TRAINER’S MANUAL

This Trainer’s Manual is an essential component of the CRIC™ education program. It contains the guidelines and information needed to effectively and efficiently teach medical personnel how to perform a cricothyroidotomy using the CRIC Kit.

Although the CRIC can be quickly and easily mastered, this is a SPECIALIZED MEDICAL PROCEDURE WHICH SHOULD NOT BE ATTEMPTED BY UNTRAINED PERSONNEL. The CRIC is for use by those personnel authorized and trained to perform a surgical cricothyroidotomy.

Quality education is paramount to ensure users achieve the highest levels of competence and confidence with this lifesaving device.

Upon completion of training, students will be able to:

• Discuss the principles of airway management
• Discuss when a cricothyroidotomy procedure should be performed
• List indications and precautions for use of the CRIC
• Demonstrate safe and effective use of the CRIC on a simulator

Pyng Medical Corp. is committed to “saving lives by saving time through innovation in resuscitation.” Comments and suggestions for improvement of training and use of the CRIC are greatly appreciated.
# CRIC LESSON PLAN

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INTRODUCTION
(5 minutes)

1. Introduce yourself and welcome students.

2. Display course objectives:
   By the end of this session you will be able to:
   • Discuss the principles of airway management
   • Discuss when a cricothyroidotomy procedure should be performed
   • List indications and precautions for use of the CRIC
   • Demonstrate safe and effective use of the CRIC on a simulator

3. Provide overview of training:
   • Brief discussion of airway management
   • Overview of the CRIC Kit and its components
   • Demonstration of CRIC (done in real-time)
   • Step-by-step instruction
   • Skill practice to mastery
   • Troubleshooting
   • Evaluation
QUESTIONS FOR DISCUSSION

1. Has anyone responded to someone that was not breathing?
   - On the battlefield
   - Civilian EMS/pre-hospital
   - Hospital

2. What were your initial actions?
   - Reposition head
   - Check for upper airway obstructions
   - Initiate CPR

3. What airway devices have you used to secure an airway?
   - Oral or nasal airway
   - Laryngeal Mask Airway or dual lumen airway tube
   - Intubation

4. Have you ever been in a situation where ventilation was not possible because of mechanical, chemical or burn trauma with distortion of the face or upper airway?

5. Have any of you performed a cricothyroidotomy?

6. If yes, what devices and methods have you used?
   - Convenience kit with various surgical instruments
   - QuickTrach®
   - PerTrach®
   - Other devices

7. Have students describe their experiences.
   - How long did it take?
   - Was it successful?
   - Did you feel comfortable doing a cricothyroidotomy?
REASONS TO PERFORM A CRICOThYROIDOTOMY

1. The most common reason to perform a cricothyroidotomy is severe facial trauma causing significant distortion of normal anatomy
   • A very rare, but very critical life saving intervention
   • Last step in the “difficult airway” algorithm
   • The solution to the “Can’t Intubate, Can’t Ventilate” situation

2. The difficult airway algorithm varies with level of training and operational environment but can be summarized as follows:
   • Assess airway patency and breathing
   • If there is a problem:
     • Chin Lift, Jaw Thrust
     • Oral or Nasal Pharyngeal Airway
     • Multi-lumen airway device or LMA
     • Definitive airway requires a tube in the trachea
     • Definitive surgical airway (cricothyroidotomy)

3. Cricothyroidotomy is only performed if a secure airway and ventilation can not be achieved by non-surgical techniques and procedures.

4. The CRIC is for use by those personnel authorized and trained to perform a surgical cricothyroidotomy.

5. Cricothyroidotomy is taught to and as part of:
   • Advanced Trauma Life Support
   • Advanced Cardiac Life Support
   • Trauma Nursing Core Course
   • Transport Nurse Advanced Trauma Course
   • Military medics of all services
   • EMT - Paramedics

The cricothyroidotomy is considered the emergent surgical airway of choice when a secure airway and ventilation can not be achieved by non-surgical techniques and procedures.
CRIC INDICATIONS FOR USE

- User is trained and authorized to perform a cricothyroidotomy
- User has been unable to establish a definitive airway by non-surgical techniques and procedures
- Patient is 12 years of age or older
  - Needle cricothyroidotomy is the recommended surgical airway in children younger than 12 years of age

ADVANTAGES OF THE CRIC KIT

- **All-in-One:** CRIC comes complete with depth-limited extending scalpel blade, actuated direct-insertion Tissue-Spreaders, on-board visible spectrum and infrared LED lighting.
- **Built-in Safety:** Depth-limited scalpel reduces the risk of penetrating the posterior wall of the trachea by only extending 12mm.
- **Built-in Safety:** Scalpel auto-retracts when Tissue-Spreaders are actuated.
- **Sterile:** Designed for sterile, single use, with negligible risk of cross-contamination.
- **Efficient:** Allows for a safe, one-handed, simple-to-perform airway option.
- **Effective:** Actuated Tissue-Spreaders with integrated tracheal hooks ensure that the airway is not lost during the procedure.
DEMONSTRATION
(Should be less than 1 minute)

1. Be sure you are prepared and that the CRIC device, SEATD trainer and other equipment are ready for a speedy, flawless procedure. Practice, practice, practice!

2. Invite someone to time it. Ask students to hold their questions until afterward.

3. Describe a real-life scenario with the SEATD Trainer/simulator as your patient.
   (ex: “Here’s a 24 year-old male with severe facial trauma and upper airway obstruction. I cannot intubate or ventilate, so I’m going to use the CRIC.”)

4. Perform procedure.

5. Ask if this appears to be superior to the classical cricothyroidotomy procedure using just a scalpel.
STEP-BY-STEP INSTRUCTIONS
(5-10 minutes)

1. Assess patient’s airway and breathing.
   Follow organizational and educationally based airway management algorithms.
   If you cannot establish a “definitive airway” using conventional, non-surgical techniques and procedures, determine that a cricothyroidotomy is needed.

2. Remove the CRIC from the package and hold it in your dominant hand.
   Point out and discuss each of the features of the CRIC including:
   - IR LED Light Switch
   - Visible LED Light Switch
   - Button #1 (scalpel)
   - Button #2 (Tissue-Spreaders)

3. Identify the superficial landmarks and explain to the students how to find each of the following:
   - Thyroid Cartilage
   - Cricoid Cartilage

   Explain that the Cricothyroid Membrane is found midline between the Thyroid Cartilage and the Cricoid Cartilage.
   “These are the landmarks – they are easy to find on any patient. This is where you will be performing the cricothyroidotomy.”
4. Clean insertion site.

Cleanse the incision site with the non-dominant hand.

Stabilize the incision site with the non-dominant hand (secure larynx laterally between the thumb and the forefinger).

5. Demonstrate how to activate the on-board lights.

Be sure to explain that the lights only have to be turned on if necessary.


Show that the scalpel is extended by advancing Button #1 with the thumb until it stops.

Explain that the blade only extends 12mm to provide protection from trachea posterior wall penetration.

7. Make Vertical Skin Incision.

On the SEATD training device, make a vertical skin incision approximately 1.5 - 2” in length.

Be sure to mention that depending on your training and background, a 1 - 1.25” horizontal skin incision can also be made over the Cricothyroid Membrane.
8. Expose the Cricothyroid Membrane.

Spread the skin laterally with the non-dominant hand exposing the Cricothyroid Membrane.

While looking at the training device, ask the students to visualize and identify the Cricothyroid Membrane, in preparation for the next step.


Make a 0.5 - 0.75" horizontal skin incision through the Cricothyroid Membrane.

10. Extend Tissue-Spreaders.

While maintaining the position of the scalpel blade in the horizontal position, push the Tissue-Spreader actuator (Button #2) forward until it stops.

The Tissue-Spreader tips will insert directly into the incision area and spread cephalad to caudad (vertically).

Explain that as a safety feature, the scalpel blade automatically retracts upon full extension of Tissue-Spreaders.
11. Rotate CRIC 90°.

Rotate CRIC 90° so the spreader bars are oriented horizontally (left to right).

Repeat rotation as necessary to assure opening of tissue and airway.

12. Insert Airway Tube. (not included in CRIC package)

While maintaining the position of the CRIC with the dominant hand, take an airway tube in your non-dominant hand and insert the tip of the airway tube between the spreader bars.

Continue until the tube is fully inserted.

13. Remove CRIC Device and Assess Breathing.

Once the airway tube has been fully inserted, remove the CRIC device. It is not necessary to retract the spreaders to do this.

Assess the positioning of the airway tube.
   - Listen for bilateral breath sounds
   - Listen and feel for air movement


Depending on the type of tube you are using, secure the airway tube in place.

If using cuffed tube, inflate balloon.

Use a tie-down strap or other means.
SKILL PRACTICE TO MASTERY
(time variable)

Most medical personnel will only need one or two trials to be totally competent and confident, but, since everyone achieves mastery of psychomotor skills at a different rate, be sure to plan for and allow plenty of time with this section. Remember, once a medic/doc feels comfortable with the CRIC, he is more likely to use it.

HANDY TEACHING HINT:

Put the students who finish first to work: They can quickly be taught to reset the training device, put new modules in the training devices, etc., which frees you up to work more closely with anyone who requires a bit more instruction. Reassure those who are struggling that, “I needed to practice that a few times too.”
1. The most common complication of the classic cricothyroidotomy procedure is penetration of the posterior tracheal wall due to excessive force or depth of penetration of the scalpel blade
   • With only a 12 mm extension of the CRIC scalpel blade, the chance of penetration of the posterior wall of the trachea is minimized
   • No penetration of the posterior tracheal wall occurred during validation studies on cadavers

2. Venous or minor arterial bleeding:
   • Some bleeding will occur regardless of user skill
   • The minor bleeding may block clear visualization of the Cricothyroid Membrane and tube insertion
     • Blotting with gauze/bandage will usually be adequate
     • Suction may provide additional assistance if available

3. Penetration of the esophagus is a rare complication of the classical cricothyroidotomy procedure due to excessive force or depth of penetration
   • With only a 12 mm extension of the CRIC scalpel, the chance of penetration of the posterior wall of the trachea is minimized
   • No penetration of the esophagus occurred during validation studies on cadavers
4. False passage or mal-positioned airway tube:
   • If the incision was not made correctly through the Cricothyroid Membrane (saggital plane) and angled laterally, the airway tube could be inserted outside of the trachea
   • Follow correct procedure
   • Assess proper positioning of the airway tube
   • Listen for bilateral breath sounds
   • Listen and feel for air movement

5. Fracture of the cricoid or thyroid cartilage:
   • Will not affect the ability to perform procedure and establish an airway
   • Can be assessed and managed when definitive care is provided

6. During any malfunction or delay in initiating the cricothyroidotomy, maintain patient ventilation as best as possible.

7. If a definitive airway cannot be established, the patient will most likely die without a cricothyroidotomy.

8. Light fails to illuminate:
   • Use ambient or other light sources
   • User can palpate the superficial landmarks
9. Scalpel fails to extend:
   • Try again by pushing on Button #1 until you hear an audible click and you feel a detent
   • Open and use another CRIC device

10. Tissue-Spreaders fail to extend:
    • Try again and push the actuator more firmly
    • Use another surgical instrument to maintain patency of the opening in the Cricothyroid Membrane

11. Scalpel fails to retract (Tissue-Spreaders should stay extended):
    • Carefully maintain CRIC position and insert airway tube
CRIC SKILLS EVALUATION

1. Identify superficial landmarks on simulator/patient for where the procedure will be done.

2. Clean insertion site.

3. (Optional) Turn on-board lights on.

4. Extend Scalpel.

5. Make vertical skin incision.

6. (Optional) Make horizontal skin incision.

7. Expose Cricothyroid Membrane.

8. Make horizontal incision through Cricothyroid Membrane.


10. Rotate CRIC device 90°.

11. Insert airway tube.

12. Remove CRIC and assess breathing.

1. What is the primary indication to use the CRIC to perform a cricothyroidotomy?
   a) The patient is not breathing.
   b) Can not establish an airway by non-surgical means.
   c) There is evidence of head trauma.
   d) There is evidence of upper airway obstruction.

2. The CRIC may be used to perform a cricothyroidotomy on patients 12 years of age and older.
   a) True
   b) False

3. When can a person use the CRIC to perform an emergency cricothyroidotomy?
   a) Only in the pre-hospital environment.
   b) Only under the direct supervision of a physician.
   c) After completing this class.
   d) Only if trained and authorized to perform a cricothyroidotomy.

4. What is the most common complication of performing a classical or traditional cricothyroidotomy with surgical instruments?
   a) Penetration of the posterior tracheal wall.
   b) Severe bleeding.
   c) Improperly placed airway tube due to lack of experience.
   d) Penetration of the esophagus.
5. When should a cricothyroidotomy only be performed?
   a) If the patient is not intubated.
   b) After two cycles of CPR have been completed.
   c) If the patient is not breathing and it will take more than 30 minutes to transport the patient to a hospital.
   d) If you are trained and authorized to perform a cricothyroidotomy and you cannot establish an airway by non-surgical techniques and procedures.

6. What is the most common reason to perform a cricothyroidotomy?
   a) Severe facial trauma (burns, chemical, mechanical) that does not allow for the placement of a non-surgical airway.
   b) The patient is not breathing.
   c) The patient is not breathing and CPR cannot be performed.
   d) There is evidence of upper airway obstruction.

7. What is the next step in a cricothyroidotomy after inserting the airway tube?
   a) Check for additional cervical and facial trauma.
   b) Immediately provide 100% oxygen.
   c) Hyperventilate the patient.
   d) Assess the position of the airway tube.
ANSWER KEY

1. What is the primary indication to use the CRIC to perform a cricothyroidotomy?
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