The next meeting of PMAC is on:
Monday, June 28, 2010
9:00AM – 11:00AM
Riverside County Regional Medical Center
26520 Cactus Avenue, Moreno Valley
Rooms A1018 and A1021
951/358-5029

1. CALL TO ORDER
Chairman Reza Vaezazizi, MD

2. PLEDGE OF ALLEGIANCE
Reza Vaezazizi, MD

3. ROUNDTABLE INTRODUCTIONS
Reza Vaezazizi, MD

4. APPROVAL OF MINUTES
March 22, 2010 Minutes (Attachment A)

5. COMMITTEE / TASK FORCE DISCUSSION (90 Minutes)
This is the time / place in the agenda in which a brief committee report will be given. PMAC members are expected to engage in discussion for about 10 to 15 minutes per topic for the purposes of providing improved understanding and / or recommendations to the EMS Agency.

5.1 Policies—Scott Moffatt (PowerPoint)
5.2 Interfacility Transfers—Kent McCurdy
5.3 CQI TAG P&P Appendix—Laura Wallin (Attachment B)
5.4 HEMS CQI—Steve Patterson, MD (Attachment C)
5.5 Trauma—Cindi Stoll (Attachment D)
5.6 STEMI—Laura Wallin (Attachment E)
5.7 MCI—Trevor Douville

6. New Business (15 Minutes)
This is the time / place in the agenda that brief reports will be given followed by a recommendation from PMAC.

6.1 Base Hospital Policy—Laura Wallin (Attachment F)
6.2 Fireline Paramedic Policy—Kevin Powell (Attachment G)
6.3 Hospital Reduction of Serv. Policy—Brian MacGavin (Attachment H)
6.4 PMAC Tentative Schedule For 2011 (Attachment I)
6.5 PMAC Vacancies—Brian MacGavin
7. **Unfinished Business (1 Minute)**
   7.1 Policy Changes / Updates—Karen Petrilla

8. **Announcements (5 Minutes)**
   This is the time / place in the agenda that committee members
   and non committee members can speak on items not on the
   agenda but within the purview of PMAC. Each announcement
   should be limited to 1 minute unless extended by the PMAC
   Chairperson
   8.1 Committee Members
   8.2 Non Committee Members

9. **Next Meeting / Adjournment**
   September 27, 2010

Please come prepared to discuss the agenda items. If you have any questions, call Brian MacGavin at (951) 358-5029. PMAC
Agendas with attachments are available at our website: www.rivcoems.org.

The County of Riverside does not discriminate on the basis of disability in admission to, access to, or operations of its programs,
services or activities. It is committed to ensuring that its programs, services, and activities are fully accessible to and usable by people
with disabilities. If you have a disability and need assistance to attend this meeting, contact Brian MacGavin at (951) 358-5029.
## Prehospital Medical Advisory Committee
### Meeting Minutes
#### March 22, 2010

<table>
<thead>
<tr>
<th>Attendees</th>
<th>Member</th>
<th>Organization Represented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humberto Ochoa, MD</td>
<td>X</td>
<td>EMS Agency – Medical Director</td>
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<tr>
<td>Sam Chua, MD</td>
<td>X</td>
<td>American Medical Response</td>
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<tr>
<td>Steve Patterson, MD</td>
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<td>Dwight Arakaki, MD</td>
<td>X</td>
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<td>Bill Herbert</td>
<td>X</td>
<td>Moreno Valley Community Hospital</td>
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<tr>
<td>Kay Schulz</td>
<td>X</td>
<td>Riverside County Regional Medical Center</td>
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<td>Scott Visyak</td>
<td>X</td>
<td>Riverside County Fire Department/Coves</td>
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<td>Mike Markert-Green</td>
<td>X</td>
<td>EMT- I-At-Large</td>
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<tr>
<td>Paul Duenas</td>
<td>X</td>
<td>EMT Paramedic-At-Large</td>
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<tr>
<td>Art Durbin</td>
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<td>Bruce Barton</td>
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<td>EMS Agency-Director</td>
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<td>Sabrina Yamashiro</td>
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<td>Michael Wallace</td>
<td>X</td>
<td>Blythe Ambulance Service</td>
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<tr>
<td>Debra Costa</td>
<td>X</td>
<td>Kaiser Permanente Hospital Riverside</td>
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<tr>
<td>Wayne Ennis</td>
<td>X</td>
<td>American Medical Response (Desert)</td>
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<td>Jim Price</td>
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<td>American Medical Response (Riverside County)</td>
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<td>Heidi Anderson</td>
<td>X</td>
<td>Desert Regional Medical Center</td>
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<td>Patrick Krentz</td>
<td>X</td>
<td>Mercy Air</td>
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<tr>
<td>Kevin Powell</td>
<td>X</td>
<td>Riverside County Fire Department</td>
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<tr>
<td>Michael Mulhall</td>
<td>X</td>
<td>Idyllwild Fire Protection District</td>
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<tr>
<td>Brian MacGavin</td>
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<td>EMS Agency – Asst. Director</td>
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<tr>
<td>Christina Bivona-Tellez</td>
<td>X</td>
<td>Hospital Association of Southern California</td>
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<tr>
<td>Tony Ricci</td>
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<td>CAL Fire</td>
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<td>Lisa Holloway</td>
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<td>Misty Sieger</td>
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<td>AMR Riverside County</td>
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<td>Sean Rogoff</td>
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<td>DOPH – EMS Specialist, PHEPR</td>
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<td>Chuck Clements</td>
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<td>Gigi Kramer</td>
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<td>Christina Pettit</td>
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<td>Desert Air</td>
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<tr>
<td>Katharine Johnson</td>
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<td>PSFD</td>
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</tbody>
</table>
**CALL TO ORDER**

Meeting was called to order at 9:00 AM by Kevin Powell.

**PLEDGE OF ALLEGIANCE**

Dr. Patterson led the pledge of allegiance.

**ROUNDTABLE INTRODUCTIONS**

**CHANGES IN MEETING STRUCTURE**

We have changed our agenda and meeting structure to function more like a working group with an emphasis on discussion. We have two primary committees: Prehospital Medical Advisory Committee (PMAC) and Emergency Medical Care Committee (EMCC). EMCC is the committee we are required to have by the Health and Safety Code. Standing reports will be reserved for EMCC.

**APPROVAL OF MINUTES**

January 5, 2010 minutes were approved without changes.

**COMMITTEE / TASK FORCE DISCUSSION (90 MINUTES)**

Policies – Scott Moffatt

The next committee meeting will be on March 31, 2010. The goal is to revise the 6000 – 8000 treatment protocol sections, to merge ALS and BLS into one protocol and have them finished by September. There are about five to six people serving on five separate work groups for this committee. They will be meeting once a month. Please email Scott Moffatt if you are interested in participating on the Treatment Policy Review Committee.
5150s – Christina Bivona-Tellez

The Hospital Association of Southern California (HASC) has been collecting 5150 transportation data from hospitals and EMS Agencies in Riverside and San Bernardino Counties. So far at least twelve hospitals have submitted data but there is still no total count on how many 5150 patients are being evaluated in emergency departments. Hospitals representatives claim emergency departments are being inundated with 5150 patients. Last year mental health clinic services were cut by 50 percent in both counties, and more cuts are expected. HASC will use 5150 data to recommend County and State policy changes that would encourage collaboration and problem solving for addressing mental health issues.

Regarding the lawsuit filed in San Bernardino County requiring the author of the 5150 to ride with the patient, a motion for reconsideration was denied. ICEMA will have to either appeal or introduce new legislation.

Interfacility Transfers – James Lee

Kent McCurdy was not available to give a report.

A draft of the CCT/RN portion of the interfacility transfer policy has been completed. We are now working on the ALS and BLS transfer portion. Also there is more work needed on the Continuation of Care policy. Those patients needing a rapid transport from a receiving center to a trauma center requires rapid deployment of appropriate resources and a trauma center willing to accept a patient at a moment’s notice. There have been delays in transporting trauma patients because non-trauma centers performing time consuming procedures or not being able to find a local trauma center willing to accept the patient. There has also been discussion on whether to call 9-1-1 or the Exclusive Operating Area (EOA) ambulance provider directly.

CQI TAG – Bruce Barton

CQI TAG committee is finished with the skills matrix. We have been working on the performance standard expectation end points. Now is the time to make changes before submitting to a written comment period. Regarding performance standard PS01, there were concerns on whether the standard should require oxygen administration prior to immediate positive pressure ventilation and referencing Magill forceps and laryngoscopes in a BLS skill. There was a discussion on foreign body obstructions and attempting to force the obstruction through the trachea in order to ventilate. This practice does not exist in REMSA protocol. Dr. Ochoa does not want this procedure to be practiced and would like it to be removed from any written policies. There was further discussion on ensuring responsibility for proper ET tube placement.

HEMS CQI TAG – Steve Patterson, M.D.

HEMS CQI TAG has been meeting every other month. They have been discussing deployment of California Highway Patrol (CHP) rescue helicopters. There was further discussion on who should have the final decision to deploy a helicopter.
The next STEMI group meeting will be on April 22, 2010. We need all of the false positive data in by April 8 in preparation for this meeting. This meeting is open to everyone. If you have any questions please contact Laura at the EMS Agency.

VII. New Business

Policy Changes – Karen Petrilla

Most of the policy changes are small and they will possibly be going out in May for incorporation into REMSA’s Policies and Procedures Manual. These changes are for review and discussion during this PMAC meeting. The following policies were reviewed: Patient Care Documentation Standards, Withholding Resuscitation Efforts, Pre prescribed Medical Devices, Poisonings, Pediatric Cardiac Emergencies, and Pediatric Extremity Trauma. Per the PMAC group, these policies will be going out for a 30-day written public comment period.

VIII. Unfinished Business

MCI Policy – Trevor Douville

The MCI Policy Task Force’s last meeting was on March 4, 2010. We will have the final policy sent out before the next PMAC meeting on June 28, 2010.

IX. Open Discussion

Committee Members

Scott Moffatt is now working for Riverside County EMS Agency as an EMS Specialist. Scott has been a Paramedic in the system for a number of years and has recently become an RN.

Non-Committee Members

Please submit data in April for the pediatric ET intubation moratorium review. The memo regarding the moratorium is posted on the EMS Agency’s web site.

There is a Rural CQI class on June 24 and 25 for providers. The class room has limited seating so please have only one person from your agency to attend, except for CAL Fire and AMR; they are allowed three. If interested, please contact Laura Wallin at the EMS Agency.

X. Next meeting / Adjournment

Adjournment at 11:25 AM

Monday, June 28, 2010 - 9:00 AM to 11:00 AM
Riverside County Regional Medical Center, Rooms A1018 and A1021
26520 Cactus Avenue, Moreno Valley, CA
Existing Appendix to Performance Standards Crosswalk Tool

This tool is intended to identify historical and existing appendix policies that have been transitioned into performance standards. As work continues on the County-wide quality improvement action plan, all of the existing appendix policies will be reviewed by the Technical Advisory Group (TAG) and transitioned into performance standards.

<table>
<thead>
<tr>
<th>Existing Appendix Skill</th>
<th>Action</th>
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</thead>
<tbody>
<tr>
<td>Policy 10 End-Tidal CO2 Monitoring Devices</td>
<td>DELETE-Incorporated in and replaced by performance standards for intubation (PS04-PS07) and Post Intubation Confirmation and Monitoring (PS08)</td>
</tr>
<tr>
<td>Policy 17 ET Introducing Stylet</td>
<td>DELETE-Replaced by Supplemental Performance Standard for ET Introducing Stylet PS04A (content remains the same)</td>
</tr>
<tr>
<td>Policy 19 Intranasal Administration of Medications</td>
<td>Remains as is for this update.</td>
</tr>
<tr>
<td>Policy 20 Intraosseous Infusions</td>
<td>Remains as is for this update.</td>
</tr>
<tr>
<td>Policy 25 King Airway</td>
<td>DELETE-Replaced by Supplemental Performance Standard for King Airway PS07A (minor content change removing the requirement to have a second stand-by tube)</td>
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<tr>
<td>Policy 28 Multi-Lumen Airway Intubation</td>
<td>DELETE-Replaced by Supplemental Performance Standard for Multi-Lumen Airway/Combitube PS07B (content remains the same)</td>
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<tr>
<td>Policy 30 Nasopharyngeal Airway Insertion</td>
<td>DELETE-Incorporated in and replaced by Performance Standard for BLS Airway Adjuncts PS01</td>
</tr>
<tr>
<td>Policy 40 Nasotracheal Intubation</td>
<td>DELETE-Incorporated in and replaced by Performance Standard for Nasotracheal Intubation PS05</td>
</tr>
<tr>
<td>Policy 45 Needle Cricothyrotomy</td>
<td>Remains as is for this update.</td>
</tr>
<tr>
<td>Policy 50 Needle Thoracostomy</td>
<td>DELETE-Incorporated in and replaced by Performance Standard for Needle Thoracostomy PS09</td>
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<tr>
<td>Policy 60 Pediatric Intubation</td>
<td>DELETE-Incorporated in and replaced by Performance Standard for Pediatric Endotracheal Intubation PS06</td>
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<td>-----------------------------------------------</td>
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<tr>
<td>Policy 67 Transcutaneous Pacing (TCP)</td>
<td>DELETE-Incorporated in and replaced by Performance Standard for Transcutaneous Pacing (TCP) PS10</td>
</tr>
<tr>
<td>Policy 70 Transtracheal Instillation of Medications</td>
<td>DELETE-Replaced by Supplemental Performance Standard for Transtracheal Instillation of Medications PS04B</td>
</tr>
<tr>
<td>Policy 80 12-Lead EKG</td>
<td>Remains as is for this update.</td>
</tr>
</tbody>
</table>
All patients with emergency medical needs have the fundamental right to high quality care. Basic and Advanced Life Support (BLS & ALS) Skills performed by EMS professionals rendering emergency medical care are critical to meeting patient needs.

These performance standards are designed to describe performance criteria for the application of BLS and ALS skills. They are intended to be used by Riverside County EMS provider agencies to standardize system-wide skill performance as benchmarks for assuring individual skills competency and improving patient care. EMTs and Paramedics must demonstrate the ability to integrate relevant empirical data to form an accurate assessment and competently perform the appropriate skill. Applicable data could include clinical values, (e.g. Blood Glucose Level, SpO₂, FiO₂, ETCO₂ and other pertinent values) as well as more subjective findings (e.g. perceptible patient distress, skin signs, verbalized symptoms, etc.)

Advanced Life Support (ALS) skills are part of a dynamic process and as such, they exist as part of the continuum of care that begins with the initial assessment of the patient. A comprehensive knowledge base, along with the ability to effectively integrate information, allows the caregiver to form an appropriate yet flexible plan of action. Continuous patient assessment is vital for confirming the validity of the assessment, efficacy of applied therapies and to determine if further interventions are needed.

These standards will be employed by provider agency quality assurance and improvement personnel, Field Training Officers, educators and other performance evaluation personnel to educate and objectively validate skills performance. These standards apply to both field performance and controlled educational settings (e.g. skills days). They are designed to be used in conjunction with prospective, concurrent and retrospective elements of the countywide and provider agency Quality Improvement Programs (QIP). Although it is understood that no skill simulation can fully capture the reality of the “field,” or the infinite variety of possible patient presentations, the intent of the Skills Standards is to distill universal aspects of patient care into a quantifiable matrix. While realistically not all patient outcomes may meet the Terminal Performance Objectives or Critical Success Targets, attaining these objectives / targets is the goal.
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<td>PS11 Synchronized Cardioversion Performance Standard</td>
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<td>Synchronized Cardioversion Performance Validation Form</td>
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Terminal Performance Objective

To establish and maintain an open airway for spontaneous respiration or to facilitate effective positive pressure ventilation.

While managing a patient’s airway with BLS adjuncts, EMTs and paramedics must:

1. Methodically complete an assessment of the airway and breathing within 30 seconds.
2. Identify inadequate ventilation (minute volume) and/or signs of hypoxia within the first 30 seconds.
3. Manually position the head and mandible of the unconscious patient to open the upper airway.
4. Manually clear blood, vomit and foreign bodies when present.
5. Identify the need for suction or more invasive removal of foreign body.
6. Determine the need for and employ the appropriate BLS airway adjunct.
   a. Select the correct size oropharyngeal (OP) airway for the patient without a gag reflex that requires PPV.
   b. Select the correct size nasopharyngeal (NP) airway for the patient with a gag reflex that requires PPV.
7. Utilize appropriate technique per AHA standards to insert the selected airway within 10 seconds
8. Confirm correct airway placement and immediately initiate PPV with oxygen at 10-15 LPM
9. Effectively evaluates the efficacy of PPV following BLS airway insertion.
10. Limit suction attempts to 10 seconds.
11. Limit interruption of PPV to 30 seconds
12. Consider and treat reversible causes of hypoventilation and hypoxia such as opiate overdose and hypoglycemia
13. Rapidly determines the need for Advanced Life Support (ALS) airway adjuncts when airway patency or ventilations cannot be effectively supported by BLS means.

Critical Success Targets for BLS Airway Management

1. Successful and secure adjunct insertion
2. Effective PPV

System Benchmark

% of hypoventilating patients that receive successful positive pressure ventilation

Applicable Protocols

All 6000 BLS Patient care Policies, 7000 ALS Patient Care Policies, 8000 ALS Pediatric Patient Care Policies and 9000 Appendix Skills Policies that delineate positive pressure ventilation under optional or required treatment.

Core Competency Requirements to be covered during education/training

1. Patient assessment
2. Airway anatomy & physiology
3. Airway pathophysiology
4. BLS techniques for relief of anatomical or foreign body airway obstruction
5. Manual positioning of the airway
Performance Standard

PS01

<table>
<thead>
<tr>
<th>Category</th>
<th>Skill – Low Frequency/High Risk</th>
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<tbody>
<tr>
<td>BLS Airway Adjuncts</td>
<td>Approval: EMS Medical Director Humberto Ochoa MD</td>
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<tbody>
<tr>
<td>ALL EMS Provider Agencies</td>
<td>Approval: EMS Agency Director Bruce Barton, CCEMT-P</td>
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</tbody>
</table>

Date: June 2010  
Review Date: June 2012

6. Identification for use of BLS airway adjunct indications  
7. OPA indications/ contraindications  
8. OPA sizing and insertion  
9. NPA indications/ contraindications  
10. NPA sizing and insertion  
11. Evaluation of ventilatory efficacy following BLS airway adjunct insertion  
12. Identification and correction of complications of BLS airway management  
13. Rapid identification of the need for ALS airway and/or medications when BLS airway adjuncts are ineffective

Adjunctive Performance Standards

1. Positive Pressure Ventilation  
2. Laryngoscopy with FBAO Removal/Magill Forceps (ALS personnel)

Equipment Requirements

1. Airway mannequin  
2. OP Airway  
3. NP Airway  
4. Lubricant  
5. BVM with reservoir and manometer  
6. Stethoscope  
7. Supplemental oxygen  
8. PPE

Instructor Resource Materials

1. Prehospital Trauma Life Support  
2. AHA CPR and BLS Provider Manual  
3. 2005 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care  
4. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

AHA
**Performance Objective:** To establish and maintain an open airway for spontaneous respiration or to facilitate effective positive pressure ventilation

**Performance Criteria:** 100% accuracy required on all items

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<th>Pts</th>
<th>Score</th>
<th>Performance Steps</th>
<th>Additional Information</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>Take or verbalize body substance isolation</td>
<td>Selection: gloves, goggles, mask, gown, booties, N95</td>
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<tr>
<td>1</td>
<td></td>
<td>Methodically complete an assessment of the airway and breathing within 30 seconds.</td>
<td>Follow respiratory assessment sequence</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Identify inadequate ventilations and/or signs of hypoxia within the first 30 seconds</td>
<td>Pale/cyanotic, altered level of consciousness, diaphoresis, increased work of breathing or apnea, poor chest rise and fall</td>
</tr>
</tbody>
</table>
| 1   |       | Manually position the head and mandible of the unconscious patient to open the upper airway | • Head-tilt/chin lift  
• Jaw thrust |
| 1   |       | Manually clear blood, vomit, and foreign bodies when present | If no cervical spine injury suspected, turn the victim’s mouth to the side and remove the vomit using your finger, a cloth, or suction |
| 1   |       | Identify the need for suction or more invasive removal of foreign body | Use a rigid pharyngeal catheter tip, if available, for suctioning oropharynx |
| 1   |       | Consider and treat reversible causes of airway obstruction, hypoventilation and hypoxia such as opiate overdose and hypoglycemia | |
| 1   |       | Determine the need for and employ the appropriate BLS airway adjunct | • Select the correct size oropharyngeal (op) airway for the patient without a gag reflex that requires PPV  
  o Measure from earlobe to the corner of the mouth  
• Select the correct size nasopharyngeal (NP) airway for the patient with a gag reflex that requires PPV  
  o Measure from earlobe to nares |
| 1   |       | Confirm the absence of contraindications for the selected airway | Contraindications  
• OPA  
  o Intact gag reflex  
• NPA  
  o Suspected or confirmed basilar skull fracture  
  o Mid-facial trauma  
  o Nasal bleeding |
| 1   |       | Utilize appropriate technique per AHA standards to insert the selected airway within 10 seconds | • OPA  
  o Place tip into patient’s mouth with curve facing up toward the nose  
  o Advance until you meet resistance and rotate 180 degrees until flange is flush against lips  
• NPA  
  o Lubricate tube using water-soluble lubricant  
  o Place tip in nostril with beveled edge against septal wall  
  o Advance approximately one inch and rotate once resistance is met  
  o Continue until flange is resting against outside of nostril |
<table>
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<tr>
<th></th>
<th>Confirm correct airway placement and immediately initiate PPV with oxygen at 10 – 15 LPM</th>
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<tr>
<td></td>
<td>Evaluate the efficacy of PPV following BLS airway insertion.</td>
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<tr>
<td></td>
<td>Chest rise and fall symmetrically, lung sounds auscultated bilaterally, absent epigastric</td>
</tr>
<tr>
<td></td>
<td>sounds with ventilations, patient's skin becoming less diaphoretic, pinker</td>
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<tr>
<td></td>
<td>Limit suction attempts to 10 seconds</td>
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<td></td>
<td>Limit interruption of PPV to 30 seconds</td>
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<td></td>
<td>Rapidly determines the need for Advanced Life Support airway adjuncts when airway patency</td>
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<tr>
<td></td>
<td>or ventilations cannot be effectively supported by BLS means.</td>
</tr>
</tbody>
</table>

**Critical Failure Criteria**

- Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
- Insertion of an oropharyngeal airway without checking for an intact gag reflex
- Failure to properly identify ineffective ventilations
- Any procedure that would have harmed the patient
Terminal Performance Objective
An open unobstructed airway able to support spontaneous respiration or positive pressure ventilation (PPV).

While performing laryngoscopy and use of Magill forceps paramedics must:
1. Methodically complete an assessment of the airway and breathing within 30 seconds.
2. Identify inadequate ventilations and/or signs of hypoxia within the first 30 seconds.
3. Apply appropriate, clinically required technique to manually position the head and mandible of the unconscious patient to-open the upper airway.
   a. Medical - Head tilt/chin lift
   b. Trauma - Jaw thrust or modified chin lift
4. Manually clear blood, vomit and foreign bodies when present.
5. Employ the indicated BLS airway adjunct.
   a. NPA is preferred BLS airway
   b. OPA can be used if the patient does not have a gag reflex
6. Provide positive pressure ventilation (PPV) with oxygen at 10-15 LPM.
7. Determine the presence of a foreign body airway obstruction (FBAO).
8. Perform one (1) cycle of rescue breaths and chest compressions to clear a persistent obstruction.
9. Repeat assessment of airway and breathing to determine if the airway is still obstructed.
11. Appropriately position the patient based on presentation and condition (medical vs. trauma).
12. Use good technique with the laryngoscope to directly visualize anatomical structures of the airway and minimize oral trauma.
13. Recognize and remove a foreign body with the Magill Forceps.
14. Recognize persistent airway obstruction with inability to perform PPV and consider the following:
   a. Rapid transport to the closest most appropriate Hospital and:
      i. Needle cricothyrotomy
15. Reassess airway, breathing and circulation, applying oxygen as clinically indicated (non-rebreather mask or PPV) or returning to cycles of ventilations / compressions as indicated by patient condition.

Critical Success Targets for laryngoscopy and use of Magill Forceps
1. An open unobstructed airway
2. Spontaneous respiratory rate within age appropriate normal limits
3. Ability to perform effective positive pressure ventilation
4. SpO2 of greater than 95%
5. ETCO2 between 30-45 mmHg in the patient with spontaneous circulation
System Benchmark

% of patients with an obstructed airway that receive laryngoscopy with the use of Magill forceps resulting in successful restoration of an open airway

Applicable Protocols

Airway Obstruction (7830), Pediatric Airway Obstruction (8830),

Core Competency Requirements to be covered during education/training

1. Assessment of mental status
2. Ensure patient is unconscious prior to using Magill forceps or beginning chest compressions
3. Airway / patient positioning
4. Assessment of airway / breathing
5. Relative benefit of NPA over OPA for patients with suspected reversible airway obstruction
6. Suctioning / clearing oral cavity of debris
7. Performance of BLS FBAO maneuvers per current AHA standards
8. Use of laryngoscope to visualize airway and look for obstruction
9. Use of Magill forceps to grasp / remove obstruction
10. Reassessment of airway / breathing status to determine further action(s)
11. Recognition of complications (Dislodgement, Obstruction, Pneumothorax, Equipment Failure, or DOPE)

Adjunctive Performance Standards

1. BLS Airway Adjuncts
2. ALS Airways
3. Positive Pressure Ventilation (PPV)

Equipment Requirements

1. Adult advanced airway mannequin
2. Oxygen source
3. Stethoscope
4. Laryngoscope
5. Magill forceps
6. Suction equipment (both rigid and flexible)
7. Personal protective equipment
8. NP/OP Airway
9. BVM w/ manometer and reservoir
10. Pulse Oximeter
11. Capnometer/capnography
12. Cardiac monitor
<table>
<thead>
<tr>
<th>Category</th>
<th>Skill – Low Frequency/High Risk</th>
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<tr>
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<td>Laryngoscopy and Magill Forceps</td>
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<th>Applies To:</th>
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<tbody>
<tr>
<td>EMS Medical Director</td>
<td>Humberto Ochoa MD</td>
</tr>
<tr>
<td>EMS Agency Director</td>
<td>Bruce Barton, CCEMT-P</td>
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</table>

Instructor Resource Materials
1. AHA ACLS Provider Manual
2. AHA PALS Provider Manual
3. 2005 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
4. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic
**Performance Objective:** An open unobstructed airway able to support spontaneous respiration or positive pressure ventilation (PPV)

**Performance Criteria:** 100% accuracy required on all items

<table>
<thead>
<tr>
<th>Pts</th>
<th>Score</th>
<th>Performance Steps</th>
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<tr>
<td>1</td>
<td></td>
<td>Take or verbalize body substance isolation</td>
<td>Selection: gloves, goggles, mask, gown, booties, N95</td>
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<tr>
<td>1</td>
<td></td>
<td>Methodically complete an assessment of the airway and breathing within 30 seconds</td>
<td>Follow respiratory assessment sequence</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Identify inadequately ventilations and/or signs of hypoxia within the first 30 seconds</td>
<td>Pale/cyanotic, altered level of consciousness, diaphoresis, increased work of breathing or apnea, poor chest rise and fall</td>
</tr>
</tbody>
</table>
| 1   |       | Use appropriate technique (trauma vs. medical) to manually position the head and mandible of the unconscious patient to open the upper airway | • Head tilt/chin lift  
• Jaw thrust  
• “Sniffing” position |
| 1   |       | Manually clear blood, vomit, and foreign bodies when present | • If no cervical spine injury suspected, turn the victim’s mouth to the side and remove the vomit using your finger, a cloth, or suction  
• Use a rigid pharyngeal tip, if available, for suctioning oropharynx |
| 1   |       | Employ the indicated BLS airway adjunct | • NPA is the preferred BLS airway  
• OPA can be used if the patient does not have a gag reflex |
| 1   |       | Provide positive pressure ventilation (PPV) with oxygen at 10 – 15 LPM | |
| 1   |       | Determine the presence of a foreign body airway obstruction (FBAO) | Sudden onset of respiratory distress with coughing, gagging, stridor, or wheezing, inability to ventilate the patient with a BVM despite repositioning of airway |
| 1   |       | Perform one (1) cycle of rescue breaths and chest compressions to clear a persistent obstruction | |
| 1   |       | Repeat assessment of airway and breathing to determine if the airway is still obstructed | Follow respiratory assessment sequence |
| 1   |       | Prepare equipment for laryngoscopy and FBAO removal using Magill forceps within 30 seconds | Laryngoscope with functioning bulb, Magill forceps, suction, suction catheters (flexible and rigid), stethoscope, BVM with manometer, waveform capnography, pulse oximetry |
| 1   |       | Appropriately position the patient based on presentation and condition (medical vs. trauma) | • Head tilt/chin lift  
• Jaw thrust  
• “Sniffing” position |
| 1   |       | Use good technique with the laryngoscope to directly visualize anatomical structures of the airway and minimize oral trauma | • Do not use the teeth as a fulcrum |
| 1   |       | Recognize and remove a foreign body with the Magill forceps | |
| 1 | Recognize persistent airway obstruction with inability to perform PPV and consider the following:  
  - Rapid transport to the closest most appropriate hospital  
  - Needle cricothyrotomy | Make base hospital contact as soon as possible to allow the receiving hospital time to adequately prepare for the patient’s arrival |

| 1 | Reassess airway, breathing and circulation, applying oxygen via appropriate device (non-rebreather mask or bag-valve-mask) or returning to cycles of ventilations/compressions as indicated by patient condition. |

**Critical Failure Criteria**

- Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
- Failure to properly identify a FBAO
- Failure to attach oxygen to the BVM
- Failure to appropriately position patient and open airway
- Failure to initiate compressions and ventilations prior to attempting to use Magill forceps
- Using the patient’s teeth as a fulcrum
- Failure to initiate rapid transport once persistent airway obstruction is identified
- Any procedure that would have harmed the patient
Terminal Performance Objective
To establish and maintain adequate airflow (oxygenation and ventilation) to support gas exchange at the cellular level and prevent or reverse tissue hypoxia.

While performing positive pressure ventilation Paramedics and EMTs must adhere to the following performance criteria:

1. Methodically complete an assessment of the airway and breathing within 30 seconds.
2. Identify inadequate ventilations (minute volume) and/or signs of hypoxia within the first 30 seconds.
3. Identify the need for suction or removal of foreign body.
4. Manually position the head and mandible of the unconscious patient to open the upper airway.
5. Select and employ the clinically required BLS airway adjunct.
6. Employ the correct technique to achieve a tight mask seal while maintaining position of the head and mandible to maximize airflow to the lower airway.
7. Correctly apply cricoid pressure (Sellick’s Maneuver).
8. Initiate manual ventilations the clinically required (sized) bag-valve-mask and oxygen at 10-15 LPM within the first 30 seconds.
9. Provide the clinically required ventilatory (minute volume) support for the patient demonstrating the ability to modify tidal volume and/or ventilation rate to achieve chest/diaphragm expansion and full exhalation with each ventilatory cycle.
10. Provide assisted ventilations and oxygen at 10-15 LPM to the conscious patient who is hypoventilating.
11. Ventilate patients with spontaneous circulation (Rescue Breathing) as clinically required:
   a. Ventilate the adult patient once every 5 to 6 seconds (10 – 12 times per minute) with tidal volume (TV) sufficient to produce visible chest rise and fall\(^1\)\(^2\)
   b. Ventilate the pediatric patient once every 3 to 5 seconds (12 – 20 times per minute) with tidal volume sufficient to produce visible chest rise and fall\(^3\) without hyperinflation or gastric insufflation.
   c. Ventilate neonatal patients 40-60 times per minute to maintain a heart rate greater than 100\(^4\).
12. Ventilate cardiac arrest patients during CPR as clinically required:
   a. Ventilate the adult patient without an advanced airway – synchronize 2 ventilations with 30 chest compressions. Provide ventilations with enough tidal volume to produce visible chest rise and fall during pauses in compression cycles (Class Ila).
   b. Ventilate the adult patient with an advanced airway in place – Provide 8-10 unsynchronized ventilations per minute with tidal volume sufficient to achieve rise and fall of the chest (Class Ila)

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\(^1\) 2005 American Heart Association (AHA), Circulation, Part 4, Adult Basic Life Support, pp 23-24, Part 7.1 p 51.
\(^2\) PHTLS, Sixth Edition, Chapter 6, p 121.
\(^3\) 2005 American Heart Association (AHA), Circulation, Part 11, Pediatric Basic Life Support, pp 158-159.
<table>
<thead>
<tr>
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<td><strong>Date</strong></td>
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<th>Skill – Low Frequency/High Risk</th>
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<tr>
<td><strong>Positive Pressure Ventilation</strong></td>
<td>Approval: EMS Medical Director Humberto Ochoa MD</td>
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<tr>
<td><strong>Applies To:</strong></td>
<td>Approval: EMS Agency Director Bruce Barton, CCEMT-P</td>
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</table>

13. Deliver positive pressure ventilations over a minimum of 1 second to avoid hyperinflation and minimize gastric insufflation, high (peak) airway pressures, pulmonary barotrauma and compromise of venous return to the heart (Class IIa).

14. Avoid hyperventilation to minimize high airway pressures, hypocarbia and cerebral vasoconstriction\(^5\) \(^6\).
   a. Reduce minute volume if ETCO2 is greater than 25mmHg in a patient with spontaneous circulation.

15. Differentiate respiratory pathophysiology and modify BVM technique based upon changes in lung compliance and/or airway resistance to maintain therapeutic airway pressure while minimizing gastric insufflation\(^7\).
   a. Ensure changes in inspiratory and expiratory time ratio (I:E Ratio) is factored into ventilatory cycles allowing for exhalation of each breath prior to delivery of the next breath.

16. Efficiently employ diagnostic tools such as pulse oximetry (target Sp02 is greater than or equal to 95%) and auscultation of lung fields to thoroughly assess overall effectiveness of ventilatory support.

17. Immediately identify malfunctioning equipment or ineffective techniques and employs alternative measures to achieve effective ventilations.

18. Maintain effective ventilation and oxygenation throughout the entire Prehospital period of treatment.

19. Maintain calm and effectively lead a team based approach to resuscitation.

20. Rapidly determine the need for Advanced Life Support (ALS) airway adjuncts and/or medications when airway patency or ventilations cannot be effectively supported by BLS means.

21. Document all procedures and patient response to therapy on the PCR.

**Critical Success Targets for PPV**

1. Tight mask seal
2. Chest rise and fall with each ventilation cycle
3. SpO2 of greater than 95% in patients with spontaneous circulation.
4. ETCO2 between 30 – 45 mmHg in patients with spontaneous circulation.
5. ETCO2 between 15 – 45 mmHg in cardiac arrest patients
6. Limited interruption of PPV (30 seconds max)
7. Management of secretions and other airway obstructions
8. Minimal gastric distension

**System Benchmark**

Number of patients PPV with chest rise and fall, patient airway, signs of adequate oxygenation. Patient arrival at Hospital with spontaneous circulation.

\(^5\) PHTLS, Sixth Edition, Chapter 6 et al & Chapter 8, p 214
\(^6\) AHA Advanced Cardiac Life Support (ACLS), Core Case: Respiratory Arrest p 23.
\(^7\) 2005 AHA Pediatric Advanced Life Support, Chapters 2 - 3, Recognition and Management of Respiratory Distress and Failure
**Performance Standard**

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**Category** | Skill – Low Frequency/High Risk

**Positive Pressure Ventilation**

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**Applies To:**

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<th>All EMS Provider Agencies</th>
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**Approval:** EMS Medical Director
Humberto Ochoa MD

**Signature:**

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<td>Bruce Barton, CCEMT-P</td>
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**Applicable Protocols**

All 6000 BLS Patient care Policies, 7000 ALS Patient Care Policies, 8000 ALS Pediatric Patient Care Policies and 9000 Appendix Skills Policies that delineate positive pressure ventilation under optional or required treatment.

**Core Competency Requirements to be covered during education/training on PPV**

1. Respiratory A&P and Pathophysiology
2. Assessment of airway and breathing
3. Differentiation between adequate and inadequate respiration
4. Airway Positioning
5. Suctioning
6. Removal of foreign body obstructions
7. Oropharyngeal Airway selection and insertion
8. Nasopharyngeal Airway selection and insertion
9. BVM selection
10. Induction of supplemental oxygen
11. Hand ventilation with a BVM
12. Application of cricoid pressure during PPV
13. Assessment of PPV adequacy and efficacy
14. Airway pressure secondary to PPV – mean verses peak
15. Possible complications of PPV – gastric, pulmonary, cerebral, and cardiovascular complications of over inflation and over ventilation
16. Auscultation and diagnostic differentiation of lung sounds
17. Team Leadership and Patient Safety
18. Use of diagnostic tools

**Adjunctive Performance Standards**

1. Laryngoscopy with FBAO Removal/Magill Forceps (ALS personnel)
2. BLS Airway Adjuncts
3. ALS Airways

**Equipment Requirements**

1. Mannequin
2. NP Airway
3. OP airway
4. Advanced Airways
5. BVM with manometer
6. Stethoscope
7. Supplemental oxygen
## Performance Standard PS03

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#### Category I Skill – Low Frequency/High Risk

**Positive Pressure Ventilation**

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</table>

8. Magill forceps  
9. Laryngoscope  
10. Pulse oximeter  
11. Waveform capnometer  
12. Suction device (both hard and flexible)

### Instructor Resource Materials

1. Prehospital Trauma Life Support  
2. AHA CPR and BLS Provider Manual  
3. AHA ACLS Provider Manual  
4. AHA PALS Provider Manual  
5. 2005 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care  
6. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic
**Performance Objective:** To establish and maintain adequate airflow (oxygenation and ventilation) to support gas exchange at the cellular level and prevent or reverse tissue hypoxia.

**Performance Criteria:** 100% accuracy required on all items

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<td>Methodically complete an assessment of the airway and breathing within 30 seconds</td>
<td>Follow respiratory assessment sequence</td>
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<td>Identify inadequate ventilations and/or signs of hypoxia within the first 30 seconds</td>
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<td>1</td>
<td></td>
<td>Identify the need for suction or removal of foreign body</td>
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</tbody>
</table>
| 1   |       | Manually position the head and mandible of the unconscious patient to open the upper airway | • Head-tilt/chin lift  
• Jaw thrust |
| 1   |       | Select and employ the appropriate BLS airway adjunct | • Oropharyngeal airway  
• Nasopharyngeal airway |
| 1   |       | Employ the correct technique to achieve a tight mask seal while maintaining position of the head and mandible to maximize airflow to the lower airway | • E-C Clamp technique (one rescuer)  
• Two rescuers is best for achieving a tight mask seal, with one rescuer holding the mask against the patient’s face while maintaining head position, and the 2nd rescuer squeezing the bag |
| 1   |       | Correctly apply cricoid pressure (Sellick’s maneuver) | Apply gentle pressure to the patient’s cricoid cartilage to occlude the esophagus and reduce the patient’s chances of aspirating gastric contents. |
| 1   |       | Initiate manual ventilations with a appropriately sized bag-valve-mask and oxygen at 10 – 15 LPM within the first 30 seconds | |
| 1   |       | Provide the appropriate minute volume ventilatory support for the patient demonstrating the ability to modify tidal volume and/or ventilation rate to achieve chest/diaphragm expansion and full exhalation with each ventilatory cycle. | • During adult CPR tidal volumes of approximately 500 to 600 mL (6 – 7 ml/kg) should suffice  
• Give sufficient volume to cause visible chest rise |
| 1   |       | Appropriately ventilate patients with spontaneous circulation (Rescue Breathing) | • Ventilate the adult patient once every 5 to 6 seconds (10 – 12 times per minute) with tidal volume (TV) sufficient to produce visible chest rise and fall.  
• Ventilate the pediatric patient once every 3 to 5 seconds (12 – 20 times per minute) with tidal volume sufficient to produce visible chest rise and fall without hyperinflation or gastric insufflations.  
• Ventilate neonatal patients 40 – 60 times per minute to maintain a heart rate greater than 100. |
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<tr>
<th></th>
<th>Appropriately ventilate cardiac arrest patients during CPR</th>
<th>Ventilate the adult patient without an advanced airway – synchronize 2 ventilations with 30 chest compressions. Provide ventilations with enough tidal volume to produce visible chest rise and fall during pauses in compression cycles (Class IIa). Ventilate the adult patient with an advanced airway in place – provide 8 – 10 unsynchronized ventilations per minute with tidal volume sufficient to achieve rise and fall of the chest (Class IIa)</th>
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<td></td>
<td>Deliver positive pressure ventilations over a minimum of 1 second.</td>
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<td>Avoid hyperinflation to minimize high airway pressures, hypocarbia, and cerebral vasoconstriction</td>
<td>Reduce minute volume if ETCO2 is less than 25 mmHg in a patient with spontaneous circulation.</td>
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<td>Differentiate respiratory pathphysiology and modify BVM technique based upon changes in lung compliance and/or airway resistance to maintain therapeutic airway pressure while minimizing gastric insufflation.</td>
<td>Ensure changes in inspiratory and expiratory time ration (I:E ratio) is factored into ventilatory cycles allowing for exhalation of each breath prior to delivery of the next breath.</td>
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<td></td>
<td>Efficiently employ diagnostic tools such as pulse oximetry and auscultation of appropriate lung fields to thoroughly assess overall effectiveness of ventilatory support.</td>
<td>SpO2 target is greater than or equal to 95%</td>
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<td></td>
<td>Immediately identify malfunctioning equipment or ineffective techniques and employ alternative measures to achieve effective ventilations</td>
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<td>Maintain effective ventilation and oxygenation throughout the entire Prehospital period of treatment</td>
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<td>Maintain calm and effectively lead a team based approach to resuscitation.</td>
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<td>Rapidly determine the need for Advanced Life Support (ALS) airway adjuncts and/or medications when airway patency or ventilations cannot be effectively supported by BLS means.</td>
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<td>Document all procedures and patient response to therapy on Patient Care Report (PCR).</td>
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**Critical Failure Criteria**

- ___ Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
- ___ Failure to achieve and maintain a tight mask seal
- ___ Failure to apply cricoid pressure
- ___ Failure to properly identify ineffective ventilations
- ___ Any procedure that would have harmed the patient
Terminal Performance Objective

Secure placement of an endotracheal tube (ETT) in the trachea to ensure a patent airway for positive pressure ventilation.

Before performing oro-tracheal intubation paramedics must:
1. Determine BLS airway adjuncts are inadequate for effective positive pressure ventilation (PPV) and confirm the need for Endotracheal Intubation (ETI).^1^ ^2^  
2. Recognize signs of a difficult airway, if present, and select, prepare and employ the appropriate alternative tools and techniques to secure the airway (e.g. Bougie, Rescue Airway)
   a. A difficult airway is defined as the presence of anatomic conditions which preclude direct visualization of the patient’s glottic opening (e.g. airway edema, Mallampati Class III and IV)  
3. Correctly assemble all equipment required for ETI within 60 seconds.  
4. Provide optimal ventilation and oxygenation to the patient while ETI equipment is prepared.  
5. Correctly apply cricoid pressure during PPV.

While performing oro-tracheal intubation paramedics must:
1. Correctly apply cricoid pressure during intubation attempts.  
2. Visualize anatomical structures including the glottic opening (vocal cords) during direct laryngoscopy.  
   a. Use manual percutaneous laryngeal manipulation to assist with visualization of the glottic opening as needed.  
3. Minimize oral trauma during laryngoscopy by utilizing correct technique.  
4. Place the appropriately sized ETT securely in the trachea at the correct depth within 30 seconds.  
5. Confirm the ETT is in the trachea by:
   a. Direct visualization of the tube passing through the vocal cords  
   b. Use of an Esophageal Detector Device (EDD)  
6. Immediately re-establish PPV at the clinically required rate and tidal volume (minute volume) and oxygen at 10-15 LPM following ETI placement.  
7. Continue procedures for confirming the ETT is in the trachea by simultaneously performing the following^3^:
   a. Visualizing symmetrical rise and fall of the chest with PPV  
   b. Auscultation over lung fields for confirmation of airflow with PPV  
   c. Auscultation over the epigastrium for the absence of airflow with PPV.

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2 PHTLS Sixth Edition, Chapter 6, Chapter 8 pp 213-214  
<table>
<thead>
<tr>
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<td>Category I Skill – Low Frequency/High Risk</td>
<td>Approval: EMS Medical Director Humberto Ochoa MD</td>
</tr>
<tr>
<td>Adult Orotracheal Intubation</td>
<td>Approval: EMS Agency Director Bruce Barton, CCEMT-P</td>
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<tr>
<th>8. Secure the ETT in the trachea at the correct depth with tape or a commercial device.</th>
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<tr>
<td>9. Re-implement effective PPV within 10 seconds following unsuccessful ET attempts:</td>
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<tr>
<td>a. Employ rescue airway after 2 failed attempts on the patient</td>
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<tr>
<td>b. Passing the laryngoscope past the teeth with the intent of placing an ETT is considered an intubation attempt</td>
</tr>
<tr>
<td>10. Stabilize the patients head to avoid movement and possible ETT dislodgement.</td>
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<tr>
<td>11. Efficiently employ post ETT diagnostic tools to thoroughly assess overall effectiveness of ventilatory support throughout the duration of respiratory management efforts, including:</td>
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<tr>
<td>a. Symmetrical rise and fall of the chest with PPV</td>
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<td>b. Monitor pulse oximetry – the target SpO2 is greater than or equal to 95% if spontaneous circulation is present.</td>
</tr>
<tr>
<td>c. Monitor ETCO2 for appropriate waveform morphology and target CO2 levels.</td>
</tr>
<tr>
<td>i. The target range for ETCO2 level is between 30 – 45 mmHg if spontaneous circulation is present.</td>
</tr>
<tr>
<td>ii. In cardiac arrest metabolic derangements will significantly alter ETCO2 values and waveform morphology. Target range for ETCO2 level is between 15mmHg and 45mmHg during CPR.</td>
</tr>
<tr>
<td>d. Monitor ECG for dysrhythmia due to vagal stimulation or other treatable causes.</td>
</tr>
<tr>
<td>e. Frequent auscultation of lung fields and epigastrium.</td>
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<td>f. Constant evaluation of ventilatory compliance and resistance during PPV</td>
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<td>12. Immediately identify malfunctioning equipment, ineffective techniques or changes in post ETI PPV compliance/resistance and employ alternative measures to achieve effective ventilations.</td>
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<td>13. Reconfirm correct ETT placement each time the patient is moved and before transfer of care to Hospital staff.</td>
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<td>14. Provide direction to personnel that have been delegated management of post ETT PPV.</td>
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<tr>
<td>15. Maintain effective ventilation and oxygenation throughout the entire prehospital treatment period.</td>
</tr>
<tr>
<td>16. Maintain calm and effectively lead a team-based approach to resuscitation under all conditions.</td>
</tr>
<tr>
<td>17. Accurately document all assessment findings, therapeutic treatments and the patient’s response to therapy.</td>
</tr>
</tbody>
</table>

**Critical Success Targets for ETI**

1. ETT securely placed in the trachea followed by effective PPV
2. Chest rise and fall with each ventilation cycle
3. Ventilatory rate and tidal volume appropriate for patient condition and response
4. SpO2 of greater than or equal to 95% in patients with spontaneous circulation

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Riverside County EMS – Adult Endotracheal Intubation Performance Standard  Page 2 of 4
5. ETCO2 between 30 – 45 mmHg in patients with spontaneous circulation
6. ETCO2 between 15 – 45 mmHg in cardiac arrest patients
7. Limited interruption of PPV (30 seconds maximum)

System Benchmark
ETT securely placed in the trachea within 2 attempts in 90% of the indicated patients.
Recognition of misplaced or dislodged ETT in 100% of the occurrences.

Applicable Protocols
ALS Guidelines 7060, V-FIB/V-Tach 7250, Asystole 7260, PEA 7270, Burns 7300, Respiratory Arrest 7800, Airway Obstruction 7830

Core Competency Requirements to be covered during education/training on ETI
1. Respiratory A&P and Pathophysiology
2. Assessment of airway and breathing
3. Techniques for PPV
4. Airway pressure secondary to PPV – mean versus peak
5. Possible complications of PPV – gastric, pulmonary, cerebral, and cardiovascular complications of over-inflation and over-ventilation
6. Determination of PPV adequacy and efficacy
7. Differentiation between effective and ineffective patient response to PPV via BLS measures
8. Indications and contraindications for ETI
9. Selection of correct equipment required for ETI (e.g. ETT size)
10. Identification of the difficult airway and employment of alternative techniques and tools
11. Laryngoscopy Techniques
12. ETT placement techniques
13. Post-placement ETT monitoring
14. Auscultation and diagnostic differentiation of lung sounds
15. Use of diagnostic tools, e.g., Capnography
16. Recognition of complications (Dislodgement, Obstruction, Pneumothorax, Equipment Failure, or DOPE)
17. Team Leadership and Patient Safety
18. Documentation

Adjunctive Performance Standards
1. Positive Pressure Ventilation
2. Laryngoscopy with FBAO Removal/Magill Forceps
3. BLS Airway Adjuncts
4. Post ETI Confirmation and Monitoring
5. Rescue Airway
6. Gum Elastic Bougie
Equipment Requirements

1. Personal Protective Equipment
2. NP/OP Airways
3. BVM
4. Stethoscope
5. Supplemental oxygen
6. Magill Forceps
7. Laryngoscope(s)
8. Laryngoscope Blades (multi sizes)
9. Appropriate size ET tubes
10. Stylet(s)
11. Pulse Oximeter
12. Waveform Capnometer
13. Suction device (both rigid and flexible catheters)
14. Cardiac monitor
15. Difficult Airway Kit/Rescue Airway Kit (including just in time training aids)

Instructor Resource Materials

1. Prehospital Trauma Life Support
2. AHA CPR and BLS Provider Manual
3. AHA ACLS Provider Manual
4. AHA PALS Provider Manual
5. 2005 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
6. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic
Performance Objective: Secure placement of an endotracheal tube (ETT) in the trachea to ensure a patent airway for positive pressure ventilation.

Performance Criteria: 100% accuracy required on all items

<table>
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<tr>
<th>Pts</th>
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<td>Take or verbalize body substance isolation</td>
<td>Selection: gloves, goggles, mask, gown, booties, N95</td>
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<td>1</td>
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<td>Determine BLS airway adjuncts are inadequate for effective positive pressure ventilation (PPV) and confirm the need for Endotracheal Intubation (ETI)</td>
<td>No or inadequate rise and fall of chest, no improvement in patient’s color</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Recognize signs of a difficult airway and select, prepare, and employ the appropriate alternative tools and techniques (e.g., Bougie, Rescue Airway)</td>
<td>Signs of a difficult airway include, but are not limited to: 1. Arthritis or scoliosis of the spine 2. Significant overbite 3. Small mandible 4. Short neck 5. Morbid obesity 6. C-spine immobilization 7. Face or neck trauma 8. Mallampati Class III or IV</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Correctly assemble all equipment required for ETI within 60 seconds</td>
<td>ETT, stylet, laryngoscope with functioning bulb, Magill forceps, suction, suction catheters (flexible and rigid), 10cc syringe with luer-lock, stethoscope, Rescue Airways (King tube or Combitube), Toomey Syringe, waveform capnography, pulse oximetry, BVM with manometer</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Provide optimal ventilation and oxygenation to the patient while ETI equipment is prepared</td>
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While performing orotracheal intubation, paramedics must:

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<tr>
<td>1</td>
<td></td>
<td>Correctly apply cricoid pressure during intubation attempts</td>
<td>Apply gentle pressure to the patient’s cricoid cartilage to occlude the esophagus and reduce the patient’s chances of aspirating gastric contents.</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Properly position the patient for intubation</td>
<td>“Sniffing” position, if not a trauma patient.</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Visualize anatomical structures including the glottic opening (vocal cords) during direct laryngoscopy</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Minimize oral trauma during laryngoscopy by utilizing correct technique.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Place the appropriately sized ETT securely in the trachea at the correct depth within 30 seconds.</td>
<td>• Adult women typically will take a 7.0 – 7.5 ETT; adult men will typically take 7.5 – 8.0 ETT  • Appropriate depth is ½ - 1 inch beyond the vocal cords, usually 22 – 23 cm marking at the teeth</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Immediately re-establish PPV with the appropriate rate, tidal volume and oxygen at 10 – 15 LPM following ETT placement</td>
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</table>
| 1 | Confirm ETT is in the trachea. | • Direct visualization of the tube passing through the vocal cords  
• Visualizing symmetrical rise and fall of the chest with PPV  
• Auscultation over lung fields for confirmation of airflow with PPV  
• Auscultation over the epigastrium for the absence of airflow with PPV  
• Use of an Esophageal Detector Device (EDD)  
• Placement of waveform capnography monitor and confirm the appropriate ETCO2 waveform is present. |
| 1 | Secure the ETT in the trachea at the correct depth with tape or a commercial device. |   |
| 1 | Re-implement effective PPV within 10 seconds following unsuccessful ET attempts. | • Employ rescue airway after 2 failed attempts on the patient  
• Passing the laryngoscope past the teeth with the intent of placing an ETT is considered an intubation attempt. |
| 1 | Stabilize the patient’s head to avoid movement and possible ETT dislodgement | Consider utilizing a Cervical Collar to stabilize the patient’s head. |
| 1 | Efficiently employ post ETT diagnostic tools to thoroughly assess overall effectiveness of ventilatory support throughout the duration of respiratory management efforts | • Symmetrical rise and fall of the chest  
• Monitor pulse oximetry – the target SpO2 is greater than or equal to 95% if spontaneous circulation is present  
• Monitor ETCO2 for appropriate waveform morphology and target CO2 levels.  
  o The target range for ETCO2 level is between 30 – 45 mmHg if spontaneous circulation is present.  
  o In cardiac arrest, metabolic derangements will significantly alter ETCO2 values and waveform morphology. Target range for ETCO2 levels is between 15 mmHg and 45 mmHg during CPR.  
• Monitor ECG for dysrhythmia due to vagal stimulation or other treatable causes.  
• Frequent auscultation of lung fields and epigastrium.  
• Constant evaluation of ventilatory compliance and resistance during PPV. |
| 1 | Immediately identify malfunctioning equipment, ineffective techniques, or changes in post ETI PPV compliance/resistance and employ alternative measures to achieve effective ventilations. |   |
| 1 | Reconfirm correct ETT placement each time the patient is moved and before transfer of care to hospital staff | Record and print the waveform ETCO2 strip prior to transfer of care to the hospital staff and attach the recording strip to the completed PCR. |
| 1 | Provide direction to personnel that have been delegated management of post ETT PPV. |   |
| 1 | Maintain effective ventilation and oxygenation throughout the entire prehospital treatment period. | Target SpO2 is greater than or equal to 95%; target ETCO2 is 30 – 45 mmHg in the spontaneously circulating patient |
| 1 | Maintain calm and effectively lead a team-based approach to resuscitation under all conditions. |   |
| 1 | Accurately document all assessment findings, therapeutic treatments, and the patient’s response to therapy |   |
| 1 | Complete a Procedure Evaluation Form |   |
Critical Failure Criteria

___ Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
___ Failure to initiate ventilations within 30 seconds after applying gloves or interrupts ventilations for greater than 30 seconds.
___ Failure to ventilate patient at a rate appropriate to patient age
___ Failure to provide adequate tidal volume per breath
___ Failure to pre-oxygenate patient prior to intubation attempt
___ Failure to successfully intubate within 2 attempts
___ Failure to disconnect syringe immediately after inflating cuff of ET tube
___ Uses teeth as a fulcrum
___ Failure to assure proper tube placement by auscultation over lung fields and epigastrium
___ Failure to use either a Colorimetric end tidal CO2 cap or waveform capnography
___ If used, stylet extends beyond end of tube
___ Failure to re-check tube placement after each patient movement and before transfer of care to hospital staff
___ Any procedure that would have harmed the patient
Purpose
This performance standard is supplemental to the Adult Orotracheal Intubation Standard (PS04).

Terminal Performance Objective
To assist with the secure placement of an endotracheal tube (ETT) in the trachea to ensure a patent airway for positive pressure ventilation (PPV).

Before using the ET introducing stylet to assist with intubation paramedics must:
1. Determine BLS airway adjuncts are inadequate for effective PPV and confirm the need for endotracheal intubation (ETI)¹ ² .
2. Recognize signs of a difficult airway characterized by the presence of anatomic conditions which preclude direct visualization of the patient’s glottic opening.
3. Correctly assemble all equipment required for ETI within 60 seconds.
4. Provide optimal ventilation and oxygenation to the patient while ETI equipment is prepared.
5. Correctly apply cricoid pressure during PPV.

Contraindications
1. DO NOT use the ET introducing stylet with endotracheal tubes smaller than 6.0.

Complications
1. Complications of the ET tube introducing stylet may include:
   • Tracheal/esophageal perforation
   • Hemopneumothorax
   • Mediastinal emphysema
   • Right-sided pneumothorax
   • Right mainstem intubation

Procedure
1. Apply cricoid pressure
2. Perform laryngoscopy as per orotracheal intubation procedure, and obtain the best possible laryngeal view.
   a. Use manual percutaneous laryngeal manipulation to assist with visualization of the glottic opening as needed.

¹ 2005 AHA Guidelines for CPR and ECC, Part 7.1 p 53.
² PHTLS Sixth Edition, Chapter 6, Chapter 8 pp 213-214
3. While holding ET tube introducing stylet in right hand with the angled tip pointing upward, gently advance the ET tube introducer anteriorly (under the epiglottis) to the glottic opening (cords).
4. If able to visualize the vocal cords, direct through the cords.
5. If unable to visualize cords, direct the ET tube introducer to the anatomical area where the cords should be, and feel for a “washboard” sensation as the stylet tip ratchets on the tracheal rings.
6. Gently advance the device until resistance is encountered (at the carina).
   a. NEVER force the stylet, as pharyngeal/tracheal perforation can occur.
   b. If no resistance is encountered and the entire length of the introducing stylet is inserted, the device is in the esophagus.
7. The stylet is correctly placed when the device can be seen going through the cords, when ratcheting of the tip on the tracheal rings is felt, and/or when resistance is met after advancing (stylet is at the carina).
   a. When using a marked stylet, withdraw the stylet back until the black line (or other such mark) is at the lips prior to advancing the ET tube, indicating distal tip is beyond vocal cords and proximal end has enough length to slide ET tube over it.
8. Once the stylet is positioned, advance the ET tube over the stylet and into the trachea.
9. If resistance encountered, withdraw the ET tube slightly, rotate 90 degrees and re-attempt. If unsuccessful, attempt with a smaller tube.
10. Once the ET tube is placed, maintain tube placement while removing introducer stylet.
11. Because this is a blind intubation, ETCO₂ or waveform capnography must be present to confirm tracheal placement.
Purpose
This performance standard is supplemental to the Adult Orotracheal Intubation Standard (PS04).

Terminal Performance Objective
1. The purpose of this policy is to define the indications and procedure for the transtracheal instillation of medications.
2. In a cardiac arrest or other medical situation, it is not always possible to administer essential drugs intravenously. It has been shown that some of these drugs are readily absorbed into the circulatory system via the tracheobronchial tree. If endotracheal (ET) intubation is successful, it is possible to give some specific drugs down the ET tube when no IV access has been established. (There are additional alternative routes if an IV cannot be established. All drugs listed below can be administered IO; Narcan can also be given IN. The transtracheal route should be the route of last resort.) The dosages of medications administered via the ET are generally doubled except for pediatric epinephrine.
3. The following drugs and dilutions are recommended to achieve ET dosages:
   a. Adult
      - Atropine 2.0 mg, diluted to a total of 10cc with sterile water or normal saline
      - Epinephrine 2.0 mg (1:1,000), diluted to a total of 10cc with sterile water or saline
      - Narcan 0.8 - 4.0 mg, diluted to a total of 10cc with sterile water or normal saline
      - Lidocaine 3.0 mg/kg
      - With multiple dosings, no more than a combined total of 30 cc of fluid should be administered transtracheally without Base Hospital consultation.
   b. Pediatric – individual doses should be diluted with NS to a 1 - 3cc fluid volume:
      - Atropine 0.02 mg/kg (min dose is 0.1mg)
      - Epinephrine 0.1 mg/kg (1:1000)
      - Narcan 0.2 mg/kg
      - Lidocaine 2.0 mg/kg
      - With multiple dosings, no more than a combined total of 15 cc of fluid should be administered transtracheally without Base Hospital consultation.
4. The following procedure should be done:
   a. Confirm medication dose (drug, amount, dilution and route of administration)
   b. Reassess the placement status of the endotracheal tube prior to the medication instillation.
   c. Maintain CPR, if indicated.
   d. Hyperventilate the patient 4-6 times.
   e. Remove the bag-valve-mask from the adaptor of the endotracheal tube.
   f. Remove the needle from the syringe, if needle is not permanently attached.
   g. Instill the prescribed medications.
h. Reattach the BVM to the adaptor and hyperventilate the patient 4-6 times to aid in the dispersion of the medication.

i. Re-evaluate the patient’s status and EKG rhythm.

5. Precautions include:
   a. Ventilations should not be interrupted for more than five (5) seconds.
   b. Care should be exercised not to move the tube.
   c. Reassess the tube placement after each instillation.
   d. Continue CPR as indicated.
Terminal Performance Objective

Secure placement of an endotracheal tube (ETT) in the trachea via the nasopharyngeal route to ensure a patent airway for positive pressure ventilation.

Before performing nasotracheal intubation (NTI) paramedics must:

1. Determine BLS airway adjuncts are inadequate for effective positive pressure ventilation (PPV) and confirm the need for NTI.
   a. Confirm signs of impending respiratory failure or hypoxia refractory to BLS management techniques.
   b. Confirm the patient is unable to protect their own airway and an ALS adjunct is required, and
      i. Orotracheal intubation is not possible, and
      ii. Rescue airway placement is not possible.

2. Confirm none of the following contraindications for NTI are present.
   a. Apnea
   b. Children less than 30 kg or 14 years of age
   c. Suspected altered level of consciousness from hypoglycemia or overdose of narcotics prior to the administration of Narcan and/or dextrose

3. Carefully consider complications and the risk versus benefit of performing NTI if the following relative contraindications are present:
   a. Head, facial or nasal trauma with possible basilar skull fracture
   b. Blood or fluid draining from the nose or ears
   c. Facial fractures
   d. Battle’s Sign or Raccoons Eyes
   e. Anticoagulant therapy or hemostatic disorder
   f. Laryngeal fracture

4. Correctly assemble all equipment required for NTI within 60 seconds.
   a. Endotracheal tubes used for NTI must be at least 7.0 or larger due to the length of the nasopharyngeal route to the glottis

While performing nasotracheal intubation paramedics must:

1. Provide optimal oxygenation of the patient while NTI equipment is prepared.
2. Prepare the patient by positioning them appropriately and by providing procedural information with a calming manner if they are conscious.
3. Choose nostril and prepare by:
   b. Applying neosynephrine (consider applying to both nares)

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1 2005 AHA Guidelines for CPR and ECC, Part 7.1 pp 53
2 PHTLS Sixth Edition, Chapter 6, Chapter 8 pp 213-214.
c. Instilling 2-5 mL viscous lidocaine into nostril (5 mL syringe works well for this) or, alternatively, place a viscous-lidocaine coated NPA in the target nostril. This numbs the nostril and confirms free passage for tube.

d. Allowing time for the medications to work (60 seconds)

4. Minimize trauma to the nares by utilizing correct technique.
   a. Apply cricoid pressure with one hand, insert the ETT into the prepared nares with the other hand and guide it along the curve of the nasopharynx to the glottic opening where maximum airflow can be felt/heard. If resistance is felt do not advance the tube with force, remove it, hyperoxygenate the patient and re-attempt on the other nostril.

5. Place the ETT securely in the trachea by timing the passage of the distal tip/balloon through the glottic opening with the patient’s inspiratory phase.

6. Confirm ETT is in the trachea by:
   a. Air passage through and fogging of the tube
   b. Positive airflow by using the BAAM whistle

7. Immediately establish PPV at the clinically required rate and tidal volume (minute volume) and oxygen at 10-15 LPM following ETT placement.

8. Continue procedures for confirming the ETT in the trachea by simultaneously performing the following:
   a. Visualizing symmetrical rise and fall of the chest with PPV
   b. Auscultation over lung fields for confirmation of airflow with PPV
   c. Auscultation over the epigastrium for the absence of airflow with PPV
   d. Immediate placement of waveform capnography monitor and confirm the appropriate ETCO2 waveform is present with PPV

9. Minimize movement of the patients head to avoid NTT dislodgement.

10. Efficiently employ post NTT diagnostic tools to thoroughly assess overall effectiveness of ventilatory support throughout the duration of respiratory management efforts, including:
   a. Pulse oximetry – the target SpO2 is greater than or equal to 95%
   b. End tidal CO2 capnography or capnometry – the target range is between 30 – 45 mmHg
   c. Cardiac monitor to watch for vagal stimulation and dysrhythmias
   d. Frequent auscultation of all lung fields
   e. Constant evaluation of ventilatory compliance and resistance during PPV
   f. Improvement in the patient’s vital signs and appearance

11. Re-implement effective PPV within 10 seconds following unsuccessful NTI attempts.

12. Immediately identify malfunctioning equipment, ineffective techniques or changes in post NTI PPV compliance/resistance and employ alternative measures to achieve effective ventilations.

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13. Reconfirm correct NTT placement each time the patient is moved and before transfer of care to Hospital staff.
   g. Record and print the waveform ETCO2 strip prior to transfer of care to the Hospital staff and attach the
      recording strip to the completed PCR
14. Provide direction to personnel that have been delegated post NTT PPV.
15. Maintain effective ventilation and oxygenation throughout the entire Prehospital interval.
16. Maintain calm and effectively lead a team-based approach to resuscitation under all conditions.
17. Accurately document all assessment findings, therapeutic treatments and the patient’s response to therapy 100% of the time.
18. Complete a procedure evaluation form.

Critical Success Targets for NTI
1. NTT securely placed in the trachea followed by effective PPV
2. Chest rise and fall with each ventilation cycle
3. SpO2 of greater than or equal to 95%
4. ETCO2 between 30 – 45 mmHg in a patient with spontaneous circulation.
5. Limited interruption of PPV (30 seconds maximum)

System Benchmark

NTT securely placed in the trachea within 2 attempts in 90% of the indicated patients.

Applicable Protocols
7300 Burns, 7320 Heat Illness, 7410 Allergic Reaction, 7820 COPD, Asthma, Bronchospasm, 7850 Acute Pulmonary Edema, 7910 Traumatic Shock, 7920 Abdominal Trauma, 7930 Chest Trauma

Core Competency Requirements to be covered during education/training on NTI
1. Respiratory A&P and Pathophysiology
2. Assessment of airway and breathing
3. Techniques for PPV
4. Airway pressure secondary to PPV – mean versus peak
5. Possible complications of PPV – gastric, pulmonary, cerebral, and cardiovascular complications of over-inflation and over ventilation
6. Determination of PPV adequacy and efficacy
7. Differentiation between effective and ineffective patient response to PPV via BLS measures
8. Indications and contraindications for NTI
9. Selection of correct equipment required for ETI (e.g. NTT size)
10. NTT placement techniques
11. Post-placement NTT monitoring
12. Auscultation and diagnostic differentiation of lung sounds
## Performance Standard

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<tbody>
<tr>
<td><strong>Category 1 Skill – Low Frequency/High Risk</strong></td>
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<tr>
<td><strong>Nasotracheal Intubation</strong></td>
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<tr>
<th>Applies To:</th>
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<tbody>
<tr>
<td>ALS Provider Agencies</td>
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| Approval: EMS Medical Director |
| Humberto Ochoa MD |

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| Approval: EMS Agency Director |
| Bruce Barton, CCEMT-P |

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13. Use of diagnostic tools, e.g., Capnography, End-tidal CO2 Device
14. Recognition of complications (Dislodgement, Obstruction, Pneumothorax, Equipment Failure, or DOPE)
15. Team Leadership and Patient Safety
16. Documentation
17. Need to control the patient and their movements

### Adjunctive Performance Standards

1. Positive Pressure Ventilation
2. BLS Airway Adjuncts
3. Post ETI/NTI Confirmation and Monitoring

### Equipment Requirements

1. Personal Protective Equipment
2. NP/OP Airways
3. BVM with manometer and reservoir
4. BAAM Whistle
5. EDD – esophageal detection device
6. Stethoscope
7. Supplemental oxygen
8. Neosynephrine
9. Viscous Lidocaine
10. Appropriate size ET tubes
11. Pulse Oximeter
12. Waveform Capnometer
13. Suction device (both rigid and flexible catheters)
14. Cardiac monitor
15. Difficult Airway Kit/Rescue Airway Kit (including just in time training aids)

### Instructor Resource Materials

1. Prehospital Trauma Life Support
2. AHA CPR and BLS Provider Manual
3. AHA ACLS Provider Manual
4. AHA PALS Provider Manual
5. 2005 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
6. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic
## Nasotracheal Intubation – PS05

**Performance Objective:** Secure placement of a nasotracheal tube (NTT) in the trachea to facilitate positive pressure ventilation

**Performance Criteria:** 100% accuracy required on all items

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<td>Selection: gloves, goggles, mask, gown, booties, N95</td>
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<tr>
<td>1</td>
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<td>Determine BLS airway adjuncts are inadequate for effective positive pressure ventilation (PPV) and confirm the need for Nasotracheal Intubation (NTI).</td>
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</table>
| 1   |       | Identify the indications for NTI are present. | - Impending respiratory failure or hypoventilation when respiratory distress is refractory to high flow oxygen therapy and medications  
- Possible cervical spine injury  
- Clenched jaw  
- Visual laryngoscopy unavailable due to patient trapped and inaccessible  
- Gag reflex still present  
- If the patient can be adequately ventilated utilizing the bag-valve-mask, then NTI may not be necessary. |
| 1   |       | Confirm no contraindications for NTI are present. | - Apnea  
- Head, facial or nasal trauma with possible basilar skull fracture  
- Blood or fluid draining from the nose or ears  
- Facial fractures  
- Battle’s Sign or Raccoons Eyes  
- Children less than 30 kg or 14 years of age  
- Anticoagulant therapy or hemostatic disorder  
- Laryngeal fracture  
- Suspected altered level of consciousness from hypoglycemia or overdose of narcotics prior to the administration of Narcan and/or dextrose |
| 1   |       | Correctly assemble all equipment required for NTI within 60 seconds | ETT, suction, suction catheters (flexible and rigid), 10cc syringe with luer-lock, 3 and 5 cc syringes, stethoscope, Toomey Syringe, waveform capnography, pulse oximetry, BVM with manometer, BAM whistle, Neo-Synephrine, viscous lidocaine, NPA |
| 1   |       | Ensure PPV and optimal oxygenation of the patient while NTI equipment is prepared. | |
| 1   |       | Prepare the patient by positioning them appropriately and by providing procedural information with a calming manner if they are conscious | |
| 1   |       | Choose nostril and prepare | - Apply neosynephrine  
- Inject 2 – 5 ml viscous lidocaine into nostril, or alternatively, place a viscous-lidocaine coated NPA in the target nostril. This numbs the nostril and confirms free passage for tube  
- Allow time for the medications to work (60 seconds) |
| 1   |       | Correctly apply cricoid pressure during ventilation and intubation attempts | Apply gentle pressure to the patient’s cricoid cartilage to occlude the esophagus and reduce the patient’s chances of aspirating gastric contents. |
|   | Minimize trauma to the nares by utilizing correct technique:  
|   | - Select appropriate size ETT and lubricate the distal tip with 2% viscous lidocaine or water soluble lubricant  
|   | - Insert and guide the ETT along the curve of the nasopharynx.  
|   | - Advance tube until maximum airflow is heard  
|   |   • If resistance is felt, do not force the tube; withdraw the tube, hyperventilate and attempt in other nostril  
|   | - Make only one attempt per nostril  
| 1 | Place appropriately sized NTT securely in the trachea within 60 seconds  
| 1 | Immediately re-establish PPV with the appropriate rate, tidal volume and high concentration supplemental oxygen following NTT placement  
| 1 | Confirm NTT is in the trachea  
|   | By the following methods (all are required)  
|   | - Visualizing symmetrical rise and fall of the chest  
|   | - Use of the BAAM whistle  
|   | - Auscultation over lung fields for confirmation of airflow with PPV  
|   | - Auscultation over the epigastrium for the absence of airflow with PPV  
|   | - Fogging of NTT  
|   | - Placement of waveform capnography monitor and confirm the appropriate ETCO2 waveform is present.  
| 1 | Minimize movement of the patient’s head to avoid NTT dislodgement  
|   | Consider use of a cervical collar, if the patient will tolerate it  
| 1 | Efficiently employ post ETT diagnostic tools to thoroughly assess overall effectiveness of ventilatory support throughout the duration of respiratory management efforts  
|   | - Pulse oximetry – the target is greater than or equal to 95%  
|   | - End tidal CO2 capnography or capnometry – the target range is between 30 - 45 mmHg  
|   | - Cardiac monitor to watch for vagal stimulation and dysrhythmias  
|   | - Frequent auscultation of all lung fields  
|   | - Constant evaluation of ventilatory compliance and resistance during PPV  
|   | - Improvement in the patient’s vital signs and appearance  
| 1 | Re-implement effective PPV within 10 seconds following unsuccessful NTI attempts  
| 1 | Immediately identify malfunctioning equipment, ineffective techniques or changes in post NTI PPV compliance/resistance and employ alternative measures to achieve effective ventilations  
| 1 | Reconfirm correct NTT placement each time the patient is moved and before transfer of care to hospital staff  
|   | Record and print the waveform ETCO2 strip prior to transfer of care to the hospital staff and attach the recording strip to the completed PCR.  
| 1 | Provide direction to personnel that have been delegated management of post NTT PPV.  
| 1 | Maintain effective ventilation and oxygenation throughout the entire prehospital treatment period.  
|   | Target SpO2 is greater than or equal to 95%; target ETCO2 is 30 – 45 mmHg in the spontaneously circulating patient
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<thead>
<tr>
<th></th>
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<td>Accurately document all assessment findings, therapeutic treatments, and the patient’s response to therapy</td>
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**Critical Failure Criteria**

- Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
- Failure to initiate ventilations within 30 seconds after applying gloves or interrupts ventilations for greater than 30 seconds.
- Failure to ventilate patient at a rate appropriate to patient age
- Failure to provide adequate tidal volume per breath
- Failure to pre-oxygenate patient prior to intubation attempt
- Failure to successfully intubate within 2 attempts
- Failure to disconnect syringe immediately after inflating cuff of ET tube
- Failure to assure proper tube placement by auscultation over lung fields and epigastrium
- Failure to use either a Colorimetric end tidal CO2 cap or waveform capnography
- Failure to re-check tube placement after each patient movement and before transfer of care to hospital staff
- Any procedure that would have harmed the patient
Terminal Performance Objective

Secure placement of an endotracheal tube (ETT) in the trachea to ensure a patent airway for positive pressure ventilation.

Before performing pediatric orotracheal intubation paramedics must:
1. Determine BLS airway adjuncts are inadequate for effective positive pressure ventilation (PPV) and confirm the need for Pediatric Endotracheal Intubation (PETI)\(^1\)\(^2\).
2. Recognize signs of a difficult airway (i.e., signs of Mallampati Class III and IV) and select, prepare and employ the appropriate alternative tools and techniques (i.e., Rescue Airway for patients greater than 16, height greater than four feet)
3. Correctly assemble all equipment required for PETI within 60 seconds.
4. Provide optimal ventilation and oxygenation (minute volume) to the patient while PETI equipment is prepared.
5. Correctly apply cricoid pressure during PPV as indicated

While performing pediatric orotracheal intubation paramedics must:
1. Place the patient on a pediatric backboard or other device that allows for immobilization of the head following ETT placement.
   a. Consider padding under the body for placement in neutral alignment if the patient has a large occiput
2. Correctly apply cricoid pressure during intubation attempts.
3. Visualize anatomical structures including the glottic opening (vocal cords) during direct laryngoscopy.
4. Minimize oral trauma during laryngoscopy by utilizing correct technique.
5. Place the clinically indicated size ETT securely in the trachea at the correct depth within 30 seconds.
   a. Have a variety of sizes available for back-up
6. Confirm the ETT is in the trachea by:
   a. Direct visualization of the tube passing through the vocal cords
   b. Use of the Esophageal Detector Device (EDD) and/or Toomey syringe
7. Immediately re-establish PPV at the clinically required rate and tidal volume (minute volume) and oxygen at 10-15 LPM following ETT placement.
8. Continue procedures for confirming ETT is in the trachea by simultaneously performing the following\(^3\):
   a. Visualize symmetrical rise and fall of the chest with PPV
   b. Auscultation of bilateral lung fields for confirmation of airflow with PPV.
   c. Auscultation over the epigastrium for the absence of airflow with PPV.

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\(^1\) 2005 AHA Guidelines for CPR and ECC, Part 12 Pediatric Advanced Life Support, pp 168-169

\(^2\) PHTLS, Sixth Edition, Chapter 14 Pediatric Trauma pp 367-369

\(^3\) 2005 AHA Guidelines for CPR and ECC, Part 12 Pediatric Advanced Life Support, pp 168-169
**Performance Standard**

<table>
<thead>
<tr>
<th>Category</th>
<th>Skill – Low Frequency/High Risk</th>
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<tbody>
<tr>
<td>Pediatric Endotracheal Intubation</td>
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<th>Applies To:</th>
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<td>ALS Provider Agencies</td>
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<th>Date</th>
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<td>June 2010</td>
<td>June 2012</td>
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**PS06**

| Approval: EMS Medical Director Humberto Ochoa MD |
| Signature |

| Approval: EMS Agency Director Bruce Barton, CCEMT-P |
| Signature |

a. Placement of waveform capnography monitor and confirm the appropriate ETCO2 waveform is present with PPV.

9. Secure the ETT in the trachea at the correct depth with tape or a commercial device.

10. Re-implement effective PPV within 10 seconds following unsuccessful ET attempts:
   a. Employ rescue airway after 2 failed attempts on the patient for patients greater than 16 years and taller than four feet
   b. Passing the laryngoscope past the teeth with the intent of placing an ETT is considered an intubation attempt
   c. Only 2 attempts per patient are permitted.

11. Stabilize the patients head to the backboard or other immobilization device to avoid movement and possible ETT dislodgement.

12. Employ post ETT diagnostic tools to thoroughly assess overall effectiveness of ventilatory support throughout the duration of respiratory management efforts, including:
   a. Visualize symmetrical rise and fall of the chest with PPV
   b. Monitor pulse oximetry – the target SpO2 is greater than or equal to 95% if spontaneous circulation is present.
   c. Monitor ETCO2 for appropriate waveform morphology and target CO2 levels.
      i. The target range for ETCO2 level is between 30 – 45 mmHg if spontaneous circulation is present.
      ii. In cardiac arrest metabolic derangements will significantly alter ETCO2 values and waveform morphology. Target range for ETCO2 level is between 15mmHg and 45mmHg during CPR.
   d. Monitor ECG for dysrhythmia due to vagal stimulation or other treatable causes.
   e. Frequent auscultation of lung fields and epigastrium.
   f. Constant auscultation of lung fields and epigastrium.

13. Immediately identify malfunctioning equipment, ineffective techniques or changes in post PETI PPV compliance/resistance and employ alternative measures to achieve effective ventilations.

14. Reconfirm correct ETT placement each time the patient is moved and before transfer of care to Hospital staff.
   a. Record and print the waveform ETCO2 strip prior to transfer of care to the Hospital staff and attach the recording strip to the completed PCR

15. Provide direction to personnel that have been delegated management of post ETT PPV.


17. Maintain calm and effectively lead a team-based approach to resuscitation under all conditions.

18. Accurately document all assessment findings, therapeutic treatments and the patient’s response to therapy.

19. Complete a procedure evaluation form.
Critical Success Targets for PETI

1. ETT securely placed in the trachea followed by effective PPV
2. Chest rise and fall with each ventilation cycle
3. Ventilatory rate and tidal volume (minute volume) appropriate for patient condition and response.
4. SpO2 of greater than or equal to 95% in patients with spontaneous circulation
5. ETCO2 between 30 – 45 mmHg in patients with spontaneous circulation.
6. ETCO2 between 15 – 45 mmHg in cardiac arrest patients
7. Limited interruption of PPV (30 seconds maximum)

System Benchmark

ETT securely placed in the trachea within 2 attempts in 90% of the indicated patients.

Applicable Protocols

8220 Bradycardia, 8230 Tachycardia with Pulses, 8250 Ventricular Fibrillation/Ventricular Tachycardia, 8260 Asystole, 8270 PEA, 8300 Burns, 8600 Newborn Resuscitation, 8800 Respiratory Arrest, 8810 Respiratory Distress, 8830 Airway Obstruction, 8900 Traumatic Arrest, 8910 Traumatic Shock, 8920 Abdominal Trauma, 8930 Chest Trauma, Appendix 60 Pediatric Intubation.

Core Competency Requirements to be covered during education/training on PETI

1. Respiratory A&P and Pathophysiology
2. Assessment of airway and breathing
3. Techniques for PPV
4. Determination of PPV adequacy and efficacy
5. Airway pressure secondary to PPV – mean versus peak
6. Possible complications of PPV – gastric, pulmonary, cerebral, and cardiovascular complications of over inflation and over ventilation
7. Differentiation between effective and ineffective patient response to PPV via BLS measures
8. Indications and contraindications for PETI
9. Selection of correct equipment required for PETI (e.g. ETT size)
10. Identification of the difficult airway and employment of alternative techniques and tools
11. Laryngoscopy Techniques
12. ETT placement techniques
13. Post-placement ETT monitoring
14. Auscultation and diagnostic differentiation of lung sounds
15. Use of diagnostic tools, e.g., Capnography
16. Recognition of complications (Dislodgement, Obstruction, Pneumothorax, Equipment Failure, or DOPE)
17. Team Leadership and Patient Safety
18. Documentation
Adjunctive Performance Standards

1. Positive Pressure Ventilation
2. Laryngoscopy with FBAO Removal/Magill Forceps
3. BLS Airway Adjuncts
4. Post ETI Confirmation and Monitoring
5. Rescue Airway
6. Gum Elastic Bougie

Equipment Requirements

1. Personal Protective Equipment
2. Pediatric backboard and head immobilization device
3. Pediatric intubation mannequin
4. NP/OP Airways
5. BVM with manometer and reservoir
6. Age appropriate size ET Tubes with 2.5 -5.5 uncuffed
7. Broselow tape or Pedi-Wheel
8. EDD – esophageal detection device
9. Stethoscope
10. Supplemental oxygen
11. Magill Forceps
12. Laryngoscope(s)
13. Laryngoscope Blades (multi sizes)
14. Stylet(s)
15. Pulse Oximeter
16. Waveform Capnometer
17. Suction device (both rigid and flexible catheters)
18. Cardiac monitor
19. Difficult Airway Kit/Rescue Airway Kit (including just in time training aids)

Instructor Resource Materials

1. Prehospital Trauma Life Support
2. AHA CPR and BLS Provider Manual
3. AHA PALS Provider Manual
4. 2005 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
5. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic
Pediatric Endotracheal Intubation – PS06
Performance Validation Form

**Performance Objective:** Secure placement of an endotracheal tube (ETT) in the trachea to ensure a patent airway for positive pressure ventilation.

**Performance Criteria:** 100% accuracy required on all items

**Before performing pediatric endotracheal intubation paramedics must:**

<table>
<thead>
<tr>
<th>Pts</th>
<th>Score</th>
<th>Performance Steps</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Take or verbalize body substance isolation</td>
<td>Selection: gloves, goggles, mask, gown, booties, N95</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Determine BLS airway adjuncts are inadequate for effective positive pressure ventilation (PPV) and confirm the need for Pediatric Endotracheal Intubation (PETI)</td>
<td>No or inadequate rise and fall of chest, no improvement in patient’s color</td>
</tr>
</tbody>
</table>
| 1   |       | Recognize signs of a difficult airway and select, prepare, and employ the appropriate alternative tools and techniques (e.g., Bougie, Rescue Airway) | • All pediatric patients fit the definition of a difficult airway due to their short neck, small mandible, and relatively large tongue.  
• Signs of a difficult airway include, but are not limited to:  
  1. Morbid obesity  
  2. C-spine immobilization  
  3. Face or neck trauma  
  4. Mallampati Class III or IV |
| 1   |       | Correctly assemble all equipment required for PETI within 60 seconds | ETT, stylet, laryngoscope with functioning bulb, Magill forceps, suction, suction catheters (flexible and rigid), 10cc syringe with luer-lock, stethoscope, Rescue Airways (King tube or Combitube), Toomey Syringe, waveform capnography, pulse oximetry, BVM with manometer |
| 1   |       | Provide optimal ventilation and oxygenation to the patient while PETI equipment is prepared |

**While performing pediatric orotracheal intubation, paramedics must:**

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<td>Place the patient on a pediatric backboard or other device that allows for immobilization of the head following ETT placement.</td>
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<td>Correctly apply cricoid pressure during intubation attempts</td>
<td>Apply gentle pressure to the patient’s cricoid cartilage to occlude the esophagus and reduce the patient’s chances of aspirating gastric contents.</td>
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<td></td>
<td>Properly position the patient for intubation</td>
<td>“Sniffing” position, if not a trauma patient.</td>
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<td>Visualize anatomical structures including the glottic opening (vocal cords) during direct laryngoscopy</td>
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<td>Minimize oral trauma during laryngoscopy by utilizing correct technique.</td>
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<tr>
<td>1</td>
<td></td>
<td>Place the appropriately sized ETT securely in the trachea at the correct depth within 30 seconds.</td>
<td>Inner diameter of the tube should be roughly equivalent to the size of the child’s pinkie finger</td>
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<tr>
<td>1</td>
<td></td>
<td>Immediately re-establish PPV with the appropriate rate, tidal volume and oxygen at 10 – 15 LPM following ETT placement</td>
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<td>No.</td>
<td>Task</td>
<td>Details</td>
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<tr>
<td>1</td>
<td>Confirm ETT is in the trachea.</td>
<td>• Direct visualization of the tube passing through the vocal cords</td>
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<td>• Visualizing symmetrical rise and fall of the chest with PPV</td>
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<td>• Placement of waveform capnography monitor and confirm the appropriate ETCO2 waveform is present.</td>
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<td>• Employ rescue airway after 2 failed attempts on the patient</td>
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<td>• Monitor ETCO2 for appropriate waveform morphology and target CO2 levels.</td>
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<td>• In cardiac arrest, metabolic derangements will significantly alter ETCO2 values and waveform morphology. Target range for ETCO2 levels is between 15 mmHg and 45 mmHg during CPR.</td>
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Critical Failure Criteria

- Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
- Failure to initiate ventilations within 30 seconds after applying gloves or interrupts ventilations for greater than 30 seconds.
- Failure to ventilate patient at a rate appropriate to patient age
- Failure to provide adequate tidal volume per breath
- Failure to pre-oxygenate patient prior to intubation attempt
- Failure to successfully intubate within 2 attempts
- Failure to disconnect syringe immediately after inflating cuff of ET tube
- Uses teeth as a fulcrum
- Failure to assure proper tube placement by auscultation over lung fields and epigastrium
- Failure to use either a Colorimetric end tidal CO2 cap or waveform capnography
- If used, stylet extends beyond end of tube
- Failure to re-check tube placement after each patient movement and before transfer of care to hospital staff
- Any procedure that would have harmed the patient
Terminal Performance Objective

Secure placement of a rescue airway in the trachea to facilitate positive pressure ventilation.

Before performing insertion of a Rescue Airway paramedics must:

1. Determine BLS airway adjuncts are inadequate for effective positive pressure ventilation (PPV) and confirm the need for ALS airway placement.
2. Recognize signs of a difficult airway and select, prepare and employ the appropriate rescue airway and techniques
   a. A difficult airway is defined as the presence of anatomic conditions which preclude direct visualization of the patient’s glottic opening (e.g. airway edema, Mallampati Class III and IV)
3. Correctly assemble all equipment required for rescue airway insertion within 60 seconds.
4. Ensure optimal ventilation and oxygenation of the patient while rescue airway equipment is prepared.
5. Correctly apply cricoid pressure during PPV.

While performing insertion of a Rescue Airway paramedics must:

1. Minimize oral trauma during insertion by utilizing correct technique.
2. Place the appropriately sized rescue airway securely per the manufacturer’s instructions at the correct depth within 30 seconds.
3. Immediately re-establish PPV with the appropriate rate and tidal volume (minute volume) and oxygen at 10-15 LPM following rescue airway placement.
4. Confirm correct placement by:
   a. Visualizing symmetrical rise and fall of the chest with PPV
   a. Auscultation of bilateral lung fields for confirmation of airflow with PPV.
   b. Auscultation over the epigastrium for the absence of airflow with PPV.
   c. Fogging of the airway tube with PPV.
   d. Placement of waveform capnography monitor and confirm the appropriate ETCO2 waveform is present with PPV.
5. Secure the rescue airway at the correct depth per the manufacturer’s directions.
6. Stabilize the patients head to avoid movement and possible rescue airway dislodgement.
7. Employ post Rescue Airway diagnostic tools to thoroughly assess overall effectiveness of ventilator support throughout the duration of respiratory management efforts, including:
   a. Visualizing symmetrical rise and fall of the chest with PPV
   b. Monitor pulse oximetry – the target SaO2 is greater than or equal to 95% if spontaneous circulation is present.
   c. Monitor ETCO2 for appropriate waveform morphology and target CO2 levels.
      i. The target range for ETCO2 level is between 30 – 45 mmHg if spontaneous circulation is present.
ii. In cardiac arrest metabolic derangements will significantly alter ETCO2 values and waveform morphology. Target range for ETCO2 level is between 15mmHg and 45mmHg during CPR.

d. Monitor ECG for dysrhythmia due to vagal stimulation or other treatable causes.

e. Frequent auscultation of lung fields and epigastrium.

f. Constant evaluation of ventilatory compliance and resistance during PPV

8. Re-implement effective PPV within 10 seconds following unsuccessful placement attempts.

a. Rapidly transport patients to the closest Emergency Department when rescue airway placement is unsuccessful and airway patency is not secure.

9. Immediately identify malfunctioning equipment, ineffective techniques or changes in post placement PPV compliance/resistance and employ alternative measures to achieve effective ventilations.

10. Reassess rescue airway placement each time the patient is moved and before transfer of care to hospital staff.

a. Record and print the waveform ETCO2 strip prior to transfer of care to the hospital staff and attach the recording strip to the completed PCR

11. Provide direction to personnel that have been delegated management of post Rescue Airway PPV.

12. Maintain effective ventilation and oxygenation throughout the entire prehospital treatment period.

13. Maintain calm and effectively lead a team-based approach to resuscitation under all conditions.


15. Complete a procedure evaluation form.

Critical Success Targets for use of a rescue airway

1. Rescue Airway securely placed in the trachea followed by effective PPV

2. Chest rise and fall with each ventilation cycle

3. Ventilatory rate and tidal volume (minute volume) appropriate for patient condition and response

4. SpO2 of greater than 95% in patients with spontaneous circulation

5. ETCO2 between 30 – 45 mmHg in patients with spontaneous circulation.

6. ETCO2 between 15 – 45 mmHg in cardiac arrest patients

7. Limited interruption of PPV (30 seconds maximum)

System Benchmark

Rescue airway securely placed in the trachea within 2 attempts in 98% of the indicated patients.

Applicable Protocols

ALS Guidelines 7060, V-FIB/V-Tach 7250, Asystole 7260, PEA 7270, Burns 7300, Respiratory Arrest 7800, Airway Obstruction 7830, King Airway (Appendix 25), Multi-lumen Airway Intubation (Appendix 28)
Core Competency Requirements to be covered during education/training on use of a Rescue Airway

1. Respiratory A&P and Pathophysiology
2. Assessment of airway and breathing
3. Techniques for PPV
4. Airway pressure secondary to PPV – mean versus peak
5. Possible complications of PPV – gastric, pulmonary, cerebral, and cardiovascular complications of over-inflation and over-ventilation
6. Determination of PPV adequacy and efficacy. Note that greater tidal volume may be necessary due to greater dead space in use of rescue airways.
7. Differentiation between effective and ineffective patient response to PPV via BLS measures
8. Indications for use of a rescue airway
9. Selection of correct equipment required for insertion of a rescue airway
10. Identification of the difficult airway and employment of alternative techniques for airway management
11. Rescue airway placement techniques
12. Post-placement airway monitoring
13. Auscultation and diagnostic differentiation of lung sounds
14. Use of diagnostic tools, e.g., Capnography
15. Recognition of complications (Dislodgement, Obstruction, Pneumothorax, Equipment Failure, or DOPE)
16. Team Leadership and Patient Safety
17. Documentation

Adjunctive Performance Standards

1. Positive Pressure Ventilation
2. Laryngoscopy with FBAO Removal/Magill Forceps
3. BLS Airway Adjuncts
4. ALS Airways

Equipment Requirements

1. Personal Protective Equipment
2. Adult Airway mannequin
3. NP/OP Airways
4. BVM with manometer and reservoir
5. Combitube(s) or King Tube(s)
6. Stethoscope
7. Supplemental oxygen
8. Magill Forceps
9. Laryngoscope(s)
10. Pulse Oximeter
11. Waveform Capnometer
12. Suction device (both rigid and flexible catheters)
13. Cardiac monitor
14. Difficult Airway Kit/Rescue Airway Kit (including just in time training aids)

Instructor Resource Materials
1. Prehospital Trauma Life Support, Sixth Edition
2. AHA CPR and BLS Provider Manual
3. AHA ACLS Provider Manual
4. AHA PALS Provider Manual
5. 2005 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
6. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic
7. Adjunct specific manufacturer guidelines for use
**Rescue Airway Insertion – PS07**  
**Performance Validation Form**

**Performance Objective:** Secure placement of a rescue airway to ensure a patent airway for positive pressure ventilation.  
**Performance Criteria:** 100% accuracy required on all items

**Before performing pediatric endotracheal intubation paramedics must:**

<table>
<thead>
<tr>
<th>Pts</th>
<th>Score</th>
<th>Performance Steps</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Take or verbalize body substance isolation</td>
<td>Selection: gloves, goggles, mask, gown, booties, N95</td>
</tr>
</tbody>
</table>
| 1   |       | Determine BLS airway adjuncts are inadequate for effective positive pressure ventilation (PPV) and confirm the need for ALS airway placement. | Signs of a difficult airway include, but are not limited to:  
1. Arthritis or scoliosis of the spine  
2. Significant overbite  
3. Small mandible  
4. Short neck  
5. Morbid obesity  
6. C-spine immobilization  
7. Face or neck trauma  
8. Mallampati Class III or IV |
| 1   |       | Recognize signs of a difficult airway and select, prepare, and employ the appropriate rescue airway and techniques. | Rescue airways, laryngoscope with functioning bulb, Magill forceps, suction, suction catheters (flexible and rigid), 10cc syringe with luer-lock, stethoscope, Rescue Airways (King tube or Combitube), Toomey Syringe, waveform capnography, pulse oximetry, BVM with manometer |
| 1   |       | Correctly assemble all equipment required for rescue airway insertion within 60 seconds | Apply gentle pressure to the patient’s cricoid cartilage to occlude the esophagus and reduce the patient’s chances of aspirating gastric contents. |
| 1   |       | Ensure optimal ventilation and oxygenation of the patient while rescue airway equipment is prepared. |                                                |
| 1   |       | Correctly apply cricoid pressure during PPV |                                                |

**While performing insertion of a Rescue Airway paramedics must:**

<table>
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<tr>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>Minimize oral trauma during insertion by utilizing correct technique.</td>
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<td>1</td>
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<td>Place the appropriately sized rescue airway securely in the hypopharynx at the correct depth within 30 seconds</td>
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<td>1</td>
<td></td>
<td>Immediately re-establish PPV with the appropriate rate, tidal volume, and oxygen at 10 – 15 LPM following rescue airway placement.</td>
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</tr>
<tr>
<td>1</td>
<td></td>
<td>Confirm correct placement</td>
<td></td>
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</tbody>
</table>
• Visualize symmetrical rise and fall of the chest with PPV  
• Auscultation over lung fields for confirmation of airflow with PPV  
• Auscultation over epigastrium for the absence of airflow with PPV.  
• Fogging of the airway tube  
• Placement of waveform capnography monitor and confirm the appropriate ETCO2 waveform is present |
| 1   |       | Secure the rescue airway at the correct depth | Per manufacturer’s instructions |
| 1   |       | Stabilize the patient’s head to avoid movement and possible rescue tube dislodgement | Consider utilizing a Cervical Collar to stabilize the patient’s head. |
|   | Efficiently employ post intubation diagnostic tools to thoroughly assess overall effectiveness of ventilator support throughout the duration of respiratory management efforts | • Visualize symmetrical rise and fall of the chest with PPV  
• Monitor pulse oximetry – the target is greater than or equal to 95% if spontaneous circulation is present  
• Monitor ETCO2 for appropriate waveform morphology and target CO2 levels  
  o The target range for ETCO2 level is between 30 – 45 mmHg if spontaneous circulation is present  
  o In cardiac arrest metabolic derangements will significantly alter ETCO2 values and waveform morphology. Target range for ETCO2 level is between 15 mmHg and 45 mmHg during CPR  
• Monitor ECG for dysrhythmia due to vagal stimulation or other treatable causes  
• Frequent auscultation of lung fields and epigastrium  
• Constant evaluation of ventilatory compliance and resistance during PPV |
|   | Re-implement effective PPV within 10 seconds following unsuccessful placement attempts | Rapidly transport patients to the closest most appropriate hospital when rescue airway placement is unsuccessful and airway patency is not secure. |
|   | Immediately identify malfunctioning equipment, ineffective techniques or changes in post placement PPV compliance/resistance and employ alternative measures to achieve effective ventilations. | |
|   | Reassess rescue airway placement each time the patient is moved and before transfer of care to hospital staff | Record and print the waveform ETCO2 strip prior to transfer of care to the Hospital staff and attach the recording strip to the completed PCR |
|   | Provide direction to personnel that have been delegated management of post intubation PPV |  |
|   | Maintain effective ventilation and oxygenation throughout the entire prehospital treatment period |  |
|   | Maintain calm and effectively lead a team-based approach to resuscitation under all conditions. |  |
|   | Accurately document all assessment findings, therapeutic treatments, and the patient’s response to therapy |  |
| 1 | Complete a procedure evaluation form |  |

**Critical Failure Criteria**

___ Failure to take or verbalize BSI appropriate to the skill prior to performing the skill  
___ Failure to initiate ventilations within 30 seconds after applying gloves or interrupts ventilations for greater than 30 seconds.  
___ Failure to ventilate patient at a rate appropriate to patient age  
___ Failure to provide adequate tidal volume per breath  
___ Failure to pre-oxygenate patient prior to intubation attempt  
___ Failure to successfully intubate within 2 attempts  
___ Failure to disconnect syringe immediately after inflating cuff of ET tube  
___ Failure to assure proper tube placement by auscultation over lung fields and epigastrium  
___ Failure to use either a Colorimetric end tidal CO2 cap or waveform capnography  
___ Failure to re-check tube placement after each patient movement and before transfer of care to hospital staff  
___ Any procedure that would have harmed the patient
Supplemental Performance Standard PS07A

<table>
<thead>
<tr>
<th>Category I Skill – Low Frequency/High Risk</th>
<th>King Airway</th>
<th>Approval: EMS Medical Director Humberto Ochoa MD</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applies To: ALL EMS Provider Agencies</td>
<td>Approval: EMS Agency Director Bruce Barton, CCEMT-P</td>
<td>Signature</td>
<td></td>
</tr>
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</table>

**Purpose**

This performance standard is intended to be supplemental to the Rescue Airway Performance Standard (PS07) and delineates specific criteria based upon the manufacturer’s recommendations for use of the King Airway.

**Terminal Performance Objective**

Secure placement of the King Tube in the trachea to facilitate positive pressure ventilation.

**Before performing insertion of a Rescue Airway paramedics must:**

1. Determine BLS airway adjuncts are inadequate for effective positive pressure ventilation (PPV) and confirm the need for ALS airway placement.
2. Recognize signs of a difficult airway and select, prepare and employ the appropriate rescue airway and techniques
   a. A difficult airway is defined as the presence of anatomic conditions which preclude direct visualization of the patient’s glottic opening (e.g. airway edema, Mallampati Class III and IV)
3. Correctly assemble all equipment required for rescue airway insertion within 60 seconds.
4. Ensure optimal ventilation and oxygenation of the patient while rescue airway equipment is prepared.
5. Correctly apply cricoid pressure during PPV.

**Procedure**

1. The King Airway is an alternate airway for use by properly trained paramedics in Riverside County, when the placement of an ET tube is not possible or not prudent.
2. This airway is an optional piece of equipment. When chosen, it is used in place of a multi-lumen airway (MLA). Those agencies choosing to utilize the King Airway are required to stock all three sizes for appropriate patient fit, based on patient height -- Patient height 4 ft - 5 ft 5 ft - 6 ft over 6 ft

   - Size 3 (yellow cap)
   - Size 4 (red cap)
   - Size 5 (purple cap)

3. Indications for use of this airway:
   a. Unresponsive patients without a gag reflex and
   b. Adjunctive airway protection and positive pressure ventilation is required and
   c. Airway protection and/or positive pressure ventilation is inadequate or ineffective by BLS means

**Note:** when the above indications are met and signs of difficult intubation are present, the King airway should be considered as the initial ALS airway adjunct.

4. Contraindications for use include patients with:
   a. an intact gag reflex
   b. known esophageal disease
   c. probable ingestion of caustic substance(s)
5. Procedure for insertion
   a. Select the proper tube size.
   b. While preparing tube, have assistive personnel open the airway, and clear of any foreign objects. Pre- 
oxigenate with 100% oxygen.
   c. Test cuff inflation system by injecting the maximum recommended volume of air into the cuffs (size 3 – 
60 ml; size 4 – 80 ml; size 5 – 90 ml). Remove all air from both cuffs prior to insertion.
   d. Apply water-soluble lubricant to the distal tip and posterior aspect (only) of the tube, taking care to 
avoid introduction of the lubricant into or near the ventilatory openings.
   e. Position patient into “sniffing position” if possible, otherwise head may be in a neutral position.
   f. Hold the tube at the colored connector with the dominant hand. With the non-dominant hand, hold 
open the patient’s mouth and apply a chin lift. (Thumb into oral cavity, index finger under chin)
   g. Rotate the tube 90° laterally, so that the blue orientation/x-ray line on the inside curve of the airway is 
touching the outer corner of the mouth, with the tube curving out.
   h. While advancing the tip of the tube across the tongue to its base, rotate the tube an additional 90° back 
to midline, so that the blue orientation line now faces the chin.
   i. Without exerting excessive force, advance the tube until the base of the connector is aligned with the 
teeth or gums. Be sure to maintain the tip of the tube midline so as to advance it into the upper 
esophagus and not into the piriform fossa (blind pocket).
   j. Using a syringe, inflate the cuffs with the minimum volume necessary to seal the airway at the peak 
ventilatory pressure employed (“just seal” volume). Typical inflation volumes are as follows:
      Size 3: 45-50 ml
      Size 4: 60-70 ml
      Size 5: 70-80 ml
   k. Attach a BVM. While gently bagging the patient to assess ventilation, carefully withdraw the airway until 
ventilation is easy and free flowing (large tidal volume with minimal airway pressure).
   l. Confirm proper position by auscultation, chest movement and verification of CO₂ by waveform 
capnography or an End Tidal CO₂ Detector. CO₂ monitoring device shall remain in place for continuous 
monitoring.
   m. Readjust cuff inflation to new “just seal” volume, taking care not to exceed maximum cuff volume - 60 ml, 
80 ml, 90 ml (see 5.3 above).
   n. Secure tube to the patient.
6. Document time of placement, recording the final volume of air used and the depth markings (cm) on the tube.
7. Procedure for removal
   Removal of the airway in the field will only occur if the airway malfunctions or the patient’s condition changes so 
as to make an airway adjunct unnecessary (ex. - a deeply hypoglycemic patient becomes conscious).
   a. Have suction and additional intubation equipment ready.
b. Deflate tube cuffs completely.

c. Remove in a smooth, swift motion.

d. Reassess the patients’ airway to ensure it is protected.

e. Ensure the patient has adequate minute volume and apply supplemental oxygen as needed.

f. Record time, reason for tube removal, and how removal was tolerated by the patient.

8. As part of the quality assurance process, all placements or attempted placements of a King airway will be documented on the Special Procedures form. This form will be submitted, along with a copy of the PCR, to the paramedic’s QI coordinator for internal review. The QI coordinator will then forward these materials to the EMS Agency.
Purpose
This performance standard is intended to be supplemental to the Rescue Airway Performance Standard (PS07) and delineates specific criteria based upon the manufacturer’s recommendations for use of the MLA (Combitube).

Terminal Performance Objective
Secure placement of the Multi-Lumen Airway (MLA) Combitube in the trachea to facilitate positive pressure ventilation.

Before performing insertion of a Rescue Airway paramedics must:
1. Determine BLS airway adjuncts are inadequate for effective positive pressure ventilation (PPV) and confirm the need for ALS airway placement.
2. Recognize signs of a difficult airway and select, prepare and employ the appropriate rescue airway and techniques
   a. A difficult airway is defined as the presence of anatomic conditions which preclude direct visualization of the patient’s glottic opening (e.g. airway edema, Mallampati Class III and IV)
3. Correctly assemble all equipment required for rescue airway insertion within 60 seconds.
4. Ensure optimal ventilation and oxygenation of the patient while rescue airway equipment is prepared.
5. Correctly apply cricoid pressure during PPV.

Procedure
1. The purpose of this policy is to define the indications, contraindications and procedure for the utilization of the multi-lumen airway (MLA) in the adult patient.
2. The multi-lumen airway may be used in certain circumstances when airway maintenance is necessary AND endotracheal intubation cannot be performed, AND BVM management is inadequate (see #3 below).
3. MLA intubation is a mandatory skill for paramedics. It is an optional skill for BLS personnel. It may only be performed by those persons having passed an approved training program who are:
   a. EMT-I utilizing it in conjunction with defibrillation while working for approved AED service providers, OR
   b. EMT-I working with a paramedic partner for an approved ALS provider, OR
   c. Licensed and accredited paramedics.
4. MLA intubation may be performed only on those patients who meet ALL of the following criteria:
   a. are unconscious and without purposeful movement
   b. do not have a gag reflex
   c. are apneic or have a respiratory rate of less than 6
   d. appear to be at least 16 years old AND at least 4½ feet tall
5. MLAs should not be removed by ALS personnel for endotracheal tube insertion, unless there is a malfunction of the MLA.
6. MLAs may be utilized by ALS personnel as an optional airway tool after two (2) unsuccessful ET intubation attempts on the patient.
   a. In the event that an MLA patient requires immediate drug administration and an IV cannot be successfully established after 2 attempts, an IO line may be instituted with or without base hospital contact.

7. MLAs must NOT be placed on patients who meet any one of the following criteria:
   a. airway can be managed with an upper airway device only - i.e., OP or NP airway
   b. have a positive gag reflex
   c. have known esophageal injury, surgery, or disease (e.g., tumor, varices)
   d. have a foreign body airway obstruction (FBAO)
   e. have a history of laryngectomy with stoma
   f. are known narcotic overdoses, with ALS less than 10 minutes away
   g. any circumstance where airway edema is suspected or could develop -
      i. ingestion of a caustic substance
      ii. allergic / anaphylactic reaction
   h. meet the requirements of Policy #5600, Withholding Resuscitation Efforts
   i. have appropriate DNR paperwork or medallion (reference Policy #5620, Do Not Resuscitate)

8. MLAs should not be forced. If resistance is met on intubation attempts, the tube should be removed and BVM continued.

9. MLAs must be stored in their original boxes to ensure maintenance of proper curvature (important for placement and function).
Terminal Performance Objective

Secure placement of an endotracheal tube (ETT) in the trachea to ensure a patent open airway allowing effective positive pressure ventilation throughout the entire prehospital period of care.

After placement, paramedics must continuously maintain the ETT within the trachea by performing all of the following:

1. Verify symmetrical rise and fall of the chest with on-going PPV
2. Auscultate all lung fields to confirm the presence of airflow to the lower airway during PPV
3. Auscultate over the epigastrium to confirm the absence of airflow to the stomach during PPV
4. Utilize an esophageal detection device (EDD) to confirm placement in the trachea
5. Utilize waveform capnography to evaluate for the presence of end tidal carbon dioxide (ETCO2) during PPV\(^1\) \(^2\)
   - Target Range is 30 – 45 mmHg with appropriate waveform morphology in patients with spontaneous circulation
   - Target Range is between 15 mmHg and 45 mmHg with appropriate waveform morphology for patients in cardiac arrest receiving CPR.
   - Consider ineffective diagnostic readings due to patient down time when evaluating ETCO2 in the cardiac arrest patient.
6. Utilize pulse oximetry to evaluate for adequate O2 saturation during PPV
   - Target Range is an SpO2 greater than or equal to 95%
7. Confirm the presence of misting of the ETT during PPV
8. Confirm the absence gastric contents in the ETT during PPV
9. Ensure the ETT remains inserted at the correct depth within the trachea during PPV
10. Stabilize the patient’s head to avoid movement and possible ETT dislodgement during PPV.
11. Continuously monitor and re-verify tube placement after each and EVERY move, looking for signs of tube dislodgement and migration out of the trachea.
12. Rapidly identify 100% of the occurrences when an ETT is misplaced or an ETT has migrated out of the trachea after placement.
13. Record and print the waveform ETCO2 strip prior to transfer of care to the Hospital staff and attach the recording strip to the completed PCR
14. Once identified as misplaced, or if there is significant doubt of the tube’s placement, remove the tube at once and provide PPV.
15. Re-intubate or consider insertion of a rescue airway if unable to control the airway with BLS adjuncts.

\(^1\) 2005 AHA Guidelines for CPR and ECC, Part 7.1, p 54
\(^2\) PHTLS, Sixth Edition, Chapter 6, p 135
Critical Success Targets for Endotracheal Intubation (ETI)

1. ETT securely placed in the trachea followed by effective PPV
2. Chest rise and fall with each ventilation cycle
3. SpO2 of greater than or equal to 95%
4. ETCO2 between 30 – 45 mmHg in the patient with spontaneous circulation
5. ETCO2 between 15 – 45 mmHg in the cardiac arrest patient receiving CPR
6. Limited interruption of PPV (30 seconds maximum)

System Benchmark

ETT securely placed in the trachea within 2 attempts in 90% of the indicated patients. 100% of the misplaced or dislodged ET tubes are identified and corrected.

Applicable Protocols

ALS Guidelines 7060, V-FIB/V-Tach 7250, Asystole 7260, PEA 7270, Burns 7300, Respiratory Arrest 7800, Airway Obstruction 7830, King Airway (Appendix 25), Multi-lumen Airway Intubation (Appendix 28).

Core Competency Requirements to be covered during education/training on post ETI confirmation and monitoring.

1. Rapid assessment of endotracheal tube placement
2. Use of primary verification methods
3. Use of secondary verification methods
4. Positive pressure ventilation
5. Appropriate re-assessment of tube placement after each move
6. Rapid recognition of a misplaced tube
7. Removal of a misplaced tube
8. Alternate techniques for advanced airway management
9. Dislodgement, Occlusion, Pneumothorax, Equipment Failure (DOPE)

Adjunctive Performance Standards

1. ALS Airways
2. Positive Pressure Ventilation (PPV)

Equipment Requirements

1. Personal Protective Equipment
2. NP/OP Airways
3. BVM
4. Stethoscope
5. Supplemental oxygen
6. Magill Forceps
7. Laryngoscope(s)
<table>
<thead>
<tr>
<th><strong>Performance Standard</strong></th>
<th><strong>PS08</strong></th>
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<tbody>
<tr>
<td><strong>Date</strong></td>
<td>June 2010</td>
</tr>
<tr>
<td><strong>Review Date</strong></td>
<td>June 2012</td>
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**Category I Skill – Low Frequency/High Risk**

Post ETI Confirmation and Monitoring

<table>
<thead>
<tr>
<th>Applies To:</th>
<th>ALS Provider Agencies</th>
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<tr>
<td>Humberto Ochoa MD</td>
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<td>Bruce Barton, CCEMT-P</td>
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8. Laryngoscope blades (multi sizes)
9. Appropriate sized ET tubes
10. Stylet(s)
11. Pulse Oximeter
12. Waveform Capnography
13. Suction device (both rigid and flexible catheters)
14. Cardiac monitor
15. Difficult Airway Kit/Rescue Airway Kit (including just in time training aids)

**Instructor Resource Materials**

1. Prehospital Trauma Life Support, Sixth Edition
2. AHA ACLS Provider Manual
3. AHA PALS Provider Manual
4. 2005 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
5. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic
**POST ENDOTRACHEAL INTUBATION CONFIRMATION AND MONITORING – PS08**

**Performance Objective:** Secure placement of an endotracheal tube (ETT) in the trachea to ensure a patent open airway allowing effective positive pressure ventilation throughout the entire prehospital period of care.

**Performance Criteria:** 100% accuracy required on all items

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<tr>
<td>1</td>
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<td>Verify symmetrical rise and fall of the chest with ongoing PPV.</td>
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<td>1</td>
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<td>Auscultate all lung fields to confirm the presence of airflow to the lower airway during PPV</td>
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</tr>
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<td>Auscultate over the epigastrium to confirm the absence of airflow to the stomach during PPV.</td>
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</tr>
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<td></td>
<td>Utilize an esophageal detection device (EDD) to confirm placement in the trachea.</td>
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</table>
| 1   |       | Utilize waveform capnography to evaluate for the presence of end tidal carbon dioxide (ETCO2) during PPV | • Target range is 30 – 45 mmHg with appropriate waveform morphology in patients with spontaneous circulation  
• Target Range is between 15 mmHg and 45 mmHg with appropriate waveform morphology for patients in cardiac arrest receiving CPR  
• Consider ineffective diagnostic readings due to patient down time when evaluating ETCO2 in the cardiac arrest patient. |
| 1   |       | Utilize pulse oximetry to evaluate for adequate O2 saturation readings during PPV | Target range is an SpO2 greater than or equal to 95% |
| 1   |       | Confirm the presence of misting of the ETT during PPV | |
| 1   |       | Confirm the absence of gastric contents in the ETT during PPV | Tape the tube into place at the correct depth or utilize a commercial device for securing an ETT |
| 1   |       | Ensure the ETT remains inserted at the correct depth within the trachea during PPV | |
| 1   |       | Stabilize the patient’s head to avoid movement and possible ETT dislodgement during PPV | Consider placing the patient in an appropriately sized cervical collar |
| 1   |       | Continuously monitor and re-verify tube placement after each and EVERY move, looking for signs of tube dislodgement and migration out of the trachea. | • After moving the patient from the scene to the back board  
• After moving the patient onto the gurney  
• When the patient is loaded into the ambulance  
• After any significant bumps en route to the hospital  
• When the patient is off-loaded from the ambulance  
• When the patient is moved from the ambulance gurney to the hospital gurney  
• Any time there is any concern that the tube might have become displaced. |
<p>| 1   |       | Rapidly identify 100% of the occurrences when an ETT is misplaced or an ETT has migrated out of the trachea after placement. | |</p>
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<tbody>
<tr>
<td>1</td>
<td>Once identified as misplaced or if there is significant doubt of the tube’s placement, remove the tube at once and provide PPV.</td>
<td></td>
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<tr>
<td>1</td>
<td>Re-intubate or consider insertion of a rescue airway if unable to control the airway with BLS adjuncts.</td>
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<td>Maintain calm and effectively lead a team-based approach to resuscitation under all conditions.</td>
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<td>Accurately document all assessment findings, therapeutic treatments, and the patient’s response to therapy</td>
<td>Record and print the waveform ETCO2 strip prior to transfer of care to the hospital staff and attach the recording strip to the completed PCR.</td>
</tr>
</tbody>
</table>

**Critical Failure Criteria**

- [ ] Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
- [ ] Failure to recognize a missed intubation
- [ ] Failure to recognize a tube migrated out of the trachea
- [ ] Failure to re-check the tube placement following each movement
- [ ] Failure to properly stabilize the patient’s head following intubation
- [ ] Failure to immediately begin PPV following a missed or dislodged ETT
- [ ] Interruption of PPV for greater than 30 seconds maximum
- [ ] Failure to auscultate over all lung fields and epigastrium immediately following intubation
- [ ] Any procedure that would have harmed the patient
Terminal Performance Objective
Relieve intrathoracic pressure resulting from tension pneumothorax to improve cardiac output and allow the return of spontaneous respirations and/or effective oxygenation and ventilation.

Before performing needle thoracostomy paramedics must:
1. Methodically complete an assessment of the airway and breathing within 30 seconds.
2. Verify adequate ventilation and/or signs of hypoxia within the first 30 seconds.
3. Recognize and differentiate signs and symptoms of tension pneumothorax and associated obstructive shock
   a. Maintain an index of suspicion when assessment reveals blunt or penetrating chest trauma or unexplained respiratory distress and:
      i. Progressively worsening respiratory distress or apnea; and,  
      ii. Unilateral decreased or absent breath sounds on the affected side; and,  
      iii. Hypotension (systolic BP less than 90 mmHg with signs of poor perfusion)
   1. This includes cardiac arrest (PEA may be the presenting rhythm)
   c. Intubated Patient—trauma or medical: maintain a high index of suspicion for progression of tension pneumothorax when assessment reveals the following:
      i. Increasing resistance to PPV
      ii. Progressively diminishing breath sounds (usually unilateral) clinically correlating with sustained injuries¹
      iii. Waveform Capnography shows reduction in ETCO2 levels in the absence of explainable cause, e.g. ventilatory rate too fast and/or deep
      iv. Paradoxical or uneven movement of the chest wall—lateral discrepancy
4. Confirm the absence of contraindications for the procedure
5. Lift occlusive dressings (if applied) to relieve intrathoracic pressure before needle thoracostomy

While performing needle thoracostomy paramedics must:
1. Correctly assemble all equipment required for needle thoracostomy within 60 seconds.
2. Ensure PPV and optimal oxygenation of the patient while equipment is prepared.

¹ Prehospital Trauma Life Support, Sixth Edition, 2007  
a. In the patient requiring respiratory support provide PPV using the lowest pressure necessary to adequately provide for oxygenation and ventilation of the patient. In the critical patient ideal SpO2 values may not be attainable until the pneumothorax is relieved.

b. In the spontaneously breathing patient provide supplemental oxygen appropriate to the patient’s condition.

3. Identify the correct anatomical landmarks and use aseptic technique to prepare the site for the needle insertion
   a. Inability to identify landmarks is a contraindication for needle thoracostomy

4. Insert the needle perpendicular (90°) to the chest at the mid clavicular line in the second intercostal space over the top of the 3rd rib on the affected side.

5. Assess for the sound of air rushing out through the needle or catheter, or stop when the pleura has been breached. Remove the IV needle, leaving the catheter in place.
   i. If no air rush or no response to treatment, consider patient’s unique anatomy (i.e. large chest)
   ii. Consider bilateral needle decompression if unrelieved when applied to affected side

6. Secure the catheter to a one-way valve if available.

7. Reassess the patient following the procedure and continue PPV with the appropriate airway adjunct as indicated by the patient’s response to the procedure.

8. Secure the catheter to the chest and continuously monitor for air or blood discharge.

9. Continuously monitor the patient for reoccurrence of tension pneumothorax.

10. Monitor the catheter for development of occlusion and consider a 1-3 ml saline flush to clear a plugged catheter.

11. Provide direction to personnel that are delegated management of post procedure PPV.

12. Maintain effective ventilation and oxygenation throughout the entire prehospital treatment period.

13. Maintain calm and effectively lead a team-based approach to resuscitation under all conditions.

14. Accurately document all assessment findings, therapeutic treatments and the patient’s response to therapy 100% of the time.

15. Complete a Procedure Evaluation Form.

Critical Success Targets for Needle Thoracostomy

1. Chest rise and fall with each ventilation cycle (Spontaneous or PPV)

2. SpO2 of greater than or equal to 95%

3. Improvement in ETCO2 level

4. Signs of improved cardiac output – return of pulses, improved skin color, improved BP, improved LOC

System Benchmark

% of patients that show improvement in vital signs after procedure.

Applicable Protocols

Traumatic Arrest (7900), Traumatic Shock (7910), Chest Trauma (7930), Pediatric Traumatic Arrest (8900), Pediatric Traumatic Shock (8910), Pediatric Chest Trauma (8930)
Core Competency Requirements to be covered during education/training on Needle Thoracostomy

1. Respiratory A&P and Pathophysiology
2. Assessment of airway, breathing and circulation
3. Differentiation between adequate and inadequate respiration
4. Needle thoracostomy indications and contraindications
5. Differentiation between a simple pneumothorax and a tension pneumothorax
6. Procedure for Needle Thoracostomy
   a. Required equipment and set up
   b. Patient preparation using aseptic technique
   c. Landmarks - the anterior chest at the mid clavicular line in the second intercostal space just over the top of the 3rd rib on the effected side.
   d. 14 gauge (minimum 2 inch) catheter insertion at a 90’ angle
   e. Advance the catheter over the needle approximately 1-1 ½ inches listening for a rush of air
   f. Catheter monitoring and security
7. Assessment of PPV adequacy and efficacy
8. Airway pressure secondary to PPV – mean versus peak
9. Possible complications of PPV – gastric, pulmonary, cerebral, and cardiovascular complications of over-inflation and over-ventilation
10. Auscultation and diagnostic differentiation of lung sounds
11. Team Leadership and Patient Safety
12. Use of diagnostic tools

Adjunctive Performance Standards

1. BLS Airways
2. ALS Airways
3. Positive Pressure Ventilation

Equipment Requirements

1. PPE
2. BVM with manometer
3. BLS Airways
4. 2 inch 14 gauge catheter over needle with 3-5 cc syringe
5. Normal saline for injection
6. Needle thoracostomy kit (optional)
7. Alcohol wipes and betadine swabs
8. Stethoscope
9. Occlusive dressings
10. Gauze sponges
11. One-way valve
12. Cardiac monitor with waveform capnography
### Performance Standard PS09

<table>
<thead>
<tr>
<th>Category</th>
<th>Skill – Low Frequency/High Risk</th>
<th>Needles Thoracostomy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Approval: EMS Medical Director</td>
<td>Humberto Ochoa MD</td>
</tr>
<tr>
<td>Applies To:</td>
<td>Approval: EMS Agency Director</td>
<td>Bruce Barton, CCEMT-P</td>
</tr>
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<td>Signature</td>
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<td>EMS Agency Director</td>
</tr>
<tr>
<td>Signature:</td>
<td>Bruce Barton, CCEMT-P</td>
</tr>
</tbody>
</table>

13. Pulse oximeter

**Instructor Resource Materials**

1. Prehospital Trauma Life Support
2. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

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1. 2005 AHA ECC Guidelines Part 10.7, IV 147
**NEEDLE THORACOSTOMY – PS09**  
Performance Validation Form

**Performance Objective:** Relieve intrathoracic pressure resulting from tension pneumothorax to improve cardiac output and allow the return of spontaneous respirations or effective PPV.

**Performance Criteria:** 100% accuracy required on all items

<table>
<thead>
<tr>
<th>Pts</th>
<th>Score</th>
<th>Performance Steps</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Take or verbalize body substance isolation</td>
<td>Selection: gloves, goggles, mask, gown, booties, N95</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Methodically complete an assessment of the airway and breathing within 30 seconds</td>
<td>Follow respiratory assessment sequence</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Verify inadequate ventilation and/or signs of hypoxia within the first 30 seconds</td>
<td>Pale/cyanotic, altered level of consciousness, diaphoresis, increased work of breathing or apnea, poor chest rise and fall</td>
</tr>
</tbody>
</table>
| 1   |       | Recognize and differentiate signs and symptoms of tension pneumothorax | Maintain an index of suspicion when assessment reveals blunt or penetrating chest trauma or pneumothorax AND
Confirm the indications for decompressive needle thoracostomy when three (3) findings are present:
1. Worsening respiratory distress, difficulty with PPV, or apnea; AND
2. Unilateral decreased or absent breath sounds on the affected side; AND
3. Cardiac Arrest or Hypotension (systolic BP < 90mmHg with associated signs of poor perfusion) |
| 1   |       | Confirm the absence of contraindications for the procedure | • Inability to identify anatomical landmarks  
• Underlying anatomical abnormalities  
• Ventilation by any other means  
• Valid prehospital DNR |
| 1   |       | Lift occlusive dressings (if applied) to relieve intrathoracic pressure before needle thoracostomy |
| 1   |       | Correctly assemble all equipment required for needle thoracostomy within 60 seconds | Betadine or alcohol wipes, 3-5 cc syringes, catheter-over-needle – 14 gauge maximum of 2 inches long, one-way valve, occlusive dressings, cardiac monitor with waveform capnography, pulse oximetry, stethoscope, BVM with manometer, gauze sponges, petroleum gauze, normal saline for injection |
| 1   |       | Ensure optimal oxygenation and ventilation of the patient while equipment is prepared | • In the patient requiring respiratory support provide PPV using the lowest pressure necessary to adequately provide for oxygenation and ventilation of the patient. In the critical patient ideal SpO2 values may not be attainable until the pneumothorax is relieved.  
• In the spontaneously breathing patient provide supplemental oxygen at 10 – 15 LPM |
| 1   |       | Identify the correct anatomical landmarks and use aseptic technique to prepare the site for the needle insertion | Mid clavicular line in the second intercostals space over the top of the 3rd rib on the affected side |
| 1   |       | Insert the needle perpendicular (90˚) to the chest and advance the catheter 1 – 1 ½ inches | Catheter should be advanced just far enough to penetrate the parietal pleura and enter the pleural space |
| 1   |       | Assess for the sound of air rushing out through the needle or catheter, or stop when the pleura has been breached | A gauze pad should be placed over the catheter hub without occluding the movement of escaping air |
| 1   |       | Secure the catheter to a one-way valve |
| 1   |       | Reassess the patient following the procedure and continue respiratory support as indicated by the patient’s response to the procedure | • Methodically complete a reassessment of the airway and breathing within 30 seconds’  
• Identify inadequate ventilation and/or signs of hypoxia |
| 1   |       | Secure the catheter to the chest and continuously monitor for air or blood discharge |
| 1 | Provide direction to personnel that perform post procedure PPV | • Personnel performing PPV must be directed to continuously monitor airway resistance and lung compliance to hand ventilations.  
• In the patient requiring respiratory support, provide PPV using the lowest pressure necessary to adequately provide for oxygenation and ventilation of the patient. |
| 1 | Initiate rapid transport of the patient with refractory or reoccurring tension pneumothorax. | • Continue indicated treatment(s) en route to the hospital  
• Make base hospital contact as soon as possible to advise and consult on further treatment. |
| 1 | Maintain effective ventilation and oxygenation throughout the entire Prehospital interval. | • Symmetrical chest rise and fall with each ventilation cycle (Spontaneous or PPV)  
• SpO2 of greater than or equal to 95%  
• Improvement in ETCO2 level – the target is 30 – 45 mmHg in the patient with spontaneous circulation  
• Signs of improved cardiac output – return of pulses, improved skin color, improved BP, improved level of consciousness |
| 1 | Maintain calm and effectively lead a team-based approach to resuscitation under all conditions | |
| 1 | Accurately document all assessment findings, therapeutic treatments and the patient’s response to therapy 100% of the time | |
| 1 | Complete a procedure evaluation form. | |

**Critical Failure Criteria**

- Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
- Failure to achieve chest rise and fall with each ventilatory cycle
- Failure to maintain aseptic technique
- Failure to properly identify a tension pneumothorax
- Improper identification of landmarks
- Improper location for insertion of the needle
- Any procedure that would have harmed the patient
**Performance Standard**

<table>
<thead>
<tr>
<th>Date</th>
<th>Review Date</th>
<th>PS10</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2010</td>
<td>June 2012</td>
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</tr>
</tbody>
</table>

**Category I Skill – Low Frequency/High Risk**

**Transcutaneous Cardiac Pacing**

**Applies To:**

ALS Provider Agencies

**Date of Issue:**

Approval: EMS Medical Director
Humberto Ochoa MD

**Signature:**

Approval: EMS Agency Director
Bruce Barton, CCEMT-P

**Signature:**

---

**Terminal Performance Objective**

Electrical capture and control of the mechanical contraction of the heart resulting in adequate cardiac output and tissue perfusion.

**Before performing transcutaneous cardiac pacing (TCP) paramedics must:**

1. Methodically assesses patient’s ABC’s.
2. Determine the patient is hemodynamically unstable due to bradycardia and is a candidate for immediate TCP by confirming all of the following are simultaneously present:
   a. The patient is exhibiting signs and symptoms of systemic poor perfusion **and**
   b. Bradycardia (HR less than 60) is present on the ECG **and**
   c. Underlying causes of the dysrhythmia have been considered and reversible causes have been treated **and**
   d. Confirm no contraindications to TCP are present **and**
   e. The cardiac monitoring equipment is placed correctly on patient and print a baseline rhythm strip.
3. Identify contraindications for TCP:
   a. Children less than or equal to 12 years old (bradydysrhythmias in children are usually respiratory related)
   b. Asystolic arrest, unless approved by base hospital
4. Prepare for TCP
   a. Administer two (2) doses of Atropine while preparing pacer. Do not delay TCP if there is difficulty establishing an IV.
   b. Use TCP without delay for high degree block (type II second-degree block or third-degree block)
5. Strongly consider sedation while preparing TCP equipment.
   a. Use IN/IM route for sedation if IV access is poor and would delay TCP
6. Explain to patient/family what they can expect to feel and to see but do not delay immediately needed treatment.

**While performing transcutaneous cardiac pacing (TCP) paramedics must:**

1. Apply the ECG monitor/pacer multifunction pads (MFP) firmly to the patient’s clean, bare skin in the correct anatomical locations for maximum electrical current flow through the heart.
2. Identify a patient with a pacemaker or internal cardiac defibrillator (ICD) and place the MFP(s) in alternate position(s) to minimize damage to the device(s) and disruption of current flow through the heart.
3. Correctly place the ECG monitor into pacing mode.
4. Turn Pacer on and accurately set initial Rate and Current values for procedure (70 ppm and 20 mA). Gradually increase current until electrical capture is gained. (i.e. Pacer spike generates a QRS complex on the ECG)
5. Confirm mechanical capture by palpating pulses that match pacemaker (70 bpm). 
6. Accurately determine and utilize **minimum** electrical current needed to maintain capture (i.e. decreases current by 5 mA increments until pulses/capture lost, increases current by 5 mA increments until capture/pulses regained).
7. Evaluate the effectiveness of TCP by assessing the patient’s level of consciousness and vital signs for improvement.

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Riverside County EMS – Transcutaneous Cardiac Pacing Performance Standard  Page 1 of 3
8. Identify continuing signs and symptoms of poor perfusion (including but not limited to hypotension, altered level of consciousness and/or poor skin signs) despite effective mechanical capture and increase TCP rate in increments of 10 bpm to a max of 100 bpm to increase cardiac output.

9. Provide sedation as clinically required

10. Continuously re-assesses the patient’s vital signs and level of consciousness throughout the prehospital period of treatment.

11. Contact the Base Hospital if signs and symptoms of poor perfusion persist.

12. Documents procedure properly, printing paced rhythm strip and attaching it to the PCR.

Critical Success Targets for TCP

1. Electrical and mechanical capture
2. Resolution of patient’s bradycardia related signs and symptoms (hypotension, skin signs, level of consciousness, dyspnea/tachypnea, chest pain)

System Benchmark

% of patients that experience mechanical capture with signs of improved cardiac output (i.e. Improved level of consciousness/mentation, peripheral pulses, BP, skin signs)

Applicable Protocols

Bradycardia (7220), Transcutaneous Pacing (Appendix 67)

Core Competency Requirements to be covered during education/training on TCP

1. Assessment of patient to determine if appropriate indications are present (hemodynamically unstable bradycardia or AV blocks with wide complexes, or bradyasystolic arrest with base station order), and contraindications (patients under age 12 or asystole).
2. Proper placement of ECG electrodes on patient
3. Proper identification of cardiac dysrhythmia(s) requiring TCP
4. Proper placement of multi-function patches on patient
5. Assessment for and recognition of hemodynamic instability
6. Verbalizes possible treatments for hemodynamically unstable bradycardias other than TCP
7. Explains procedure to patient (where applicable) / pre-medicates patient (where applicable)
8. Demonstrates proper technique for setting rate and current
9. Demonstrates proper technique for gaining electrical capture with minimum required current
10. Demonstrates/explains concept of mechanical capture
11. Describes how to obtain mechanical capture if not gained with initial electrical capture
12. Cardiac monitoring / rhythm recognition and treatment
Performance Standard

Date: June 2010
Review Date: June 2012

Category I Skill – Low Frequency/High Risk
Transcutaneous Cardiac Pacing

Approval: EMS Medical Director
Humberto Ochoa MD

Signature

Applies To:
ALS Provider Agencies

Approval: EMS Agency Director
Bruce Barton, CCEMT-P

Signature

Adjunctive Performance Standards

N/A

Equipment Requirements

1. PPE
2. CPR mannequin(s)
3. Stethoscope
4. Cardiac monitor/ECG/Defibrillator
5. ECG Rhythm Generator
6. ECG patches
7. Defibrillation/Multifunction Pads
8. Versed
9. Pre-medication equipment (IV access, IN equipment, IM equipment)

Instructor Resource Materials

1. AHA ACLS Provider Manual
2. AHA PALS Provider Manual
3. 2005 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
4. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic
**TRANSCUTANEOUS CARDIAC PACING – PS10**

**Performance Validation Form**

**Performance Objective:** Electrical capture and control of the mechanical contraction of the heart resulting in adequate cardiac output and tissue perfusion

**Performance Criteria:** 100% accuracy required on all items

### Before performing transcutaneous pacing paramedics must:

<table>
<thead>
<tr>
<th>Pts</th>
<th>Score</th>
<th>Performance Steps</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Take or verbalize body substance isolation</td>
<td>Selection: gloves, goggles, mask, booties, gown, N95</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Methodically assess patient’s ABC’s</td>
<td></td>
</tr>
</tbody>
</table>
| 1   |       | Determine the patient is hemodynamically unstable due to bradycardia and is a candidate for immediate Transcutaneous Pacing (TCP) | Confirm the following:  
1. The patient is exhibiting signs and symptoms of systemic poor perfusion  
2. Bradycardia (HR less than 60) is present on the ECG  
3. Underlying causes of the dysrhythmia have been considered and reversible causes have been treated.  
4. No contraindications to TCP are present  
5. The cardiac monitoring equipment is placed correctly on patient and a baseline rhythm strip has been printed. |
| 1   |       | Strongly consider sedation while preparing TCP equipment. | Use IN/IM route for sedation if IV access is poor and would delay TCP |
| 1   |       | Explain to patient/family what they can expect to feel and to see. | Do not delay immediately needed treatment |

### While performing Transcutaneous cardiac pacing paramedics must:

<p>| 1   |       | Apply the ECG monitor/pacer multifunction pads (MFP) firmly to the patient’s clean, bare skin in the correct anatomical locations for maximum electrical current flow through the heart. | • Anterior-posterior placement is recommended, if possible. |
| 1   |       | Identify a patient with a pacemaker or internal cardiac defibrillator (ICD) and place the MFP(s) in alternate position(s) to minimize damage to the device(S) and disruption of current flow through the heart. | |
| 1   |       | Correctly place the ECG monitor into pacing mode. | |
| 1   |       | Turn the pacer on and accurately set initial rate and current values for procedure | 70 beats per minute (bpm) and 20 mA |
| 1   |       | Gradually increase current until electrical capture is gained | i.e., a Pacer spike generates a QRS complex on the ECG |
| 1   |       | Confirm mechanical capture by palpating pulses that match pacemaker (70 bpm) | |
| 1   |       | Accurately determine and utilize <em>minimum</em> electrical current needed to maintain capture | i.e. decreases current by 5 mA increments until pulses/capture lost, increases current by 5 mA increments until capture/pulses regained |
| 1   |       | Evaluate the effectiveness of TCP | Assess the patient’s mentation and vital signs for improvement |</p>
<table>
<thead>
<tr>
<th>1</th>
<th>Identify patients suffering persistent hemodynamic instability despite effective mechanical capture and increase TCP rate in increments of 10 bpm to a max of 100 bpm to increase cardiac output.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Provide sedation as needed</td>
</tr>
<tr>
<td>1</td>
<td>Continuously reassess the patient’s vital signs and mentation throughout the prehospital period of treatment.</td>
</tr>
<tr>
<td>1</td>
<td>Maintain calm and effectively lead a team-based approach to resuscitation under all conditions.</td>
</tr>
<tr>
<td>1</td>
<td>Accurately document all assessment findings, therapeutic treatments, and the patient’s response to therapy</td>
</tr>
<tr>
<td>1</td>
<td>Complete a Procedure Evaluation Form</td>
</tr>
</tbody>
</table>

**Critical Failure Criteria**

- Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
- Failure to identify indications/contraindications for procedure
- Failure to ensure the functionality of cardiac monitor and availability of equipment
- Failure to adjust current and rate appropriately
- Failure to confirm efficacy of intervention – using electrical and mechanical capture
- Any procedure that would have harmed the patient
Terminal Performance Objective
Termination of hemodynamically significant tachycardia resulting in restoration of adequate cardiac output and tissue perfusion.

Before performing synchronized cardioversion paramedics must:
1. Assess the patient’s ABC’s
2. Determine the patient is hemodynamically unstable due to idiopathic (non-compensatory) tachycardia and is a candidate for immediate cardioversion:
   a. Confirm the patient is exhibiting signs and symptoms of systemic poor perfusion
   b. Confirm tachycardia (HR greater than 150 in adults, greater than 180 in children, greater than 220 in infants) is present on the ECG
   c. Confirm underlying causes of the dysrhythmia have been considered and reversible causes have been treated
3. Provide supplemental oxygen in high concentration (10 – 15 lpm)
4. Confirm the ECG monitor leads have been placed appropriately.
5. Differentiate between wide and narrow complex tachycardia
6. Strongly consider sedation for alert patients, but do not delay cardioversion in an unstable patient presenting with signs and symptoms of poor perfusion (hypotension, decreased LOC, chest pain, dyspnea/tachypnea, diaphoresis, pale/cool skin). If IV access is delayed consider faster alternate routes of administration for Versed (IN/IM).
7. Explain to patient/family what they can expect to feel and to see while avoiding delays in treatment.

While performing synchronized cardioversion, paramedics must:
1. Select and prepare the appropriate sites for application of the ECG monitor/defibrillator multifunction pads.
2. Apply the ECG monitor/defibrillator multifunction pads (MFP) firmly to the patient’s clean, bare skin in the correct anatomical locations for maximum electrical current flow through the heart.
3. Identify a patient with a pacemaker or internal cardiac defibrillator (ICD) and place the MFP(s) in alternate position(s) to minimize damage to the device(s) and to avoid disruption of current flow through the heart.
4. Correctly place the ECG monitor/defibrillator in synchronize mode.
5. Confirm the monitor is tracking the R wave for delivery of synchronized current
6. Select the correct energy setting on the ECG monitor/defibrillator
   • Per REMSA protocols
7. Assure everyone is clear from the patient and all possible energy conducting surfaces/contacts.
8. Discharge the defibrillator for synchronized delivery of electrical current.
9. Immediately re-assess the patient.
10. Perform and print a 12 Lead ECG and attach to PCR.
11. Provide treatment based upon re-assessment findings.
**Critical Success Targets for Synchronized Cardioversion**

1. Improvement in patient level of consciousness  
2. Improved signs of perfusion  
3. Resolution of patient’s tachycardia related signs and symptoms (chest pain)  
4. ECG return to normal sinus rhythm or sinus tachycardia  
5. Proficient use of the ECG monitor/defibrillator including lead and MFP placement  

**System Benchmark**

% of patients receiving cardioversion with restoration of a stable perfusing rhythm.  

**Applicable Protocols**

Wide Complex Tachycardia or Ventricular Tachycardia with pulses (7240), Narrow Complex Supraventricular Tachycardia (SVT) (7230), Pediatric Tachycardia with pulses (8230)  

**Core Competency Requirements to be covered during education/training on synchronized cardioversion**

1. Cardiovascular A & P  
2. Cardiology – Pathophysiology of tachycardias  
3. Assessment of circulation and recognition of hemodynamic instability  
4. Identification and contraindications for synchronized cardioversion  
5. Proper placement of ECG electrodes on patient  
6. Proper placement of multi-function pads on patient  
7. Patient communication techniques  
8. Pre-cardioversion analgesia and sedation  
9. Demonstrates proper technique for use of the ECG monitor/defibrillator for cardioversion  
10. Post cardioversion cardiac monitoring / rhythm recognition and treatment  
11. Reassessment of patient  

**Adjunctive Performance Standards**

Patient Assessment  

**Equipment Requirements**

1. PPE  
2. CPR mannequin(s)  
3. Stethoscope  
4. Cardiac monitor/ECG/Defibrillator  
5. ECG Rhythm Generator  
6. ECG patches  
7. Defibrillation/Multifunction Pads  
8. Versed  
9. Pre-medication equipment (IV access, IN equipment, IM equipment)
### Performance Standard

<table>
<thead>
<tr>
<th>Category I Skill – Low Frequency/High Risk</th>
<th>Synchronized Cardioversion</th>
<th>Approval: EMS Medical Director Humberto Ochoa MD</th>
<th>Signature</th>
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<tbody>
<tr>
<td>Applies To:</td>
<td>ALS Provider Agencies</td>
<td>Approval: EMS Agency Director Bruce Barton, CCEMT-P</td>
<td>Signature</td>
</tr>
</tbody>
</table>

#### Instructor Resource Materials

1. AHA ACLS Provider Manual
2. AHA PALS Provider Manual
3. 2005 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
4. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic
**SYNCHRONIZED CARDIOVERSION – PS11**

**Performance Validation Form**

**Performance Objective:** Termination of hemodynamically significant tachycardia resulting in restoration of adequate cardiac output and tissue perfusion

**Performance Criteria:** 100% accuracy required on all items

**Before performing synchronized cardioversion paramedics must:**

<table>
<thead>
<tr>
<th>Pts</th>
<th>Score</th>
<th>Performance Steps</th>
<th>Additional Information</th>
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<tbody>
<tr>
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<td>Selection: gloves, goggles, mask, gown, booties, N95</td>
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<tr>
<td>1</td>
<td></td>
<td>Methodically assess the patient’s ABC’s</td>
<td></td>
</tr>
</tbody>
</table>
| 1   |       | Determine the patient is hemodynamically unstable due to idiopathic (non-compensatory) tachycardia and is a candidate for immediate cardioversion | 1. Confirm the patient is exhibiting signs and symptoms of systemic poor perfusion  
2. Confirm tachycardia (HR greater than 150) is present on the ECG  
3. Confirm underlying causes of the dysrhythmia have been considered and reversible causes have been treated. |
| 1   |       | Provide supplemental oxygen in high concentration | |
| 1   |       | Confirm the ECG monitor leads have been placed appropriately. | |
| 1   |       | Differentiate between wide and narrow complex tachycardia | |
| 1   |       | Strongly consider sedation while preparing cardioversion equipment. | Use IN/IM route for sedation if IV access is poor |
| 1   |       | Explain to the patient/family what they can expect to feel and to see. | Do not delay immediately needed treatment |

**While performing synchronized cardioversion paramedics must:**

<table>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>Apply the ECG monitor/pacer multifunction pads (MFP) firmly to the patient’s clean, bare skin in the correct anatomical locations for maximum electrical current flow through the heart.</td>
<td>Anterior-posterior placement is recommended, if possible.</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Identify a patient with a pacemaker or internal cardiac defibrillator (ICD) and place the MFP(s) in alternate position(s) to minimize damage to the device(S) and disruption of current flow through the heart.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Correctly place the ECG monitor/defibrillator in synchronize mode.</td>
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<tr>
<td>1</td>
<td></td>
<td>Confirm the monitor is tracking the R wave for delivery of synchronized current.</td>
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</tbody>
</table>
| 1   |       | Select the correct energy setting on the ECG monitor/defibrillator | 100J, 200J, 300J, 360J monophasic  
• 100J, 120j, 150j, 200j biphasic |
<p>| 1   |       | Assure everyone is clear from the patient and all possible energy conducting surfaces/contacts. | |
| 1   |       | Discharge the defibrillator for synchronized delivery of electrical current. | |
| 1   |       | Immediately reassess the patient | |</p>
<table>
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<tr>
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<tbody>
<tr>
<td>1</td>
<td>Perform a 12 Lead ECG and print a rhythm strip</td>
<td>Attach the rhythm strip to your PCR</td>
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<tr>
<td>1</td>
<td>Provide treatment based upon your reassessment findings</td>
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</tr>
<tr>
<td>1</td>
<td>Maintain calm and effectively lead a team-based approach to resuscitation under all conditions.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Accurately document all assessment findings, therapeutic treatments, and the patient’s response to therapy</td>
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</tr>
<tr>
<td>1</td>
<td>Complete a Procedure Evaluation Form</td>
<td></td>
</tr>
</tbody>
</table>

**Critical Failure Criteria**

- Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
- Failure to identify indications for procedure
- Failure to ensure the functionality of cardiac monitor and availability of equipment
- Failure to confirm efficacy of intervention
- Any procedure that would have harmed the patient
HEMS UTILIZATION ALGORITHM

- Poor weather/visibility
- Chemical contamination
- Full arrest at scene

LESS than 30 min drive time
Code 3

Operational:
MCI
Terrain Considerations

30-45 minute
code 3 drive time with
2 “hits”

>45 min
code 3 drive time with
1 “hit”

>45 min
code 3 drive time with
2 “hits”

Consign AIR

1 HIT
- Trauma Physiologic Criteria

1 HIT
- Trauma Anatomic Criteria

1 HIT
- Trauma Mechanism of Injury

1 HIT
- STEMI
- >20% TSA BURNS/or inhalation
- CRITICAL PEDS
- CRITICAL OB

Early contact with Base Hospital or Specialty Center is recommended.

Dispatch and ETA Air time includes:
- ETA to scene,
- transport of pt to LZ,
- transference of care,
- air crew interventions,
- flight time to hospital and helipad to ED.
The purpose of this policy is to allow for the expedited transfer and care of the critical trauma patient, (CTP) that arrives to a non-trauma hospital Emergency Department. The CTP falls within the jurisdiction of the Riverside County EMS Trauma plan and Trauma System per Title 22, as does the need for coordination of all health care organizations to facilitate the transfer of the CTP. The CTP shall be accepted from the non-trauma hospital by the closest Trauma Center, regardless of Trauma Center’s in-patient census/capacity. The only rationale for the closest Trauma Center to refuse the CTP transfer is due to the same criteria as outlined in REMS policy 5310.

This policy allows for 2 levels of triage, the CTP who needs immediate higher care of and the Trauma patient who would benefit from higher level of care to a trauma center. Please refer to policy 5710 for trauma triage criteria.

<table>
<thead>
<tr>
<th>Trauma Triage Continuation of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Critical Trauma Patient</strong></td>
</tr>
<tr>
<td>Needs Immediate Higher Level of Care</td>
</tr>
<tr>
<td>ED to ED</td>
</tr>
<tr>
<td><strong>Trauma Patient, needs Higher Level of Care to InHouse Trauma Services</strong></td>
</tr>
</tbody>
</table>

**Vital Signs:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Resp Compromise</td>
<td>Within Normal Limits</td>
</tr>
<tr>
<td>SBP&lt;90, (&gt;70 y/o SBP&lt;100)</td>
<td></td>
</tr>
<tr>
<td>GCS&lt;13</td>
<td></td>
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</tbody>
</table>

**CNS:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Penetrating/depressed skull injury</td>
<td>Stable Spinal Cord Injury</td>
</tr>
<tr>
<td>Open injury w/ or w/o CSF leak</td>
<td>Any head injury w/ combined face, chest, abd, or pelvis</td>
</tr>
<tr>
<td>Deteriorating GCS or changes in neuro status</td>
<td></td>
</tr>
</tbody>
</table>

**CHEST:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Widened Mediastinum on initial XRAY</td>
<td>Major Chest wall injury or pulmonary contusion</td>
</tr>
<tr>
<td>Penetrating injury</td>
<td>Prolonged ventilator requirements</td>
</tr>
</tbody>
</table>

**ABDOMEN/PELVIS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Any injury w/ associated Shock (SBP&lt;90)</td>
<td>Unstable pelvic ring</td>
</tr>
</tbody>
</table>

**EXTREMITIES**

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Any injuries w/ associated shock (SBP&lt;90)</td>
<td>Open long bone fx</td>
</tr>
<tr>
<td></td>
<td>Crush injuries or prolonged ischemia</td>
</tr>
<tr>
<td></td>
<td>Loss of distal pulses</td>
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</tbody>
</table>

**MULTI SYSTEM**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Any injury w/ associated shock</td>
<td>Possible Co-morbidities with associated Traumatic injury:</td>
</tr>
<tr>
<td></td>
<td>&lt;5, &gt; 70 years of age, (RCRMC for Pediatrics)</td>
</tr>
<tr>
<td></td>
<td>known anticoagulation/antiplatelet tx</td>
</tr>
<tr>
<td></td>
<td>pregnancy</td>
</tr>
<tr>
<td></td>
<td>immunosupression</td>
</tr>
</tbody>
</table>

Reference:
America College of Surgeons, Rural Trauma Guidelines
CONTINUATION OF TRAUMA CARE

Procedure for continuation of care transport:

For Critical Trauma Patient:

The patient should be resuscitated and attempts made to stabilize for transport.

A. Referring Physician:
1. The physician initiating Continuation of Care transport should call the local ALS ambulance provider. When continuation of care has been initiated the ambulance provider will respond immediately to requesting facility code 3.
OR request the patient’s current EMS crew to stand-by on premises for immediate transport of the patient to a trauma center. The stand-by of the EMS crew should not last longer than 20 minutes.
2. Notify directly the ED physician at the receiving Trauma Center. (see #4 for script.)
3. Coordinate diagnostics and interventions w/ receiving ED physician.
4. Suggested script, “This is Dr.____ at ____ hospital. I want to speak to the ED physician regarding a critical trauma patient for higher level of care.” (Do not use the word “transfer.”)

B. Information to Transporting Personnel:
Information concerning the patient’s condition and needs during transport should be communicated to transporting personnel.

C. Documentation: DO NOT Delay Transport
1. All documents are sent including: problem, treatments, status at time of transfer, lab values, Xrays, personal belongings, and EMTLA higher level of care paperwork.
2. All paper documents may be faxed to receiving facility. Xrays should be copied and sent, or web based portal viewing capabilities shared.

D. Management during Transport:
1. Assure proper level of personnel accompany patient
2. Continued management of vital functions and continuous re-evaluation per trauma treatment protocol.
3. Contact the trauma base hospital for medical control.

For Trauma Patient:

A. Referring Physician:
Contact Closest Trauma Center, speak to accepting Trauma Surgeon. (per hosp policy or ED to ED)

B. Information to Transporting Personnel:
Information concerning the patient’s condition and needs during transport should be communicated to transporting personnel.

C. Documentation:
All documents are sent including, problem, treatments, status at time of transfer, lab values, Xrays, personal belongings and EMTLA Higher level of care paperwork.

D. Prior to Transfer:
The patient should be resuscitated and attempts made to stabilize in respect to ABCDE’s.

E. Management during Transport:
Determine if patient needs CCT, ALS or BLS transport.
During transport, continued management of vital functions and continuous re-evaluation are essential.
1. The intent of this policy is to outline the procedures for receiving hospitals to implement diversion of advanced life support (ALS) units. Authority to regulate and monitor diversion is given to the EMS Agency in Section 1797.220, Division 2.5, of the state Health and Safety Code, and by Section 1105 (c), Title 13, of the California Code of Regulations.

2. Diversion Definitions

Diversion of ambulances may only occur under the following circumstances:

2.1 Internal Disaster

A utility failure, HAZMAT, or similar unusual internal situation has occurred that affects the operation of the ED.

2.1.1 The EMS Agency shall be notified immediately when a hospital closes due to an internal disaster.

2.2 Trauma Center Diversion

Trauma Centers may divert patients if one or more of the following conditions exist:

- Both (1st and 2nd on-call) trauma surgeons/trauma teams are being utilized by trauma patients.
- Operating Rooms are not available due to all teams occupied with trauma patients.
- If the CT scanner is inoperable, isolated head injuries only may be diverted.

2.2.1 Trauma diversion will occur utilizing the same hospital specific internal authorization channels as specified in item 3 below.

2.2.2 If the closest trauma center is on diversion, the patient should be transported to the next closest alternate trauma center not more than 45 minutes from the initial scene.

2.2.3 In cases where an alternate trauma center is greater than 45 minutes from the initial scene, the patient shall be transported to the closest most appropriate facility.

2.3 Trauma Patient Destination with diversion status in place

As per policy 7050, contact closest trauma base hospital for patient destination.

3. Hospital responsibilities prior to instituting diversion:

3.1 The facility must exhaust all measures to resolve the condition(s), according to its internal diversion plan. These should include but are not limited to:

3.1.1 Internal bed triage
3.1.2 Review of staffing resources
3.1.3 Supervisor’s review of steps made to avoid diversion

3.2 Hospitals considering diversion will notify surrounding hospitals to ensure a cohesive decision-making process based on the cooperative efforts of all hospitals involved. The charge nurse/designee shall be responsible for notifications.

3.3 The hospital must obtain authorization from all of the following people prior to instituting diversion:

3.3.1 Emergency Department supervisor/house supervisor/designee
3.3.2 Emergency Department physician director/designee
AMBLANCE DIVERSION

3.3.3 Administrator on-call.

3.3.4 Trauma Surgeon on duty.

4. The decision to institute diversion is made as permitted by hospital policy. The following steps should then be taken:

4.1 Using ReddiNet, the charge nurse/designee will update the local ambulance dispatch center, and all local hospitals when going on and off diversion:

4.1.1 Names of authorizing personnel will be entered on ReddiNet.

4.1.2 Diversion rationale will be entered on ReddiNet, i.e. Both surgeons occupied, Operating Rooms at maximum capacity, CT inoperable.

4.2 Hospitals shall make every effort to re-open as soon as possible.

4.3 The EMS Agency will have an EMS Specialist on-call at all times in case of emergency.

5. Diversion Evaluation

5.1 Any problems associated with patient care for diverted patients will be submitted to the EMS Agency on an Unusual Occurrence Report Form within 72 hours.

5.2 A diversion report will be compiled by the EMS Agency for the purpose of evaluating opportunities for continuous quality improvement.

5.3 Diversion records shall become part of the Continuous Quality Improvement process within each hospital and the EMS Agency.

5.4 The EMS Agency may perform periodic, unannounced site visits of hospitals instituting ambulance diversion to ensure compliance with all guidelines. Frequency of site visits will be at the discretion of the EMS Agency.

5.5 All incidents of trauma diversion will be reviewed internally at each trauma center for appropriateness and reported to the Trauma Audit Committee for review.
## Operational Policy

**ID:** 5730  
**Effective:** July 1, 2010  
**Expires:** June 30, 2012

<table>
<thead>
<tr>
<th>Treatment Protocols</th>
<th>Approval: REMSA Medical Director Humberto Ochoa MD</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEMI Receiving Centers</td>
<td>Approval: REMSA Director Bruce Barton, CCEMT-P</td>
<td>Signature</td>
</tr>
</tbody>
</table>

### Authority

*Health and Safety Code, Division 2.5, Sections 1797.67, 1798, and 1798.170*

### Purpose

This policy defines the requirements for designation as a Riverside County ST-Elevation Myocardial Infarction (STEMI) Receiving Center (SRC) for patients who access the 9-1-1 system meeting defined criteria who show evidence of a STEMI on a 12 Lead electrocardiogram (ECG), and establishes field triage criteria to be used for transport to such centers.

### Definitions

- **STEMI - ST Elevation Myocardial Infarction**
- **PCI – Percutaneous Coronary Intervention**
- **STEMI Receiving Center (SRC) –** A facility that has emergency interventional cardiac catheterization capabilities, that has undergone the process outlined in this policy to become designated as such by the Riverside County EMS Agency Medical Director.
- **STEMI Referral Facility (SRF) –** A facility that does not carry the designation of STEMI Receiving Center.
- **STEMI Base Hospital –** A facility that has been designated by the Riverside County EMS Agency Medical Director as a SRC that also functions as a Base Hospital.
- **CQI – Continuous Quality Improvement**

The Riverside County Emergency Medical Services Agency Medical Director may designate a hospital as a SRC if the following requirements are met:

### Hospital Services:
The hospital shall have the following services:

- **Current designation as a Paramedic Receiving Center.**
- **Operate a cardiac catheterization laboratory licensed by the Department of Health Services and approved for emergency percutaneous coronary interventions.**
- **Intra-aortic balloon pump capability**
- **A Cardiovascular surgery service permit**
  
  *This requirement may be waived by the EMS Agency medical Director when appropriate for patient or system needs. The Medical Director will evaluate conformance with existing American College of Cardiology/American Heart Association or other existing professional guidelines for standards.*

- **A dedicated an audio recorded phone line, capable of being answered twenty four (24) hours per day, seven (7) days per week, used by paramedics to notify SRCs of incoming STEMI patients.**
- **Provide Continuing Education opportunities for EMS personnel in areas of 12 Lead ECG acquisition and interpretation, as well as assessment and management of STEMI patients.**

### Personnel: The hospital shall have the following designated positions filled:

- **Medical Directors –** the hospital shall designate two medical directors as co-directors for the SRC program. One physician shall be a board certified interventional cardiologist with active PCI privileges. The co-director shall be a physician who is board-certified in Emergency Medicine with active privileges to practice in the emergency department.
- **Nursing Director –** There shall be a designated SRC nursing director who is trained or certified in Critical Care Nursing.
- **Physician Consultants –** A daily roster of the following on-call physician consultants who must be promptly available within 30 minutes of notification:
  
  i. **Cardiologist with primary PCI privileges**
  
  ii. **Cardiovascular surgeon, if cardiovascular surgical services are offered.**

*If cardiovascular surgical services are not available in house the facility must have a rapid transfer agreement in place with a facility that provides this service. Additionally, the facility must have a rapid transport agreement in place with a Riverside County permitted transport provider.*
Operational Policy 5730

Effective: July 1, 2010
Expires: June 30, 2012

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Applies To
- EMS System

**Policies** – Internal policies shall be developed for the following:
- a. Fibrinolytic therapy protocol to be used only in unforeseen circumstances when PCI of a STEMI patient is not possible.
- b. Diversion of STEMI patients only during times of Internal Disaster Designation (see EMS Policy #5310, "Ambulance Diversion")

**Data Collection** – The following data shall be collected on an on-going basis and available for review by the Riverside County EMS Agency:
- a. Number of field identified STEMI patients transported for emergency care
- b. Number of above patients who received primary PCI
- c. For EMS-treated patients with STEMI, door-to-infusion times for fibrinolysis, and door-to-dilation times for primary PCI.
- d. Total number of myocardial infarction admissions/year (all patients, not just EMS)
- e. Total number of PCI procedures/year for those cardiologists/cardiac surgeons treating EMS-transported patients.
- f. Total number of EMS STEMI patients that bypass the closest, most accessible receiving hospital (not approved as a SRC) and are transported to a SRC.

**Continuous Quality Improvement** – An in-house CQI program which monitors, at minimum, the following:
- a. Death rate (within 30 days, related to procedure regardless of the mechanism)
- b. Emergency CABG rate (result of procedure failure or procedure complication)
- c. Vascular complications (PCI access site complication, hematoma large enough to require transfusion, or operative intervention required)
- d. Cerebrovascular accident rate (peri-procedure)
- e. Post-procedure nephrotoxicity (increase in serum creatinine of >0.5)
- f. Tracking of door-to-dilation times
- g. Active participation in Riverside County EMS Agency CQI activities/committees is required.

**Performance Standard**
- a. A primary door-to-dilation time goal of 90 minutes or less shall be met 90% of the time.

**Designation**
- a. The SRC shall be designated after satisfactory review of written documentation and an initial site survey by Riverside County EMS Agency personnel/designees.
  - i. Documentation of current accreditation from The Society of Chest Pain Centers as a “Chest Pain Center with PCI” shall be accepted in lieu of a formal site visit/documentation review by the EMS Agency.
- b. Initial designation as a SRC shall be for a period of two (2) years. Thereafter, redesignation shall occur every four (4) years, contingent upon satisfactory review.
- c. Failure to comply with the criteria outlined in this policy will result in disciplinary action up to and including suspension or rescission of SRC designation.

**Reporting Requirements**
- a. Door-to-dilation times will be reported to the EMS Agency every three (3) months.
  - i. If the goal of door-to-dilation times of 90 minutes or less is not met 90% of the time, an improvement plan must be submitted to the EMS Agency addressing the deficiency (ies) with steps being taken to improve the times.
- b. Prehospital personnel shall complete the first section of the Suspected ST-Elevation MI (STEMI) Report and submit it to the SRC for completion.
c. SRC shall complete the Suspected ST-Elevation MI (STEMI) Report and submit it with the Patient Care Report and a copy of the prehospital ECG(s) to the EMS Agency on a monthly basis.
   i. Suspected ST-Elevation MI (STEMI) Report shall be completed for all patients identified in the prehospital environment as being STEMI patients, regardless of whether or not the patient was subsequently identified as suffering from a ST-Elevation MI.

Triage Criteria
a. A designated SRC should be considered as the destination of choice if all of the following criteria are met:
   a. The patient’s 12-Lead ECG shows a STEMI based on machine interpretation of field 12 Lead ECG, verified by paramedic and approved by a STEMI Base Hospital physician.
   b. ETA to the STEMI Receiving Center is 30 minutes or less from the scene.
      i. The base hospital physician may override this requirement and authorize transport to the SRC with transport time of greater than thirty (30) minutes.
   c. The base hospital confirms a SRC as the destination; STEMI base hospital contact is mandatory for all patients identified as possible STEMI patients.
      i. The STEMI base hospital is the only authority that can direct a patient to a SRC.
   d. The STEMI base hospital, if different from the SRC, will notify the SRC of patient’s pending arrival as soon as possible, to allow timely activation of cardiac catheterization laboratory team at the SRC.

Destination Decision
a. The following factors, in conjunction with a suspected STEMI, should be taken into consideration when making the destination decision:
   a. Malignant dysrhythmias; ventricular fibrillation/tachycardia and second/third degree atroventricular block
   b. Contraindications to thrombolytics
   c. Duration of symptoms
   d. Hemodynamic instability (shock)
   e. Patients with uncontrollable airways or in cardiopulmonary arrest shall be transported to the closest receiving center. The only exception is if the hospital is closed due to Internal Disaster per policy #5310.
Changes to STEMI Receiving Center policy (new verbiage in red):

- New formatting
- Authority cited
- Section 1. This policy defines the requirements for designation as a Riverside County ST-Elevation myocardial infarction (STEMI) Receiving Center for patients who may benefit from emergency percutaneous coronary interventions (PCI) access the 9-1-1 system meeting defined criteria who show evidence of a STEMI on a 12 Lead electrocardiogram (ECG), and establishes field triage criteria to be used for transport to such centers.
- Definitions section added.
- Section 2.1.6: “Participation in prehospital 12-lead ECG training.” “Provide Continuing Education opportunities for EMS personnel in areas of 12 Lead ECG acquisition and interpretation, as well as assessment and management of STEMI patients.”
- Section 2.2.1: “Medical Director – The hospital shall designate a two medical directors as co-directors for the STEMI Receiving Center SRC program. One physician shall be a board-certified interventional cardiologist with active PCI privileges. The co-director who shall be a physician who is board-certified in Emergency Medicine with active privileges to practice in the emergency department or in Cardiology.”
- Section 2.2.2: Nursing Director – There shall be a designated STEMI Receiving Center nursing director who is trained or certified in Critical Care Nursing.
- Section 2.2.3: Physician Consultants – A daily roster of the following on-call physician consultants who must be promptly available within 30 minutes of notification:
- Section 2.2.3.2: Cardiovascular surgeon, if cardiovascular surgical services are offered

*If cardiovascular surgical services are not available in house the facility must have a rapid transfer agreement in place with a facility that provides this service. Additionally, the facility must have a rapid transport agreement in place with a Riverside County permitted transport provider.
- Section 2.2.4: Additional personnel who must be promptly available within 30 minutes of notification:
- Section 2.3.1 and 2.3.2: Defining patients who shall receive emergency angiography and who shall receive emergent fibrinolysis, based on physician decisions for individual patients Fibrinolytic therapy protocol to be used only in unforeseen circumstances when PCI of a STEMI patient is not possible.
- Section 2.3.3: Diversion of STEMI patients only during times of Internal Disaster designation (see EMS Policy #5310, “Ambulance Diversion”)
- Addition to Data Collection (Section 2.4 in current policy): Total number of EMS STEMI patients that bypass the closest, most accessible receiving hospital (not approved as a SRC) and are transported to a SRC.
- Section 4.1: Door-to-dilation times will be reported to the EMS Agency every six (6) three (3) months.
- Addition to Reporting Requirements (Section 4 in current policy):
b. Prehospital personnel shall complete the first section of the Suspected ST-Elevation MI (STEMI) Report and submit it to the SRC for completion.

c. SRC shall complete the Suspected ST-Elevation MI (STEMI) report and submit it with the Patient Care Report and a copy of the prehospital ECG(s) to the EMS Agency on a monthly basis.

- **Section 5.1:** The patient’s 12 Lead ECG shows a STEMI based on machine interpretation of field 12 Lead ECG, verified by paramedic and approved by a STEMI base hospital physician.

- **Section 5.2:** ETA to the STEMI Receiving Center is 30 minutes or less from the scene. Section I added: The STEMI base hospital physician may override this requirement and authorize transport to the SRC with transport time of greater than thirty (30) minutes.

- **Section 5.3:** The STEMI base hospital confirms a STEMI Receiving Center as the destination; STEMI base hospital contact is mandatory for all patients identified as possible STEMI patients.
  
i. The STEMI base hospital is the only authority that can direct a patient to a SRC.

- **d.** The STEMI base hospital, if different from the SRC, will notify the SRC of patient’s pending arrival as soon as possible, to allow timely activation of cardiac catheterization laboratory team at the SRC.
## Administrative Policy

### Base Hospital Designation and Criteria

<table>
<thead>
<tr>
<th>Administrative Policy</th>
<th>Approval: REMSA Medical Director Humberto Ochoa MD</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applies To</td>
<td>Base Hospitals</td>
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<tr>
<td></td>
<td>Approval: REMSA Director Bruce Barton, CCEMT-P</td>
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### Authority

Health & Safety Code, Division 2.5, Chapter 2, Section 1797.58; Chapter 5, Section 1798, 1798.2; Chapter 6, Article 1, Sections 1798.100 through 1798.105. California Code of Regulations, Title 22, Division 9, Section 100168 and 100390; Title 22, Division 9, Chapter 12, Sections 100400 through 100405.

### Purpose

- To define the criteria which shall be met by acute care hospitals in Riverside County for base hospital designation.
- To define the role of the base hospital within the EMS system in Riverside County.
- To establish operational, medical, and personnel standards for the base hospital in Riverside County.

### Designation: Initial designation

- Hospitals meeting Title 22 requirements and designated as a Paramedic Receiving Hospital in Riverside County that are interested in designation as a base hospital shall submit a request to the Riverside County EMS Agency (REMSA).
- REMSA shall evaluate the request and determine the system need for an additional base hospital. Hospital shall provide evidence of compliance with all criteria in this policy. A site visit may be performed at the discretion of REMSA.
- REMSA will review the submitted material, perform a site visit, and meet with appropriate hospital personnel.
- Following a review, REMSA shall provide its findings to the Emergency Medical Care Committee (EMCC) for recommendations for endorsement or denial of designation as a base hospital.
- If selected as a base hospital, hospital shall have a written agreement as described in Section 8 of this policy, and shall agree to seek approval as a Riverside County EMS Continuing Education Provider.

### Continuing Designation

- REMSA shall review each designated base hospital’s compliance to criteria at least every two (2) years or more often if deemed necessary by the REMSA Medical Director. Hospital shall provide evidence of compliance with all criteria in this policy. A site visit may be performed at the discretion of REMSA.
- REMSA shall provide its findings to the EMCC for recommendation for approval or denial of continuing designation.

### Change in Ownership / Change in base hospital Program Management Staff

- In the event of a change in ownership of the hospital, continued base hospital designation will be at the discretion of REMSA.
- REMSA shall be notified, in writing, at least ten (10) days prior to the effective date of any changes in the base hospital Medical Director and/or the Prehospital Liaison Nurse (PLN).

### Suspension / Revocation of designation by REMSA

- REMSA may suspend or revoke the designation of a base hospital for failure to comply with any applicable REMSA policy and procedure, state and/or federal laws.

### Base Hospital Obligations

- Hospital shall maintain designation by REMSA as a paramedic receiving center.
- Hospital shall maintain approval as a Riverside County EMS Continuing Education Provider.
- REMSA shall be notified immediately any time the base hospital is unable to perform the basic functions of a base hospital (Internal Disaster necessitating the closure of the hospital or any part of it, malfunction of communications equipment such that communication with prehospital personnel is no longer possible, no qualified personnel available at the hospital to communicate with prehospital personnel).

### Medical Personnel / Staffing: Base Hospital Medical Director

- The hospital shall designate a base hospital Medical Director who shall be:
  - A physician in good standing on the hospital staff and licensed in the State of California
  - Certified or eligible for certification by the American Board of Emergency Medicine or the Advisory Board for Osteopathic Emergency Medicine.
ii. Regularly assigned to the emergency department, with experience in and knowledge of base hospital radio operations and REMSA policies and procedures.

iv. Shall be responsible for functions of the base hospital including the QI Plan as designated by REMSA.

b. The base hospital Medical Director or his/her designee shall:
   i. Be responsible for the medical direction and supervision of the prehospital program within the base hospital’s area of responsibility, including review of patient care records and evaluation of personnel.
   ii. Establish a quality improvement program that complies with the requirements of California Title 22, Division 9, Chapter 12, with REMSA policies, and approved by REMSA.
   iii. Review patient care initiated in the field for adherence to REMSA policies, protocols, and procedures.
   iv. Maintain ongoing evaluation of EMT-Is, EMT-Ps and MICNs within the base hospital catchment area and making recommendations for performance reviews.
   v. Report deficiencies in patient care to REMSA, including review of patient care records and critique with personnel involved. REMSA shall be notified of unusual occurrences according to Policy #2200 (Confidential Incident Review Process).
   vi. Report any action of licensed/certified prehospital personnel which may potentially constitute a violation under Section 1798.200 of the California Health & Safety Code.
   vii. Ensure that at least one base hospital physician (defined below) is on duty twenty four (24) hours per day, seven (7) days per week.
   viii. Assure that emergency department physicians new to the base hospital are provided with a REMSA-approved orientation to the Riverside County EMS system.
   ix. Attend at least 50% of Riverside County’s Prehospital Medical Advisory Committee (PMAC) meetings.

Base Hospital Physicians
   a. Base hospital physicians responsible for providing immediate (on-line) medical direction to prehospital personnel and base hospital MICNs shall:
      i. Have an initial EMS orientation with the PLN prior to being assigned responsibility for providing on-line medical direction.
      ii. Complete eight (8) hours of ride-along or three (3) medical aid runs with a Riverside County ALS unit within the first three (3) months of employment at the base hospital unless concurrently employed by another Riverside County base hospital.
      iii. Annually provide a one (1) hour education offering at a base sponsored class or complete a four (4) hour paramedic field observation (ride-along).
      iv. Annually attend at least 50% of Riverside County PMAC meetings, EMCC meetings, or attend at least 50% of other base hospital emergency department meetings where minutes and attendance are taken and REMSA topics are presented and discussed.
      v. On an as-needed basis, but at least annually, base hospital physicians working less than 80 hours per month (averaged) must receive an update by the PLN to review changes in REMSA policies, protocols, and procedures.
      vi. The base hospital Medical Director may impose additional requirements to fulfill the responsibilities of the base hospital.

Prehospital Liaison Nurse (PLN)
   a. The base hospital shall designate a PLN who shall have experience in and knowledge of base hospital radio operations and local EMS policies and procedures. The PLN shall assist the base hospital medical director in his/her duties.
   b. The PLN shall be a registered nurse and meet all of the following requirements:
      i. Employed full time by the base hospital in the Emergency Department
      ii. Current Riverside County authorization as a Mobile Intensive Care Nurse (MICN).
      iii. Five (5) years emergency/critical care nursing experience
      iv. Three (3) years MICN experience.
   c. The PLN shall, in conjunction with the base hospital Medical Director:
      i. Act as a liaison with other EMS system participants on behalf of REMSA and the base hospital
      ii. Participate in quality improvement activities (e.g., internal base activity audits, systemwide audits, participation on REMSA QI Committees, development of the base hospital CQI Plan)
### Administrative Policy

**Administrative Policy 4500**

**Effective:** January 1, 2011  
**Expires:** December 31, 2012

<table>
<thead>
<tr>
<th>Administrative Policy</th>
<th>Base Hospital Designation and Criteria</th>
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<tbody>
<tr>
<td>Approval: REMSA Medical Director Humberto Ochoa, MD</td>
<td>Signature</td>
</tr>
<tr>
<td>Base Hospitals</td>
<td>Approval: REMSA Director Bruce Barton, CCEMT-P</td>
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iii. Provide continuing education to EMT-Ps and MICNs, based upon identified needs or quality improvement audits, including mandatory education programs required by REMSA.

iv. Select appropriate nursing staff for MICN authorization, and ensuring that those staff are prepared for MICN authorization.

v. Complete an annual competency-based MICN evaluation for all MICN staff.

vi. Ensure that all MICNs maintain REMSA authorization.

vii. Be responsible for developing an internal policy that delineates the maintenance and deactivation of MICN status.

viii. Notify REMSA of any change in staffing of the hospital, such as PLN, ED Manager, base hospital Medical Director, Chief Executive Officer, Chief Nursing Officer, Chief Operating Officer, or Disaster Coordinator within ten (10) days prior to change.

ix. Review selected calls directed by the base hospital compliance with REMSA policies and protocols, medical appropriateness, and documentation. Review shall include, but not be limited to, review of the Patient Care Reports and any audio recordings of such calls.

x. Concurrent evaluation of field personnel. This may include ride alongs, mega codes and scenario based simulations.

xi. Investigate and perform appropriate follow-up with involved personnel for deviations in practice from REMSA protocols and Performance Standards, with REMSA notification when indicated per Policy #2200, in collaboration with other involved organizations.

xii. Maintain a file for each MICN (refer to Section 7)

xiii. Coordinate with other base hospitals in Riverside County and with prehospital care providers to present skills days to MICNs, EMT-I’s and EMT-Ps in Riverside County a minimum of twice per year.

xiv. Coordinate with other base hospitals in Riverside County and with prehospital care providers for presenting reviews/field care audits/base hospital meetings a minimum of four (4) times per year.

xv. Ensure that all REMSA required data for system analysis is reviewed for accuracy and completeness and submitted within the required timeframes (refer to Section 7)

### Mobile Intensive Care Nurses (MICNs)

**a.** Base hospital emergency department registered nurses assigned to provide on-line medical direction shall maintain Riverside County authorization as a MICN.

**b.** At least one MICN shall be on duty and immediately available within the Emergency Department twenty four (24) hours/day, seven (7) days/week, to provide on-line medical direction to prehospital personnel. One MICN per shift shall have primary responsibility for providing on-line medical direction to prehospital medical care personnel.

### Equipment

**a.** The base hospital shall have and agree to maintain telecommunications equipment, as specified by REMSA, capable of direct voice communication with the prehospital personnel.

**b.** The base hospital shall have, and agree to utilize and maintain, computer equipment and data software, as specified by REMSA, for the purpose of data entry and data collection for monitoring EMS activities within the base hospital’s scope of responsibility.

**c.** The base hospital shall have, and agree to utilize and maintain, an interhospital communications system such as ReddiNet, or other such system approved by REMSA.

### Data Collection / Records

The base hospital shall:

**a.** Complete a base hospital report for each hospital contact, utilizing a REMSA approved form. Retain the original record as required by applicable state and federal laws.

**b.** Base hospital shall record all radio and telephone medical direction communication directions, maintain such recording for minimum of one (1) year, and use such recordings exclusively for auditing, continuing education and review approved by REMSA.

**c.** Agree to maintain and provide upon request to REMSA within thirty (30) days after the end of the preceding month all relevant data for program monitoring and evaluation of the EMS system. Such data may include:
i. A copy of the base hospital report
ii. STEMI reports
iii. Airship utilization
iv. Volume indicators, such as the total number of contacts for on-line medical direction, patients requiring an advanced airway, multi-casualty incident (MCI) calls managed by the base hospital, specialty center designation calls (e.g., trauma, STEMI) managed by the base hospital, or low-frequency skills (i.e., laryngoscopy w/foreign body removal, adult and pediatric endotracheal intubation, nasotracheal intubation, rescue airway insertion, post intubation ETT confirmation and monitoring, needle thoracostomy, needle cricothyrotomy, transcutaneous pacing, synchronized cardioversion, meconium aspirator, accessing pre-existing vascular devices, ET introducer styllet, or tourniquet application)
v. Other data as requested.
d. By January 30th of each year, submit to REMSA the name, REMSA-assigned identification number and authorization expiration date for each MICN sponsored by the base hospital
e. By January 30th of each year, submit to REMSA a list of physicians that are authorized to provide medical direction to prehospital personnel who have been oriented to EMS policies, and the date(s) of such orientation.
f. Maintain a file for each MICN sponsored by the base hospital to include:
i. Evidence of compliance with requirements for MICN authorization (as per Policy #3500) for the current base hospital designation period, as defined by base hospital contract
ii. Unusual occurrences, issued identified through the CQI process
iii. Annual performance evaluations for the current base hospital designation period, as defined by base hospital contract
iv. Other appropriate documentation

Hospital Policies / Agreements
a. The base hospital shall have a written agreement with REMSA indicating the concurrence of hospital administration, medical staff, and Emergency Department staff to meet the requirements for program participation as specified in Title 22 and by REMSA’s policies and procedures.
b. The base hospital shall have a Continuous Quality Improvement (CQI) plan, which assists REMSA with monitoring of EMS operations. Such plan shall be approved by REMSA. And shall be submitted for re-approval one (1) year after initial approval, and every five (5) years thereafter.
i. An annual update shall be submitted to REMSA, to include but not be limited to:
   1. Indicators monitored
   2. Key finding/priority issues identified
   3. Improvement action plan/plans for further action
   4. Follow-up needed, or not e if goals were met
   5. Recommendations for changes needed in the CQI plan for the coming year
1. PURPOSE
To establish the role, duties, and required equipment for fire-based Advanced Life Support (ALS) personnel to operate in the capacity of Fireline Paramedic (FEMP), rendering care to assigned fireline personnel, either within Riverside County, or when requested through the mutual aid system, outside of the county. This policy is designed to integrate with FEMP ICS 223 (ICS Position Manual, Fireline EMT-P).

2. AUTHORITY
California Health and Safety Code, Division 2.5, Sections 1797.204, 1797.220
California Code of Regulations, Title 22, Division 9, Sections 100165 and 100167
California Fire Service and Rescue Emergency Mutual Aid System, Mutual Aid Plan (3-02)

3. POLICY
Paramedics are authorized to render ALS level care as a designated FEMP during fire mutual aid operations as long as they meet all of the following requirements:
3.1 Has a current paramedic license in good standing from the State EMS Authority.
3.2 Is accredited as a Riverside County Paramedic.
3.3 Is authorized to function as a FEMP by her/his employing fire department.
3.4 Has been assigned to perform as a FEMP by the appropriate Incident Command authority.

4. Fire service providers should establish non-medical qualifications for their personnel to serve as a Fireline Paramedic.

5. A paramedic functioning as a FEMP shall adhere to the policies and procedures of his/her accrediting (LEMSA). At no time may a FEMP function outside the medical control policies established by their accrediting LEMS A Medical Director.

6. Riverside County paramedics assigned as FEMPs shall carry a medical equipment and supply inventory consistent with the Firescope FEMP position description and listed in item # 8 of this policy.
6.1 It will not be possible in all environments to maintain standard ALS or BLS minimums on the fireline. The included inventory prioritizes critical and probable fireline needs.
6.2 Reasonable variations may occur with consideration to weight, length of assignment and access to additional supplies.
6.3 Equipment variations must be authorized by the appropriate Incident Command authority.
7. Riverside County accredited paramedics operating as FEMPs shall adhere to the following procedures. Out-of-area personnel operating within Riverside County should be briefed on procedures.

7.1 The FEMT-P shall check in and obtain a briefing from the Logistics Section Chief, or the Medical Unit Leader (MEDL) if established at the wildfire incident.

7.2 Documentation of patient care will be completed as per the FEMP’s LEMSA policy.

7.3 Documentation of patient care (PCR) will be provided to the MEDL and submitted as part of the incident archive.

7.4 If requested, a legible copy of the Patient Care Report (PCR) will be forwarded to the identified home LEMSA.

7.5 Continuous Quality Improvement activities shall be in accordance with the FEMP’s LEMSA policy in concert with provider agency CQI procedures.

7.6 Management of controlled drugs shall be in accordance with the FEMP’s LEMSA policy.

7.7 Specifics related to controlled drug security and restock procedures shall be part of the Incident Action Plan (IAP).

8. The following items are considered standard compliment for the FEMP:

8.1 Basic Life Support (BLS) pack inventory:
- Airway, Oral Pharyngeal Kit
- Biohazard Bag (2)
- Bag Valve Mask (1)
- Space Blanket (2)
- Bandage, Sterile 4 x 4 (6)
- Bandage, Triangular (2)
- Cervical Collar, Adjustable
- Cold Pack (3)
- Dextrose Oral (1)
- Dressing, Multi-Trauma (4)
- Eye Wash (1 bottle)
- Pen Light (1)
- Exam Gloves
- Coban Wraps/Ace Bandage (2 ea.)
- Kerlix, Kling, 4.5, Sterile (2)
- Mask, Face, Disposable w/eye shield (1)
- Pad, Writing (1)
- Pen and Pencil (1 ea.)
- Triangular Dressing with Pin (2)
- Splinter Kit (1)
- Scissors, Medic (1)
- Sheet, Burn or equivalent (2)
### FIRELINE PARAMEDIC

<table>
<thead>
<tr>
<th>Applies To:</th>
<th>ALS Provider Agencies</th>
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<tbody>
<tr>
<td>Approval:</td>
<td>EMS Medical Director</td>
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<tr>
<td></td>
<td>Humberto Ochoa MD</td>
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<tr>
<td>Signature:</td>
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<tr>
<td>Approval:</td>
<td>EMS Agency Director</td>
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<td>Bruce Barton CCEMT-P</td>
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#### 8.2 Advanced Life Support (ALS) pack inventory:

- □ Stethoscope (1)
- □ Sphygmomanometer (1)
- □ Splint, Moldable
- □ Suction, Manual Device (1)
- □ Tape, 1 inch, Cloth (2 rolls)
- □ Petroleum Dressing (2)
- □ Thermometer, Digital (1)
- □ Endotracheal Intubation Equipment (6.0, 7.5 ET – Mac 4, Miller 4, stylette and handle-pedi recommended for weight)
- □ Rescue Airway (1)
- □ ETT Restraint
- □ End Tidal CO2 Detector
- □ ETT Verification Device
- □ Needle Thoracostomy Kit (1)
- □ IV Administration Set-Macro-Drip (2)
- □ Veniguard (2)
- □ Alcohol Preps (6)
- □ Betadine Swabs (4)
- □ Tourniquet (2)
- □ Razor (1)
- □ Transpore Tape (1)
- □ 14 ga. IV Catheter (2)
- □ 16 ga. IV Catheter (2)
- □ 18 ga. IV Catheter (2)
- □ 20 ga. IV Catheter (2)
- □ 10 cc Syringe (2)
- □ 1 cc TB Syringe (2)
- □ 18 ga. Needle (4)
- □ 25 ga. Needle (2)
- □ Glucometer Test Strips (4)
- □ Lancet (4)
- □ Sharps Container (1)
- □ Compact AED/SAD (waveform display preferred) (1)
- □ AED/SAD Patches (2)
- □ Pulse Oximeter (1 Optional)
□ Glucometer or Equivalent (1)

**Medications**
- □ Albuterol Metered Dose Inhaler (pending REMSA Medical Director approval)
- □ Amiodarone 300mg
- □ Aspirin-Chewable 80 mg (1 bottle)
- □ Atropine Sulfate 1 mg (2)
- □ Dextrose 50% 25 G. Pre-Load (1)
- □ Diphenhydramine 50 mg (4)
- □ Epinephrine 1 10,000 1mg (2)
- □ Epinephrine 1 1,000 1 mg (4)
- □ Glucagon 1 mg/unit (1)
- □ Versed 20 mg
- □ Morphine Sulfate 10 mg/ml (4)
- □ Naloxone – 2 mg (2)
- □ Nitroglycerin 1/150 gr (1) (1multi-dose spray or bottle of tablets)
- □ Saline 0.9% IV 1,000 ML – may be configured into two 500 cc or four 250 cc bags
- □ Narcotic Storage
- □ FEMP Pack Inventory Sheet (1)
- □ PCR (6)
- □ AMA Forms (3)
PURPOSE: To provide a mechanism for Riverside County to evaluate and report on the potential impact on the Emergency Medical Services (EMS) system of the reduction or closure of emergency services in hospitals.

AUTHORITY: Health and Safety Code Section 1300 (c).

I. POLICY: Acute care hospitals intending to implement either a reduction or closure of emergency services must advise the EMS agency as soon as possible, but at least 90 days prior to the proposed change.
   a. The notification of change proposal must include:
      i. Reason for the proposed change(s).
      ii. Itemization of the services currently provided and the exact nature of the proposed change(s).
      iii. Description of the local geography, surrounding services, the average volume of calls.
      iv. Description of potential impact on the EMS community regarding patient volume and type of prehospital and emergency department services available. Include a pre/post comparison.
      v. Description of potential impact on the public regarding accessibility of comparable alternative facilities or services. Include a pre/post comparison.

II. Evaluation Process
   a. Upon receiving notification of a planned reduction or elimination of emergency medical services by a hospital or the California Department of Public Health (CDPH), all local hospitals, fire departments, and ambulance providers, and all local planning authorities will be notified.
   b. Within thirty-five (30) days of notification, the EMS Agency, in consultation with emergency service providers and planning/zoning authorities, will complete and distribute a draft EMS Impact Evaluation and set a public hearing date. At a minimum, the Impact Evaluation report shall include:
      i. Assessment of community access to emergency medical care.
      ii. Effect on emergency services provided by other entities.
      iii. Impact on the local EMS system.
      iv. System strategies for accommodating the reduction or loss of emergency services.
      v. Potential options, if known.
      vi. Public and emergency services provider comments.
      vii. Suggested/recommended actions.
   c. Within fifty (45) days of notification, the EMS Agency will release the draft impact evaluation report to EMS stakeholders with a 10 working day comment period. Following the 10 day comment period the EMS Agency will conduct at least one (1) public hearing and incorporate the results of the hearing/s into a final Impact Evaluation. Public hearings may be incorporated with other public meetings held by the Public Health Department, Board of Supervisors and/or other government agencies, commissions, or committees.
   d. Within sixty (60) days of receiving notice, the EMS Agency will prepare the final Impact Evaluation, and submit those findings to the CDPH, State EMS Authority, Board of Supervisors, Emergency Medical Care Committee (EMCC) all city councils, fire departments, ambulance services, hospitals, planning authorities, local EMS participants and other interested parties.
   e. The hospital will serve notice of the public hearing to the community through standard and reasonable efforts (e.g. local newspapers and notices at hospitals) within the affected county.
   f. The hospital proposing a reduction or closure of service(s) will be charged a $1,500.00 fee by Riverside County Emergency Medical Services for the impact evaluation within 5 days of notification.
Tentative PMAC Meeting Schedule 2011

Monday, January 24, 2011, 9:00 – 11:00AM

Monday, March 21, 2011, 9:00 – 11:00AM

June 27, 2011, 9:00 – 11:00AM

September 26, 2011, 9:00 – 11:00AM

November 21, 2011, 9:00 – 11:00AM

All meetings will be held at the Riverside County Regional Medical Center  
26520 Cactus Avenue, Moreno Valley  
Rooms A1018 with A1021