



**COMBAT MEDIC/
CORPSMAN**



TACTICAL COMBAT CASUALTY CARE COURSE

MODULE 7:
AIRWAY MANAGEMENT IN TFC



Committee on
Tactical Combat
Casualty Care
(CoTCCC)

TCCC TIER 1
All Service Members

TCCC TIER 2
Combat Lifesaver

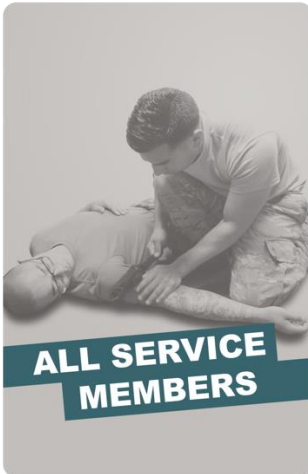
TCCC TIER 3
Combat Medic/Corpsman

TCCC TIER 4
Combat Paramedic/Provider

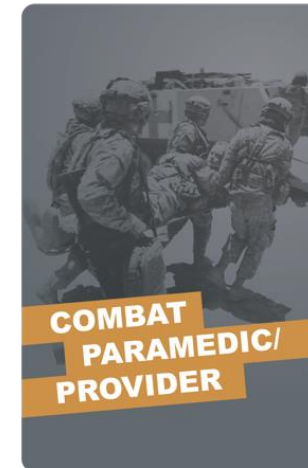
TACTICAL COMBAT CASUALTY CARE (TCCC) ROLE-BASED TRAINING SPECTRUM

ROLE 1 CARE

NONMEDICAL PERSONNEL



MEDICAL PERSONNEL



◀ **YOU ARE HERE**

STANDARDIZED JOINT CURRICULUM

1 x **TERMINAL LEARNING OBJECTIVES**

08 Given a combat or noncombat scenario, perform airway management during Tactical Field Care in accordance with CoTCCC Guidelines.

- **8.1** Identify signs of an airway obstruction. (ASM T5:E20)
- **8.2** Identify spinal immobilization considerations for casualties with suspected cervical spine injuries.
- **8.3** Describe the progressive strategies for airway management and the indications, contraindications, and limitations of airway management techniques in Tactical Field Care.
- ◐ **8.4** Demonstrate the placement of a casualty in the recovery position in Tactical Field Care. (CLS T8:E47)
- ◐ **8.5** Demonstrate opening the airway with the head-tilt/chin-lift or jaw-thrust maneuver. (CLS T8:E46)
- ◐ **8.6** Demonstrate suctioning the airway of a casualty with a Manual Suction Unit.
- ◐ **8.7** Demonstrate suctioning the airway of a casualty with a Mechanical Suction Unit.
- **8.8** Identify the indications, contraindications, and techniques for performing cricothyroidotomy in Tactical Field Care.
- **8.9** Identify the indications, contraindications, and administration methods of lidocaine as a local anesthesia when performing a cricothyroidotomy in Tactical Field Care.
- ◐ **8.10** Demonstrate the procedures for performing a cricothyroidotomy in Tactical Field Care.
- **8.11** Describe the technique for ventilating a casualty with a bag valve mask (BVM) in Tactical Field Care.
- ◐ **8.12** Demonstrate the insertion of a nasopharyngeal airway in a casualty in Tactical Field Care. (CLS T8:E48)
- ◐ **8.13** Demonstrate ventilating a casualty with a BVM in Tactical Field Care.
- **8.14** Identify the considerations, indications, and limitations for oxygen administration in Tactical Field Care.
- **8.15** Identify the importance, considerations, limitations, and application of pulse oximetry monitoring in Tactical Field Care.

15 x **ENABLING LEARNING OBJECTIVES**

= Terminal Learning Objectives ● = Cognitive ELOs ◐ = Performance ELOs

MARCH PAWS

DURING LIFE-THREATENING

- ▶ **M** MASSIVE BLEEDING
#1 Priority
- A** AIRWAY
- R** RESPIRATION
- C** CIRCULATION
- H** HYPOTHERMIA /
HEAD INJURIES

AFTER LIFE-THREATENING

- P** PAIN
- A** ANTIBIOTICS
- W** WOUNDS
- S** SPLINTING

AIRWAY MANAGEMENT INTRODUCTION

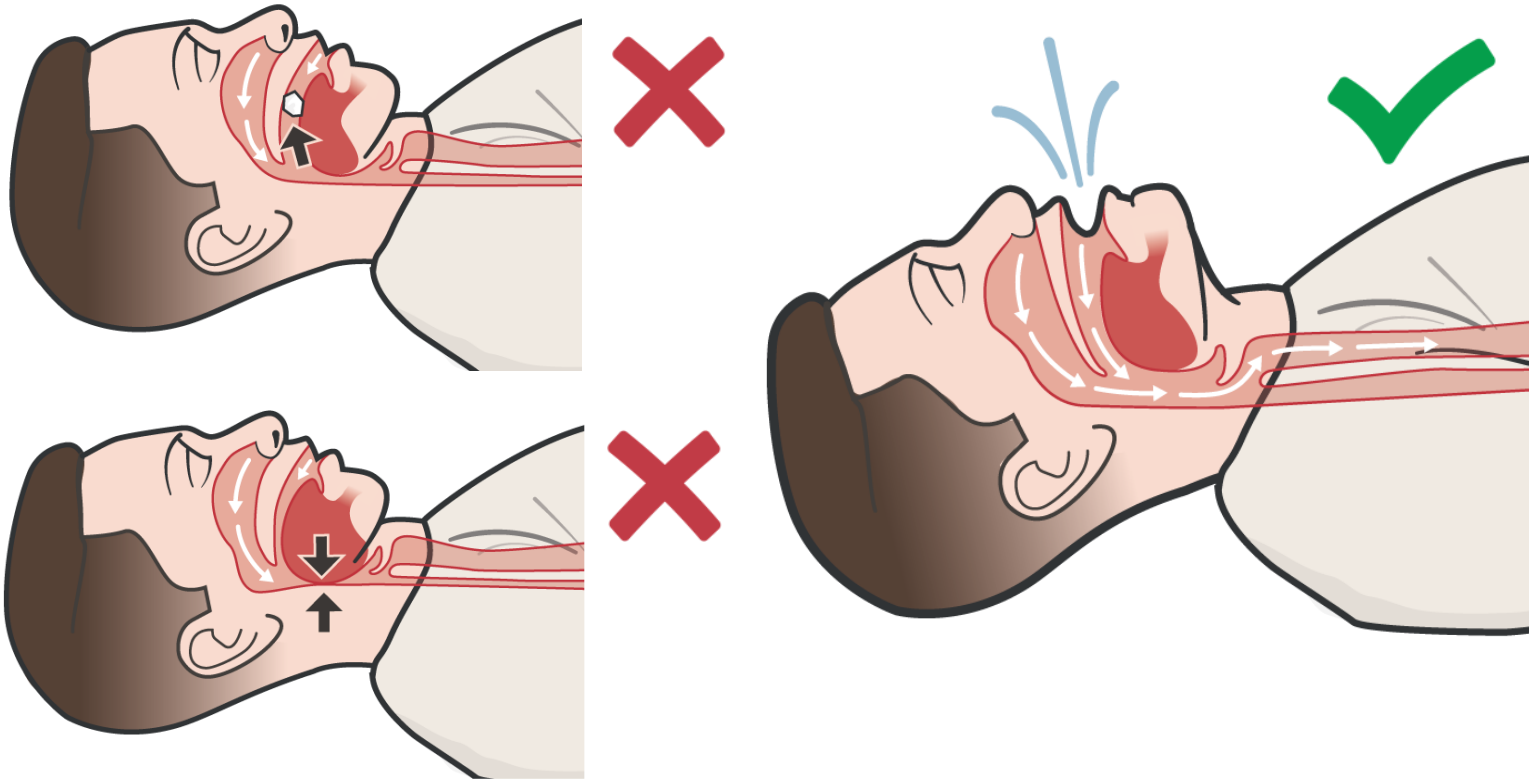


Airway obstruction on the battlefield is often due to **maxillofacial trauma**

- **Unconscious** casualties can also lose their airway when the muscles of their tongue relax, causing the tongue to block the airway by sliding to the back of the pharynx and covering the tracheal opening
- Airway obstruction on the battlefield is often easily corrected with simple maneuvers

MARCH

IDENTIFYING AN OBSTRUCTED AIRWAY



IMPORTANT! Remove any visible objects, but **DO NOT** perform a blind finger sweep

SIGNS AND SYMPTOMS AIRWAY MAY BE BLOCKED:

- Casualty is in distress and indicates they can't breathe properly
- Casualty is making snoring or gurgling sounds
- Visible blood or foreign objects are present in the airway
- Maxillofacial trauma (severe trauma to the face) is observed

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SPINAL IMMOBILIZATION CONSIDERATIONS IN TFC



Consider the mechanism of injury when determining risk of spinal injury

The jaw-thrust method is the preferred airway opening maneuver in case of suspected spinal injuries



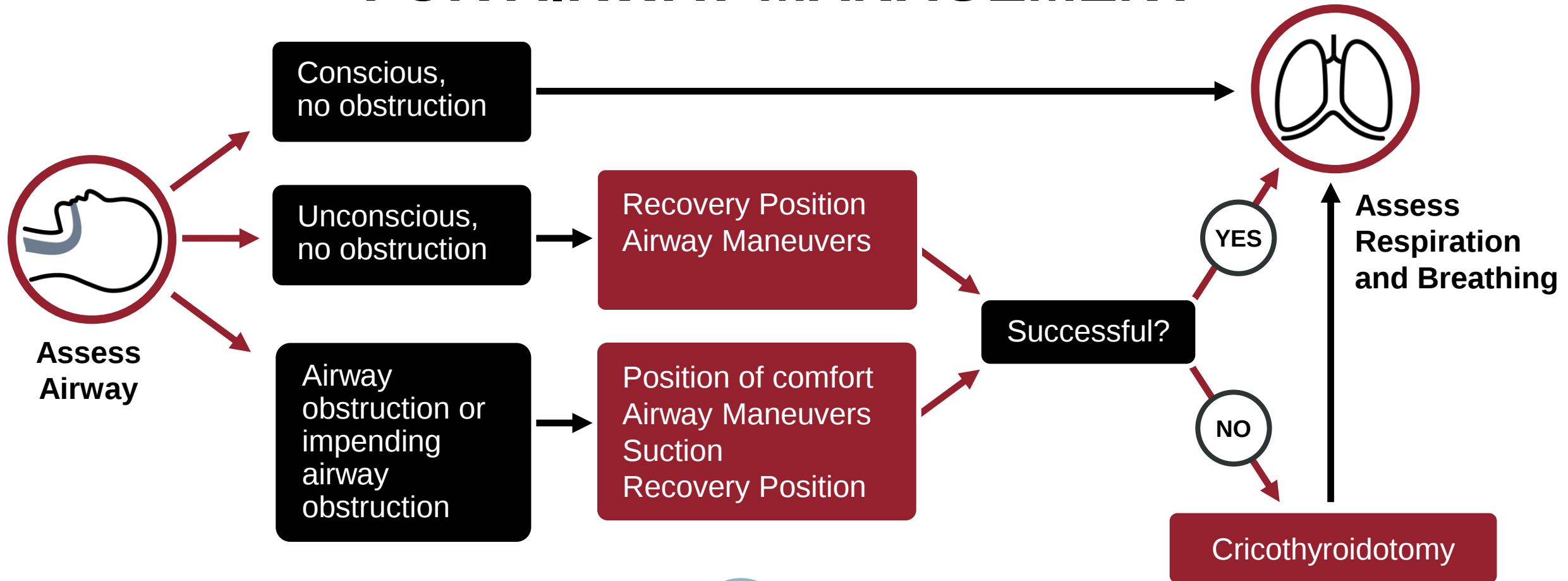
If immobilization is indicated a second responder may be needed to maintain an open airway



C-Spine stabilization is **NOT** necessary for casualties who have sustained penetrating trauma to the **FACE** or **NECK ONLY**

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PROGRESSIVE STRATEGIES FOR AIRWAY MANAGEMENT



LIMITATIONS OF AIRWAY MANAGEMENT IN TFC

Contraindications of Airway Management may include:

- Burns to the airway
- Intracranial Pressure
- Cerebral Spinal Fluid

Limitations of Airway Management:

- Massive Trauma
- Familiarization
- Skill Instructions
- Anatomical Landmarks
- Training
- Capabilities

CASUALTY POSITION: MAINTAINING THE **AIRWAY**

If a casualty **can breathe on their own**, let them assume the best position that best protects the airway, including sitting up and/or leaning forward



If a casualty can **breathe on their own** **in a position of their choice**, **DO NOT** force them into a position or perform airway procedures that causes them difficulties in breathing

M A R C H

CASUALTY POSITION: **RECOVERY** POSITION

For an **unconscious** casualty **not** in shock, or **conscious** casualty that **can tolerate** any position, place them into the **RECOVERY POSITION**

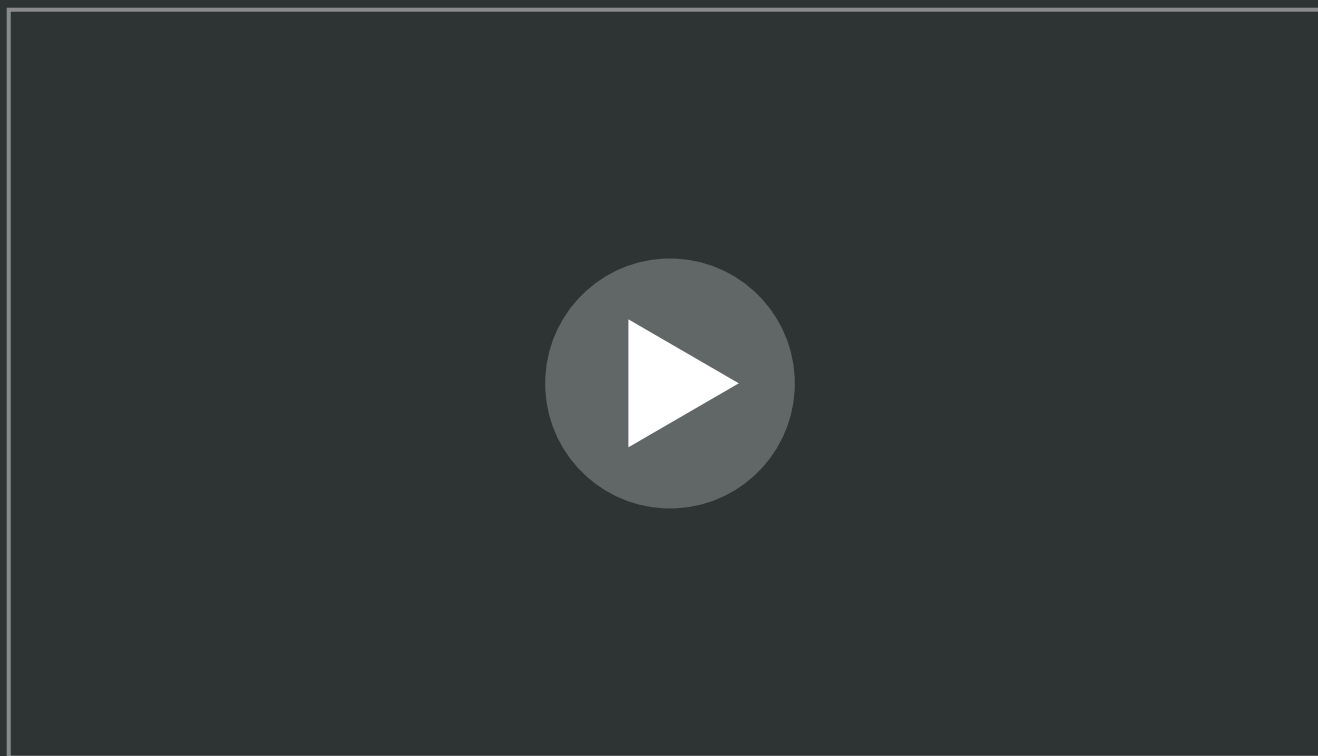


Clinical indications occasionally dictate which side is lower in the **RECOVERY POSITION**



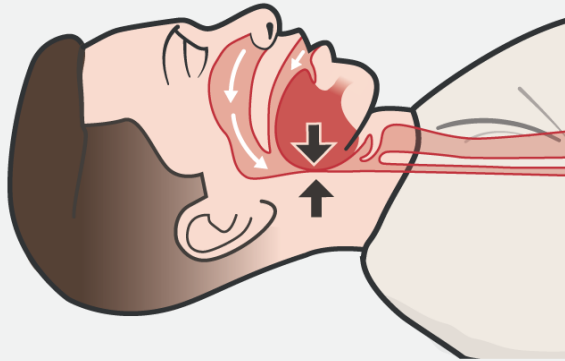
During transport patient may need to be returned to a supine position

RECOVERY POSITION TECHNIQUE VIDEO



Video can be found on deployedmedicine.com

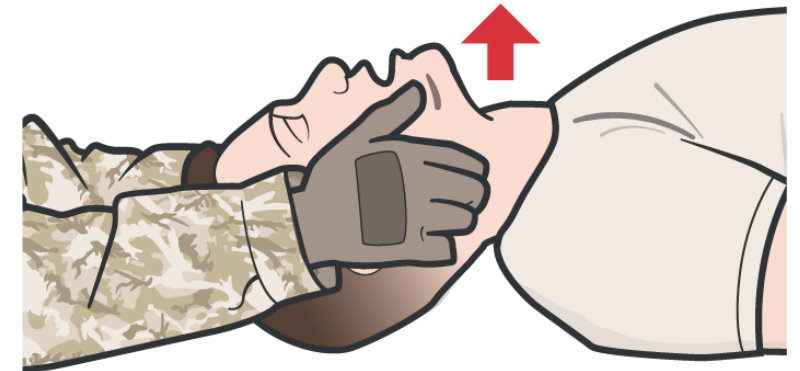
AIRWAY MANEUVERS



UNCONSCIOUS
casualty's tongue may have **relaxed**, causing the tongue to **BLOCK** the airway by sliding to the back of the mouth, **occluding the airway**



HEAD-TILT/CHIN-LIFT



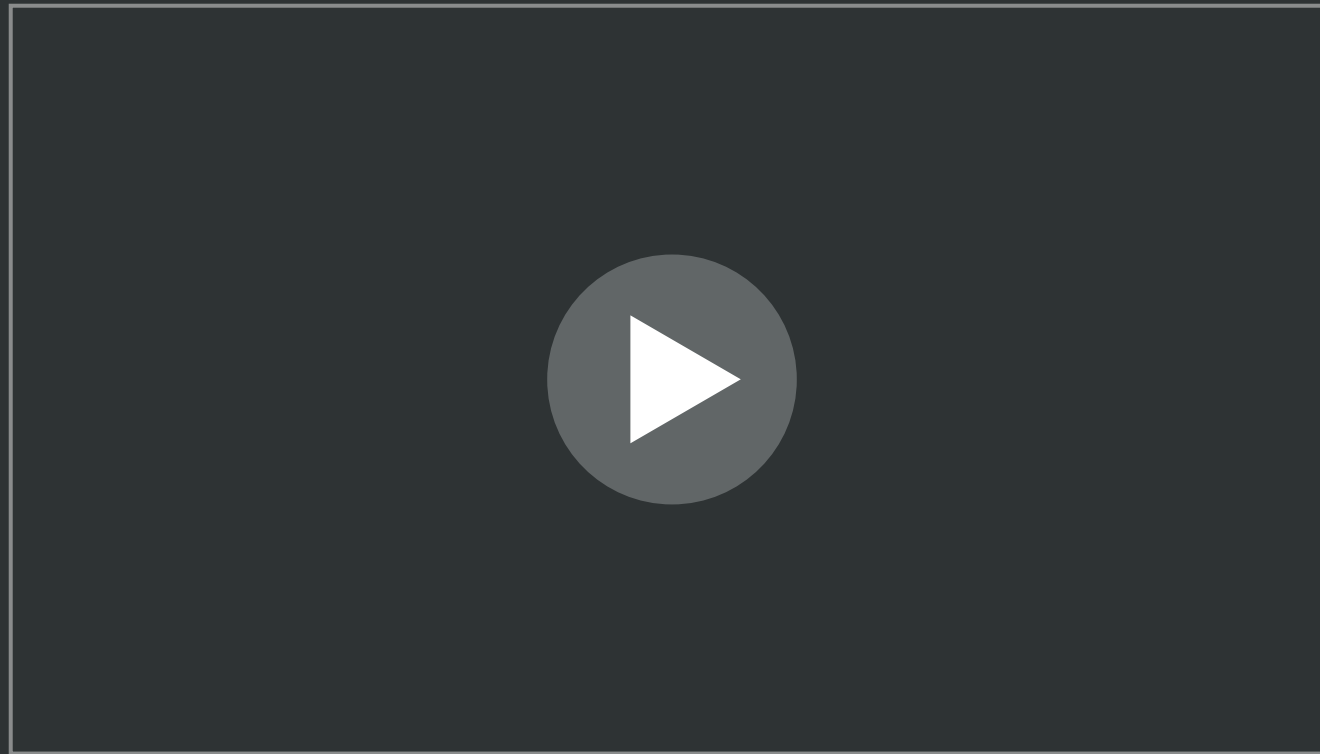
JAW-THRUST



If you suspect that the casualty has suffered a neck or spinal injury, use the jaw-thrust method if tactically feasible.

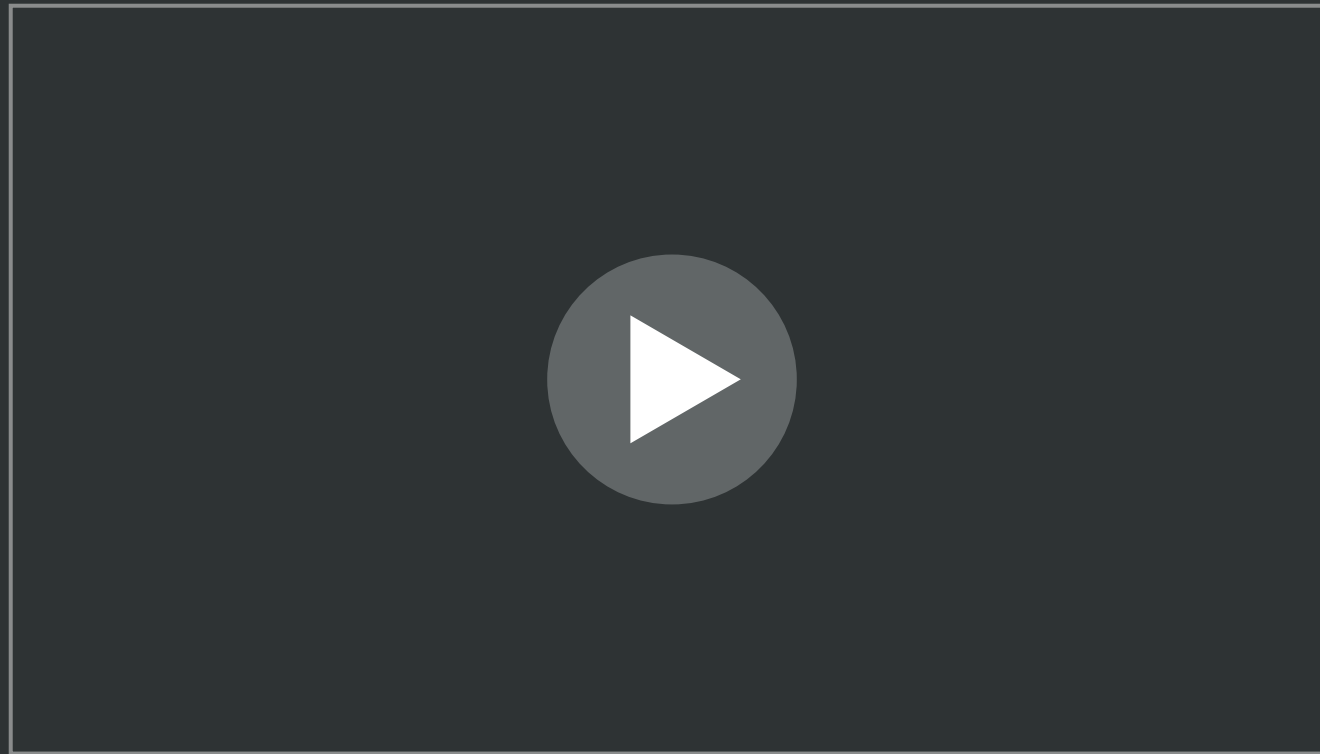
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HEAD-TILT/CHIN-LIFT MANEUVER VIDEO



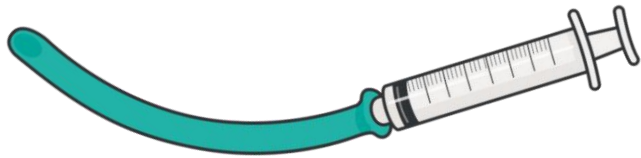
Video can be found on deployedmedicine.com

JAW-THRUST MANEUVER VIDEO

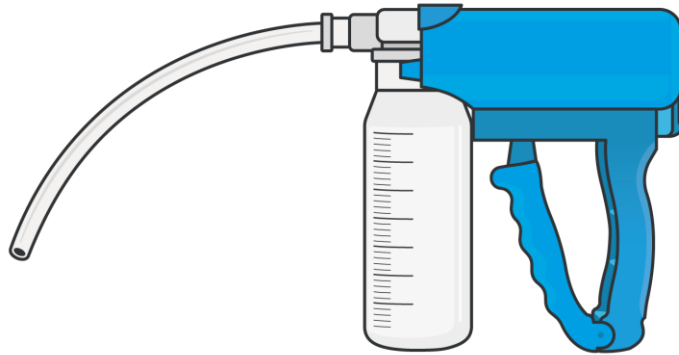


Video can be found on deployedmedicine.com

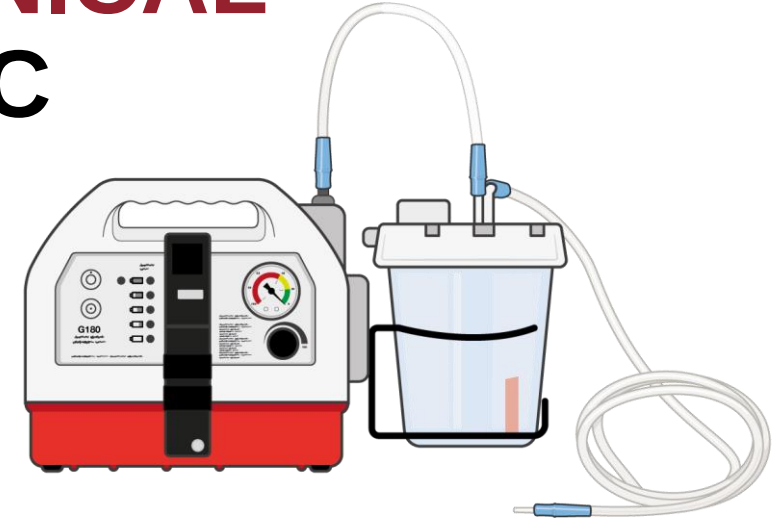
MANUAL AND MECHANICAL SUCTIONING IN TFC



GOOD:
Improvised
suction device



BETTER:
Manual suction
device



BEST:
Mechanical
suction device



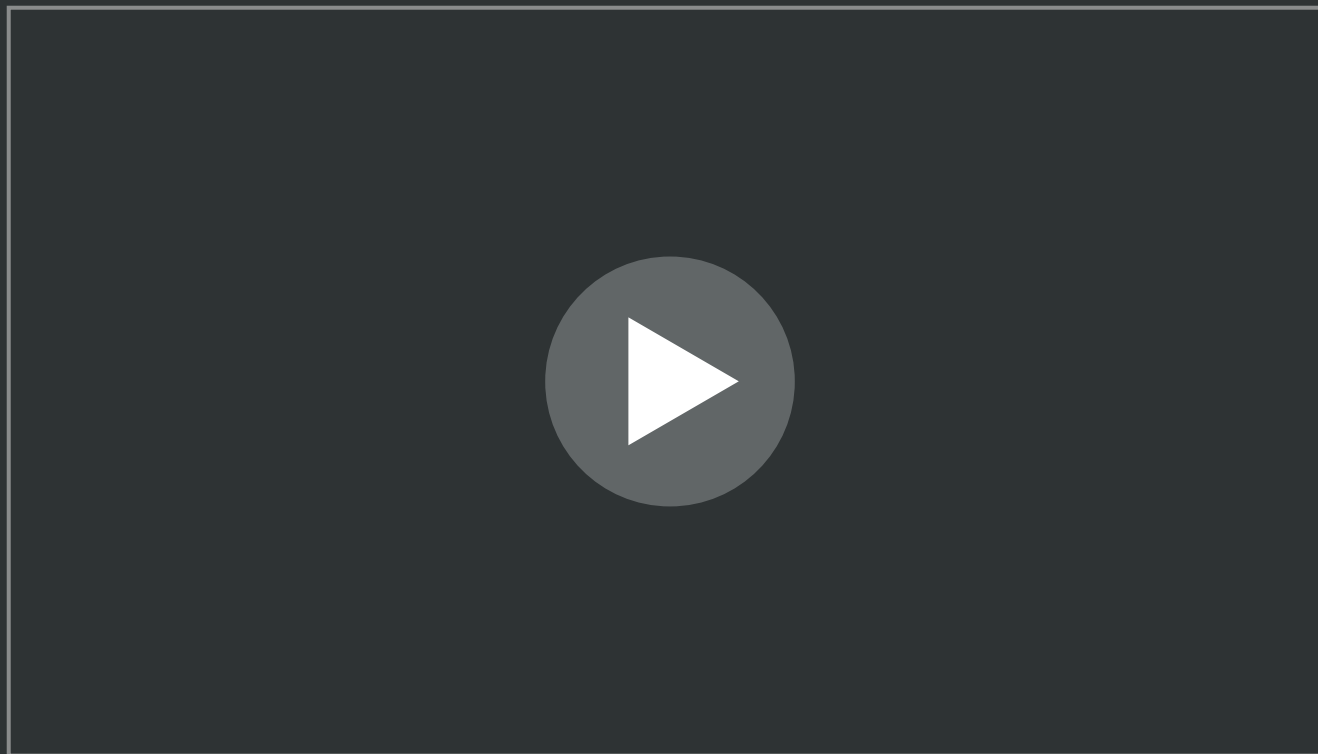
Only insert as far as you can
see to avoid eliciting a gag reflex

Limit the suction time to
NO more than 10 seconds

Suction should only be applied
when withdrawing the catheter

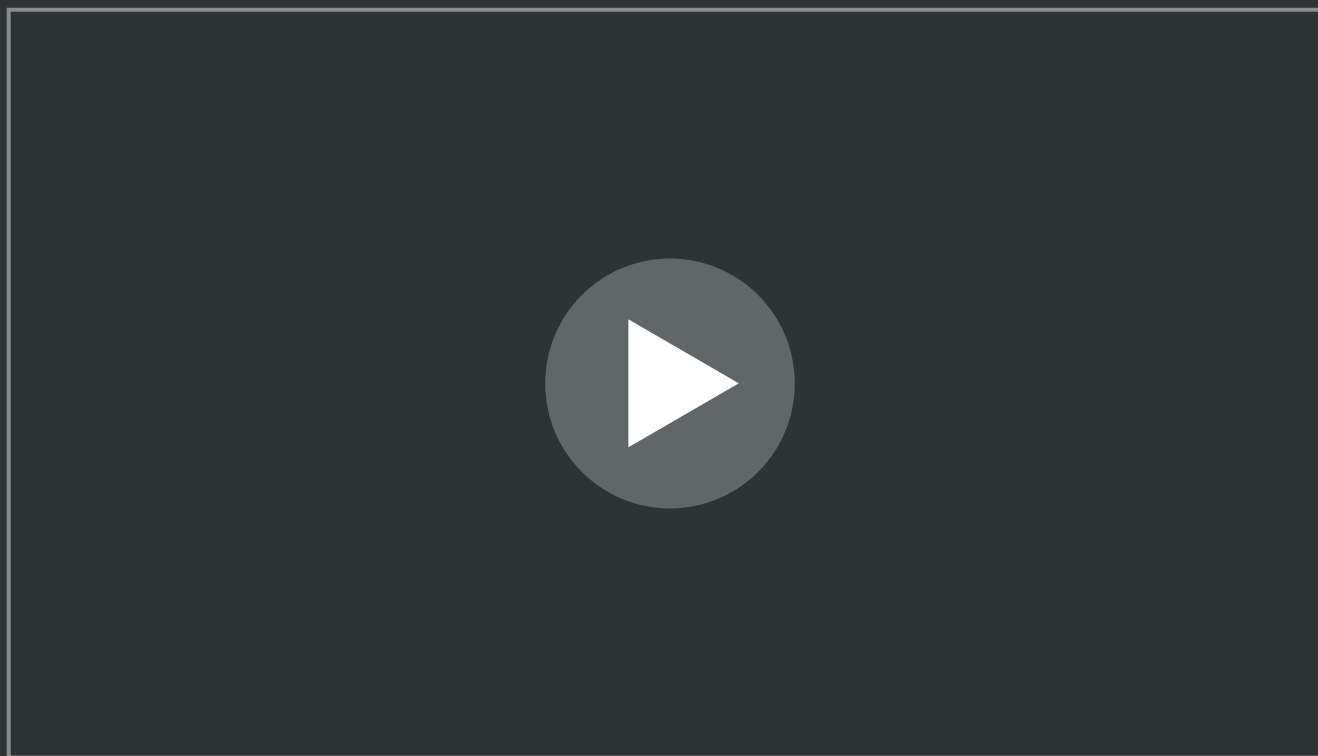
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MANUAL SUCTION VIDEO



Video can be found on deployedmedicine.com

MECHANICAL SUCTION VIDEO



Video can be found on deployedmedicine.com

SKILL STATION

Airway Maneuvers and Suctioning

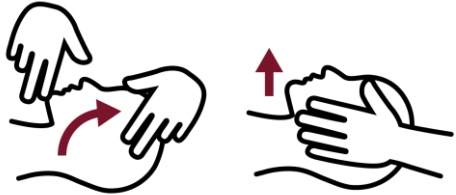
-  Head-Tilt/Chin-Lift
-  Jaw-Thrust Maneuver
-  Recovery Position
-  Manual Suctioning
-  Mechanical Suctioning

CRICOTHYROIDOTOMY

INDICATIONS

PRIMARY INDICATION

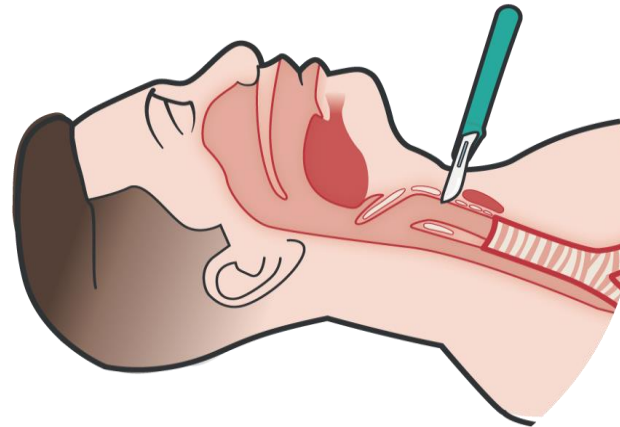
UNSUCCESSFUL airway management with:



Airway maneuvers



Suction
(if appropriate)



CRICOTHYROIDOTOMY is indicated for maxillofacial injuries, to include partial or complete airway obstruction

Thermal and toxic gas injuries are additional indications for cricothyroidotomy

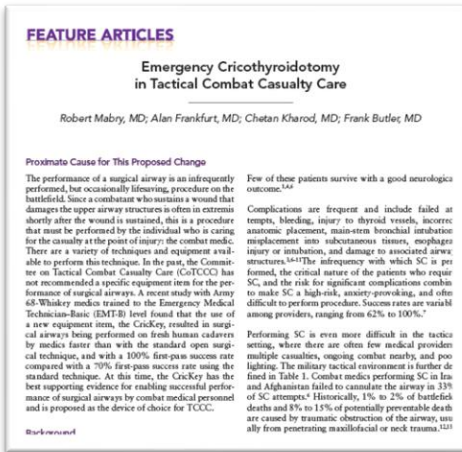


Contraindications:

- Ability to secure less invasive airway
- Tracheal transection
- Massive swelling
- Age Younger than 10-12 years old
- Massive Swelling
- Massive Airway Trauma



CRICOTHYROIDOTOMY TECHNIQUES



Cricothyroidotomy considerations:

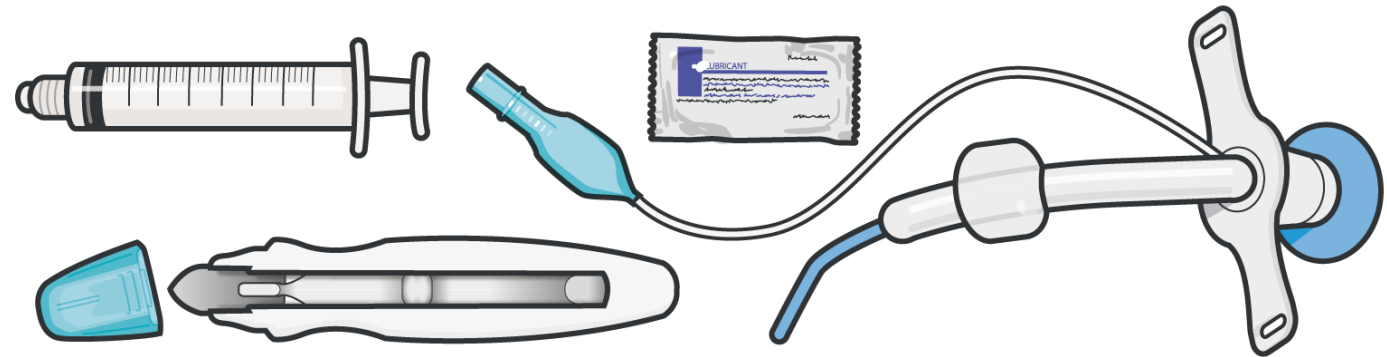
- DO NOT** make incision too short
- Practice **locating anatomical landmarks** frequently
- Avoid** a “stabbing” technique
- Palpate cricothyroid membrane with the index finger, **identifying the landmark** to make a **horizontal incision**

CoTCCC research results:

Preferred method: **Cric-Key™**

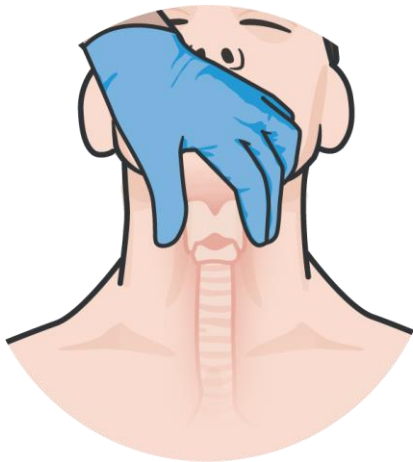
Alternate methods:

- Standard open surgical method
- Bougie-aided open surgical method

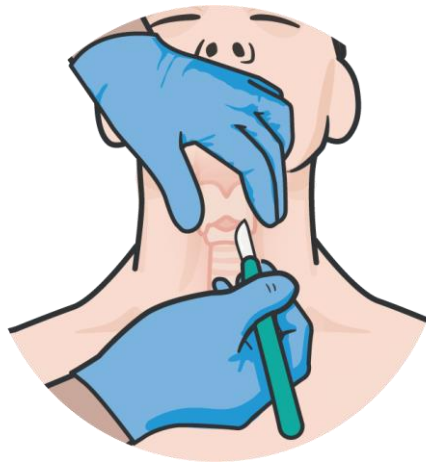


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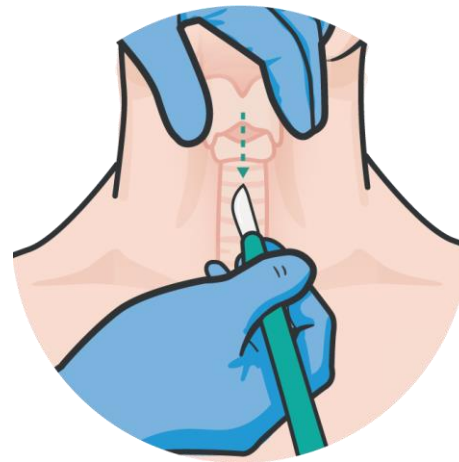
TECHNIQUES *(cont.)*



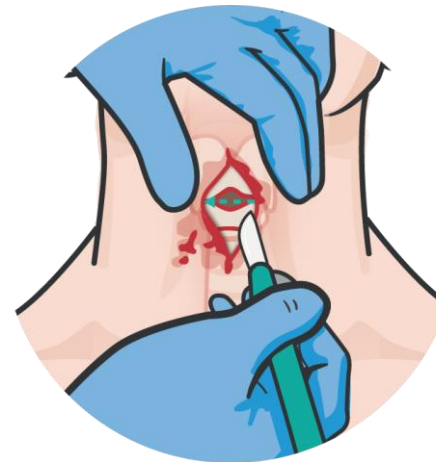
Identify
cricothyroid
membrane



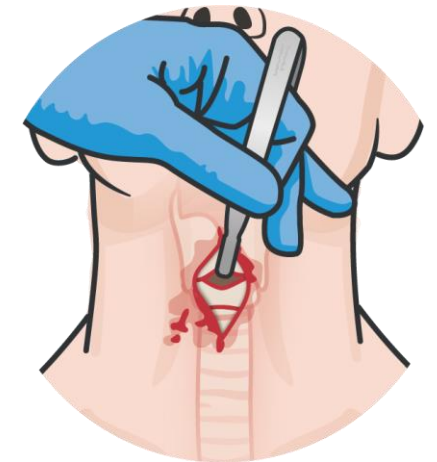
Stabilize larynx



Make 1"
vertical incision



Make horizontal
incision through
membrane



Hook cartilage
and lift to stabilize
and maintain the
opening.

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LIDOCAINE USAGE IN FIELD CRICOTHYROIDOTOMIES



Consider **LIDOCAINE** for **conscious** or **semi-conscious** casualties, or casualties with a **response to painful stimuli**



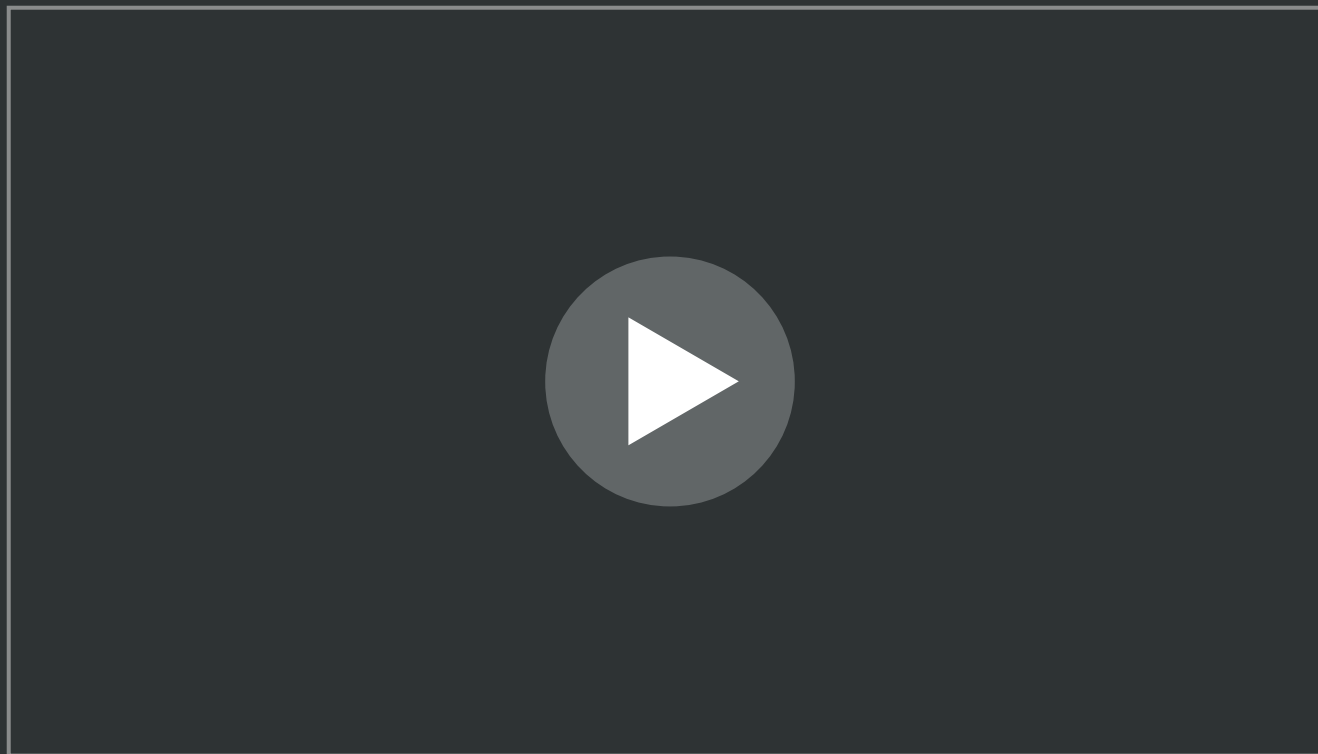
The clinical or tactical situation may be a contraindication to lidocaine usage prior to placing the airway

- Use lidocaine **after identifying** anatomical **landmarks**
- Anesthetize subcutaneous structures **without penetrating** the cricothyroid **membrane** or **trachea**

Contraindications:

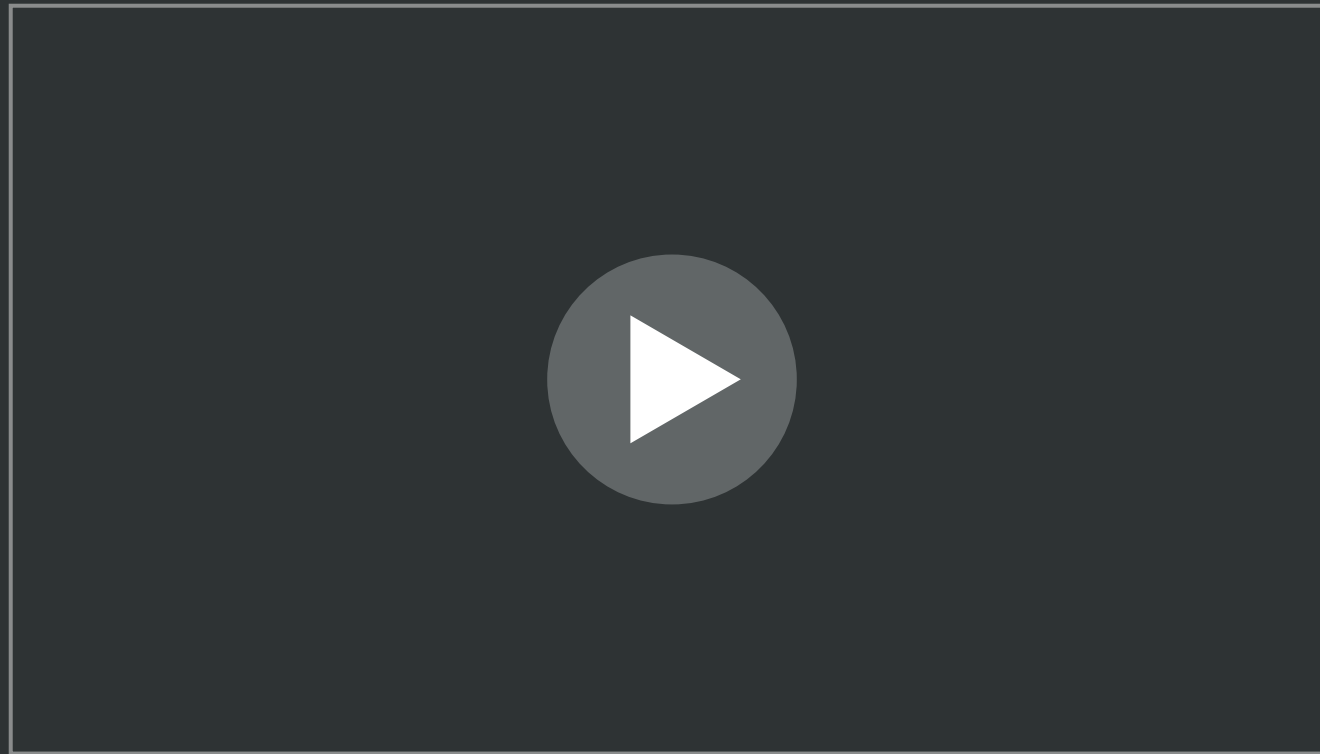
Miscalculation of the dose, injection of the drug into a blood vessel or repeated administration of therapeutic doses are the major causes of systemic toxicity

CRIC-KEY CRICOTHYROIDOTOMY VIDEO



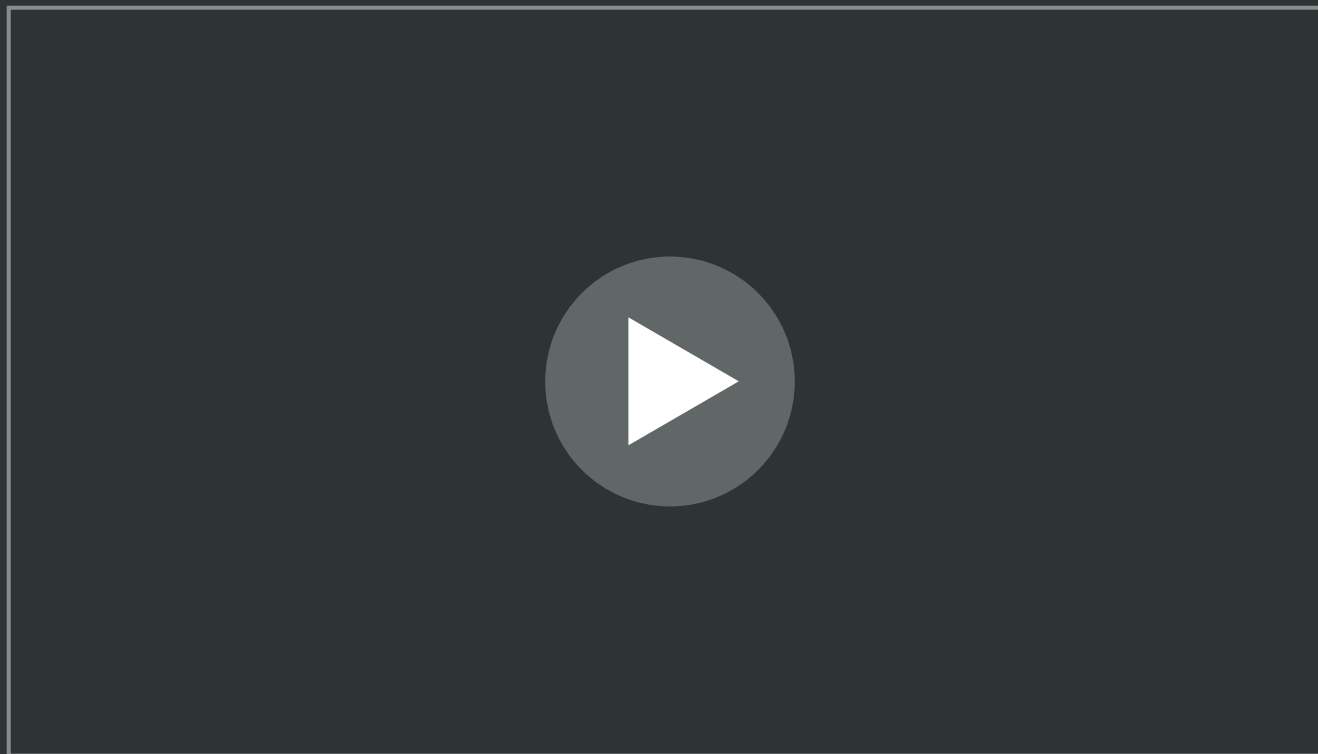
Video can be found on deployedmedicine.com

BOUGIE-AIDED CRICOTHYROIDOTOMY VIDEO



Video can be found on deployedmedicine.com

OPEN CRICOTHYROIDOTOMY VIDEO



Video can be found on deployedmedicine.com

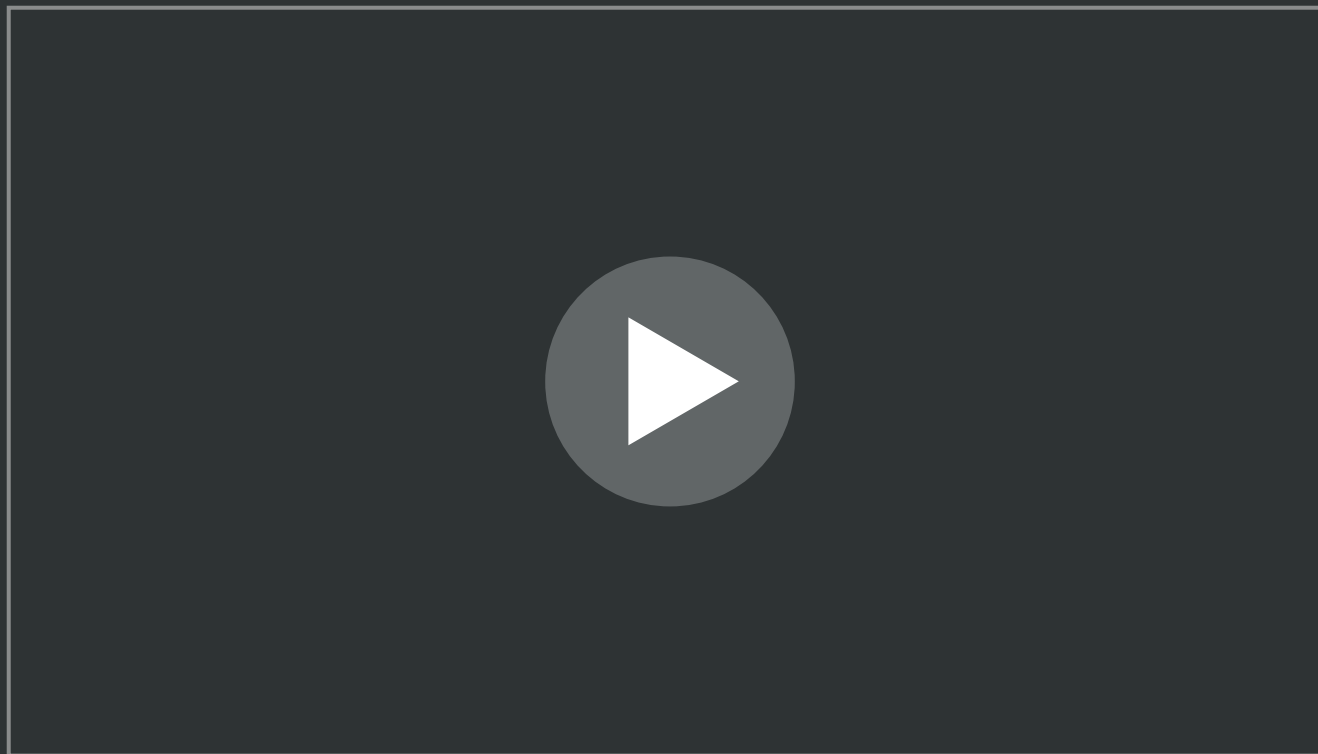
NASOPHARYNGEAL AIRWAYS

- Can be used on both **unconscious** or **semiconscious** casualties with **NO** airway obstruction
- Excellent success in Afghanistan and Iraq
- Lubricate** before inserting
- Insert at 90-degree** angle to the face, NOT along the axis of the external nose
- Tape it** in place after insertion
- To be used in conjunction with the use of a BVM



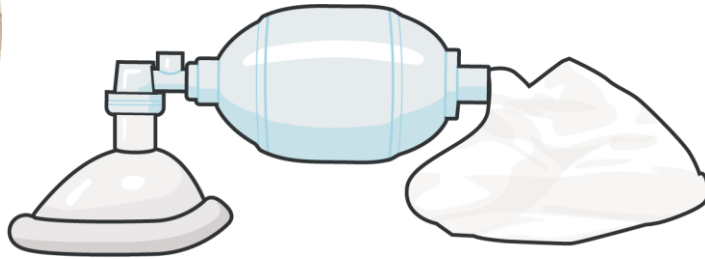
DO NOT attempt to insert an NPA if there is clear fluid coming from nose or ears, signs of inhalation burns, or moderate to severe trauma to the nose

NPA INSERTION VIDEO



Video can be found on deployedmedicine.com

BAG VALVE MASK (BVM) CONSIDERATIONS



Provide one
breath every 5-6
seconds

Use **SLOW**,
STEADY squeeze
over 1-2 seconds

Situations where ventilation
support may be needed:

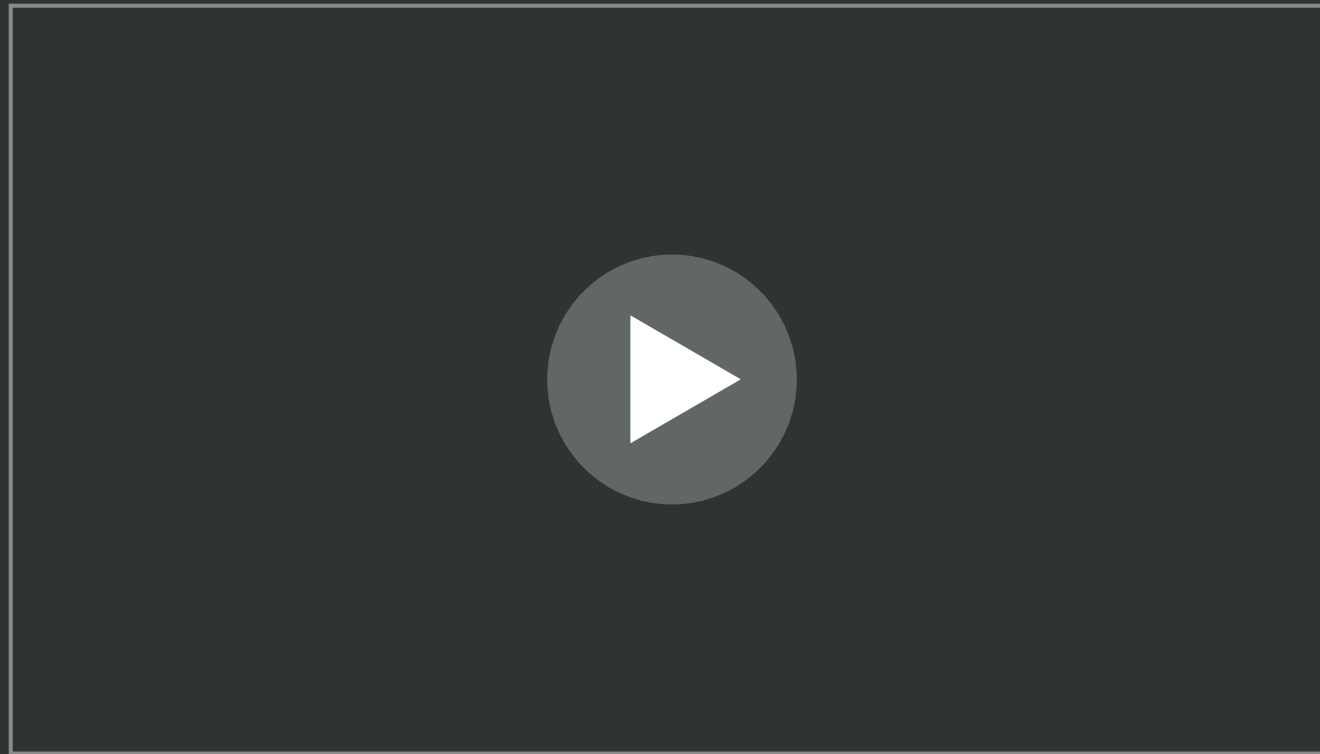
- A casualty **NOT** breathing on their own
- Progressive hypoxic respiratory distress
- Progressive hypercapnic respiratory distress
- Semi-conscious or conscious patients
with mental status changes



- The EC technique is also taught to
Combat Lifesavers so they can support you
- Ventilations can be performed alone or
with two people working together

MARCH

BAG VALVE MASK TECHNIQUES VIDEO



Video can be found on deployedmedicine.com

SKILL STATION

ADVANCED AIRWAY AND BAG VALVE MASK SKILL STATION

- ✓ Cric-Key Cricothyroidotomy
- ✓ Bougie-Aided Cricothyroidotomy
- ✓ Open Surgical Cricothyroidotomy
- ✓ Bag Valve Mask with NPA

OXYGEN ADMINISTRATION IN TFC CONSIDERATIONS



Availability of oxygen is very limited in TFC

Oxygen may be present at aid stations, casualty collection points or on convoys

Current TCCC Guidelines only recommend oxygen for refractory shock and TBI patients

Maintain O2 saturation >90%

*Flow rate often 3 liters/min
usually limited by O2 generation*



Tactical Evacuation Phase
indications:

- **Low oxygen** saturation
- Injuries with **impaired oxygenation**
- **Shock**
- **Smoke** inhalation
- Trauma at **altitude**

*If available, **consider** initiating oxygen during TFC, just prior to evacuation*

MARCH

PULSE OXIMETRY MONITORING

Hypoxemia in TFC is difficult to assess

- **Low-light** conditions mask signs
- Physical findings impaired by the **tactical environment**



Use pulse oximetry in casualties with:

- Injuries that impair oxygenation
Blasts, chest injuries, etc.
- Traumatic brain injury
Ensure O2 sats >90%

NOTE: Shock is **not** always preceded by a fall in O2 saturation levels

Factors Affecting Pulse Ox Readings

Low readings may be seen with:

- **Shock**
- **Cold temperatures**

High readiness may be seen with:

- **Carboxyhemoglobinemia**

Impaired readings may be seen with:

- Nail polish
- Very bright environments
- Skin pigmentations
- Motion artifact



TCCC Guideline Recommendation:

Monitor the hemoglobin oxygen saturation in casualties to help assess airway patency

SUMMARY

Knowledge Topics

- **Signs** of airway obstruction
- **Considerations** for spinal immobilization
- Progressive **strategies** for airway management
- **Indications** for an advanced airway
- **Considerations** for using oxygen
- Importance of pulse oximetry

Skills and Abilities

- Airway maneuvers
(head-tilt/chin-lift or jaw-thrust method)
- Recovery position
- Manual and mechanical suctioning
- Cricothyroidotomy
- Bag valve mask ventilation with NPA

CHECK ON LEARNING

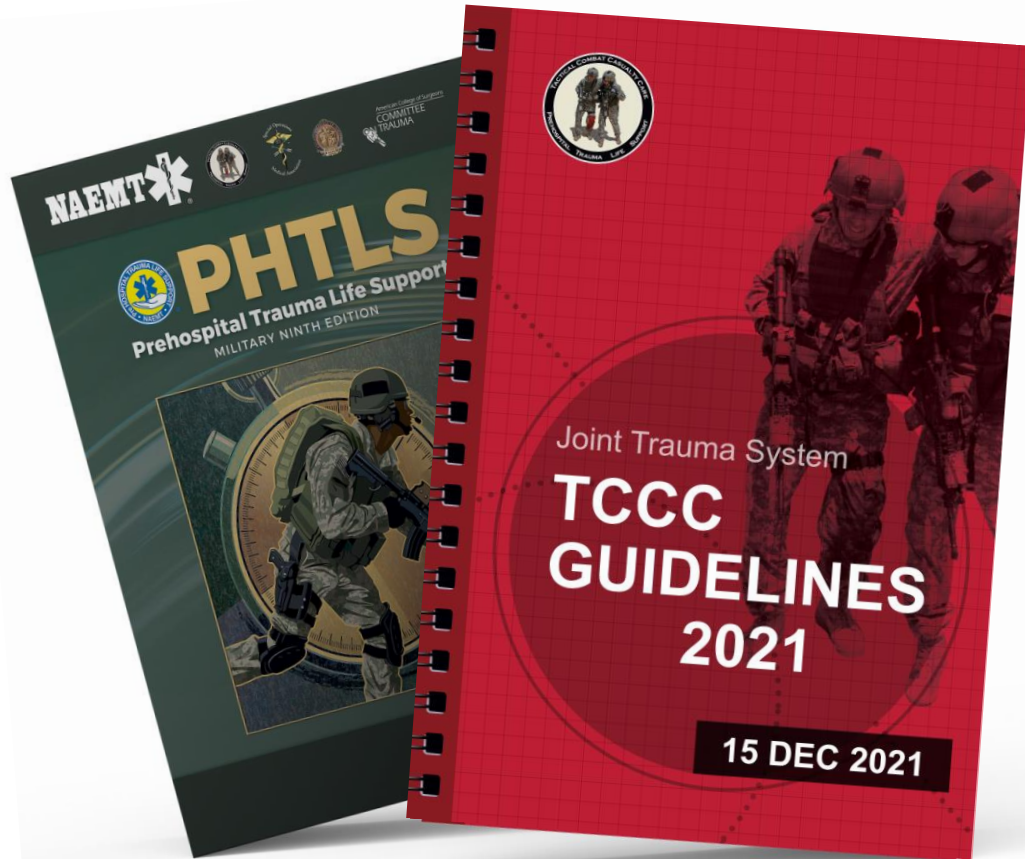
-  What are the signs of an airway obstruction?
-  What is the best position for a conscious casualty that is breathing on their own?
-  What are common errors when performing a cricothyroidotomy?
-  What condition warrants oxygenation in TFC according to the TCCC Guidelines?



ANY QUESTIONS?



REFERENCES



TCCC: Guidelines

by JTS/CoTCCC

These guidelines, updated regularly, are the result of decisions made by CoTCCC in exploring evidence-based research on best practices.

PHTLS: Military Edition, Chapter 25

by NAEMT
Prehospital Trauma Life Support,
Military Ninth Edition