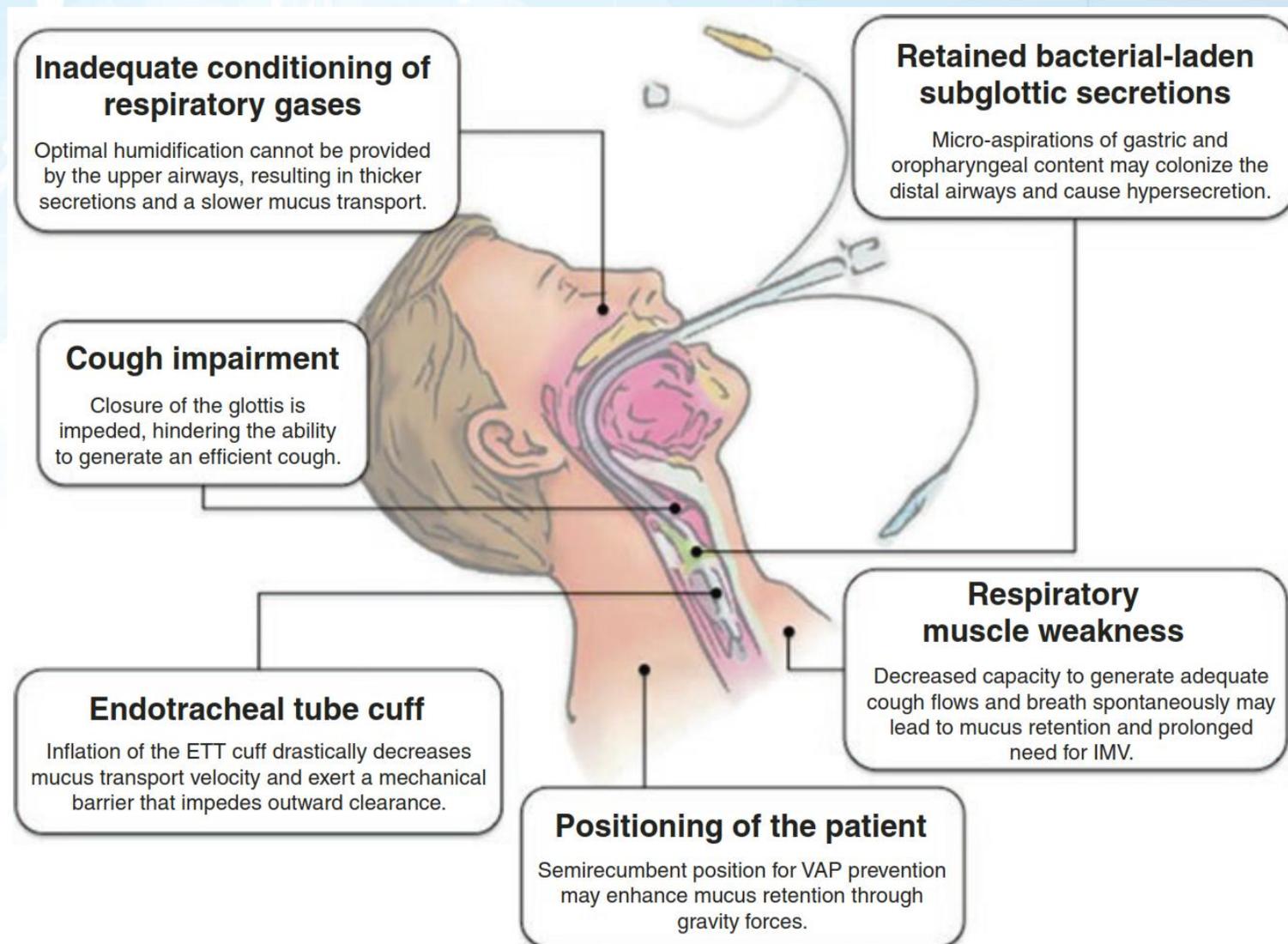
Injured cell types	<p>COPD Viral infection</p>	<p>ILD Bacterial infection</p>	<p>Asthma Bronchiectasis</p>



# TỒN THƯƠNG CƠ CHẾ PHÒNG VỆ



# TỒN THƯƠNG CƠ CHẾ PHÒNG VỆ



# TỒN THƯƠNG CƠ CHẾ PHÒNG VỆ



						
	Nasal cannula	Simple face mask	Reservoir mask	Nasal high flow	CPAP	Ventilator
OXYGEN FLOW	1-6 Litres/min	5-10 Litres/min	15 Litres/min	UP TO 70 Litres/min	15 Litres/min	AS PER LIFE SUPPORT NEEDS
FIO2* FRACTION OF INSPIRED OXYGEN	24-50%	40-60%	60-90%	UP TO 100%	UP TO 100%	UP TO 100%
		TEMP	ABSOLUTE HUMIDITY			
MEDICAL GAS		15 °C	0.3 mg/L			

# BÃO HÒA ẨM ẨM



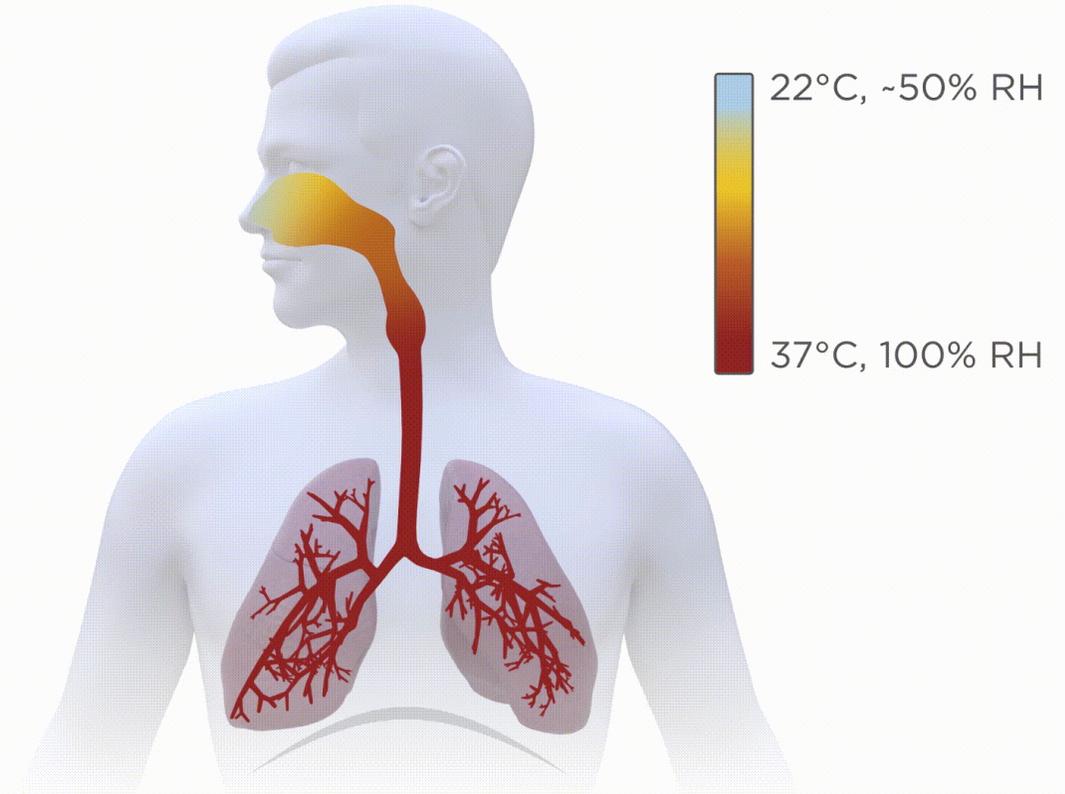
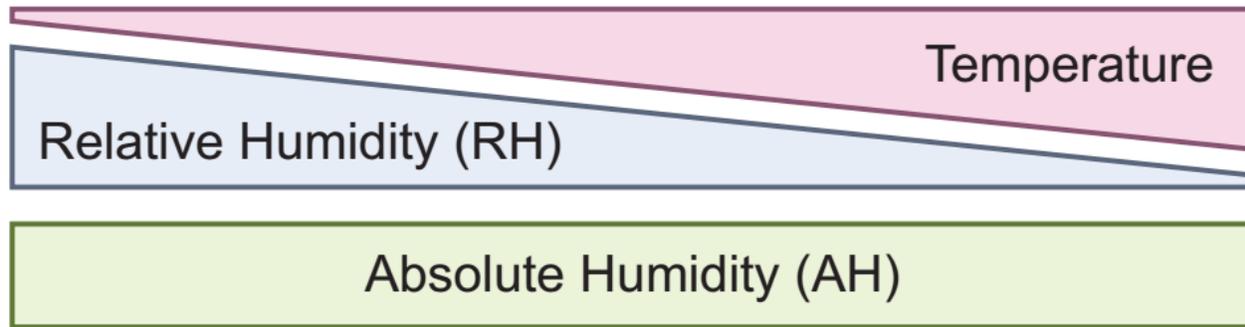
Temperature: 30°C  
RH: 100%  
AH 30 mg/L



Temperature: 35°C  
RH: 80%  
AH 30 mg/L



Temperature: 40°C  
RH: 60%  
AH 30 mg/L

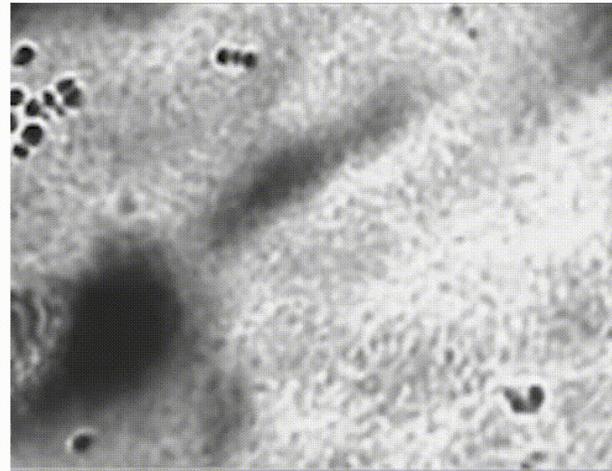


# CHỨC NĂNG LÔNG CHUYỀN

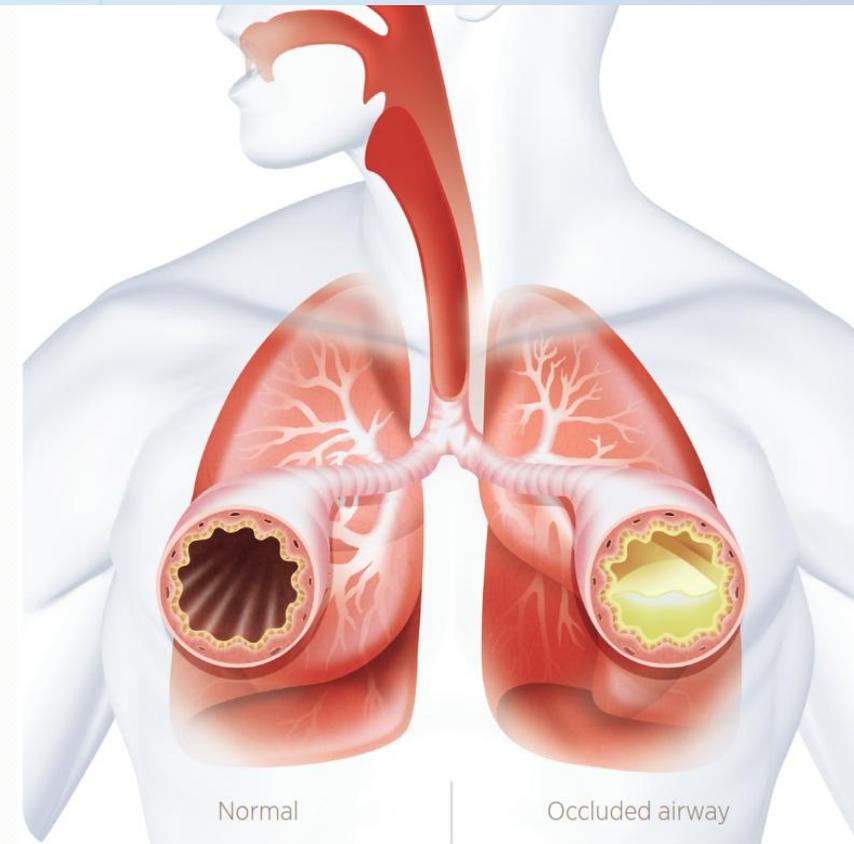
100% Humidity



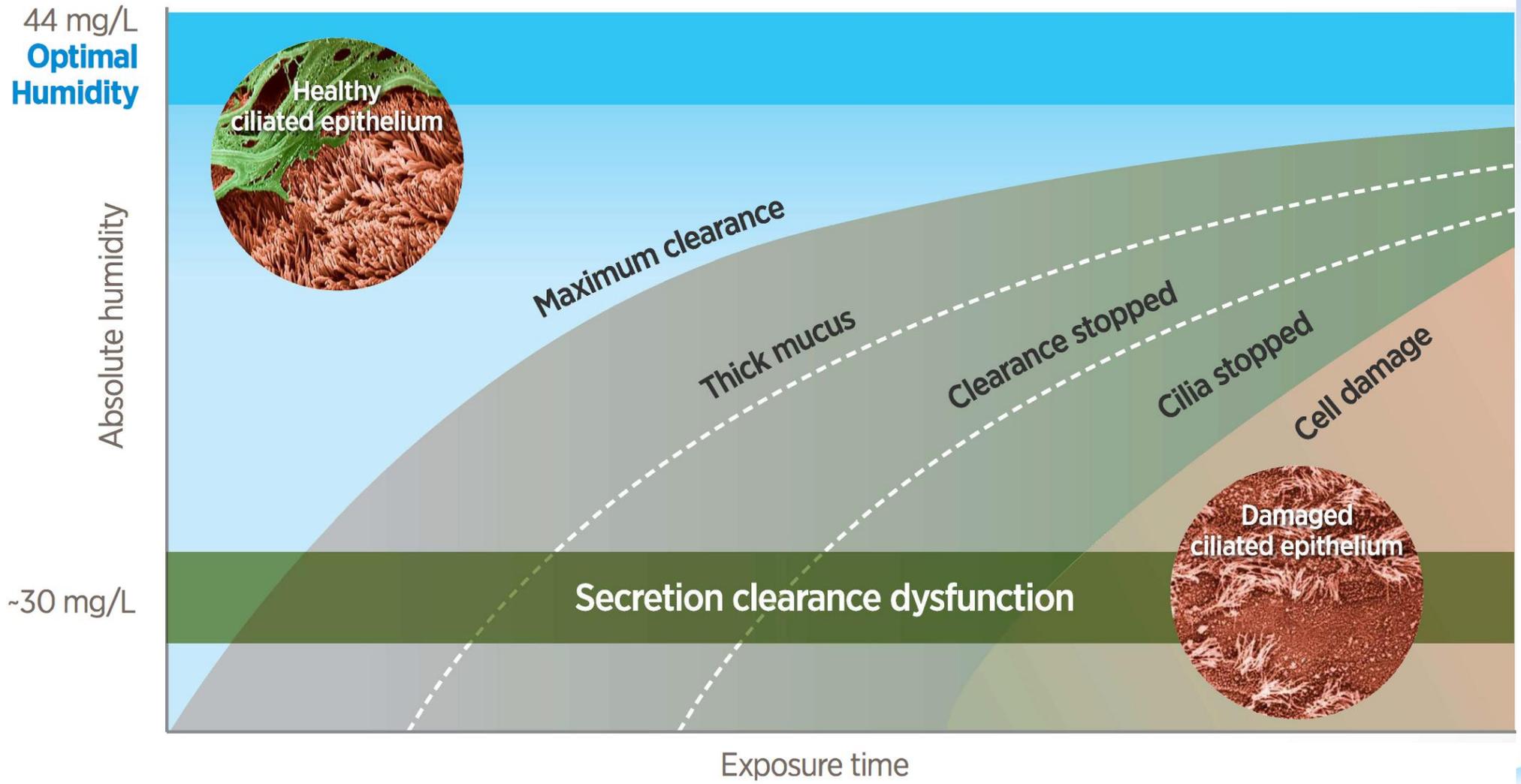
90% Humidity  
for 15 minutes



400  $\mu\text{m}$



# CHỨC NĂNG LÔNG CHUYỀN



## DẤU HIỆU LÂM SÀNG

**Complications related to poor levels of humidity are very common and include:<sup>1</sup>**

Inability to cough up secretions

Nasal congestion

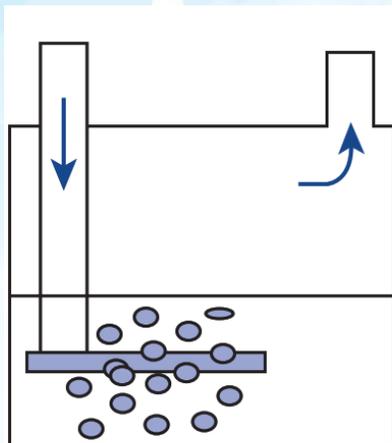
Dry mouth and cracked lips

Nasal or oral dryness

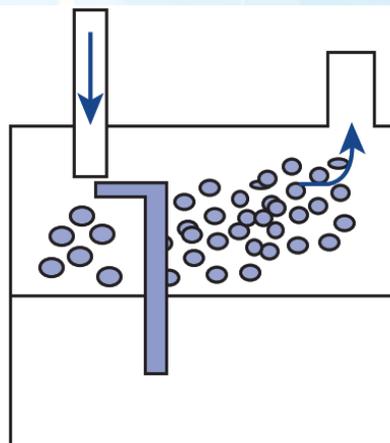
Difficulty swallowing and talking

Swelling of tongue

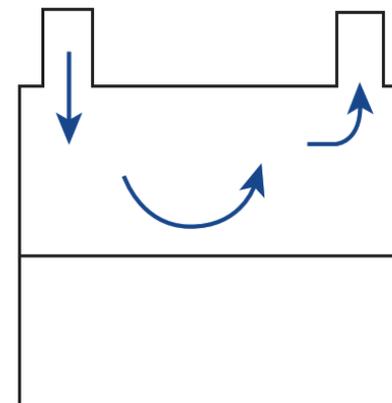
# NGUYÊN LÝ



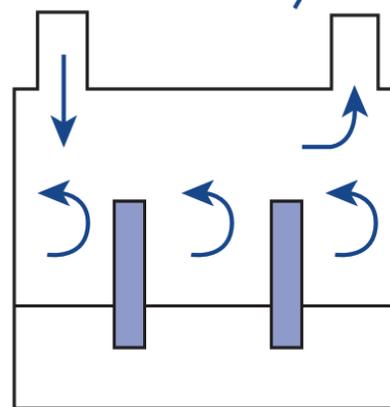
Bubble



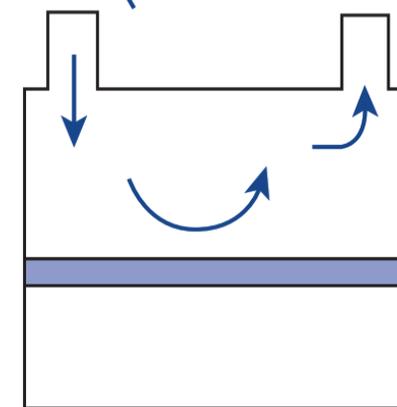
Aerosol



Passover

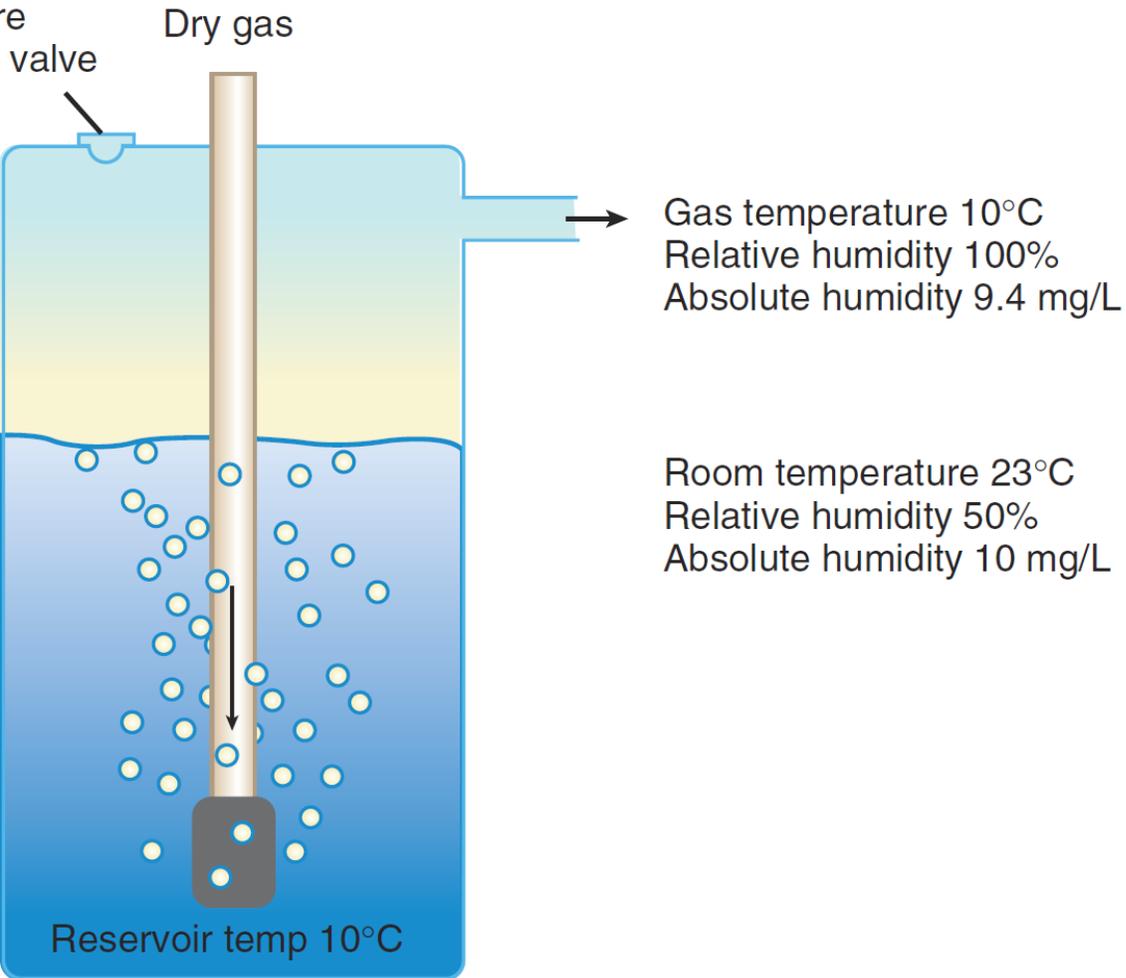


Wick



Membrane

# BÌNH SỤC



Medical gas administration

Upper airway bypassed?

YES

NO

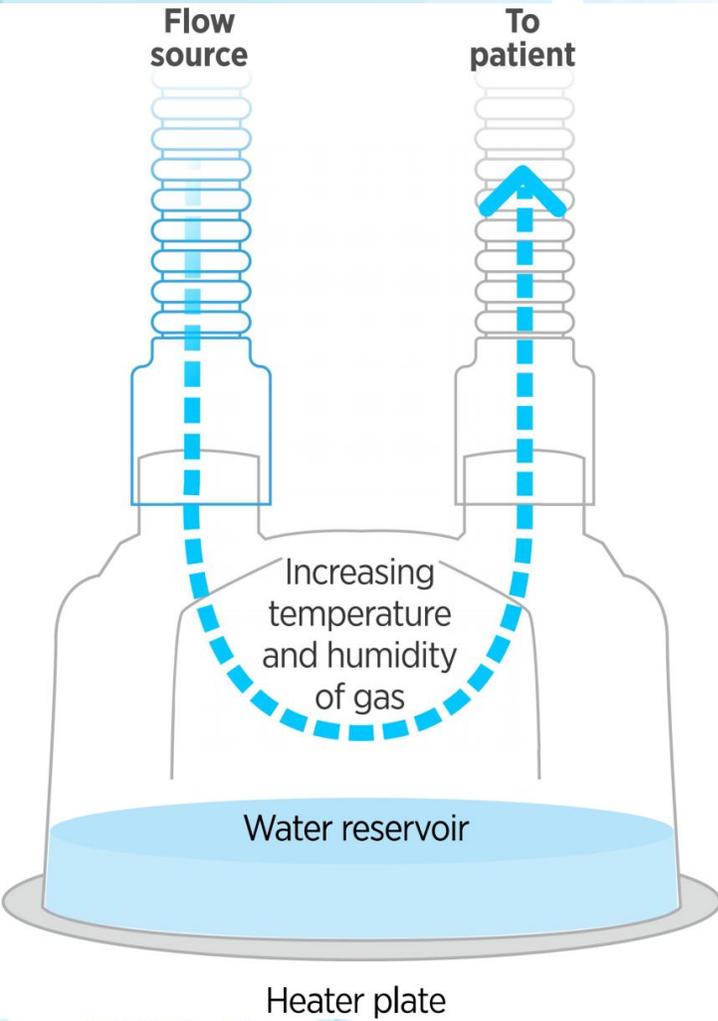
Airway leak?

NO

No humidification required at flows <4 L/min, with jet mixing at <50% or with short-term mask therapy

With flows >4 L/min, use humidifier (heated if >7 L/min)

# BÌNH ĐUN BỐC HƠI

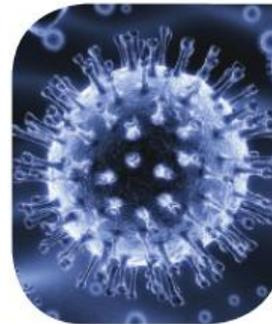


WATER VAPOR



0.0001  
Microns

VIRUS



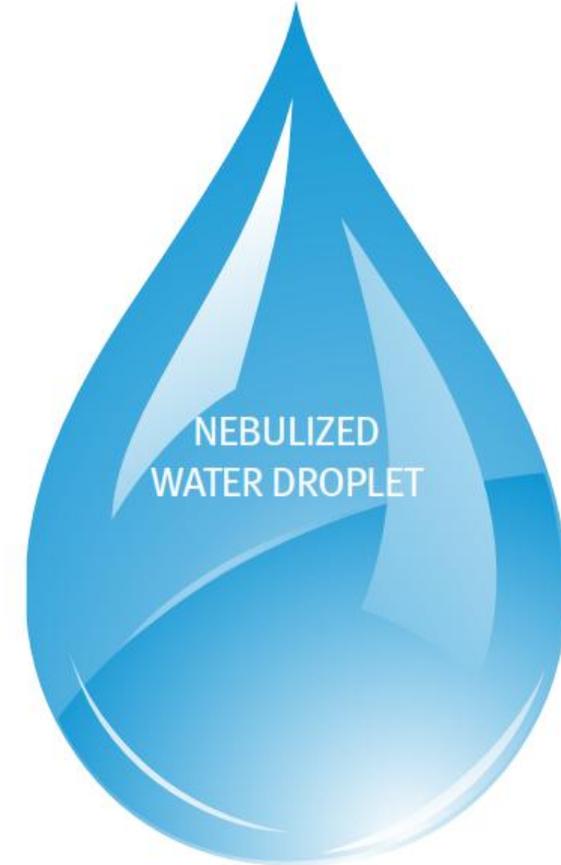
0.017 – 0.3  
Microns

BACTERIA



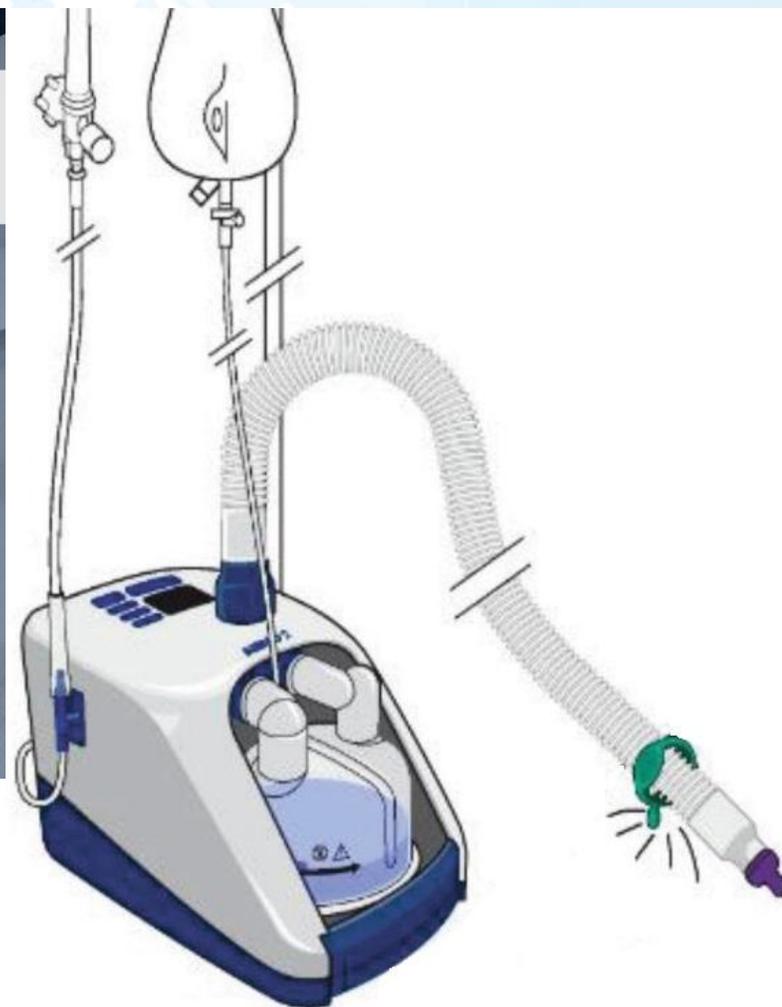
0.2 – 10  
Microns

NEBULIZED  
WATER DROPLET



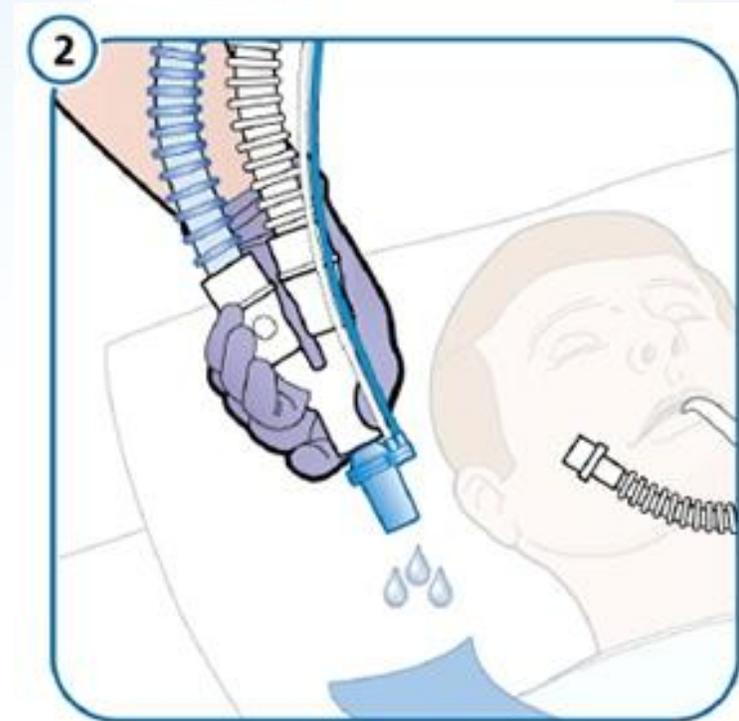
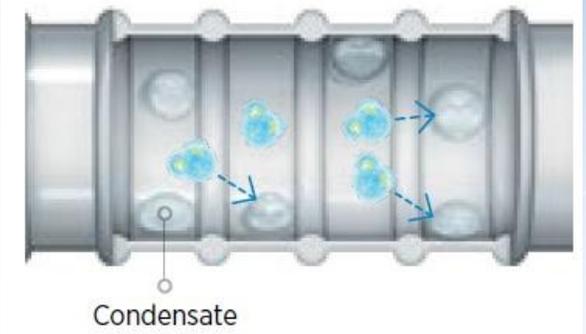
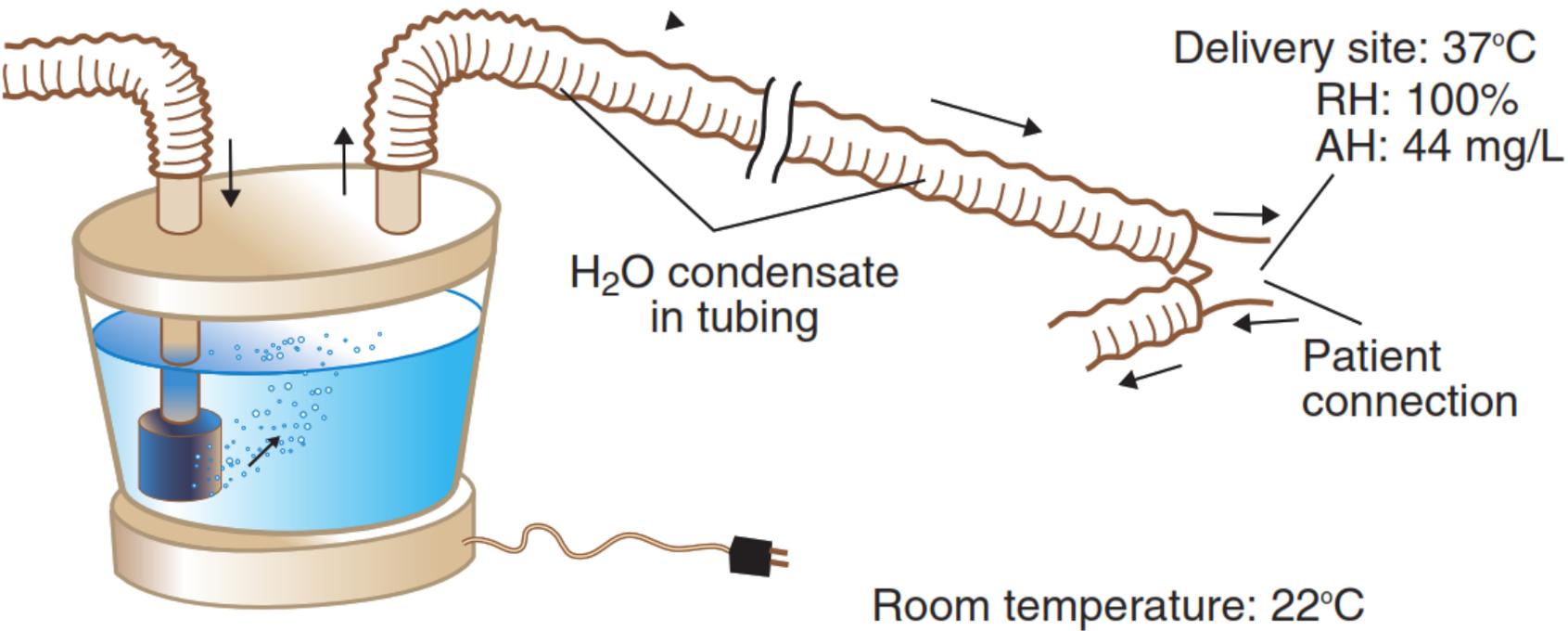
1 – 40  
Microns

# BÌNH ĐUN BỐC HƠI

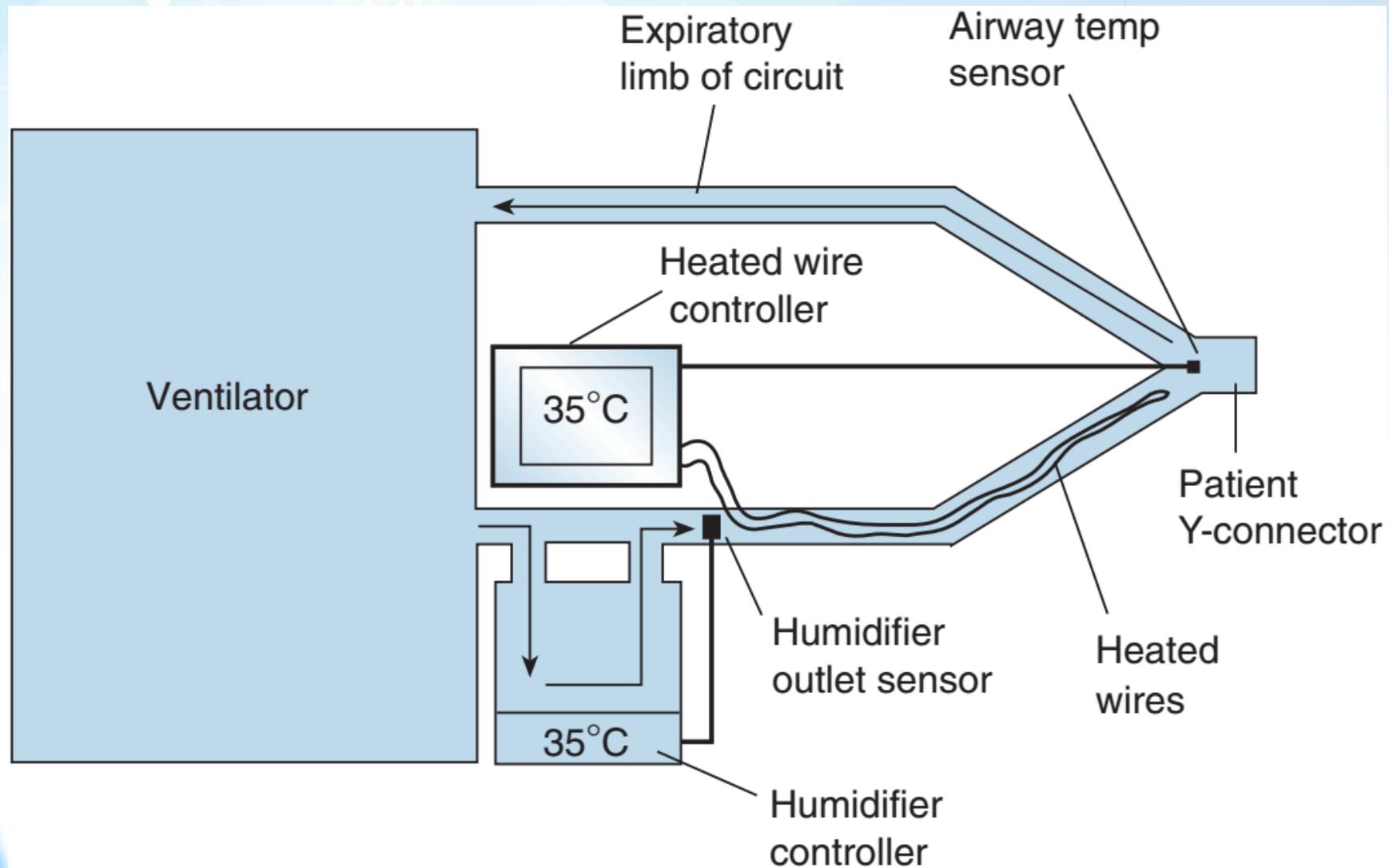


# BÌNH ĐUN BỐC HƠI

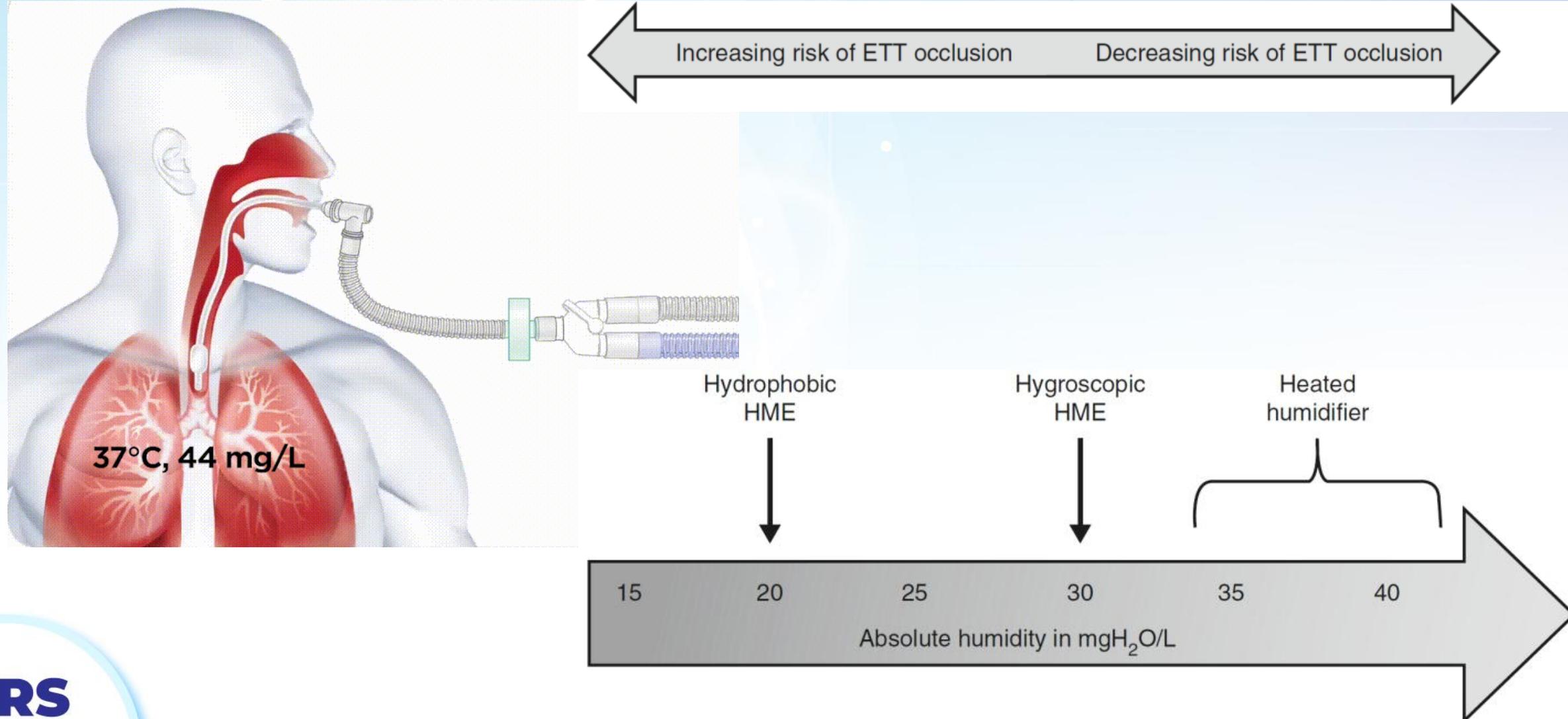
Outlet: 50°C  
RH: 100%  
AH: 84 mg/L



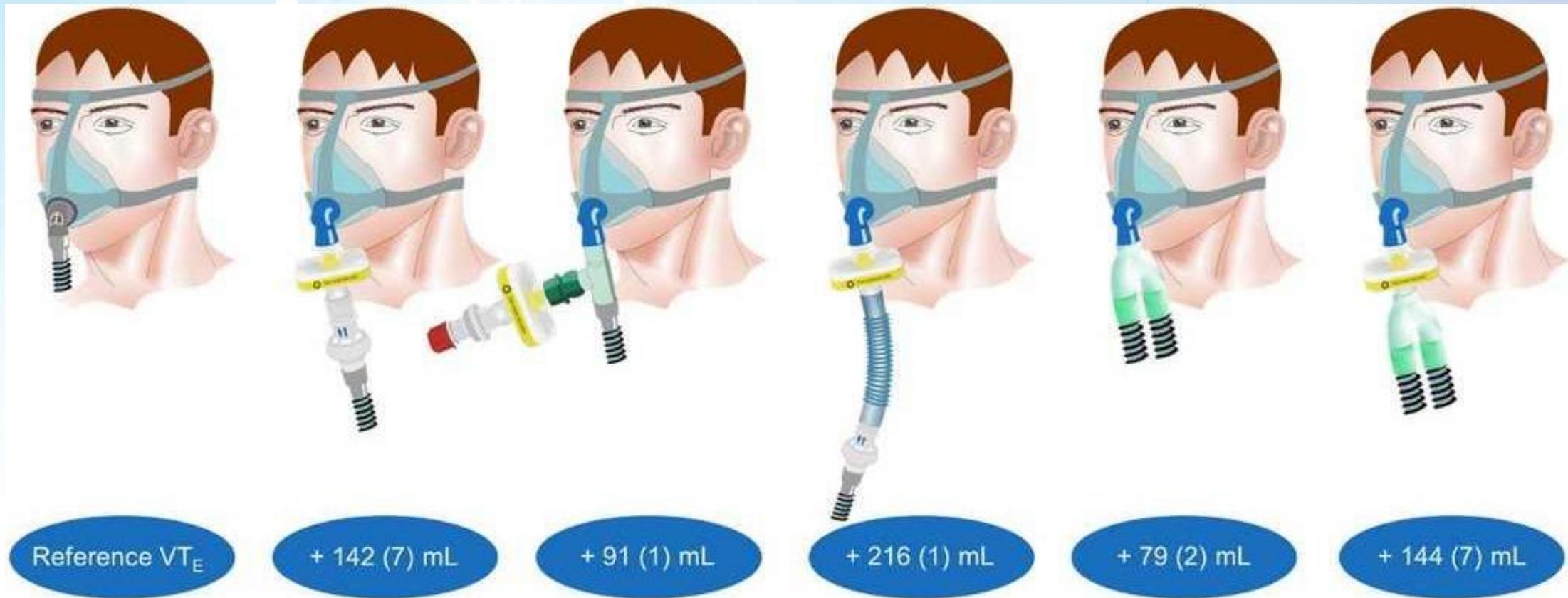
# BÌNH ĐUN BỐC HƠI GIA NHIỆT



# TRAO ĐỔI ẨM NHIỆT (HME)



# TRAO ĐỔI ẨM NHIỆT (HME)



Arch Bronconeumol. 2021;57 Supl 2:28-33

## TRAO ĐỔI ẨM NHIỆT (HME)

Humidification is recommended for **all** patients undergoing invasive ventilation.

When providing HME to patients undergoing invasive ventilation, it is suggested that a **minimum** humidity level of 30 mg H<sub>2</sub>O/L is used.

HH devices are recommended for **noninvasive respiratory support**, as they may improve patient adherence and comfort.

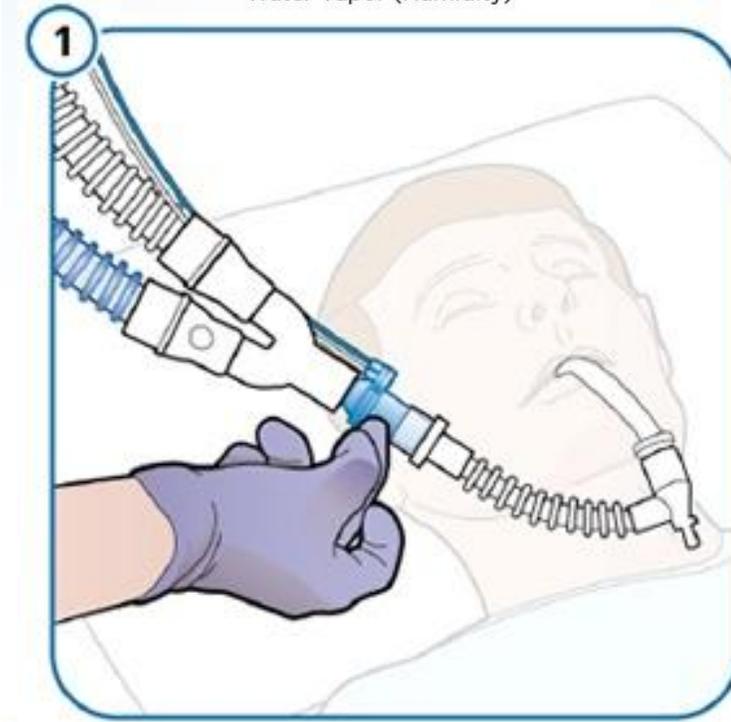
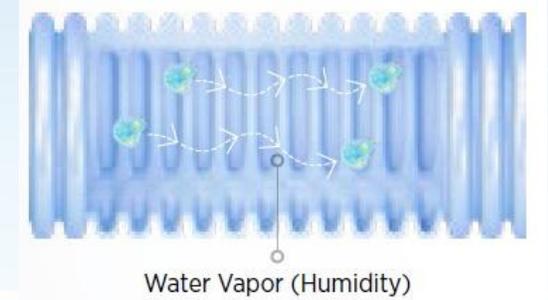
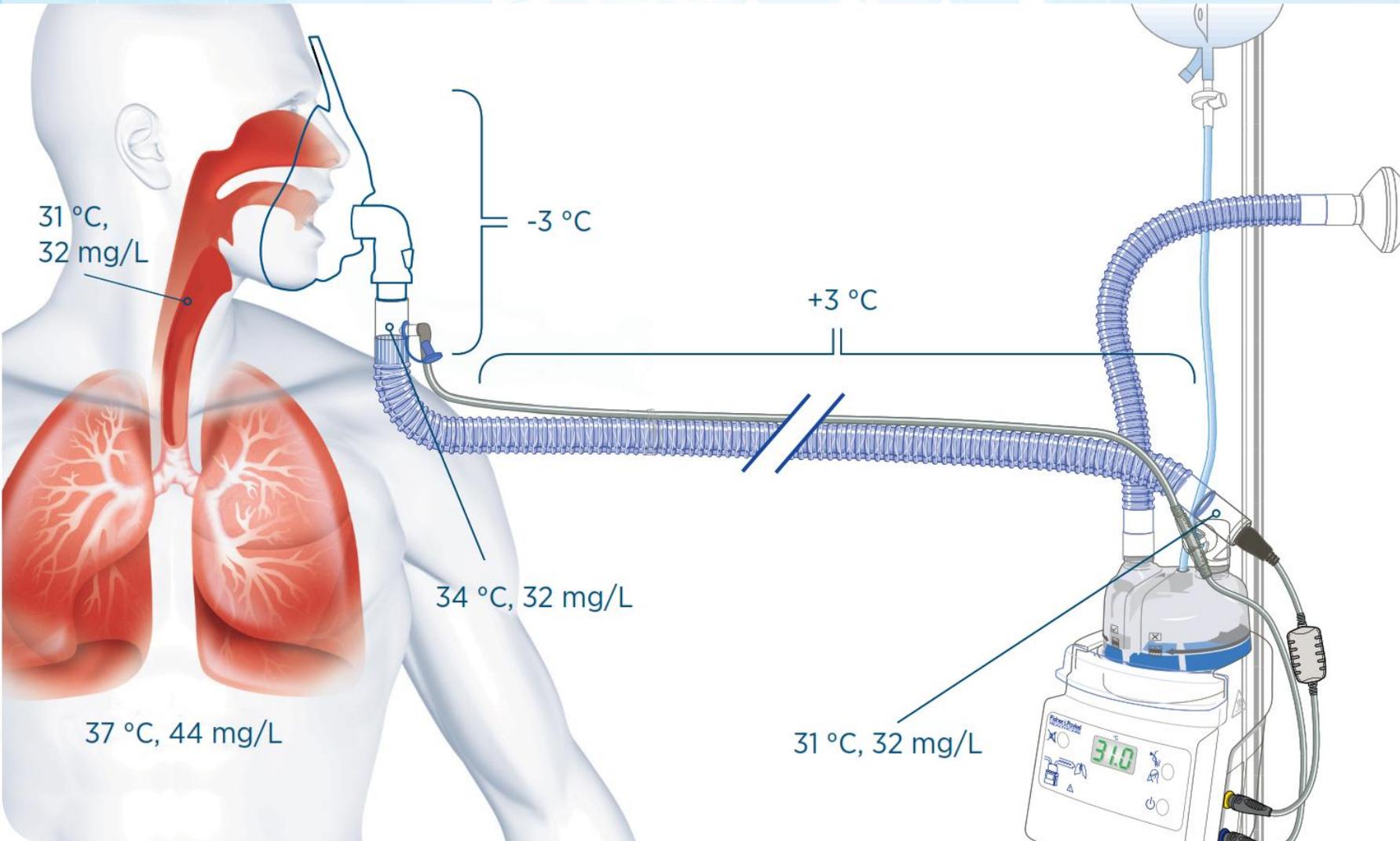
HMEs are **not recommended** for noninvasive ventilation.

It is suggested that the HH device achieves a humidity level between 33–44 mg H<sub>2</sub>O/L and 34–41 °C at the circuit Y-piece, and relative humidity of 100%.

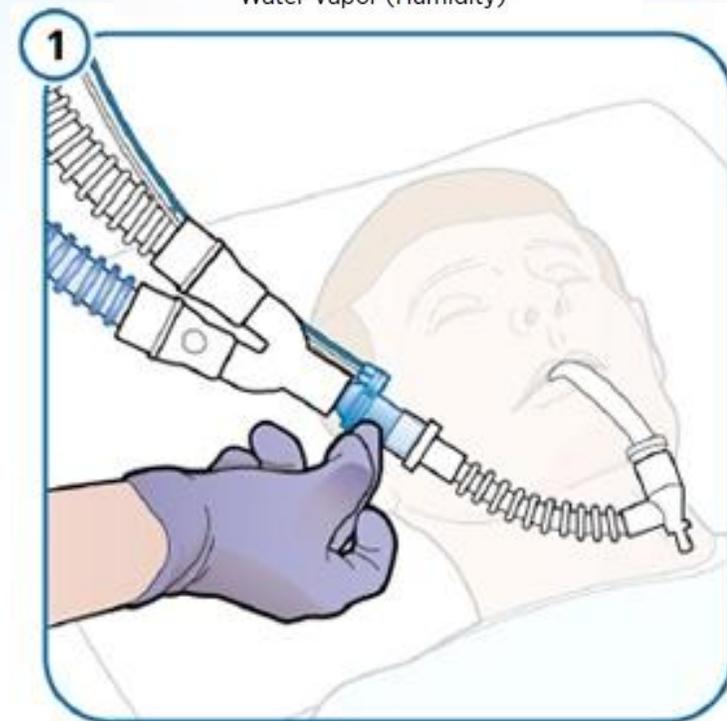
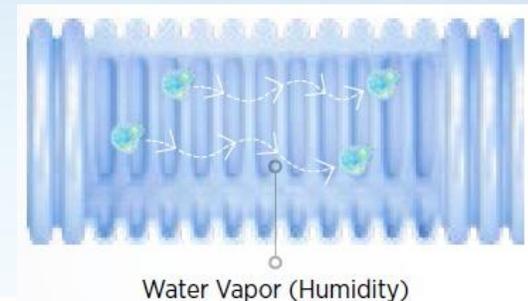
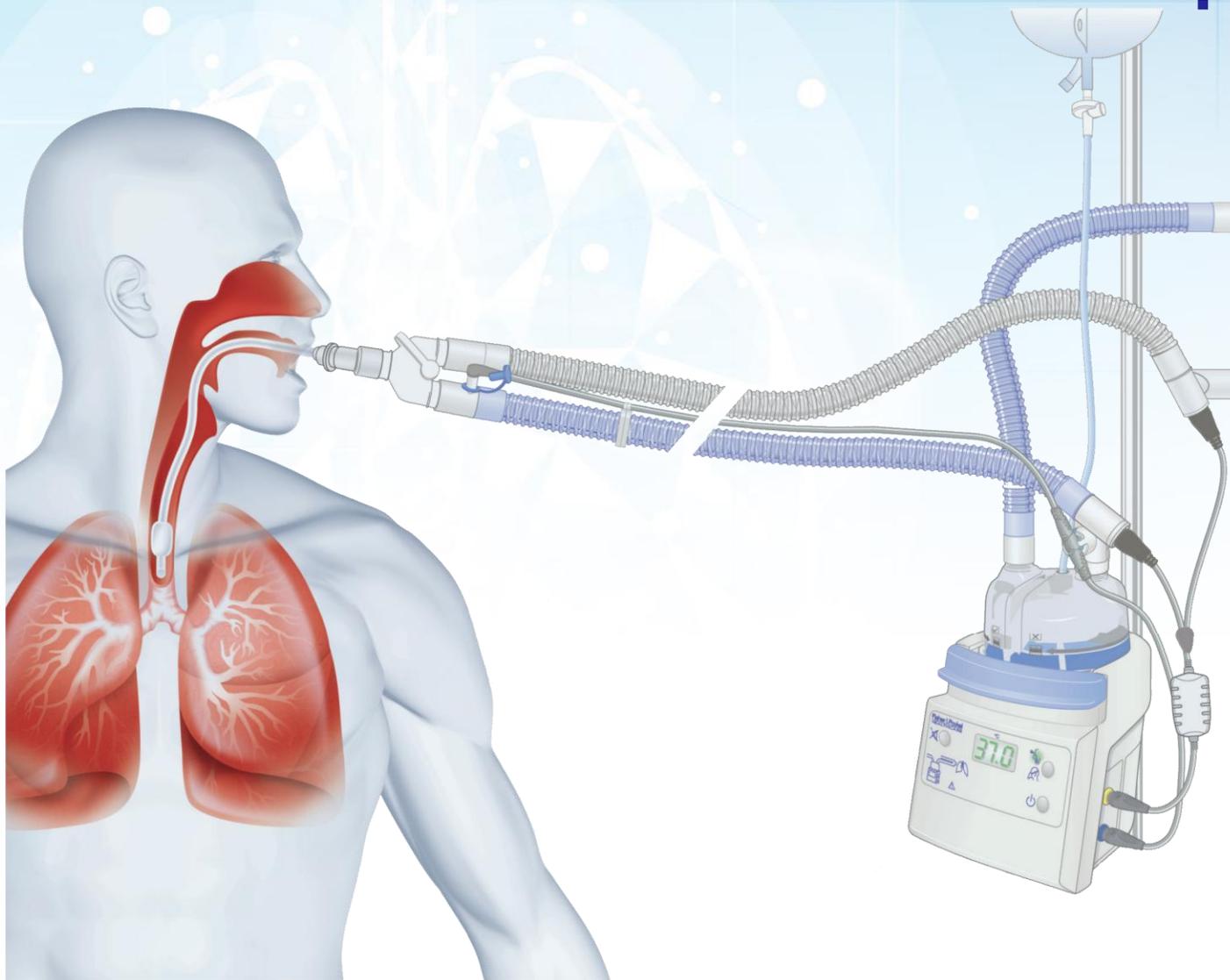
HMEs are **not recommended** in patients with low tidal volumes (such as when lung-protective ventilation strategies are used) due to the **addition of dead space**.

Due to the features and mechanisms by which HMEs operate, they are **contraindicated** in some patient groups, including those with frank bloody or thick, copious secretions, an expired tidal volume < 70% of delivered tidal volume, a body temperature < 32 °C, and those on noninvasive ventilation with large mask leaks.

# BÌNH ĐUN BỐC HƠI KIỂM SOÁT CHỦ ĐỘNG



# BÌNH ĐUN BỐC HƠI KIỂM SOÁT CHỦ ĐỘNG



## ĐIỂM CHÍNH

# KIỂM SOÁT ẤM ẤM CHỦ ĐỘNG

Bảo hòa ấm ấm sinh lý

Cơ chế phòng vệ

Hiện tượng ngưng tụ

Dễ chịu, dung nạp

Ho, làm sạch hiệu quả

Ngăn ngừa biến chứng

## GIẢM THỜI GIAN NẪM VIỆN



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THÀNH PHỐ HỒ CHÍ MINH

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**CẢM ƠN**  
**QUÝ ĐỒNG NGHIỆP**  
**ĐÃ CHÚ Ý LẮNG NGHE**

VŨNG TÀU, TP.HCM - NGÀY 21 THÁNG 3 NĂM 2026