Section: ALS Protocols
Subject: AIRWAY PROTOCOLS
Section #: 345.01
Issue Date: March 21, 2011
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Approved By: Michael Lozano, Jr., M.D., HCFR Medical Director

1. The assessment, clearing, capturing, and securing or the patient's airway will be a primary goal in treating any critical patient.

2. Proactive airway management is encouraged.
    a. Any patient who has a Glasgow Coma Score (GCS) < 8 and does not have an easily reversible condition (diabetes, narcotic OD) should have their airway actively controlled.
    b. Any patient for whom oxygen saturation cannot be maintained above 94% by non-invasive means shall have their airway controlled.
    c. Any patient whom the lead paramedic anticipates will suffer harm due to serious decompensation of their clinical status such that they will not be able to protect their own airway or sustain oxygen saturation above 94% despite non-invasive means shall have their airway controlled.

3. AIRWAY OBSTRUCTION
    a. Airway obstruction due to a foreign body will be treated in the following manner:
        i. Responsive patients:
            1. Adult and adolescents after puberty:
                a. Ask, "Are you choking?"
                b. Give abdominal thrusts (Heimlich maneuver)
                i. Chest thrusts for pregnant or obese patients
                c. Repeat thrusts until effective or victim becomes unresponsive.
            2. Children from 1 year of age to puberty:
                a. Ask, "Are you choking?"
                b. Give abdominal thrusts (Heimlich maneuver)
                c. Repeat thrusts until effective or victim becomes unresponsive.
            3. Infants less than one year of age:
                a. Confirm severe airway obstruction
                b. Perform up to five (5) back blows and up to five (5) chest compressions
                c. Repeat this cycle until effective or victim becomes unresponsive.
        ii. Unresponsive patients of all ages:
            1. Lower to floor if the victim is unresponsive with no breathing or no normal breathing.
            2. Place in rescue position (e.g. supine with arms at sides, and legs extended) and begin CPR at once
            3. Apply monitor/defibrillator
            4. Before delivering breaths at the end of the first CPR cycle, look into the mouth.
                a. If you see a foreign body that can be easily removed, remove it. Do not perform blind finger sweep.
                b. Magill forceps are authorized for paramedics to use in removal of a visualized foreign body.

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4. AIRWAY CAPTURE
    a. Rapid Sequence Induction shall be the primary method of performing endotracheal intubation in those patients who are not in a pre-terminal state (i.e. pulseless, apneic, GCS= 3, flaccid).
    b. The airway is to be controlled as deemed appropriate by the Medic-in-Charge. Acceptable airway interventions are:
        i. Positioning: Jaw thrust (preferred), head tilt/chin lift (contraindicated in trauma).
        ii. Temporizing Measures (used as a bridge to definitive airway measures, or as a supplement to those measures):
            1. Nasopharyngeal airway
            2. Oropharyngeal airways
        iii. Secure Airways:
            1. Endotracheal tube (***preferred unless otherwise stated***)
                a. Endotracheal intubation methods:
                    i. Endotracheal intubation via direct laryngoscopy (ET Tube) – (***preferred*** method of tracheal intubation for HCFR personnel).
                    ii. Endotracheal intubation via video laryngoscopy (***preferred*** method for difficult airways)
                    iii. Endotracheal intubation via gum bougie
            2. Blind Insertion, supra-glottic airway
            3. Cricothyrotomy (see HCFR CRICOTHYROTOMY protocol):
    c. Airway control of the suspected cervical spine injured patient will be performed without distracting from the neutral in-line position unless absolutely necessary.

5. ENDOTRACHEAL INTUBATION
    a. Placing the tube
        i. Advance the tube until the cuff is approximately 1 cm past the vocal cords.
            1. Ideally the tip of the tube should be positioned halfway between the vocal cords and the carina.
    b. If endotracheal intubation is unsuccessful after three (3) attempts, a supraglottic airway shall be immediately placed.
        i. An attempt shall be limited to approximately 30 seconds, or the development of clinical signs of hypoxia
    c. Verifying tube placement (Techniques for verifying tube placement will be as follows):
        i. All intubations shall be assessed immediately.
            1. Following tube insertion.
            2. Every time the patient is moved.
            3. Periodically throughout the management of the patient.
            4. Immediately prior to handing off to a hospital or another EMS agency.
        ii. Detection of exhaled carbon dioxide (primary confirmation method):
            1. With an $ETCO_2$ capnography unit attached to the monitor/defibrillator, look for an appropriate waveform change on the monitor.

2. When the changes in $ETCO_2$ described above occur it is an absolute indication of tracheal placement.
    a. If these $ETCO_2$ changes do not occur it suggests:
        i. Esophageal placement.
        ii. Blood flow or gas exchange is severely impaired.
        iii. Secretions in the $ETCO_2$ filter.

iii. Supplemental confirmation methods:
1. Visualization of tube passage between the vocal cords during insertion (best method).
2. Visualization of tube placement between the vocal cords via video laryngoscopy after insertion.
    a. Every attempt should be made to visualize tube placement in this manner after intubation via gum bougie.
3. Confirmation of placement via auscultation of the following areas:
    a. Over the epigastrium
    b. Right anterior chest wall
    c. Left anterior chest wall
    d. Right mid-axillary chest wall
    e. Left mid-axillary chest wall
4. Confirmation by attaching the Esophageal Detector Device (EDD) to the endotracheal tube.
    a. Squeeze the EDD prior to attaching to the ETT and verify the bulb inflates rapidly
5. Phonation is a negative indicator.
    a. If the patient can make vocal sounds after the alleged intubation it is an absolute sign the tube is NOT in the trachea.

iv. Note centimeter mark on ETT, once proper placement is confirmed.

v. Documentation in the ePCR shall include:
1. Individual entries for each intubation attempt, to include method of intubation, outcome of attempt, and name of paramedic performing the attempt.
2. Confirmation of ETT placement and reassessment.
    a. Must include initial $ETCO_2$ value and continuous $ETCO_2$ monitoring.
    b. Physician Verification Form required if unable to document $ETCO_2$
3. Centimeter mark of ETT at the teeth.
4. EDD result (if used)

6. ENDOTRACHEAL TUBE ANCHORING

a. Intubated patients will have their endotracheal tubes secured using HCFR provided commercial devices in compliance with the manufacturer's instructions.
    i. Use of devices that have not been authorized by the HCFR Medical Director is prohibited.

b. On those occasions where such devices are not available or do not fit the patient, the tube should be secured with tape.
    i. The tape should wrap around the tube as close to the mouth as possible.

1. Anchor point should be the maxilla and not the mandible.

ii. Wrap the tape completely around the back of the neck (without disturbing the cervical spine in cases where this is a concern).
1. Do not wrap around the back of the cervical collar.

c. Unless detrimental to the patient the use of a head immobilizer and cervical collar is required in conjunction with endotracheal tubes to reduce head movement and the potential for dislodging the ETT.
d. Methods used to secure the ETT shall be thoroughly documented in the ePCR.

7. QA Points:
   a. It is important to quickly recognize the rare but potentially disastrous, "can't intubate/can't oxygenate" scenario, and rapidly move to cricothyrotomy. Rapid transportation to a location where additional airway resources can be gathered is essential for survival in this select patient population.
   b. Adequate ventilation DOES NOT necessarily require ETT intubation.
   c. In an average size adult, inserting until the front teeth are even with the 21 cm mark on the tube will usually assure that the tip is above the carina.
   d. $ETCO_2$ monitoring will not detect a right mainstem intubation.
   e. The EDD is not 100% reliable. False indications can occur in very obese patients, and patients with lots of gas in the stomach.