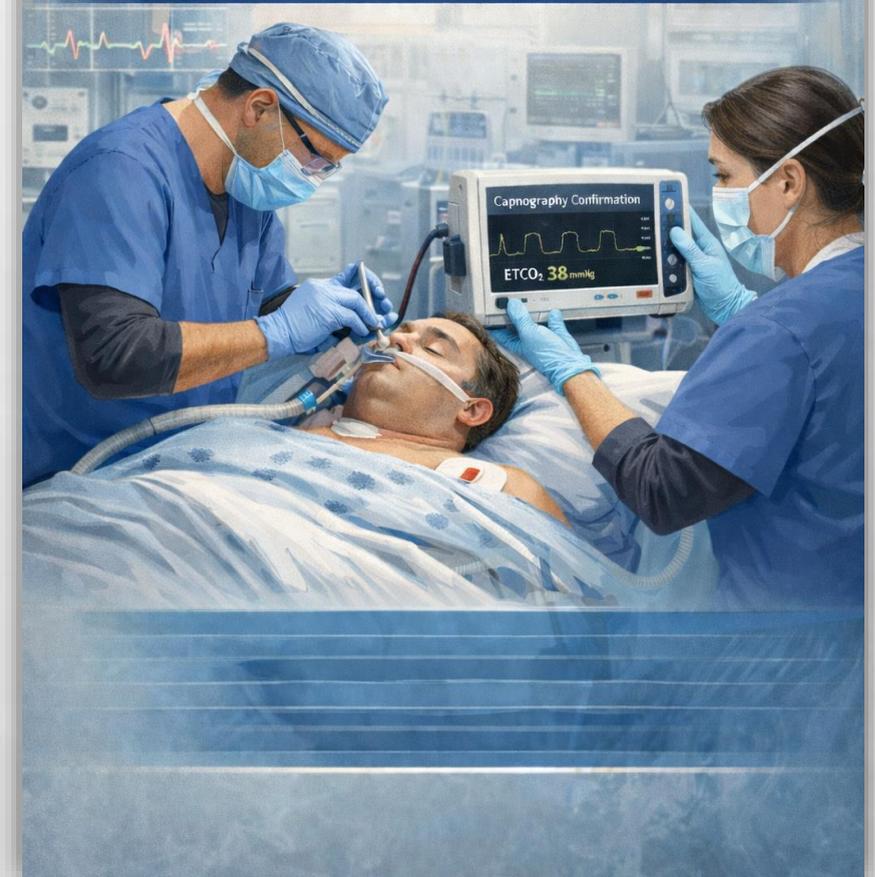


Part-2 RT-ACLS ADVANCED CEU SERIES

Advanced Emergency Airways

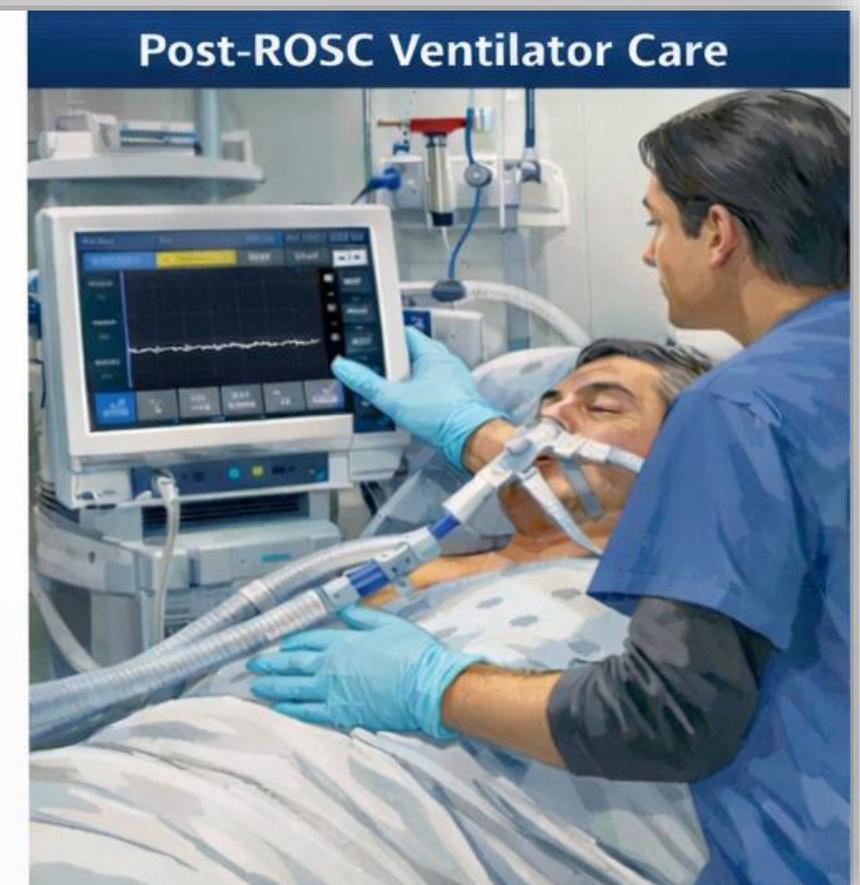
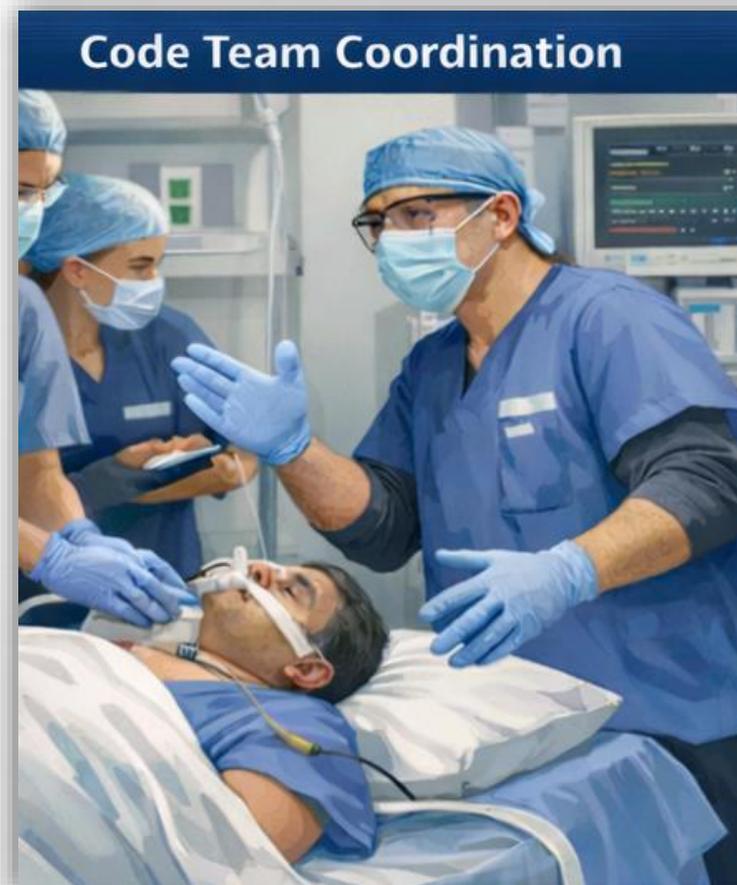
RT-ACLS ADVANCED CEU SERIES

Part 2 – Advanced Emergency Airways



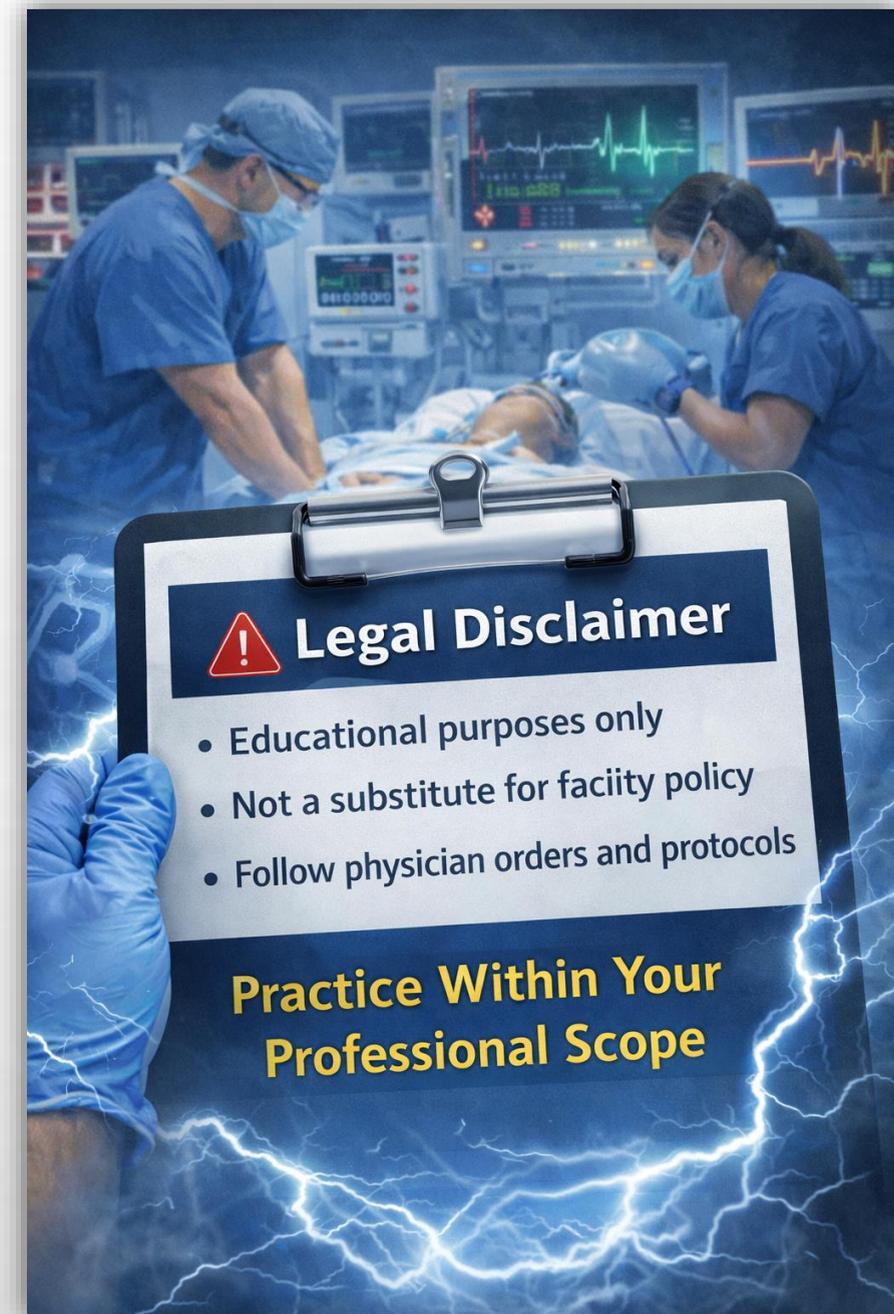
Program Introduction

- Advanced emergency airway rescue principles
- Tracheostomy complication management
- Surgical airway support in critical events
- Prevention of hypoxic deterioration



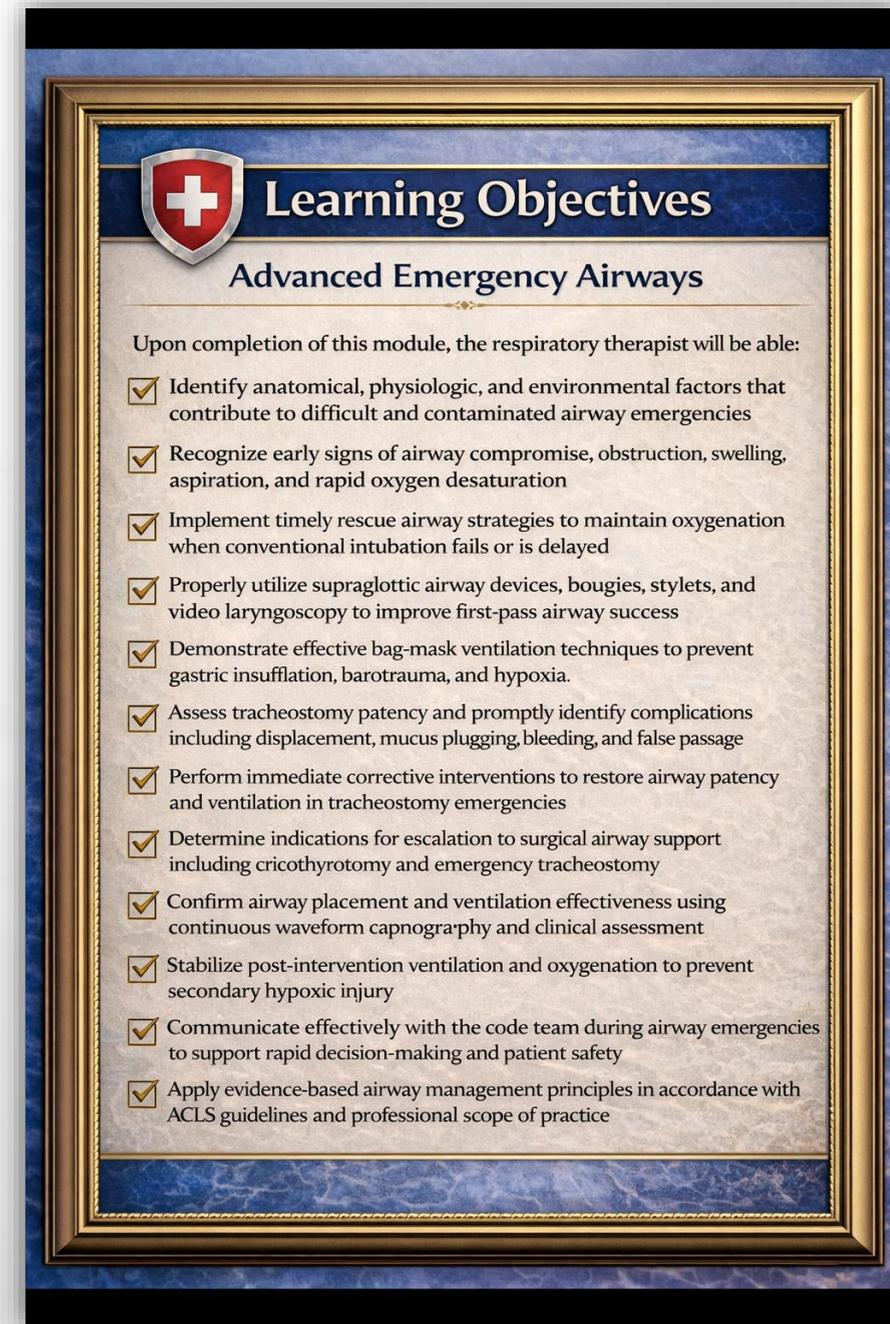
Legal Disclaimer

- Educational purposes only
- Not a substitute for facility policy
- Follow physician orders and protocols
- Practice within professional scope



Learning Objectives

- Manage difficult airway emergencies
- Utilize rescue airway devices
- Correct tracheostomy complications
- Stabilize ventilation after intervention



Learning Objectives

Advanced Emergency Airways

Upon completion of this module, the respiratory therapist will be able:

- ✓ Identify anatomical, physiologic, and environmental factors that contribute to difficult and contaminated airway emergencies
- ✓ Recognize early signs of airway compromise, obstruction, swelling, aspiration, and rapid oxygen desaturation
- ✓ Implement timely rescue airway strategies to maintain oxygenation when conventional intubation fails or is delayed
- ✓ Properly utilize supraglottic airway devices, bougies, stylets, and video laryngoscopy to improve first-pass airway success
- ✓ Demonstrate effective bag-mask ventilation techniques to prevent gastric insufflation, barotrauma, and hypoxia.
- ✓ Assess tracheostomy patency and promptly identify complications including displacement, mucus plugging, bleeding, and false passage
- ✓ Perform immediate corrective interventions to restore airway patency and ventilation in tracheostomy emergencies
- ✓ Determine indications for escalation to surgical airway support including cricothyrotomy and emergency tracheostomy
- ✓ Confirm airway placement and ventilation effectiveness using continuous waveform capnography and clinical assessment
- ✓ Stabilize post-intervention ventilation and oxygenation to prevent secondary hypoxic injury
- ✓ Communicate effectively with the code team during airway emergencies to support rapid decision-making and patient safety
- ✓ Apply evidence-based airway management principles in accordance with ACLS guidelines and professional scope of practice



DIFFICULT AIRWAYS

Causes of Difficult Airways

- Airway edema and swelling
- Anatomical obstruction
- Trauma distortion
- Limited visualization



Contaminated Airways

- Blood interference
- Vomiting and aspiration
- Thick secretions
- Visualization failure



Failed Intubation Risk

- Poor laryngoscopic view
- Unstable patients
- Rapid desaturation
- Rescue airway necessity



Points To Remember

1. Airway obstruction, swelling, blood, and secretions rapidly impair ventilation and visualization
2. Repeated failed intubation attempts increase hypoxia and airway trauma
3. Rapid oxygen desaturation can occur within seconds in critically ill patients
4. Early use of rescue airway strategies prevents arrest progression



Why Difficult Airways Deteriorate Rapidly

1 Airway Obstruction & Contamination

Swelling, blood, vomitus, and thick secretions quickly block airflow and obscure visualization, making ventilation and intubation increasingly difficult.

2 Repeated Failed Intubation Attempts

Multiple attempts worsen hypoxia, increase airway trauma, and cause progressive edema and bleeding.

3 Rapid Oxygen Desaturation

Critically ill patients can lose oxygen reserves within seconds, leading to sudden hypoxemia and cardiac instability.

4 Early Rescue Airway Intervention

Timely use of supraglottic airways, BVM optimization, and surgical airway escalation prevents respiratory arrest and cardiac collapse.

AIRWAY OBSTRUCTION → TRAUMA & HYPOXIA → RAPID DESATURATION → RESCUE SAVES LIFE

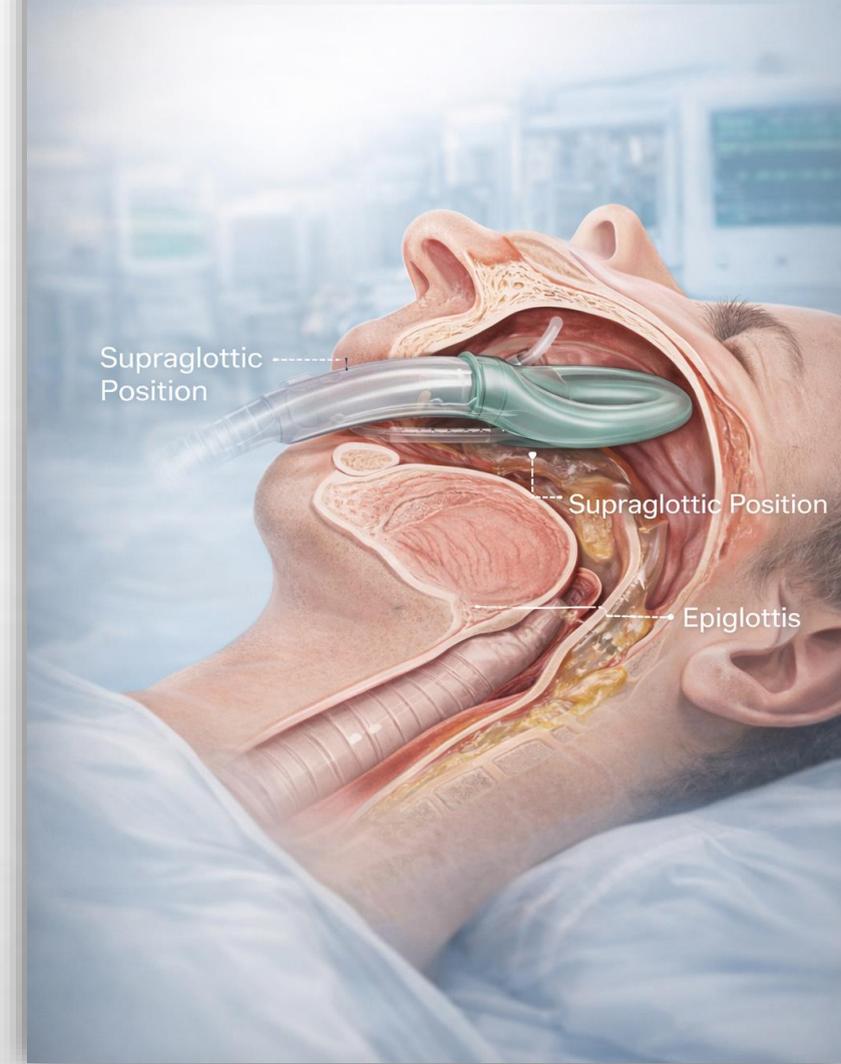


RESCUE AIRWAY DEVICES

Supraglottic Airways

- Rapid oxygenation access
- Minimal visualization required
- Temporary airway control
- Bridge to definitive airway

Supraglottic Airway Devices



Bougies & Stylets

- Guide tube placement
- Improve first-pass success
- Difficult anatomy assistance
- Reduce repeated attempts



Video Laryngoscopy

- Enhanced airway visualization
- Difficult airway support
- Confirmation of placement
- Improved success rates



Bag-Mask Optimization

- Proper seal technique
- Airway positioning
- High-flow oxygen delivery
- Two-person ventilation



Points To Remember

1. Supraglottic airways provide rapid ventilation when intubation fails or is delayed
2. Bougies and stylets improve first-pass intubation success in difficult airways
3. Video laryngoscopy enhances airway visualization and placement accuracy
4. Optimized bag-mask ventilation maintains oxygenation during airway rescue



RAPID RESPONSE

TRACHEOSTOMY EMERGENCIES

Tube Displacement

- Partial or full dislodgement
- Loss of airway patency
- Rapid desaturation
- Immediate assessment



RAPID RESPONSE

Mucus Plugging

- Thick secretion buildup
- Increased airway resistance
- Sudden ventilation failure
- Aggressive suctioning



RAPID RESPONSE

Bleeding & False Passage

- Blood airway obstruction
- Misplaced tube risk
- Subcutaneous emphysema
- Ineffective ventilation



SURGICAL AIRWAY SUPPORT

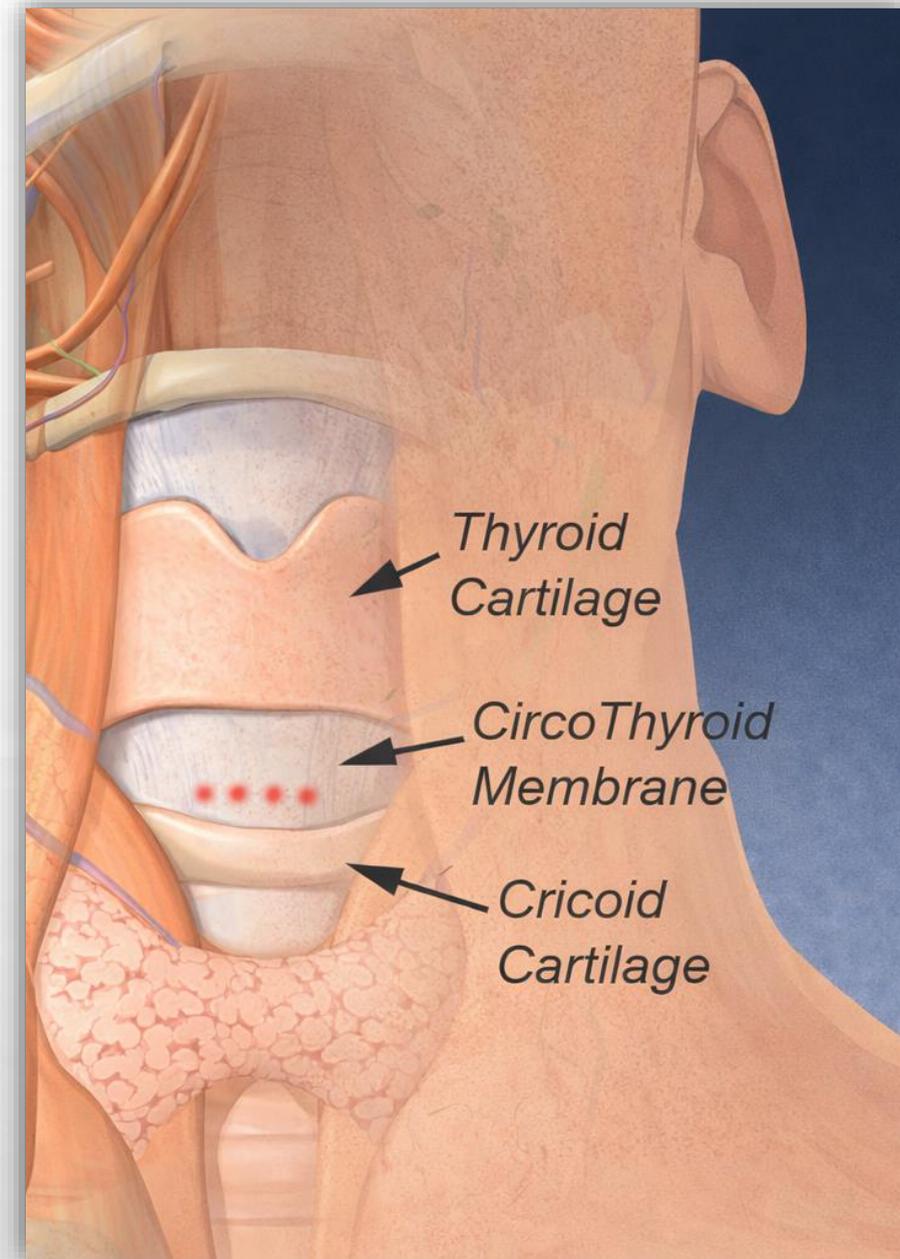
Indications for Surgical Airway

- Complete airway obstruction
- Failed intubation attempts
- Severe facial trauma
- Rapid hypoxia progression



Cricothyrotomy Overview

- Emergency airway access
- Rapid oxygen delivery
- Temporary lifesaving airway
- Arrest prevention measure



Tracheostomy Comparison

- Controlled airway placement
- Long-term airway access
- Surgical environment preferred
- Post-placement stabilization

Cricothyrotomy vs. Tracheostomy

Cricothyrotomy vs. **Tracheostomy**

- Emergency, last-resort airway
- Incision through cricothyroid membrane
- Faster to perform, in seconds
- Higher risk of complications

- Incision below cricoid cartilage
- More time to perform, in minutes
- Lower risk of complications
- Lower complication risk

Comparison	
Cricothyrotomy	Tracheostomy
Cricothyroid Membrane	Below Cricoid Cartilage
Emergency Only	Long-Term Airway
Seconds to Perform	Minutes to Perform
Higher Complication Risk	Lower Complication Risk



RT Role in Procedures

- Equipment preparation
- Emergency Supplies and Code Carts Checked
- Oxygenation support
- Ventilation monitoring
- ETCO₂ confirmation

 **RESPIRATORY THERAPIST –**
RT-ACLS AIRWAY ESCALATION & EMERGENCY RESPONSE

EARLY AIRWAY FAILURE RECOGNITION

- ✓ Rapid SpO₂ decline
- ✓ Increased work of breathing
- ✓ Obstructed airflow
- ✓ Rising ETCO₂ or loss of F waveform
- ✓ Secretion plugging or edema
- ✓ Poor chest rise & compliance changes

👍 Early recognition = early rescue

IMMEDIATE RESCUE OXYGENATION

Primary lifesaving actions

- ✓ Optimized bag-mask ventilation
- ✓ Proper airway positioning
- ✓ Jaw thrust & airway opening maneuvers
- ✓ Aggressive suctioning
- ✓ Oxygen escalation
- ✓ Rescue airway placement

👍 Oxygenation always comes first

ADVANCED AIRWAY SUPPORT

RTs manage ventilation physiology during crises

👍 **CLINICAL TRUTH** RTs are the airway specialists

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 **RT ROLE IN SURGICAL AIRWAYS, SAFETY & COMPETENCY**

PROCEDURAL PREPARATION

- ✓ Oxygen delivery systems verified
- ✓ Suction with backup ready
- ✓ ETCO₂ monitoring functional

👍 Preparedness prevents

ADVANCED AIRWAY SUPPORT

- ✓ Pre-oxygenation before intubation
- ✓ Equipment readiness & troubleshooting
- ✓ Visualization optimization
- ✓ ETCO₂ monitoring functional

👍 Not assistance – active airway management

CLINICAL TRUTH

RTs are the airway specialists of the hospital

DURING SURGICAL AIRWAY EVENTS

- ✓ Maintain oxygenation before incision
- ✓ Immediate ventilation after airway access
- ✓ ETCO₂ confirmation of placement

👍 Escalation saves lives before arrest

POST-AIRWAY STABILIZATION

- ✓ Secure airway
- ✓ Stabilize ventilation
- ✓ Monitor oxygenation & CO₂
- ✓ Adjust pressures and volumes

👍 Escalation saves lives before arrest

FINAL TAKEAWAY

- ✓ RTs do not “assist procedures”
- ✓ RTs manage life critical ventilation
- ✓ RT competence prevents arrests
- ✓ RT preparedness saves lives



Points to Remember

1. Surgical airway is required when ventilation and intubation fail
2. Cricothyrotomy provides the fastest emergency airway access
3. Tracheostomy offers controlled long-term airway support
4. Early escalation prevents prolonged hypoxia and cardiac arrest

RT-ACLS
ADVANCED CEU SERIES

ADVANCED EMERGENCY AIRWAYS

POINTS TO REMEMBER – QUICK CLINICAL GUIDE

DIFFICULT AIRWAYS

- ⚠ Swelling, blood, secretions block ventilation
- ⚠ Repeated intubation increases trauma
- ⚠ Critically ill desaturate in seconds
- ⚠ Early rescue airway prevents arrest

RESCUE AIRWAY STRATEGIES

- ✓ Supraglottic airways for rapid ventilation
- ✓ Bougies & stylets improve success
- ✓ Video laryngoscopy for better view
- ✓ Optimized bag-mask ventilation

SURGICAL AIRWAY ESCALATION

- ✓ Cricothyrotomy for emergency access
- ✓ Tracheostomy for long-term control
- ✓ Escalate early to prevent hypoxia

SURGICAL AIRWAY ESCALATION

- ✓ Cricothyrotomy for emergency access
- ✓ Tracheostomy for long-term control
- ✓ Escalate early to prevent hypoxia

COMPLICATION PREVENTION

- ✓ Suctioning & positioning
- ✓ Gentle ventilation practices
- ✓ Secured airway devices
- ✓ ETCO₂ monitoring & safety

OXYGENATE EARLY • RESCUE QUICKLY • ESCALATE CONFIDENTLY • RTs SAVE LIVES

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COMPLICATION PREVENTION

Aspiration Prevention

- Continuous suctioning
- Patient positioning
- Airway clearance
- Oxygenation maintenance



AIRWAY RT-ACLS COMPLICATION PREVENTION

BAROTRAUMA REDUCTION

- ✓ Prevent high inspiratory pressures
- ✓ Limit excessive tidal volumes
- ✓ Avoid over-inflated cuffs and high PEEP

ASPIRATION PREVENTION

- ✓ Maintain proper cuff inflation
- ✓ Regular aggressive suctioning
- ✓ Head-up positioning when able

HYPOXIA MINIMIZATION

- Pre-oxygenation critical
- ✓ Prevent desaturation/reoxygenate quickly
- ✓ Monitor SpO₂ & ETCO₂ constantly

UNPLANNED EXTUBATION PREVENTION

- ✓ Secure airway properly
- ✓ Monitor compliance/tube migration
- ✓ Monitor SpO₂ & ETCO₂
- ✓ Recognize movement, coughing, or pulling

EQUIPMENT FAILURE PREVENTION

- ✓ Verify suction functional
- ✓ BVM O₂ supply & PEEP fit
- ✓ Backup ventilator circuit
- ✓ Emergency stuff!

AIRWAY STABILITY PREVENTS ARREST, INJURY & DEATH

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Bleeding & Barotrauma Control

- Gentle ventilation pressures
- Bleeding monitoring
- Secure airway devices
- Pressure management

Signs & Symptoms
of **PULMONARY BAROTRAUMA & BLEEDING**
Key Indicators of Serious Lung Injury in a Hospital Setting



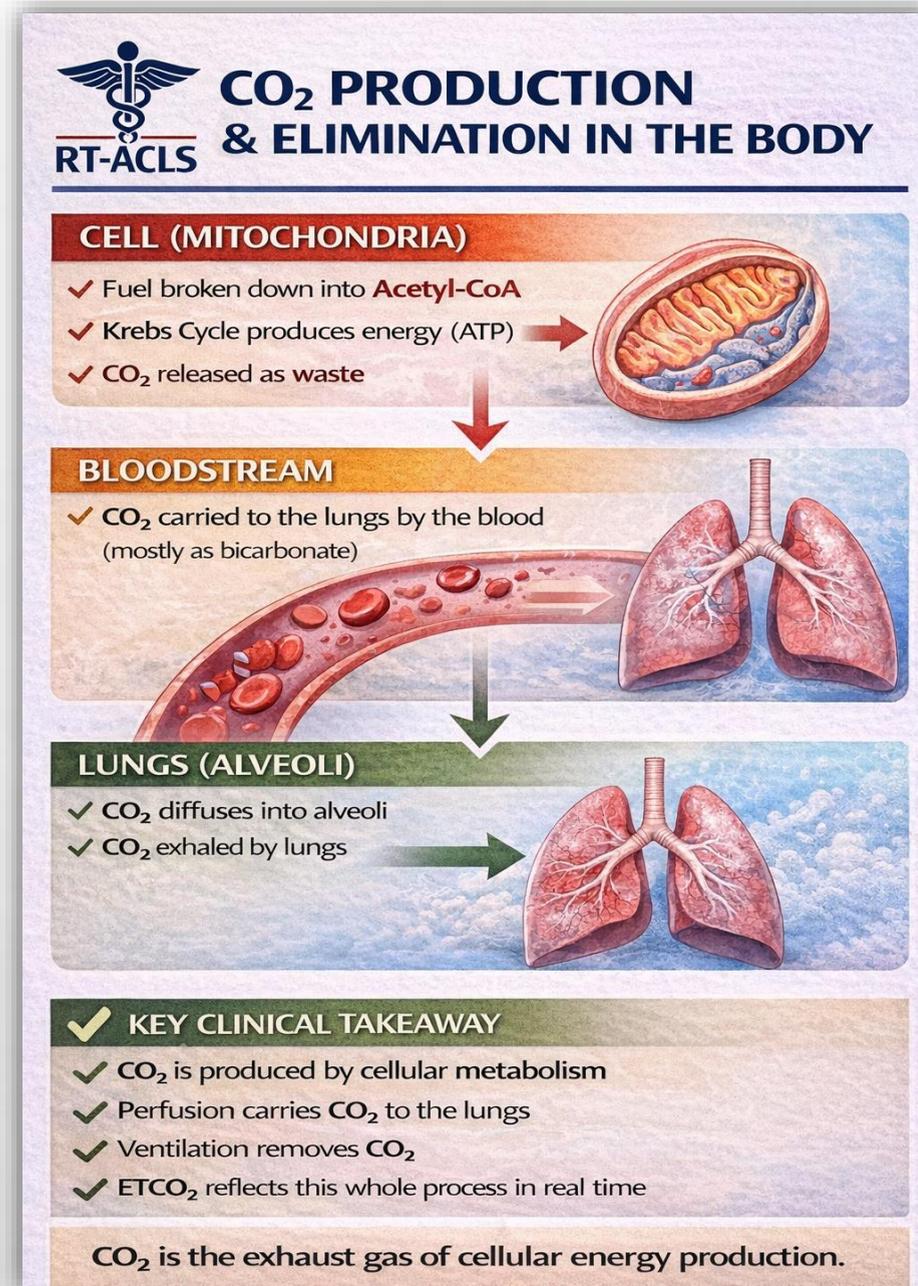
 EARLY WARNING	 SEVERE INJURY
<ul style="list-style-type: none">✓ Sudden chest pain✓ Acute shortness of breath✓ Cough✓ Bloody or pink froth at mouth	<ul style="list-style-type: none">✓ Significant hemoptysis✓ Rapid respiratory distress✓ Acute lung injury✓ ARDS risk

EMERGENCY!
 Any of these symptoms demand immediate respiratory evaluation!



ETCO₂ Monitoring

- Confirm airway placement
- Assess ventilation quality
- Monitor perfusion trends
- Early failure detection



Points To Remember

1. Continuous suctioning and positioning reduce aspiration risk
2. Gentle ventilation prevents barotrauma and lung injury
3. Securing airway devices prevents displacement
4. ETCO₂ monitoring confirms airway placement and ventilation effectiveness

RT-ACLS RT-ACLS KEY POINTS TO REMEMBER

- 1** Continuous suctioning and positioning
reduce aspiration risk



- 2** Gentle ventilation
prevents barotrauma and lung injury



- 3** Securing airway devices
prevents displacement



- 4** ETCO₂ monitoring
confirms airway placement and ventilation effectiveness



COMPREHENSIVE AIRWAY CASE STUDY

Scenario

- Post-operative patient with recent tracheostomy
- Sudden respiratory distress and desaturation
- Rising airway pressures and poor airflow

Intervention

- Suctioning attempted with minimal improvement
- Bag-mask rescue ventilation initiated
- Tracheostomy repositioned and cleared

Escalation

- Airway remains unstable
- Severe swelling prevents intubation
- Cricothyrotomy performed



RT-ACLS OPTIMIZE OXYGENATION FOR ARREST CASE REVIEW

KEY INITIATIVES DURING ARREST

1 Adequate ventilations:

- ✓ Focus on effective bagging
- ✓ Titrate FiO_2 for $\text{SpO}_2 > 94\%$
- ✓ 10 breaths/min while compressing



2 Optimize circulation:

- ✓ High-quality CPR at 100-120/min
- ✓ Monitor ETCO_2 nearing 20 mmHg
- ✓ Epinephrine for better outcomes



4 Monitor airway gas exchange:

- ✓ Aim $\text{EtCO}_2 > 20$ mmHg
- ✓ Aim $\text{PaO}_2 > 80$ mmHg
- ✓ Monitor SpO_2 94-99% saturation



KEY OUTCOMES:

- ➡ ETCO_2 rising is a desired trend
- ⬅ SaO_2 improvement



RT-ACLS OFFSET ACIDOSIS FOR SHOCK CASE REVIEW

KEY INITIATIVES DURING SHOCK

1 Perfuse & oxygenate tissues:

- ✓ Ensure fluid resuscitation
- ✓ Target initial MAP > 65 mmHg
- ✓ Titrate to achieve rising EtCO_2



2 Eliminate CO_2 to counter acid:

- ✓ Ventilate to reduce lactic acidosis
- ✓ EtCO_2 trending up is a good sign
- ✓ Aim for normal $\text{EtCO}_2 > 35$ mmHg



3 Monitor ABG for acidosis:

- ✓ Check ABG's in severe shock
- ✓ Elevated PaCO_2 indicates retention
- ✓ Rising lactate signals metabolic acidosis



KEY OUTCOMES:

- ➡ Perfusion improvement
- ➡ Respiratory acid clearance



Key Clinical Takeaways

- Early recognition saves lives
- Oxygenation is priority
- Trach emergencies require speed
- RT leadership critical



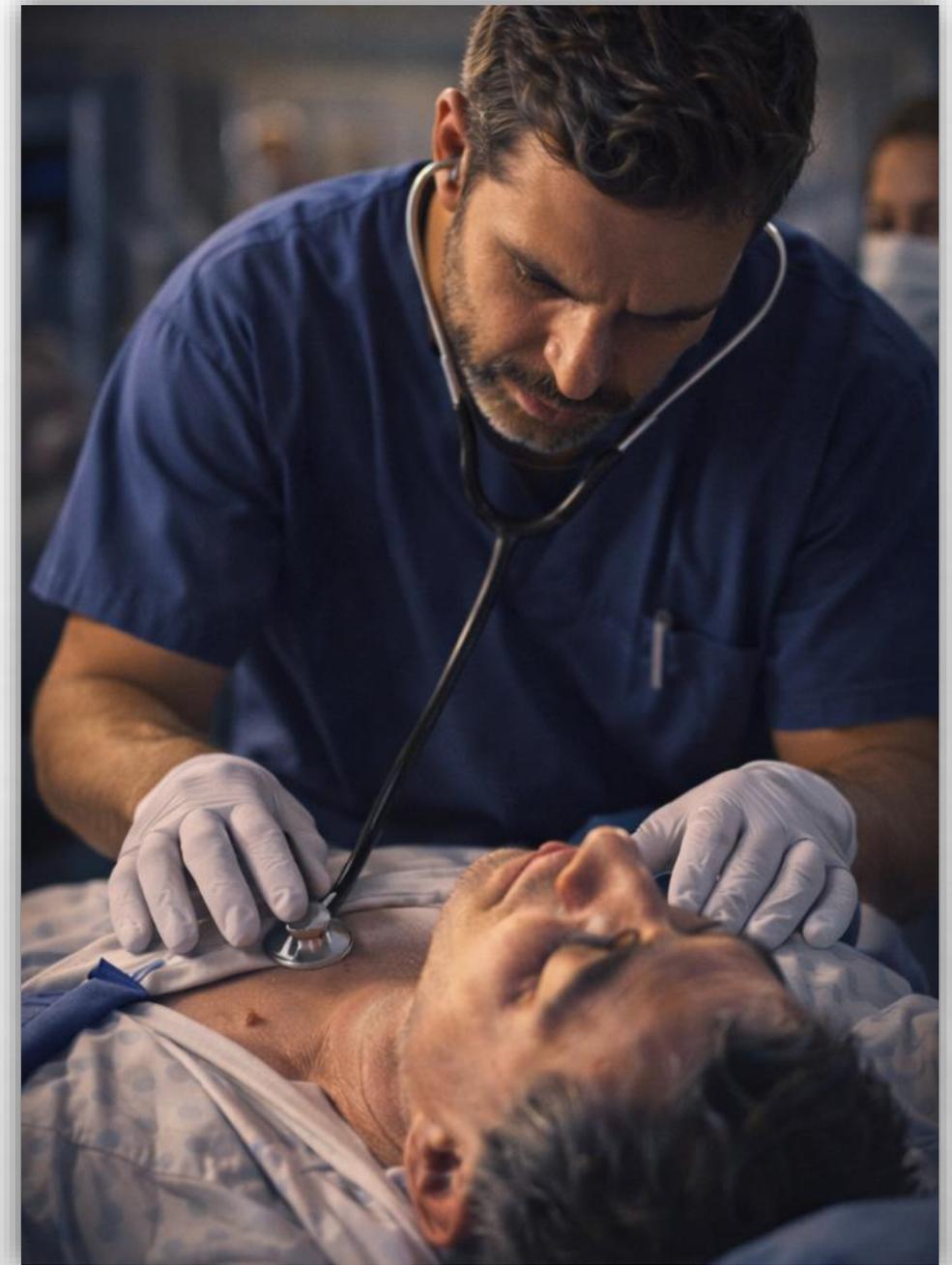
Advanced Respiratory Decision-Making in Airway Emergencies

- Advanced respiratory decision-making during airway crises
- Physiologic management before, during, and after intervention
- Respiratory therapist leadership in preventing deterioration



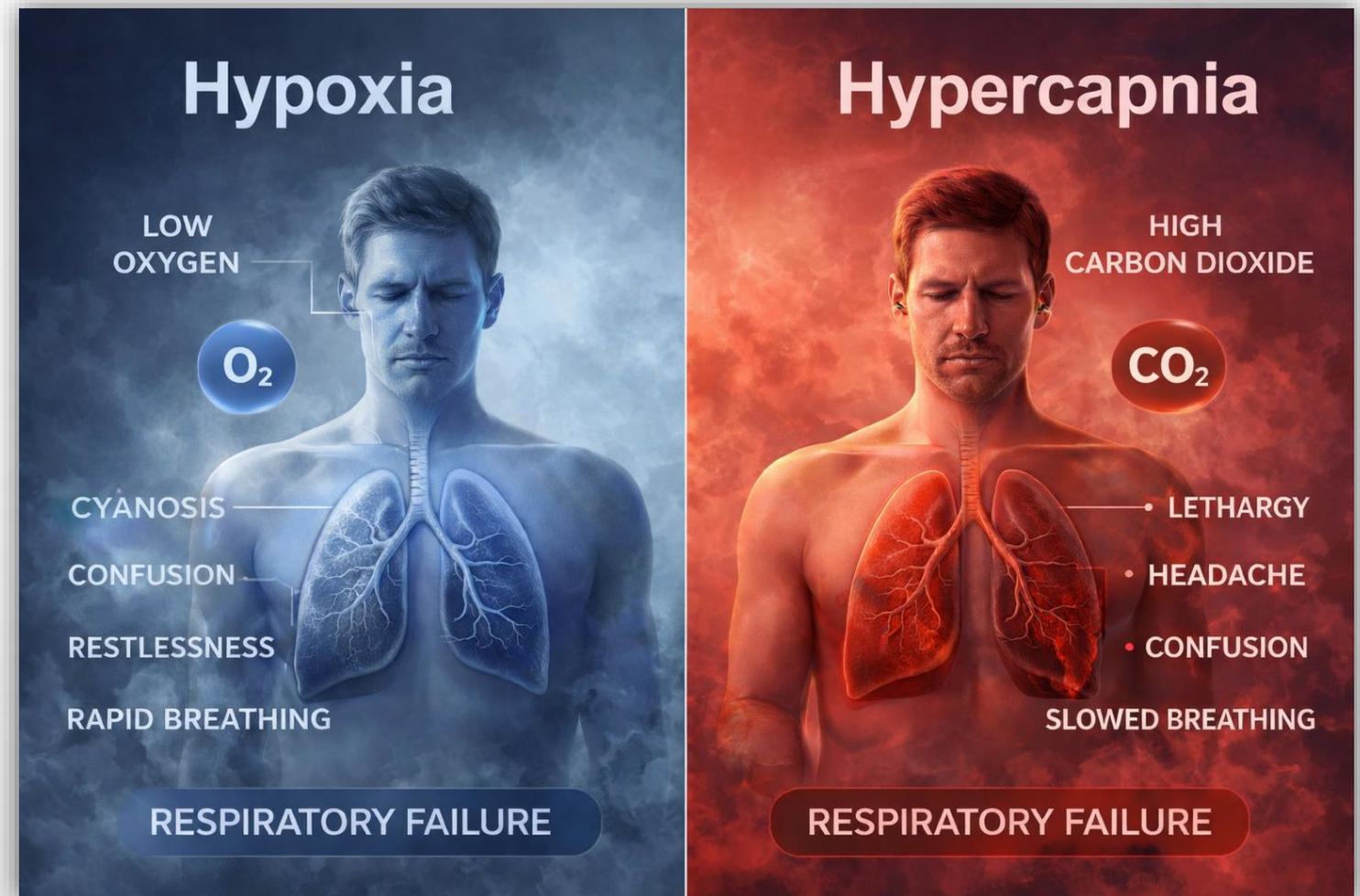
Early Respiratory Warning Signs

- Increasing work of breathing
- Subtle oxygen saturation decline
- Rising CO₂ trends
- Changes in mental status



Hypoxia vs Hypercapnia

- Hypoxic respiratory failure patterns
- Hypercapnic respiratory failure patterns
- Combined respiratory collapse
- Tailoring RT response



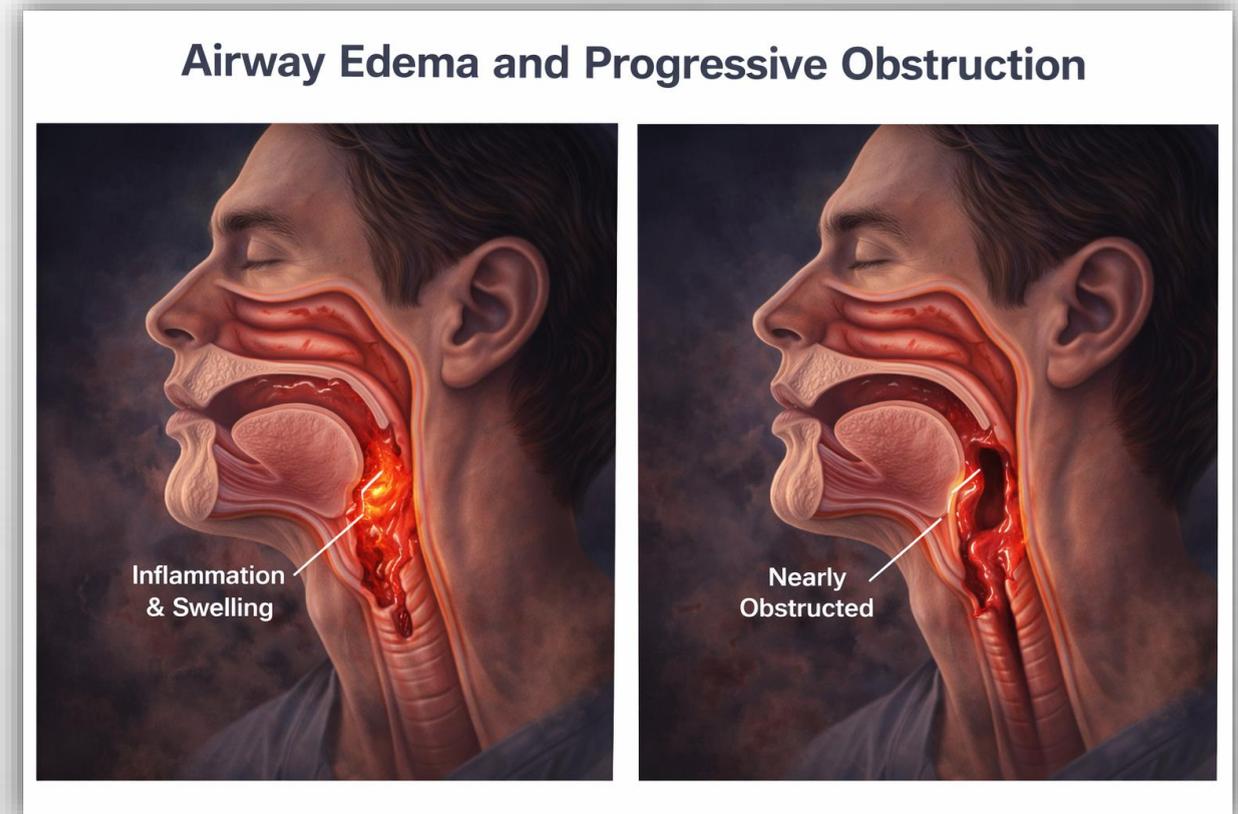
Ventilation Strategy During Airway Instability

- Controlled ventilation goals
- Avoiding excessive airway pressures
- Matching ventilation to lung mechanics
- Preventing secondary lung injury



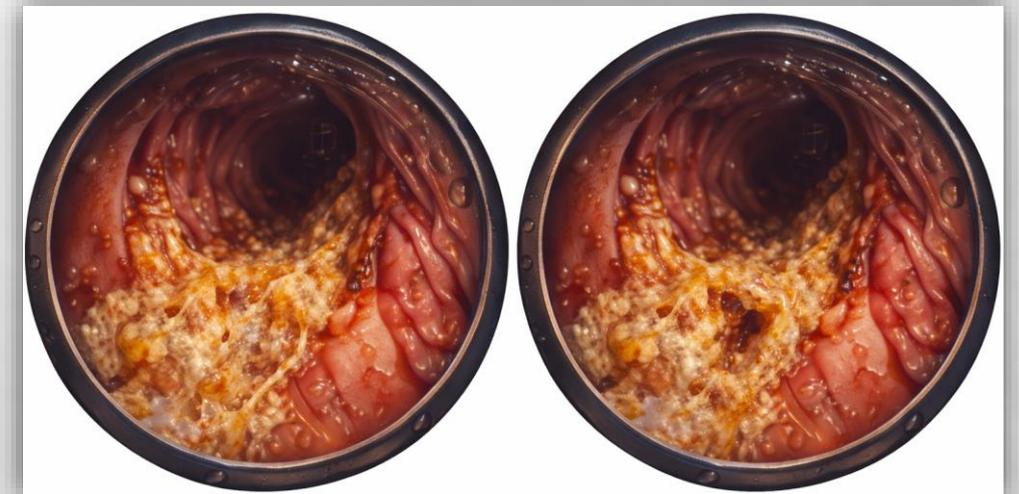
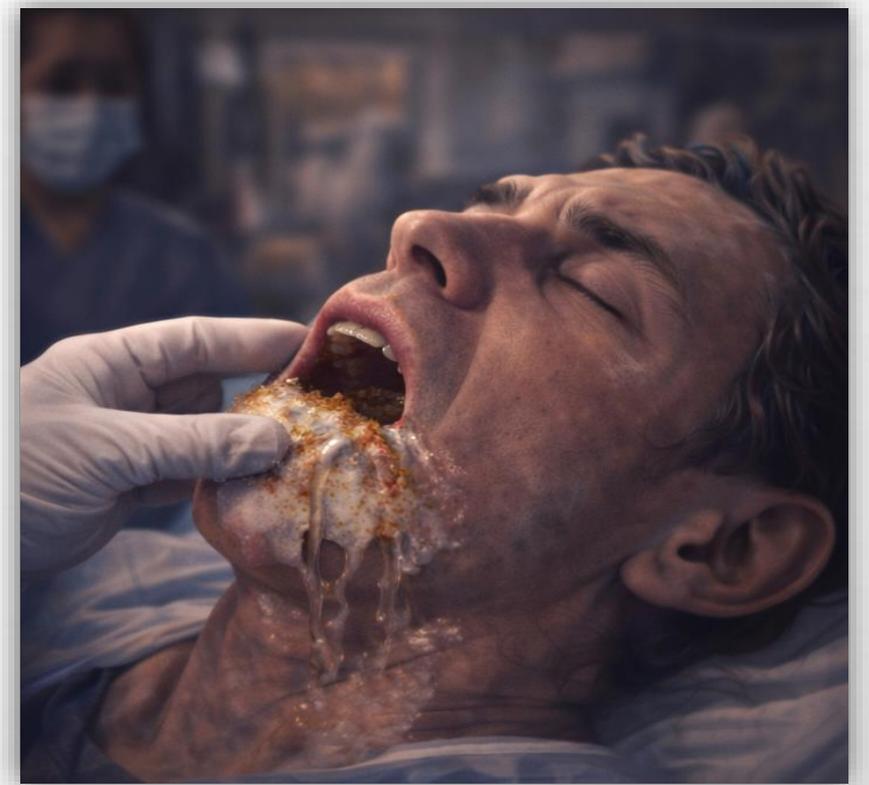
Airway Edema and Progressive Obstruction

- Inflammatory airway swelling
- Post-procedural edema
- Trauma-related obstruction
- Time-sensitive escalation



Managing Contaminated Airways

- Blood accumulation
- Thick secretions
- Aspiration risk
- Continuous reassessment



Post-Intervention Ventilation Stabilization

- Immediate post-airway priorities
- Ventilation reassessment
- Oxygenation optimization
- Preventing rapid deterioration



Air ambulance rescue teams are built around a coordinated partnership of a nurse, physician, and respiratory therapists.

RT Leadership During Airway Emergencies

- Anticipating airway failure
- Early escalation
- Coordinating team response
- Preventing arrest progression



Preventing Arrest Progression

- Early respiratory decline
- Escalation before collapse
- Stabilization without arrest

Preventing Cardiac Arrest

The Respiratory Therapist's Critical Care Checklist

Respiratory Therapists Prevent Arrest by Recognizing Deterioration Early and Acting Decisively

 Early Warning Signs <ul style="list-style-type: none">✓ Increasing work of breathing✓ Rising respiratory rate or fatigue✓ Subtle oxygen saturation decline✓ Rising CO₂ or ventilation trends✓ Changes in mental status	 Ventilation Strategy <ul style="list-style-type: none">✓ Lung-protective tidal volumes✓ Controlled respiratory rate✓ Avoid hyperventilation	 Escalation & Communication <ul style="list-style-type: none">✓ Speak up early✓ Communicate concerns clearly✓ Request additional support promptly✓ Prepare for advanced airway if needed
 Airway Risk Assessment <ul style="list-style-type: none">✓ Airway patency maintained✓ Edema or obstruction suspected✓ Secretions or contamination present✓ Aspiration risk identified	 Oxygenation Management <ul style="list-style-type: none">✓ Correct hypoxia promptly✓ Avoid excessive FiO₂✓ Reassess oxygen needs continuously	 Lung-Protective Mindset <ul style="list-style-type: none">✓ Minimize barotrauma and volutrauma✓ Adjust as lung mechanics change✓ Balance rescue with long-term lung protection
	 Physiologic Monitoring <ul style="list-style-type: none">✓ Evaluate trends, not single values✓ Reassess ventilation adequacy✓ Identify early decompensation	 RT Leadership Role <ul style="list-style-type: none">✓ Anticipate failure before collapse✓ Coordinate airway and ventilation strategy✓ Prevent progression to cardiac arrest

Experienced respiratory therapists apply continuous physiologic judgment—managing the crisis while **protecting the lungs**—to keep patients from **ever ever reaching cardiac arrest**.

These are steps but not limited to.



Final Key Takeaways

- Early recognition prevents emergencies
- Ventilation strategy impacts outcomes
- RT leadership is critical
- Preparedness reduces complications

Final Key Takeaways



Identify Risk Early

Recognize warning signs of respiratory distress, hypoxia, and fatigue.



Protect the Airway

Assess patency; be ready to clear, suction, or intubate as needed.



Optimize Ventilation

Prioritize lung-protective, oxygenation-stabilizing strategies.



Monitor Vigilantly

Continuously reassess for clinical worsening and decompensation.



Speak Up & Lead

Proactively communicate concerns and expertise to prevent arrest.

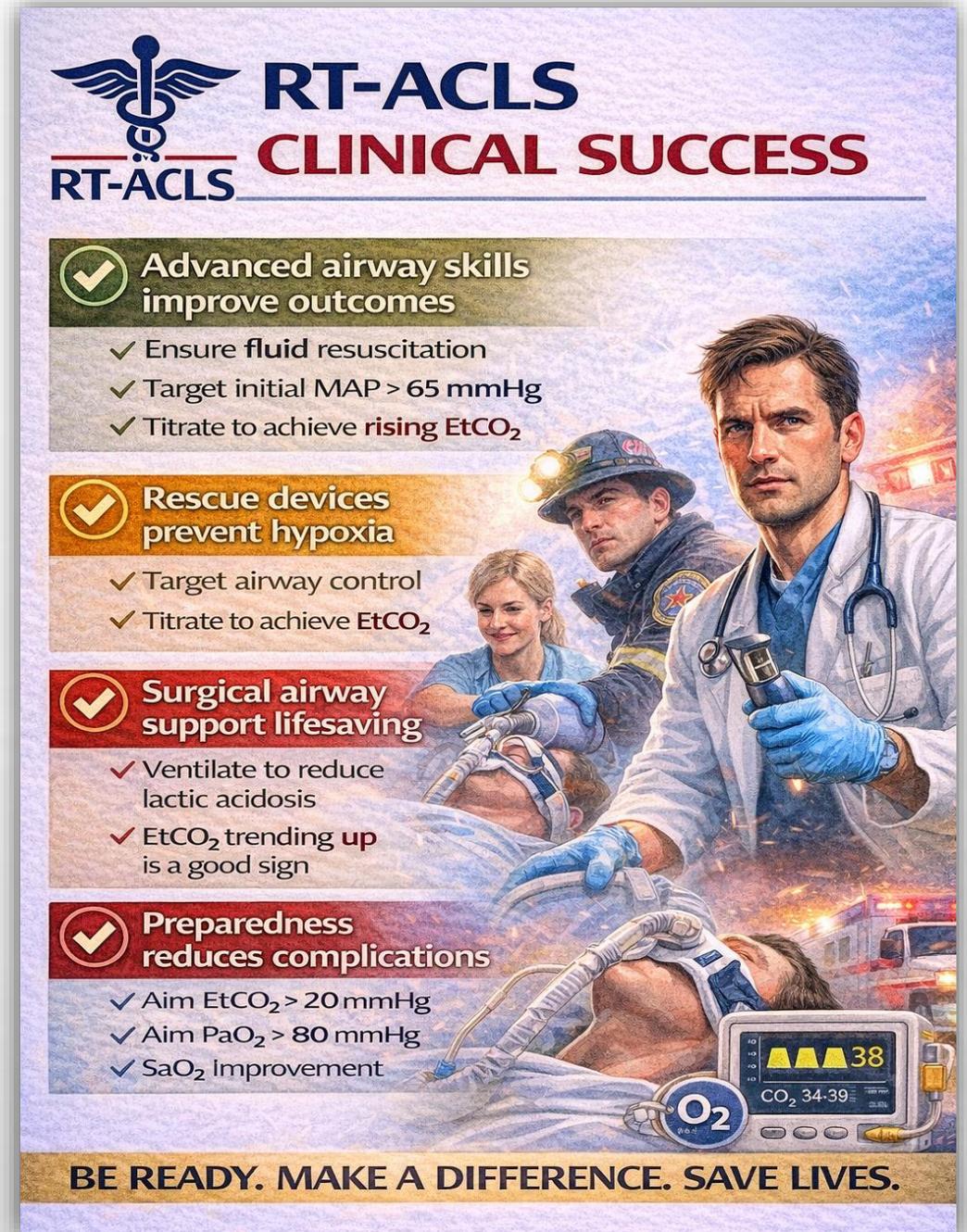
The Prepared RT Makes a Critical Difference

Respiratory therapists anticipate and avert airway emergencies—helping lead the team to successful outcomes.



Program Wrap Up

- Advanced airway skills improve outcomes
- Rescue devices prevent hypoxia
- Surgical airway support lifesaving
- Preparedness reduces complications



The infographic features a background image of medical professionals in an emergency setting. A paramedic in a helmet and a doctor in a white coat are performing a procedure on a patient lying on a stretcher. A monitor in the foreground displays vital signs: a yellow waveform with the number 38, and text indicating CO₂ 34.39 and O₂.

RT-ACLS **RT-ACLS** **CLINICAL SUCCESS**

- ✓ **Advanced airway skills improve outcomes**
 - ✓ Ensure **fluid** resuscitation
 - ✓ Target initial MAP > 65 mmHg
 - ✓ Titrate to achieve **rising EtCO₂**
- ✓ **Rescue devices prevent hypoxia**
 - ✓ Target airway control
 - ✓ Titrate to achieve **EtCO₂**
- ✓ **Surgical airway support lifesaving**
 - ✓ Ventilate to reduce lactic acidosis
 - ✓ **EtCO₂ trending up** is a good sign
- ✓ **Preparedness reduces complications**
 - ✓ Aim EtCO₂ > 20 mmHg
 - ✓ Aim PaO₂ > 80 mmHg
 - ✓ SaO₂ Improvement

BE READY. MAKE A DIFFERENCE. SAVE LIVES.



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