Surgical Cricothyrotomy
Bougie Assisted
Prerequisite Protocol

NH Department of Safety
NH Fire Academy & Emergency Medical Services
NH Bureau of EMS
2015
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NEW HAMPSHIRE
DEPARTMENT OF SAFETY
DIVISION OF FIRE STANDARDS AND TRAINING &
EMERGENCY MEDICAL SERVICES
NH EMS PREREQUISITE APPLICATION
PLEASE PRINT (BLACK INK) OR TYPE

PROTOCOL NAME_____________________________________________________

PROTOCOL NUMBER_________

LEGAL NAME OF UNIT ___________________________________________UNIT LICENSE NUMBER__________

BUSINESS STREET ADDRESS

STREET \ CITY \ STATE \ ZIP CODE

MAILING ADDRESS

STREET/PO BOX \ CITY \ STATE \ ZIP CODE

HEAD OF UNIT ___________________________________________TITLE__________________________

CONTACT TELEPHONE____________________________FAX (IF AVAILABLE)

EMAIL ADDRESS (IF AVAILABLE)_______________________________________________________________

MEDICAL RESOURCE HOSPITAL _____________________________________________________________

MEDICAL DIRECTOR OR DESIGNEE___________________________________________________________

MEDICAL DIRECTOR PHONE_______________________________________________________________

TYPE OF APPLICATION (CIRCLE) INITIAL RENEWAL

HEAD OF UNIT DATE MEDICAL DIRECTOR OR DESIGNEE DATE

ATTACHED IS SUPPORTING DOCUMENTATION FOR ALL ELEMENTS LISTED IN Saf-C 5922.01 (e) WITH A LIST OF LICENSED PROVIDERS TRAINED UNDER Saf-C 5922.
PART Saf-C PATIENT CARE PROTOCOLS

Saf-C 5922.01 Procedures...

(d) Prerequisites required by protocol shall be established by the EMS Medical Control Board in accordance with RSA 153:A-2 XVI (a).

(e) Protocol prerequisites, when required, shall address each of the following elements:

1. The protocol title and number to which the prerequisites relate;
2. The provider licensure level necessary to carry out the protocol;
3. The name of the medical director, or designee, who will oversee the training module;
4. The MRH and EMS head of unit recommendations to the division;
5. The provider experience criteria;
6. All quality management program elements;
7. Reporting requirements for monitoring and skill retention;
8. Equipment and staff support resources necessary;
9. Provider renewal criteria, and
10. Training requirements.
Surgical Cricothyrotomy - Bougie Assisted
Prerequisite Protocol

LICENSURE:
Paramedic

EXPERIENCE:
Prior to class participants are to have watched the following:
http://emcrit.org/procedures/bougie-aided-cric/
https://vimeo.com/125228375

EDUCATION:
Surgical Cricothyrotomy – Bougie Assisted Program approved by the Medical Control Board.
Medical Director or designee to oversee program

MEDICAL DIRECTION
Direct oversight of the program
Recommendation for program
QM review of all cricothyrotomy cases

RECOMMENDATION
The Medical Director and the Head of EMS Agency must mutually agree to participate in the program.

QM/PI PROGRAM
Medical Director to review all cricothyrotomy performed or attempted.
Remediation: 2 people to look at problem calls (Medical Director and NH EMS) and come up with a consensus as to remediation.

REPORTING
Reports to NH EMS via TEMSIS
NH EMS will report to MCB

COMPETANCE/EXPIRATION
Annually

RESOURCES
MRH agreement with participating Medical Director or designee.
EQUIPMENT: Chlorhexidine, #10 blade scalpel, Bougie, 6.0 mm endotracheal tube, 10ml Syringe, BVM, Quantitative ETCO2.
Cricothyrotomy manikin or lab tracheas
Surgical Cricothyrotomy – Bougie Assisted Checklist

1. Protocol
   Prerequisite Application signed by both EMS Unit leader and Medical Director.

2. Provider Level & Experience
   List of eligible providers and NH Paramedic license number.

3. Medical Direction
   Name of Medical Director or designee overseeing training.

4. Recommendation
   A letter from the Medical Director attesting to the training and competency of the providers listed in (Items 2 & 4 may be combined).

5. Quality Management Program
   Provide a copy of your Surgical Cricothyrotomy Quality Management Plan.
Surgical Cricothyrotomy - Bougie Assisted
Course Outline

OBJECTIVES
- To assess, objectively measure, and demonstrate competence in the skill of surgical cricothyrotomy, bougie assisted.
- To increase participant comfort and knowledge of indications, contraindications, medications, and procedures used during bougie assisted surgical cricothyrotomy.
- To enforce and practice the medical decision making and procedural skills utilized during bougie assisted surgical cricothyrotomy through experiential learning.

INTENDED AUDIENCE:
- NH Paramedics

COURSE STRUCTURE:
- Course and instructor introduction.
- Introduction to the materials, supplies and SIM equipment.
- NHBEAMS Surgical Cricothyrotomy – Bougie Assisted Power Point
- Review: [https://vimeo.com/125228375](https://vimeo.com/125228375)
- Review the NH Surgical Cricothyrotomy – Bougie Assisted Prerequisite Protocol.
- SIM-DEMO: Observe a bougie assisted cricothyrotomy in action (SIM-instructor demonstration/discussion/video debriefing)
- Participant participation:
  - Participants to work with Medical Director, or designee, to develop psychomotor skills to perform procedure proficiently.
- Final Skills Assessment: Participant to demonstrate proficiency in surgical cricothyrotomy, bougie assisted to the Medical Director's, or designee's, satisfaction.
- Final Written Exam: Participants are to pass NHEMS approved written examination with a score of 80% or greater.
Candidate: __________________________

Date: ____________

_____ INITIAL    _____ RETEST

Evaluator: __________________________

Time allowed: 10 minutes

Start: _________
Stop: _________
Total Time: _________

SCENE SIZE UP (scene information will be provided by the evaluator)

<table>
<thead>
<tr>
<th>Points Possible</th>
<th>Points Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scene safety and proper BSI</td>
<td>1</td>
</tr>
<tr>
<td>Verbalizing indications and contraindications</td>
<td>2</td>
</tr>
<tr>
<td>Position patient supine and extend neck.</td>
<td>1</td>
</tr>
<tr>
<td>Prepare neck with Chlorhexidine.</td>
<td>1</td>
</tr>
<tr>
<td>With non-dominant hand stabilize larynx and locate cricothyroid membrane.</td>
<td>1</td>
</tr>
<tr>
<td>Make an approximately 3cm vertical incision by 0.5cm deep through the skin and fascia, over the cricothyroid membrane.</td>
<td>1</td>
</tr>
<tr>
<td>Insert finger and dissect the tissue and locate the cricothyroid membrane.</td>
<td>1</td>
</tr>
<tr>
<td>With finger, bluntly dilate the opening through the cricothyroid membrane.</td>
<td>1</td>
</tr>
<tr>
<td>Make approximately 1.5cm horizontal incision through the cricothyroid membrane.</td>
<td>1</td>
</tr>
<tr>
<td>Insert bougie curved-tip first through the incision and angled towards the patient's feet.</td>
<td>1</td>
</tr>
<tr>
<td>Advance the bougie into the trachea feeling for “clicks” of tracheal rings and until it cannot be advanced any further.</td>
<td>1</td>
</tr>
<tr>
<td>Advance 6.0mm endotracheal tube over bougie and into trachea.</td>
<td>1</td>
</tr>
<tr>
<td>Remove bougie while stabilizing endotracheal tube, ensuring it does not become dislodged.</td>
<td>1</td>
</tr>
<tr>
<td>Inflate the cuff with 5-10mL air.</td>
<td>1</td>
</tr>
</tbody>
</table>

Confirm placement:
- Symmetrical chest-wall rise
- Equal breath sounds over chest and lack in epigastric
- Condensation in the endotracheal tube
- Quantitative waveform capnography

Secure endotracheal tube.

Reassess tube placement and ongoing waveform capnography.

Total 21

Critical Criteria

_____ Inability to locate cricothyroid membrane

_____ Does anything to harm self, patient or partners
Surgical Cricothyrotomy
Bougie Assisted — ADULT

Written notification will be provided to the Medical Resource Hospital’s EMS Medical Director, Hospital EMS Coordinator, and Bureau of EMS within 48 hours of an event. Use of this procedure documented under “Procedures Used” in the Patient Care Report constitutes notification of the Bureau of EMS.

PARAMEDIC - PREREQUISITE REQUIRED— ADULT

INDICATIONS:
Inability to adequately oxygenate and ventilate using less invasive methods

CONTRAINDICATIONS:
- Ability to oxygenate and ventilate using less invasive measures
- Age less than 12 years old

EQUIPMENT:
- Chlorhexidine
- #10 blade scalpel
- Bougie
- 6.0 mm endotracheal tube
- 10ml Syringe
- BVM
- Quantitative ETCO2

PROCEDURE:
1. Position the patient supine and extend the neck as needed to improve anatomic view.
2. Prep neck with Chlorhexidine
3. Using your non-dominant hand, stabilize the larynx and locate the following landmarks: thyroid cartilage (Adam’s apple) and cricoid cartilage. The cricothyroid membrane lies between these cartilages.
4. Make an approximately a 3cm vertical incision 0.5cm deep through the skin and fascia, over the cricothyroid membrane. With finger, dissect the tissue and locate the cricothyroid membrane.
5. Make approximately a 1.5cm horizontal incision through the cricothyroid membrane.
6. With your finger, bluntly dilate the opening through the cricothyroid membrane.
7. Insert the bougie curved-tip first through the incision and angled towards the patient’s feet.
8. Advance the bougie into the trachea feeling for “clicks” of tracheal rings and until “hangup” when it cannot be advanced any further. This confirms tracheal position.
9. Advance a 6.0 mm endotracheal tube (ensure all air aspirated out of cuff) over the bougie and into the trachea.
10. Remove bougie while stabilizing ETT ensuring it does not become dislodged.
11. Inflate the cuff with 5 – 10ml of air.
12. Confirm appropriate proper placement by symmetrical chest-wall rise, auscultation of equal breath sounds over the chest and a lack of epigastric sounds with ventilations using bag-valve-mask, condensation in the ETT, and quantitative waveform capnography.
13. Secure the ETT.
14. Reassess tube placement frequently, especially after movement of the patient.
15. Ongoing monitoring of ETT placement and ventilation status using waveform capnography is required for all patients.
Cricothyrotomy

Indications and Use for the NH Paramedic

New Hampshire

Division of Fire Standards & Training and
Emergency Medical Services
Objectives

- To assess, objectively measure, and demonstrate competence in the skill of surgical cricothyrotomy, bougie assisted.
- To increase participant comfort and knowledge of indications, contraindications, medications, and procedures used during bougie assisted surgical cricothyrotomy.
- To enforce and practice the medical decision making and procedural skills utilized during bougie assisted surgical cricothyrotomy through experiential learning.
Clinical Indications

- Inability to adequately oxygenate and ventilate using less invasive methods.
Contraindications

- Ability to oxygenate and ventilate using less invasive measures.
- Age less than 12 years old
The Medical Director, or designee, is to review the airway anatomy.
Review the upper airway with the students.
Review the lower airway
Structures and vessels in the neck. Go over vessels and nerves in proximity to cricoid membrane.
Identifying Landmarks

Cricothyroid membrane.
Find the person's Adam's apple (thyroid cartilage)

Adam's apple

cricoid cartilage
Move your fingers about one inch down the neck until you find another bulge.

This is the cricoid cartilage. The indentation between the two is the cricothyroid membrane, where the incision will be made.
Another view of the thyroid cartilage and cricoid cartilage.
Equipment

- Non latex gloves
- Approved sharps containers
- Suction apparatus
- Oxygen Supply
- BVM
- Chlorhexidine
- #10 blade scalpel
- Bougie
- 6.0 mm endotracheal tube
- 10mL syringe
- End tidal carbon dioxide monitor
- Securing device
- Bandaging materials

This is the equipment via the protocol.
Procedure

- Have all supplies (including suction) available and ready
- Proper body substance isolation
- Places patient supine and hyperextend neck if no cervical trauma suspected
- Positions at patient's side and directs assistant to attempt ventilations with 100% oxygen
- Prepare equipment

The following Procedures slide go line by line what is in the protocol.
Procedure

1. Position the patient supine and extend the neck as needed to improve anatomic view.
2. Prep neck with Chlorhexidine
3. Using your non-dominant hand, stabilize the larynx and locate the following landmarks: thyroid cartilage (Adam’s apple) and cricoid cartilage. The cricothyroid membrane lies between these cartilages.
4. Make an approximately a 3cm vertical incision 0.5cm deep through the skin and fascia, over the cricothyroid membrane. With finger, dissect the tissue and locate the cricothyroid membrane.
Procedure

5. Make approximately a 1.5cm horizontal incision through the cricothyroid membrane.
6. With your finger, bluntly dilate the opening through the cricothyroid membrane.
7. Insert the bougie curved-tip first through the incision and angled towards the patient’s feet.
8. Advance the bougie into the trachea feeling for “clicks” of tracheal rings and until “hangup” when it cannot be advanced any further. This confirms tracheal position.
Procedure

9. Advance a 6.0 mm endotracheal tube (ensure all air aspirated out of cuff) over the bougie and into the trachea.
10. Remove bougie while stabilizing ETT ensuring it does not become dislodged
11. Inflate the cuff with 5 – 10ml of air.
Procedure

12. Confirm appropriate proper placement by symmetrical chest-wall rise, auscultation of equal breath sounds over the chest and a lack of epigastric sounds with ventilations using bag-valve-mask, condensation in the ETT, and quantitative waveform capnography.

13. Secure the ETT.

14. Reassess tube placement frequently, especially after movement of the patient.

15. Ongoing monitoring of ETT placement and ventilation status using waveform
The actual protocol
Complications

- Incorrect tube placement/ false passage
- Thyroid gland damage
- Severe bleeding
- Subcutaneous emphysema
- Laryngeal nerve damage

Ensure the participants are aware of the possible complications from a surgical cricothyrotomy.
Questions?
1. To perform a surgical cricothyrotomy, the patient must be paralyzed:
   a. TRUE
   b. FALSE

2. The correct order of these anatomical structures starting at the head and working inferiorly is:
   a. Cricoid cartilage, cricoid membrane, thyroid cartilage, thyroid membrane
   b. Thyroid membrane, thyroid cartilage, cricoid membrane, cricoid cartilage
   c. Thyroid cartilage, thyroid membrane, cricoid cartilage, cricoid membrane
   d. Cricoid membrane, cricoid cartilage, thyroid membrane, thyroid cartilage

3. The “Adam’s Apple” is another name for what?
   a. Cricoid cartilage
   b. Hyoid bone
   c. Thyroid cartilage
   d. The trachea

4. Which item is not required equipment for a surgical cricothyrotomy?
   a. Waveform capnography
   b. Bougie
   c. BVM
   d. #11 Blade

5. Which patient is an appropriate surgical cricothyrotomy candidate?
   a. 10 y/o male airway burns with difficult BVM ventilations
   b. 88 y/o female with SOB that is responding well to CPAP
   c. 35 y/o male anaphylaxis patient with a failed intubation 2’ laryngeal edema
   d. 23 y/o female asthmatic patient responding to oxygen and inhaled β agonists

6. A_____ ETT should be passed over the Bougie, cuff inflated with 5-10mL of air, and secured.
   a. 5.5
   b. 6.0
   c. 6.5
   d. 7.0

7. How should the cricothyrotomy patient be positioned, assuming there is no neck trauma?
   a. Supine, neck extended
   b. Supine, neck flexed
   c. Semi fowlers, neck extended
   d. Semi fowlers, neck flexed

8. All the following support tracheal placement, except:
   a. Appreciating tactile “clicks” while advancing the Bougie
   b. The Bougie failing to fully advance because of a perceived obstruction
   c. Smooth BVM ventilations
   d. Capnography with an appropriate waveform and EtCO2 values

9. Which of the following is an example of a cricothyrotomy complication?
   a. False passage
b. Nerve damage
c. Thyroid gland damage
d. All of the above

10. The ideal surgical incisions for cricothyrotomy should be:
   a. 2.5cm vertical then 1.0 cm horizontal
   b. 2.0cm vertical then 1.5 cm horizontal
   c. 3.0cm vertical then 1.0 cm horizontal
   d. 3.0cm vertical then 1.5 cm horizontal