CMC TCCC

COMBAT MEDIC/ CORPSMAN

DHA Defense Health Agency JOINT TRAUMA SYSTEM

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

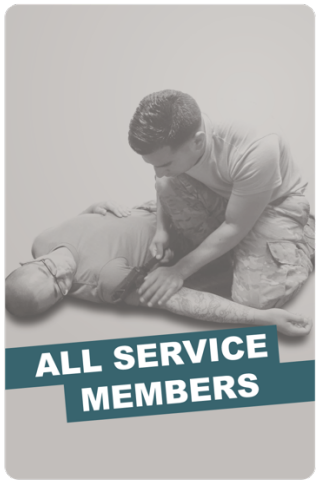
TCCC TIER 3
Combat Medic/Corpsman

TCCC TIER 4
Combat Paramedic/Provider

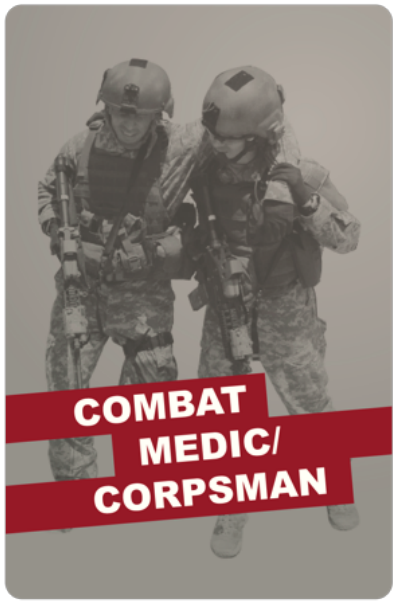
TACTICAL COMBAT CASUALTY CARE (TCCC) ROLE-BASED TRAINING SPECTRUM

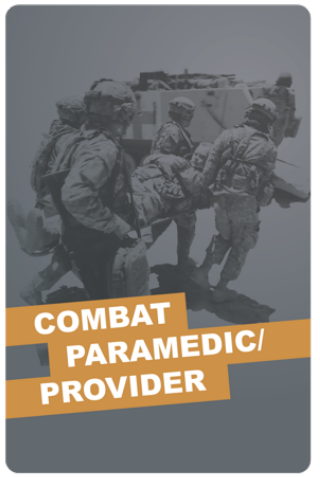
ROLE 1 CARE

NONMEDICAL PERSONNEL



MEDICAL PERSONNEL





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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 the insertion of a nasopharyngeal airway in a casualty in Tactical Field Care. (CLS T8:E48)
- **8.7** Demonstrate suctioning the airway of a casualty with a Manual Suction Unit.
- **8.8** Demonstrate suctioning the airway of a casualty with a Mechanical Suction Unit.
- **8.9** Demonstrate the insertion of a CoTCCC-recommended extraglottic airway in a trauma casualty in Tactical Field Care.
- **8.10** Identify the indications, contraindications, and techniques for performing cricothyroidotomy in Tactical Field Care.
- **8.11** Identify the indications, contraindications, and administration methods of lidocaine as a local anesthesia when performing a cricothyroidotomy in Tactical Field Care.
- **8.12** Demonstrate the procedures for performing a cricothyroidotomy in Tactical Field Care.
- **8.13** Describe the technique for ventilating a casualty with a bag valve mask (BVM) in Tactical Field Care.
- **8.14** Demonstrate ventilating a casualty with a BVM in Tactical Field Care.
- **8.15** Identify the considerations, indications, and limitations for oxygen administration in Tactical Field Care.
- **8.16** Identify the importance, considerations, limitations, and application of pulse oximetry monitoring in Tactical Field Care.

16 x ENABLING LEARNING OBJECTIVES

= **Terminal Learning Objectives** ● = Cognitive ELOs ▨ = Performance ELOs

MARCH PAWS

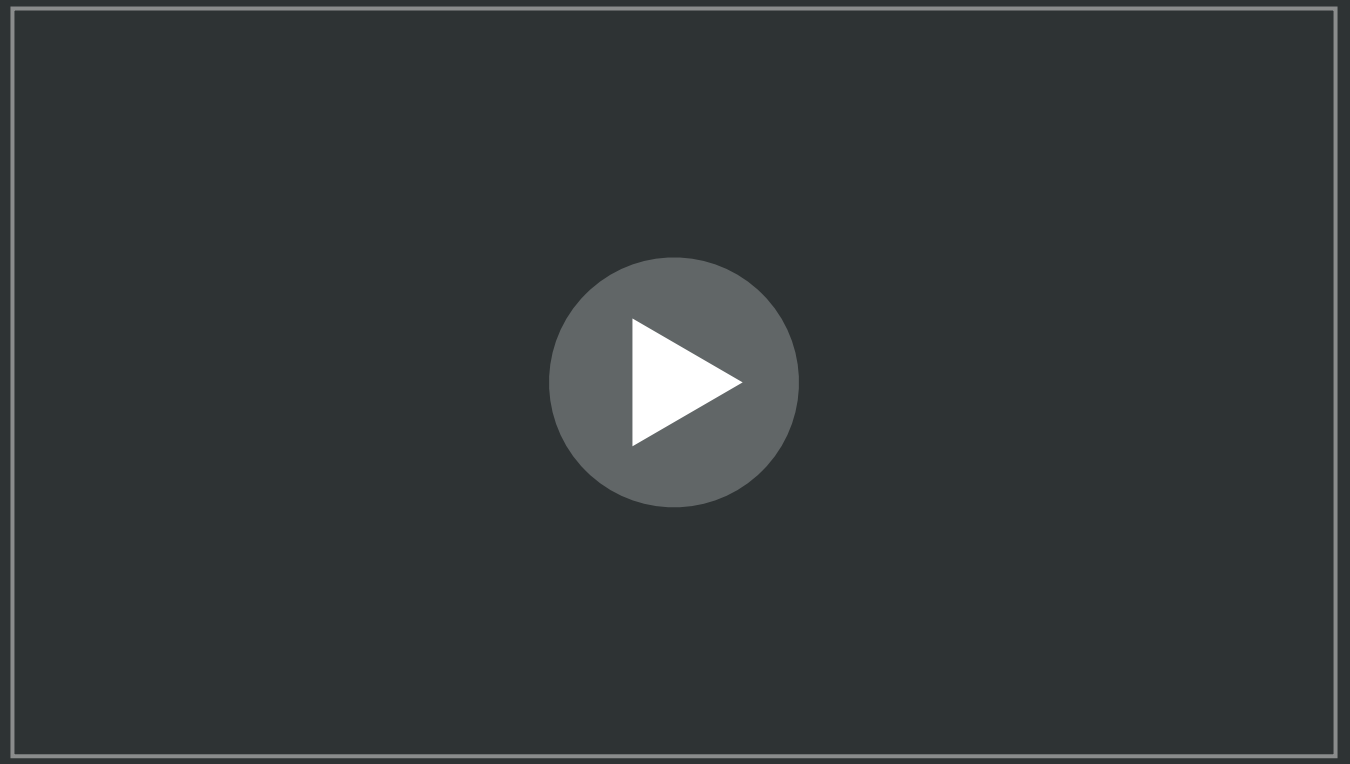
DURING LIFE-THREATENING

- **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 OVERVIEW VIDEO



Video can be found on deployedmedicine.com

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

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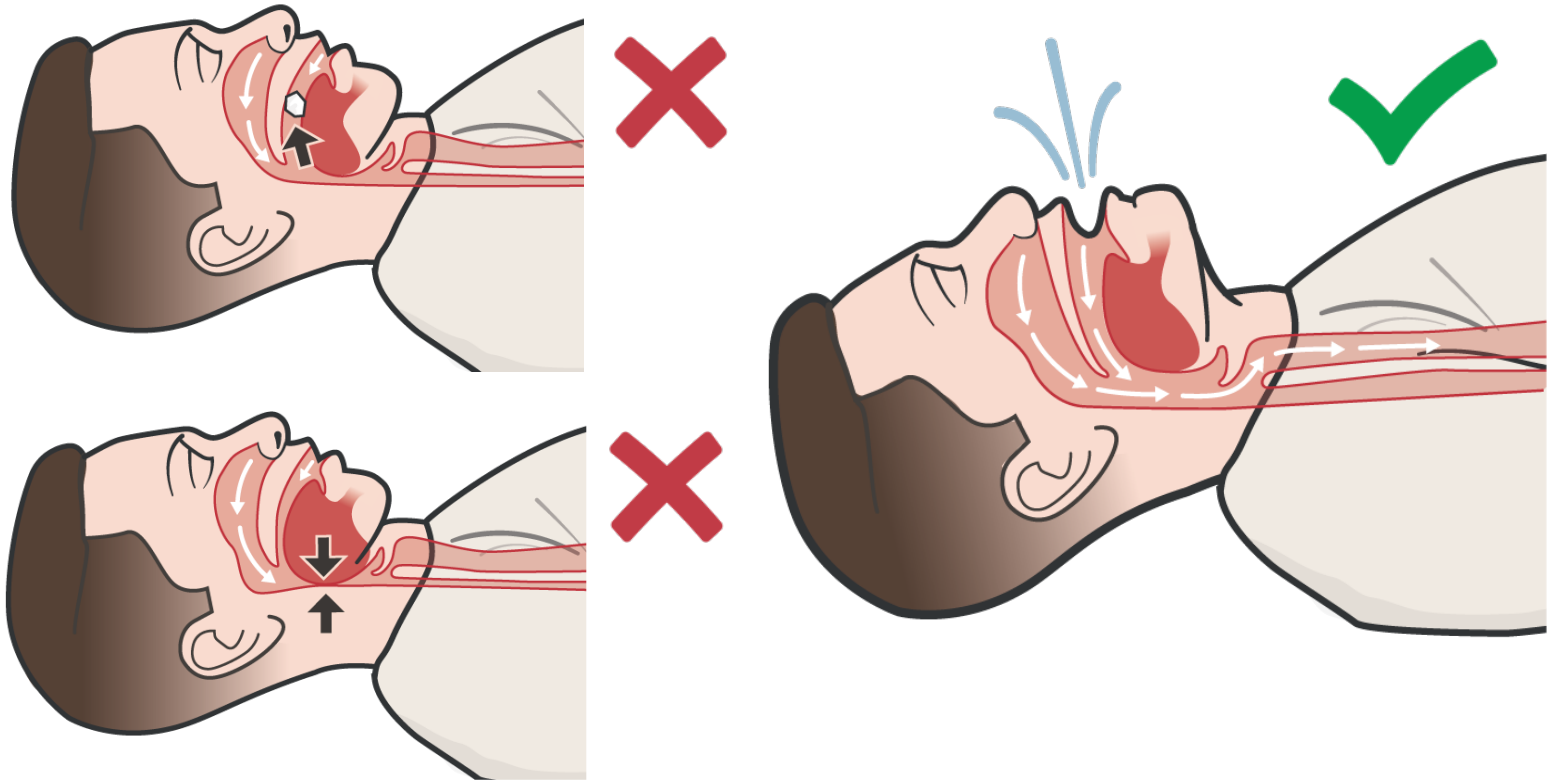
IDENTIFYING AN OBSTRUCTED AIRWAY



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

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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

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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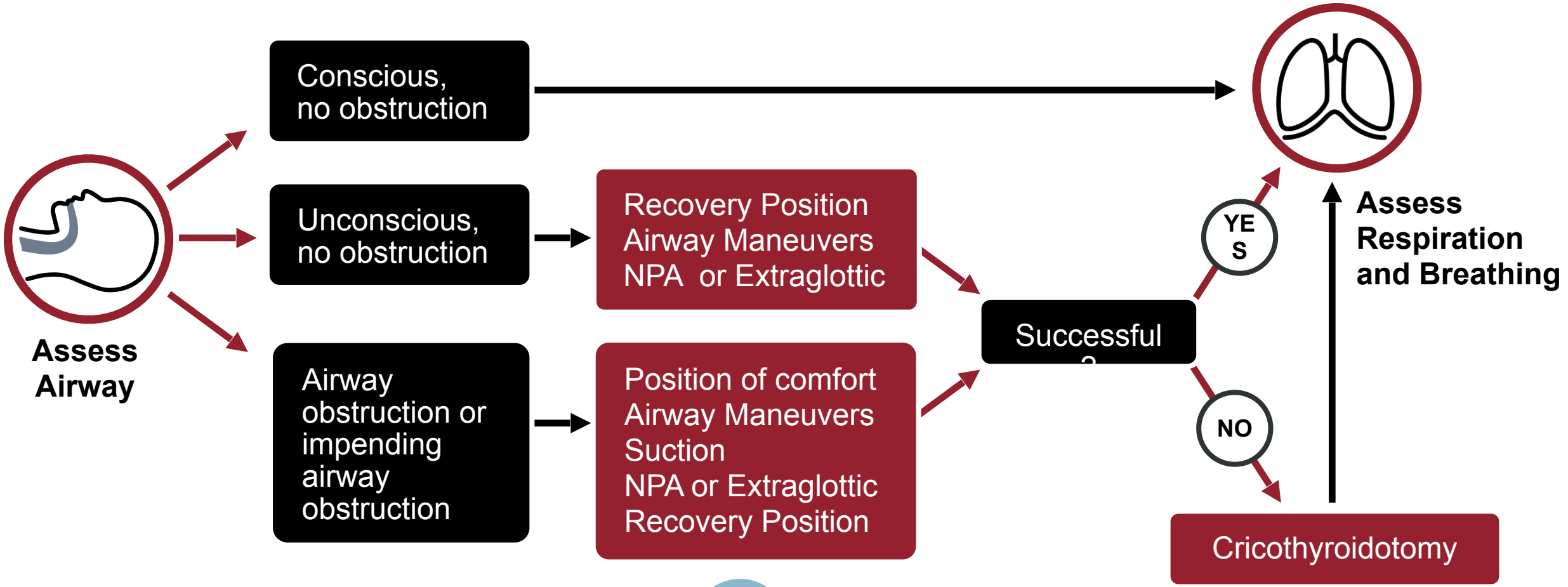
PROGRESSIVE STRATEGIES FOR AIRWAY MANAGEMENT



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LIMITATIONS OF AIRWAY MANAGEMENT IN TFC

Complications of Airway Management may include:

- Burns to the airway
- Intracranial Pressure (NPA/ OPA)
- 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

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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

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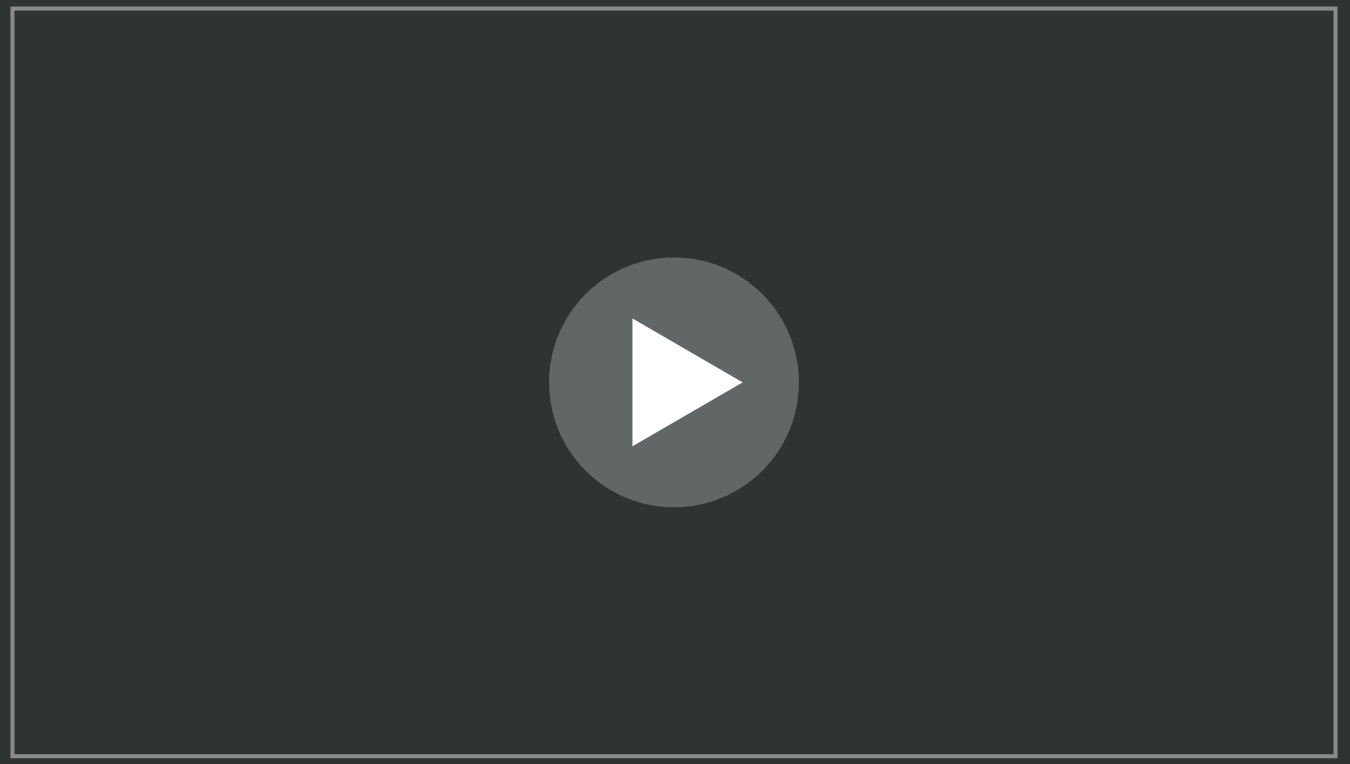
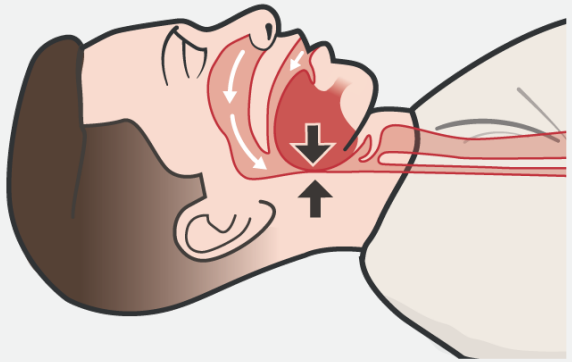
RECOVERY POSITION TECHNIQUE VIDEO



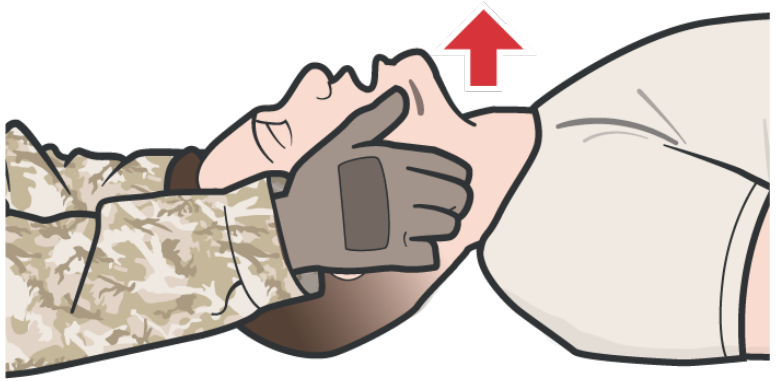
Video can be found on deployedmedicine.com

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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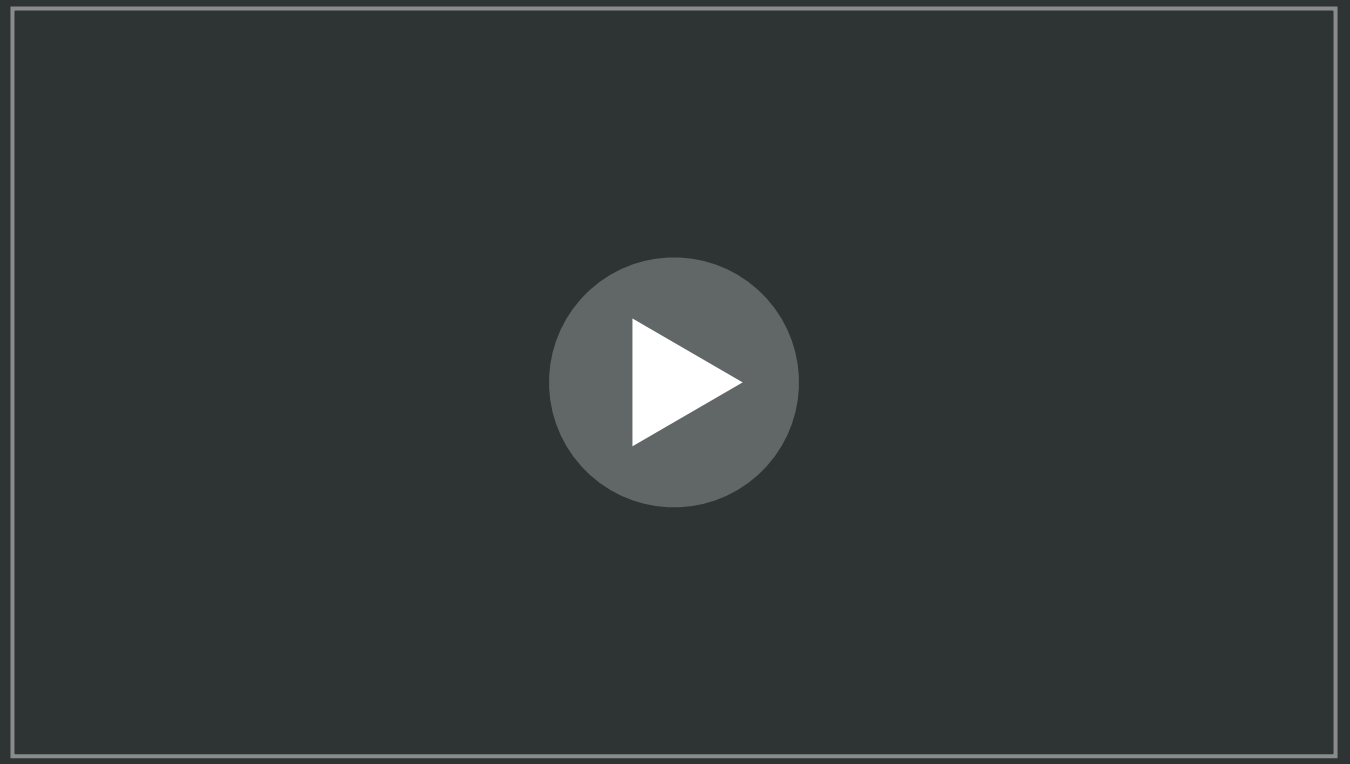
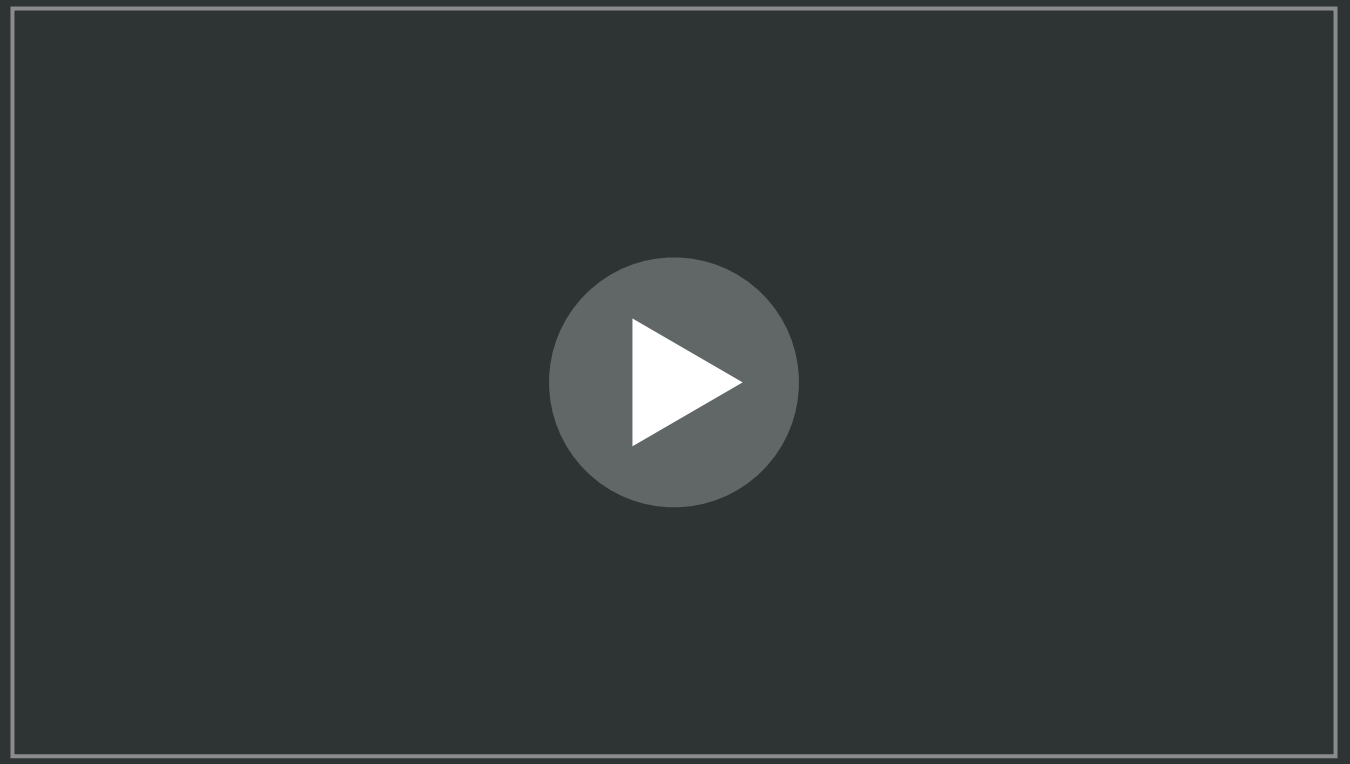
HEAD-TILT/CHIN-LIFT MANEUVER VIDEO



Video can be found on deployedmedicine.com

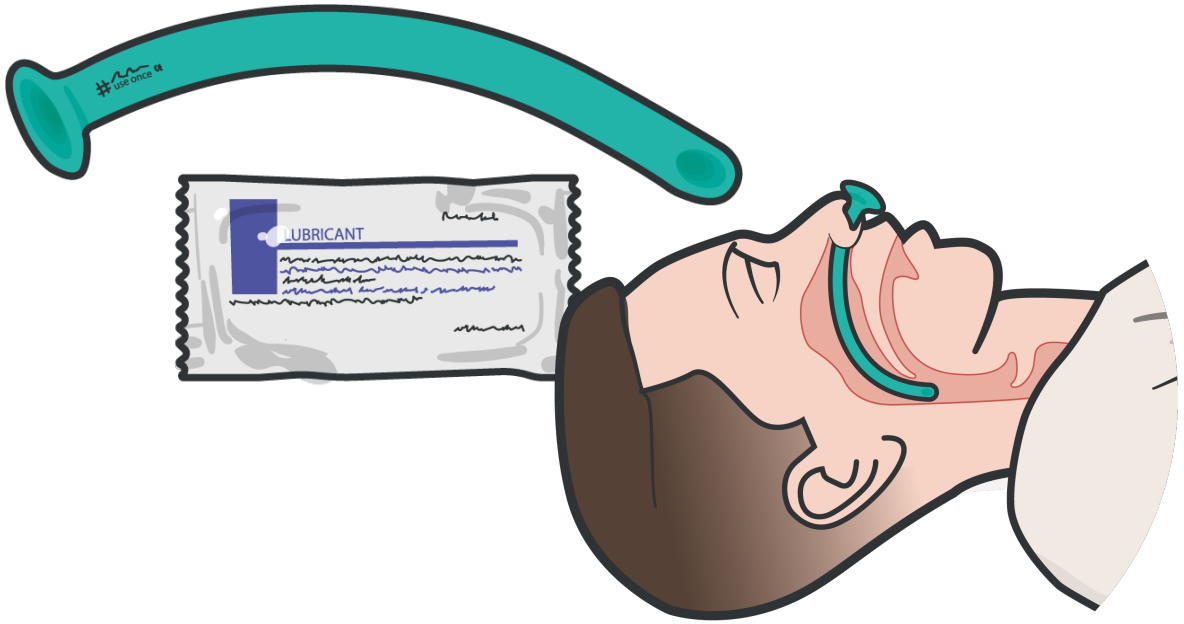
JAW-THRUST MANEUVER VIDEO



Video can be found on deployedmedicine.com

NASOPHARYNGEAL AIRWAYS

- Can be used on both **unconscious** or **semiconscious** casualties with or without airway obstruction to help **open and maintain an open airway**
- 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



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

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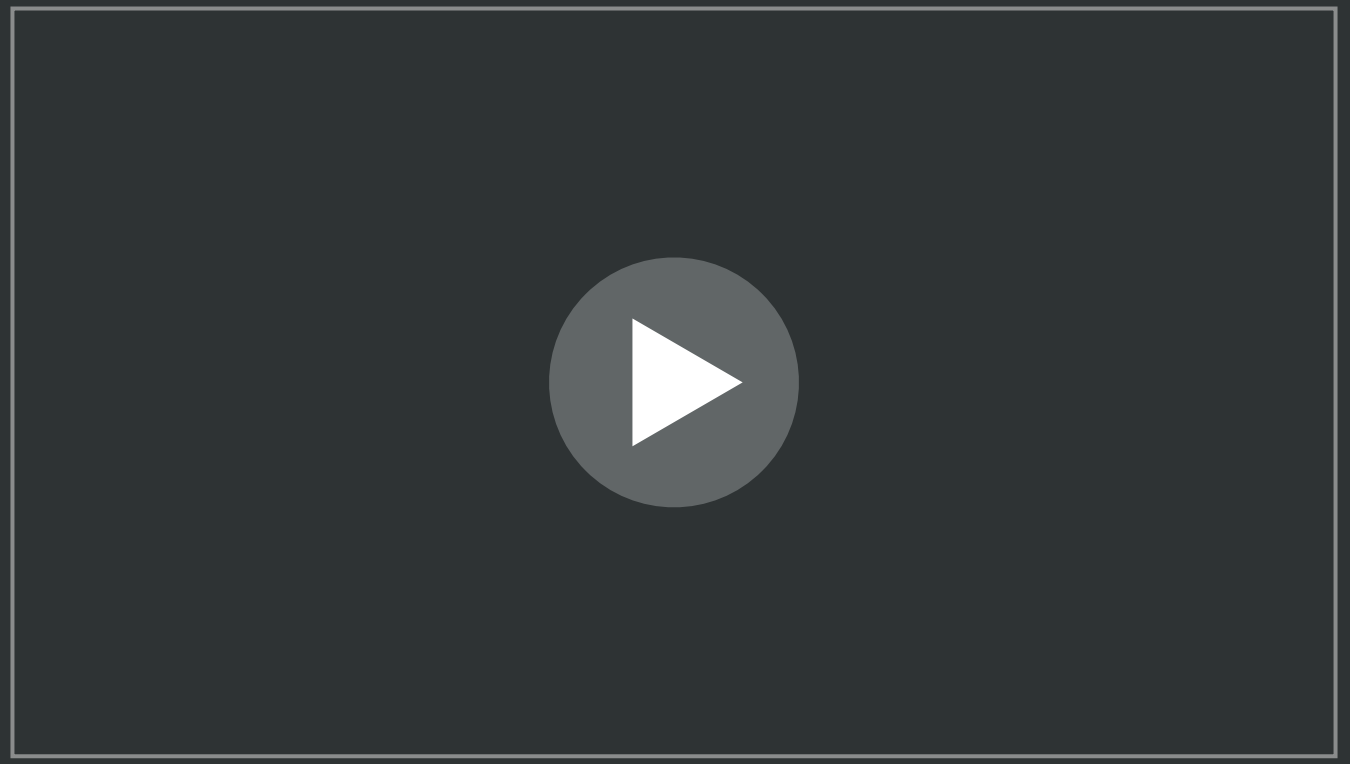
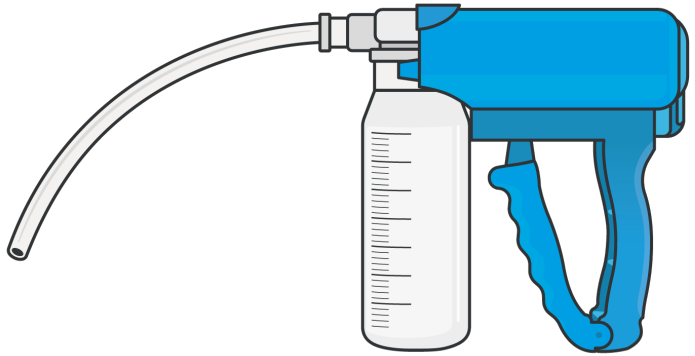
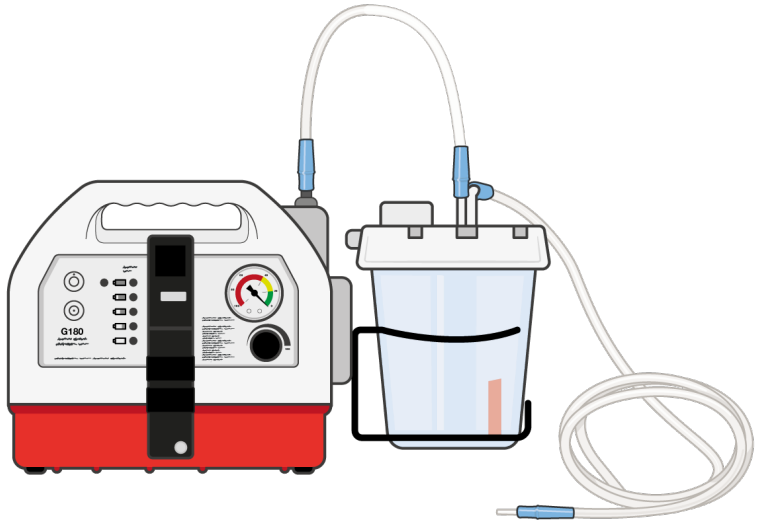
NPA INSERTION VIDEO



Video can be found on deployedmedicine.com

MANUAL AND MECHANICAL SUCTIONING IN TFC





GOOD:
Improved suction device

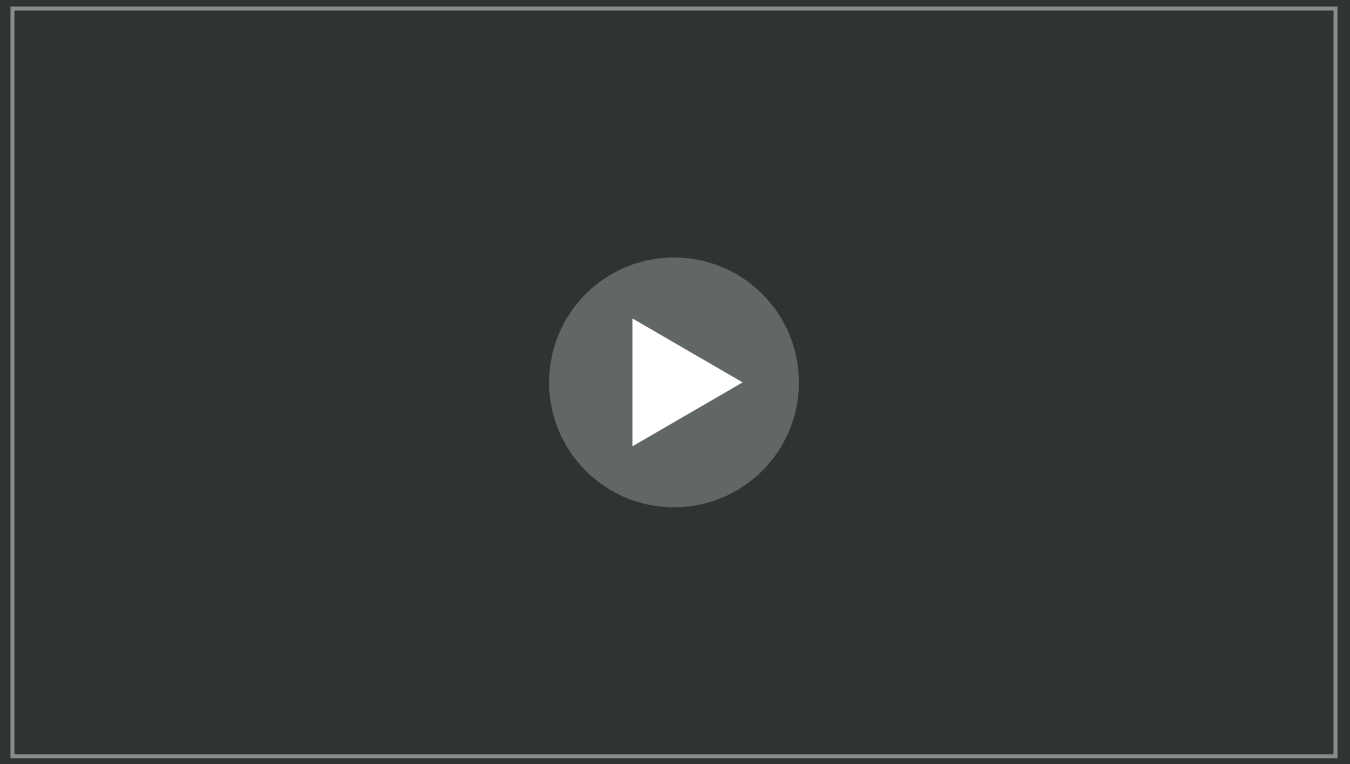
BETTER:
Manual suction device

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

MARCH

MANUAL SUCTION VIDEO



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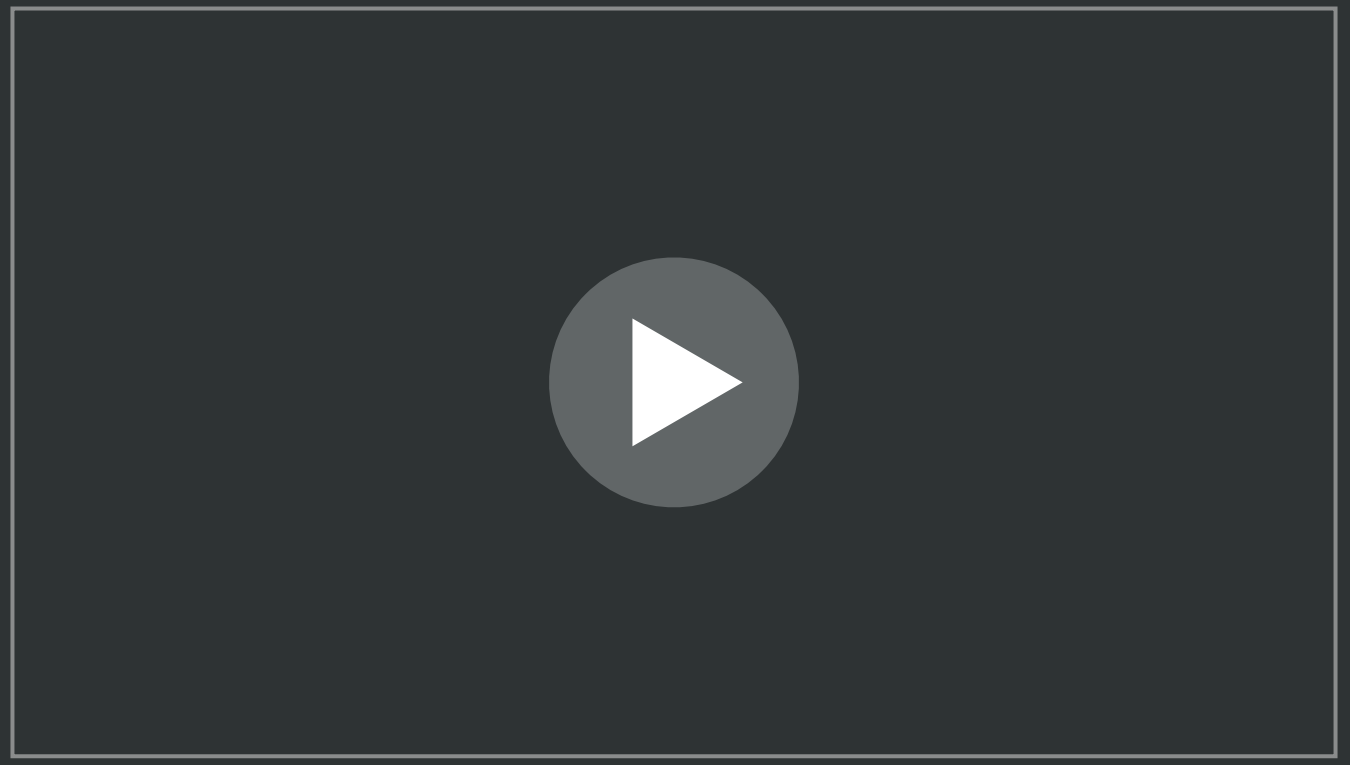
MECHANICAL SUCTION VIDEO



Video can be found on deployedmedicine.com

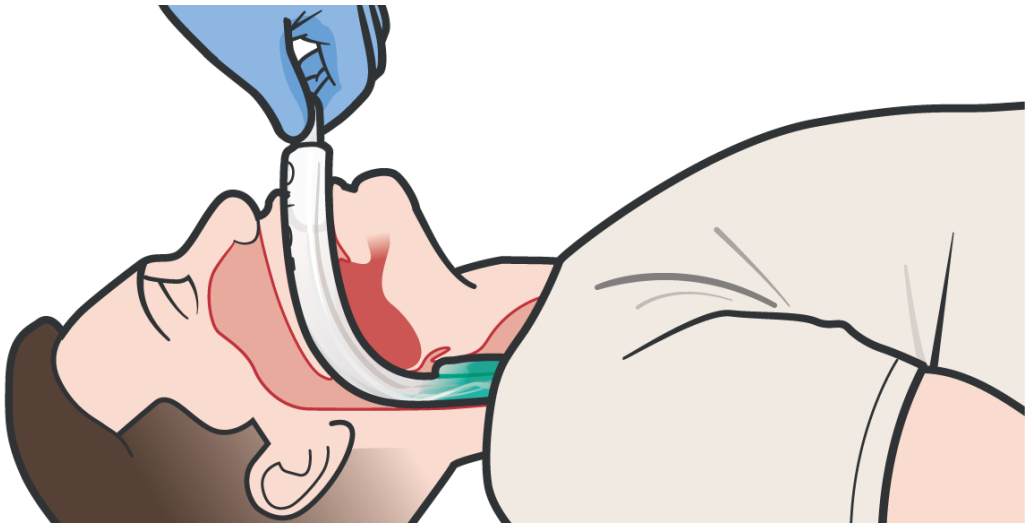
SKILL STATION

Airway Maneuvers and Suctioning

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

EXTRAGLOTTIC AIRWAYS

EXTRAGLOTTIC AIRWAYS form a seal over the hypopharynx, opening the airway for ventilations



i-gel® benefits:

- No need to inflate cuff
- No need to monitor cuff pressure during evacuation since there is no air in the cuff

EXTRAGLOTTIC AIRWAYS will not be tolerated by a casualty who is not deeply unconscious

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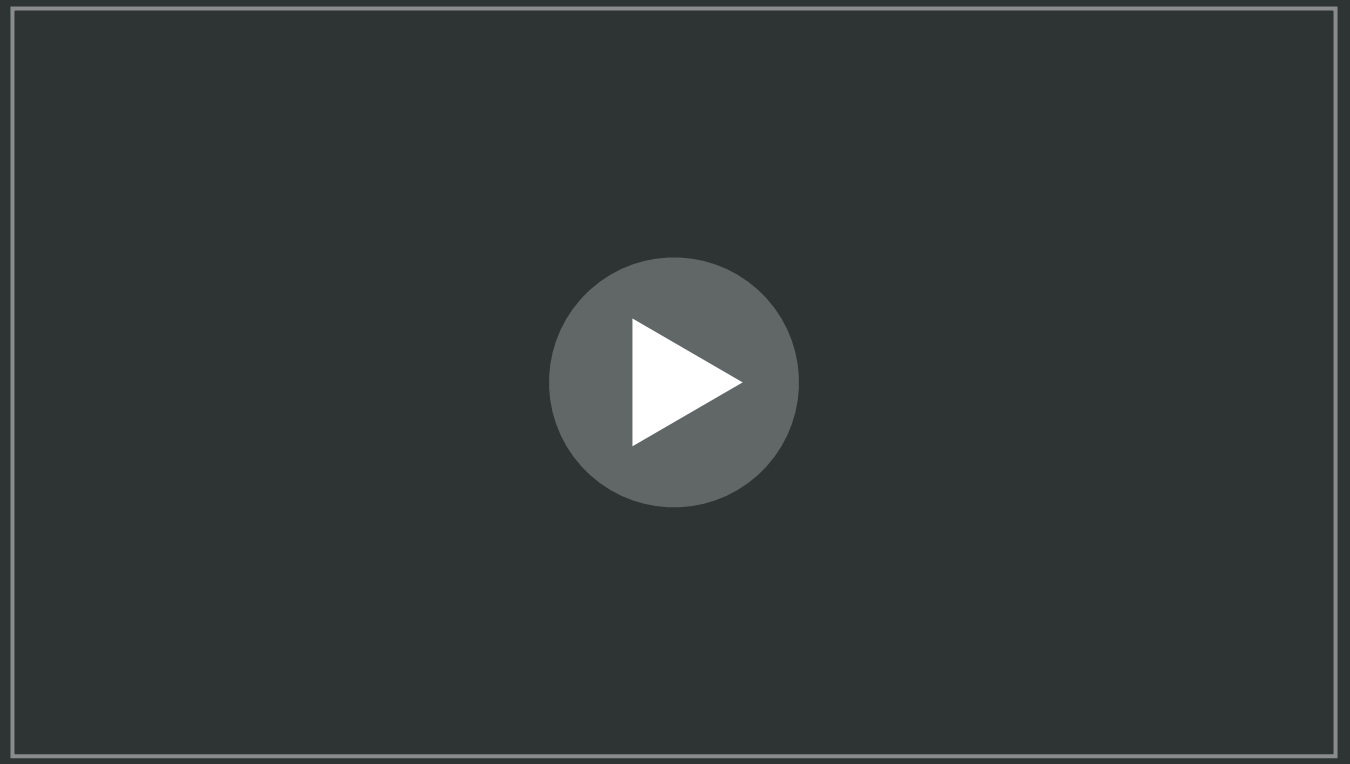
EXTRAGLOTTIC AIRWAY INSERTION VIDEO



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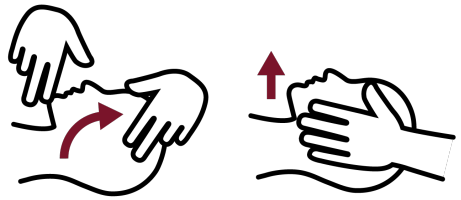
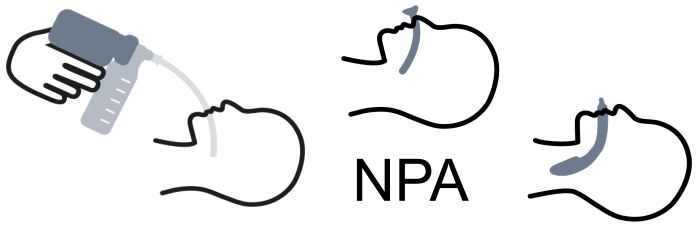
CRICOTHYROIDOTOMY
INDICATIONS

PRIMARY INDICATION
UNSUCCESSFUL airway management with:

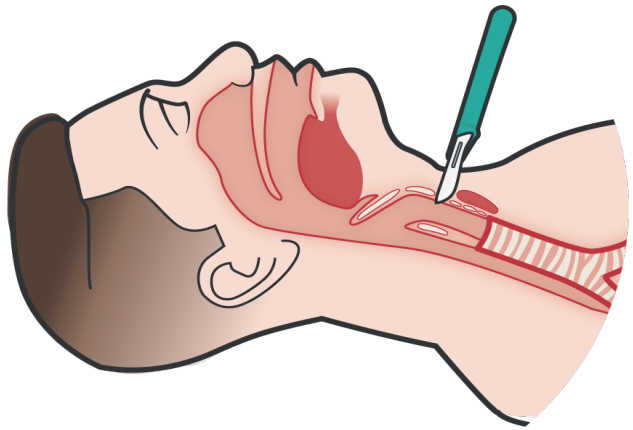


Airway maneuvers



Suction
(if appropriate)

Extraglottic airway



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

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Thermal and toxic gas injuries are additional indications for cricothyroidotomy

Contraindications:

- Ability to secure less invasive airway
- Tracheal transection that retracts into the mediastinum
- Massive swelling
- Age Younger than 10-12 years old

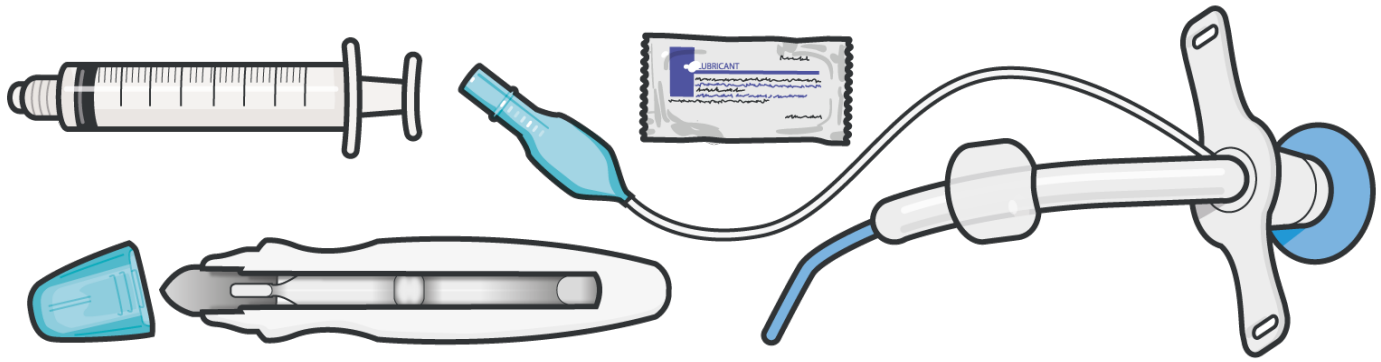
CRICOTHYROIDOTOMY TECHNIQUES

Recommended Methods:

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

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



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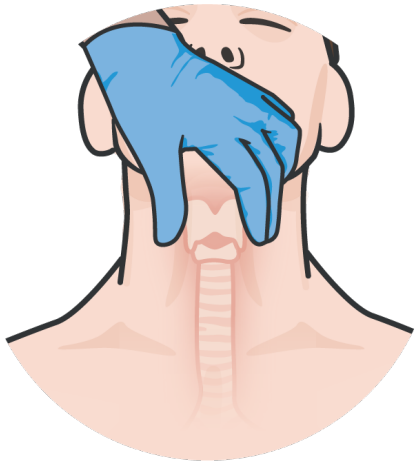
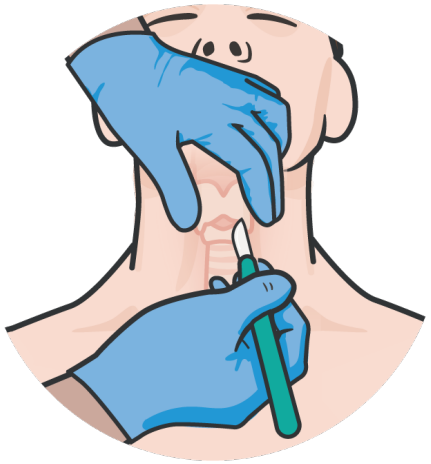
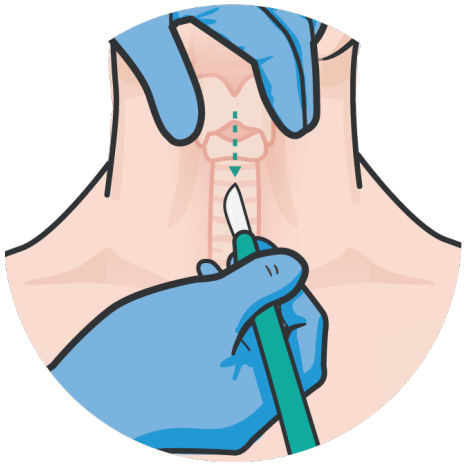
TECHNIQUES *(cont.)*



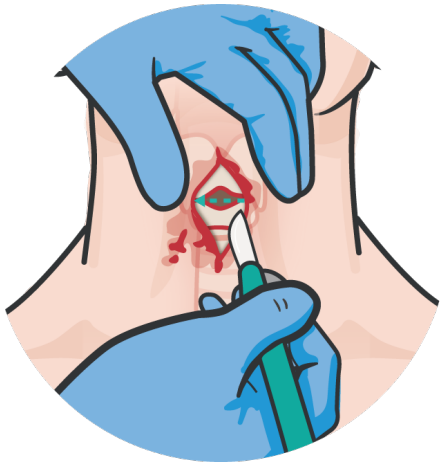
Identify cricothyroid membrane



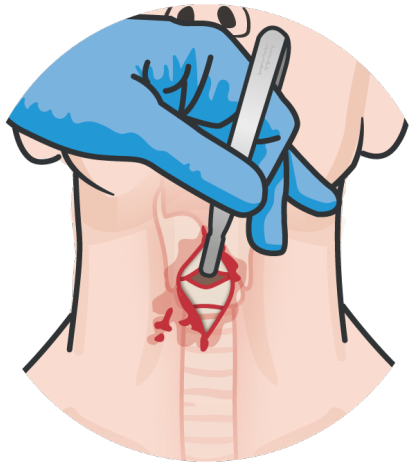
Stabilize larynx



Make 1” vertical incision



Make horizontal incision through membrane



Hook cartilage and lift to stabilize and maintain the opening.

MARCH

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**

WARNING!

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

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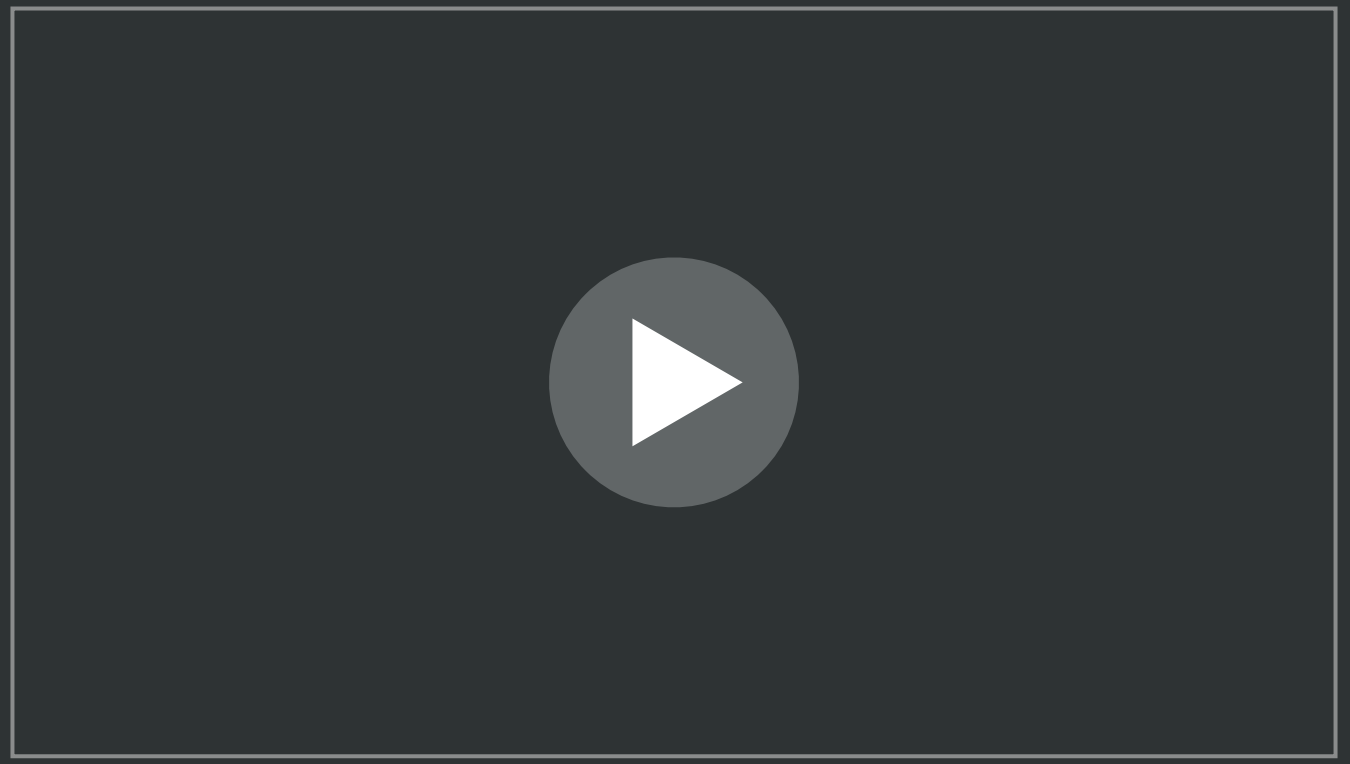
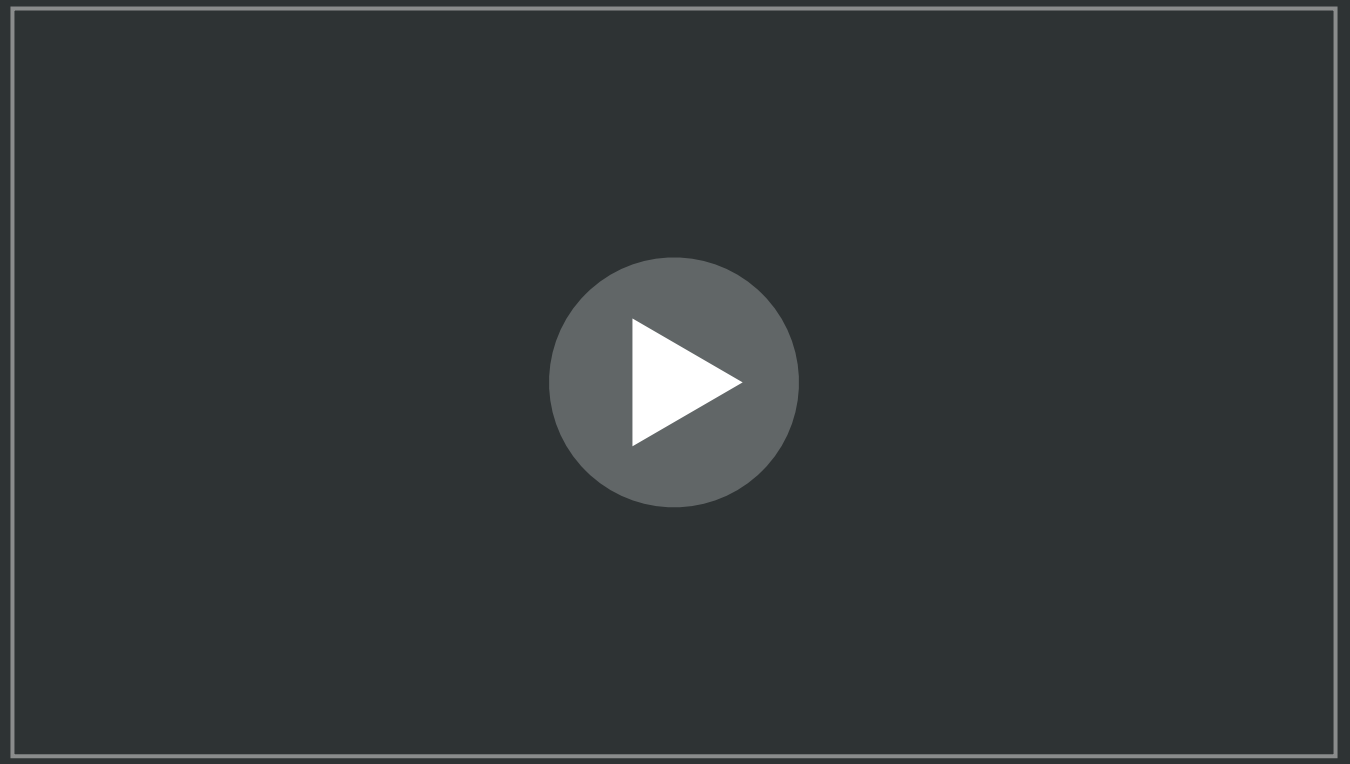
CRIC-KEY CRICOTHYROIDOTOMY VIDEO



Video can be found on deployedmedicine.com

BOUGIE-AIDED CRICOTHYROIDOTOMY VIDEO



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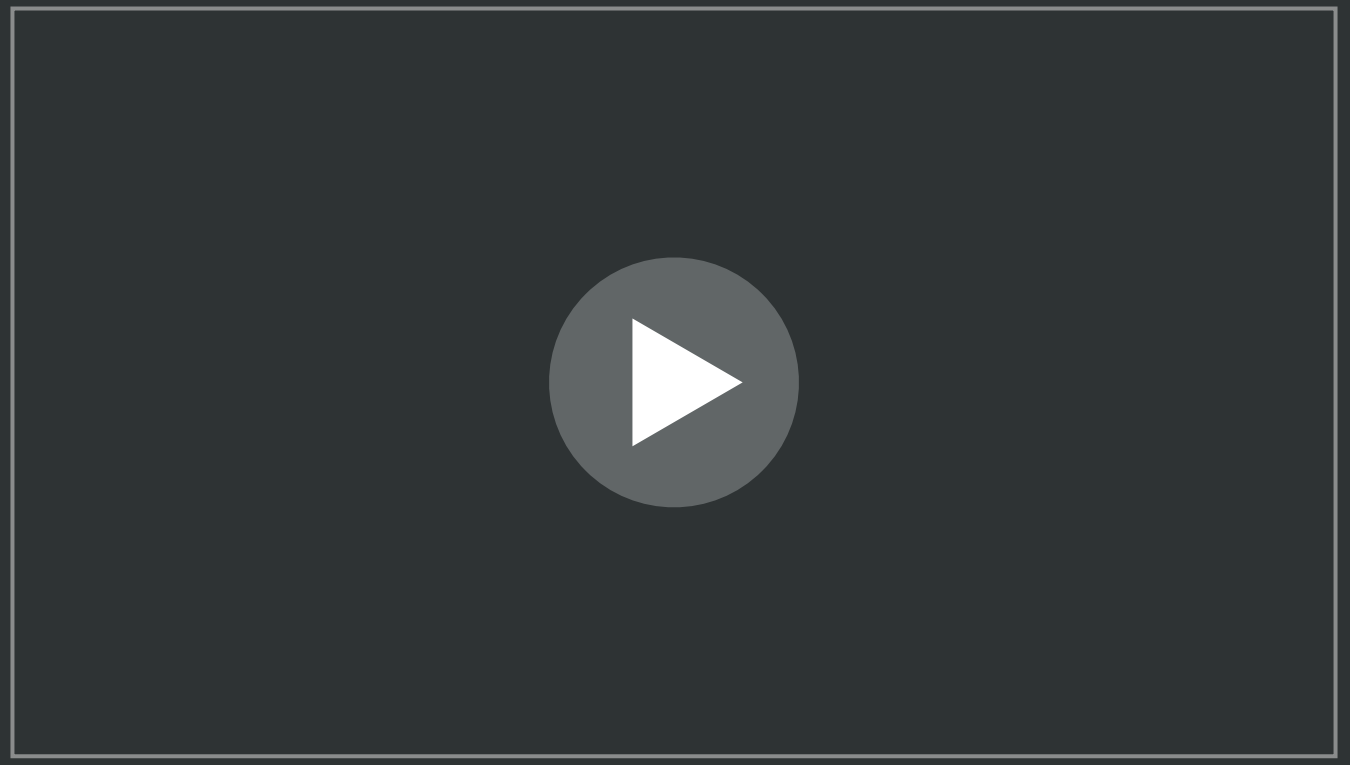
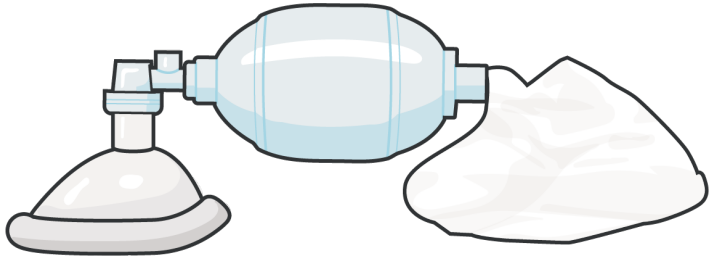
OPEN CRICOTHYROIDOTOMY VIDEO



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 casualties 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

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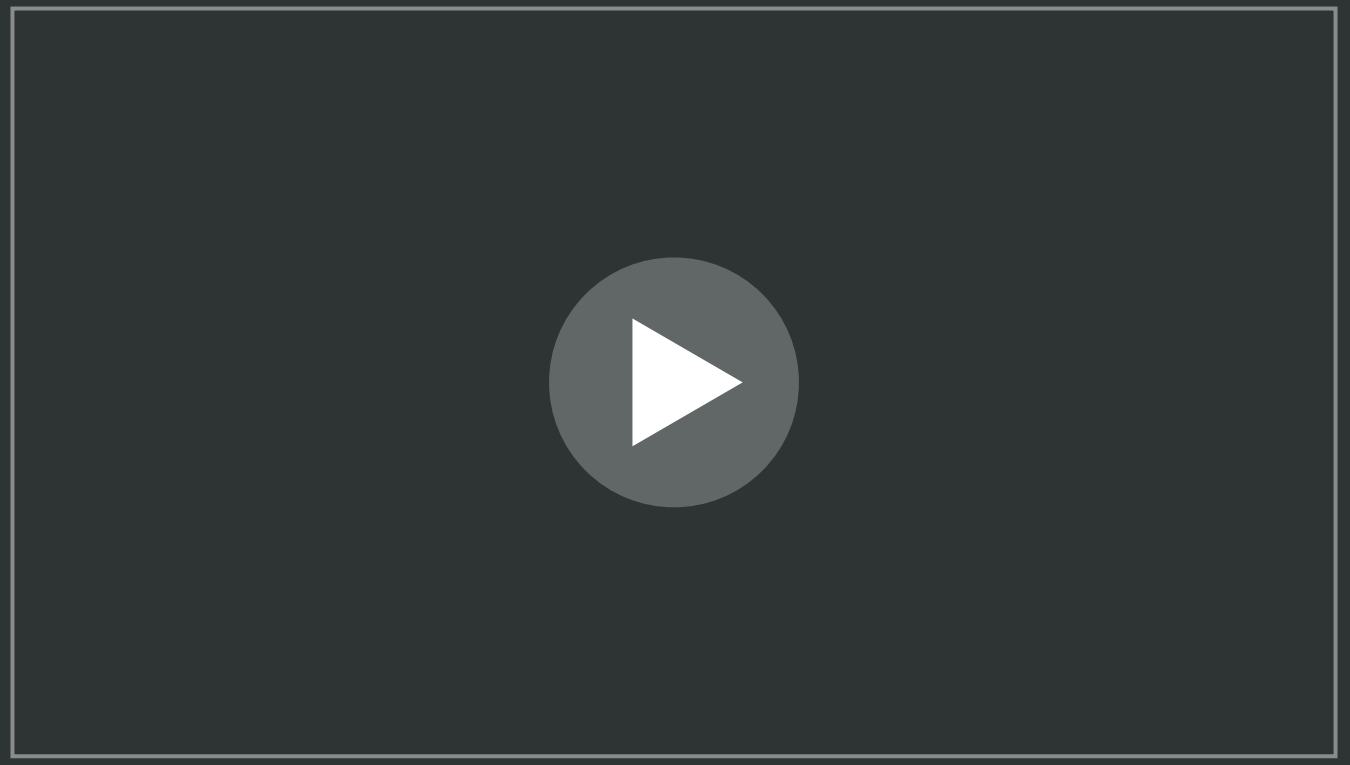
BAG VALVE MASK TECHNIQUES VIDEO



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SKILL STATION
ADVANCED AIRWAY AND BAG VALVE MASK SKILL STATION

- Extraglottic Airway
- Cric-Key Cricothyroidotomy
- Bougie-Aided Cricothyroidotomy
- Open Surgical Cricothyroidotomy
- Bag Valve Mask

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 readings 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

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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
- Nasopharyngeal airway insertion
- Manual and mechanical suctioning
- Extraglottic airway insertion
- Cricothyroidotomy
- Bag valve mask ventilation

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?

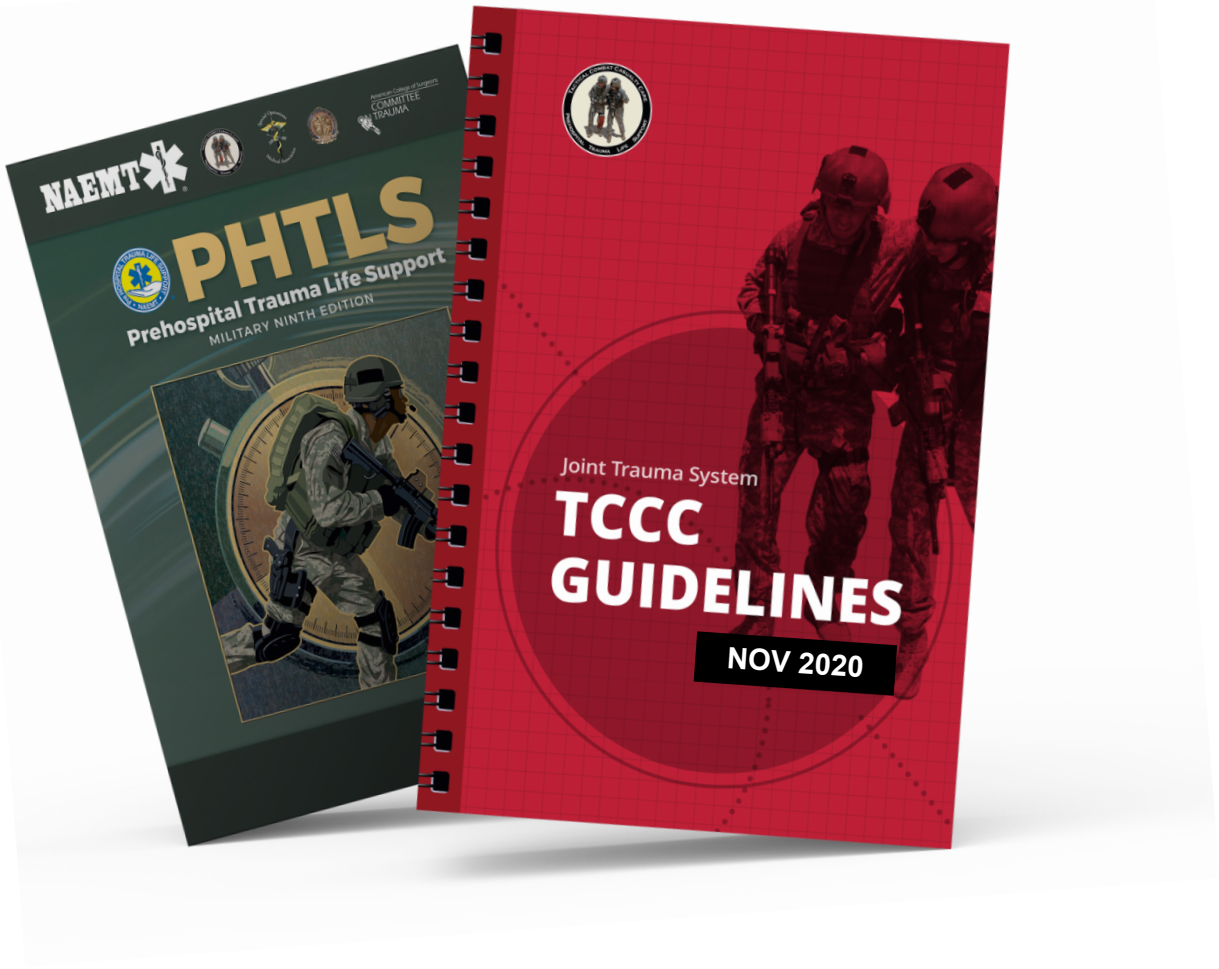
When would you use an extraglottic airway?

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

Updated regularly – latest edition dated 5 November 2020

These guidelines are the result of decisions made by the Committee on Tactical Combat Casualty Care as they explore evidence-based research regarding best practices

PHTLS: Military Edition, Chapter 25

by NAEMT

Prehospital Trauma Life Support, Military Ninth Edition