ALS Skills Competency Verification Form

1a. Name as shown on paramedic license/MICN authorization	1b. Certificate/license number
1c. Signature of person demonstrating competency	1d. Certifying authority REMSA

Airway Skills	Verification of competency	
1. BLS airway adjuncts	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
2. Continuous Positive Airway Pressure (CPAP)	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
3. i-gel Supraglottic Airway Device	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
4. Laryngoscopy and Magill Forceps	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
5. Orogastric (OG) Tube	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
6. Orotracheal Intubation (OTI)	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
7. Post OTI Confirmation & Monitoring	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
8. Positive Pressure Ventilation	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number

Cardiac Skills	Verification of competency	
9. Defibrillation	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
10. Synchronized Cardioversion	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
11. Transcutaneous Cardiac Pacing	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
General Medical Skills	**Verification of competency**	
12. Calculating and Preparing Drug Dosages	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
13. Childbirth with Neonatal Resuscitation	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
Trauma Care Skills	**Verification of competency**	
14. Needle Chest Decompression	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number
15. Tourniquets	Affiliation	Date
Signature of person verifying competency	Printed name	Cert/License/Authorization number

For paramedics: a completed ALS Skills Verification Form is required to accompany an initial, and reaccreditation, application for those individuals who are either initially obtaining accreditation, maintaining accreditation without a lapse, or reaccrediting with a lapse of less than one (1) year.

For MICNs: a completed ALS Skills Verification Form is required to accompany an initial authorization application or when challenging MICN authorization.

For reauthorizing MICNs: to meet the additional reauthorization requirements in Policy #1210, a completed ALS SCV form must be included in the reauthorization packet.

CLEAR PRINT

1a. Name of Certificate Holder
Provide the complete name, last name first, of the paramedic accreditation/MICN authorization holder who is demonstrating skills competency.

1b. Certificate Number
Provide the paramedic accreditation/MICN authorization number from the current or lapsed paramedic accreditation/ authorization of the paramedic/MICN who is demonstrating competency.

1c. Signature
Signature of the paramedic accreditation/MICN authorization holder who is demonstrating competency. By signing this section, the paramedic or MICN are verifying that the information contained on this form is accurate and that the paramedic accreditation/MICN authorization holder has demonstrated competency in the skills listed to a qualified individual.

1d. Certifying Authority
Provide the name of the paramedic/MICN certifying authority for which the individual will be accrediting through.

Verification of Competency

1. Affiliation – Provide the name of the EMS service provider or base hospital that the qualified individual who is verifying competency is affiliated with.

2. Once competency has been demonstrated by direct observation of an actual or simulated patient contact, i.e., skills station, the individual verifying competency shall sign the ALS Skills Competency Verification Form for that skill.

3. Qualified individuals who verify skills competency shall be currently licensed or certified as: A paramedic, registered nurse, physician assistant, or physician and shall be either a qualified instructor designated by an EMS approved training program (paramedic training program or continuing education training program) or by a qualified individual designated by an EMS service provider. EMS service providers include, but are not limited to, public safety agencies, REMSA authorized private ambulance providers, and other EMS providers.

4. Certification or License Number – Provide the certification or license number for the individual verifying competency.

5. Date – Enter the date that the individual demonstrated competency in each skill.

6. Print name – Print the name of the individual verifying competency in the skill.

Verification of skills competency shall be valid to apply for paramedic reaccreditation or MICN authorization for a maximum of two (2) years from the date of verification.

	BLS adjuncts	
	Skills Verification form	
Last Reviewed: **January 1, 2021**		Last Revised: **October 23, 2024**

Terminal Performance Objective

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

Before managing a patient's airway with BLS adjuncts, the PSFA*, EMT, AEMT, or paramedic must:

*__PSFA Providers__, BLS adjunct placement is an optional skill and requires REMSA authorization for performance

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. Apply the 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. Clear secretions or other obstructions using appropriate method (manually, log rolling, suctioning, etc.) maintaining spinal stabilization controls as patient's condition indicates.
5. Utilize the appropriate technique per American Heart Association Standards to insert the appropriate BLS airway within 10 seconds.
    a. Nasopharyngeal airway (NPA) is the preferred BLS airway.
6. Confirm correct airway placement and immediately initiate PPV with oxygen at 10 – 15 LPM
    a. For the hypo ventilating or apneic patient, initiate PPV with oxygen at 10 – 15 LPM.
    b. If upper airway management techniques have restored effective spontaneous respiration, apply supplemental oxygen and closely monitor the patient's airway and breathing.

While managing a patient's airway with BLS adjuncts, PSFA, EMT, AEMT, or paramedic must:

1. Effectively evaluate the efficacy of PPV following BLS airway insertion.
2. Limit suction attempts to 10 seconds.
3. Limit interruption of PPV to 30 seconds
4. Consider and treat reversible causes of hypoventilation and hypoxia such as opiate overdose and hypoglycemia
5. Rapidly determine 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 hypo ventilating patients that receive effective positive pressure ventilation

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
6. Identify the need for use of a BLS airway adjunct

7. Oropharyngeal airway (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 (PPV)
2. Laryngoscopy with FBAO Removal/Magill Forceps (ALS personnel)

Equipment Requirements

1. Airway mannequin
2. OPA(s)
3. NPA(s)
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. 2015 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
4. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

BLS Airway Adjuncts Validation

PERFORMANCE CRITERIA
100% accuracy required on all items with an *

Before managing a patient's airway with BLS adjuncts, the PSFA, EMT, AEMT, and paramedic must:

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation	Selection: gloves, goggles, mask, gown, booties, N95 PRN
1		Methodically complete an assessment of the airway and breathing within 30 seconds.*	Follow respiratory assessment sequence.
1		Identify inadequate ventilations and/or signs of hypoxia within the first 30 seconds.*	Pale/cyanotic, altered level of consciousness, diaphoresis, increased work of breathing or apnea, poor chest rise and fall
1		Apply the appropriate, clinically required technique to manually position the head and mandible of the unconscious patient to open the upper airway.*	• Medical - Head-tilt/chin lift • Trauma - Jaw thrust or modified chin lift
1		Manually clear blood, vomit, and foreign bodies when present.*	• Clear secretions or other obstructions using appropriate method (manually, log rolling, suctioning, etc.) maintaining spinal stabilization as patient condition indicates. • Use a rigid pharyngeal tip, if available, for suctioning oropharynx.
1		Utilize appropriate technique per AHA standards to insert the selected airway within 10 seconds. *	• NPA is the preferred BLS airway. • OPA a. Place tip into patient's mouth with curve facing up toward the nose. b. Advance until you meet resistance and rotate 180 degrees until flange is flush against lips. • NPA a. Lubricate tube using water-soluble lubricant. b. Place tip in nostril with beveled edge against septal wall. c. Gently advance straight back, in direction of patient's ear, rotating back and forth slightly once resistance is met. d. Continue until flange is resting against outside of nostril.
1		Confirm correct airway placement and immediately initiate PPV with oxygen at 10 – 15 LPM.*	• For the hyperventilating or apneic patient, initiate PPV with oxygen at 10 -15 LPM • If upper airway management techniques have restored effective spontaneous respiration, apply supplemental oxygen and closely monitor the patient's airway and breathing.

While managing a patient's airway with BLS adjuncts, the FR, EMT, AEMT, and paramedic must:

Points	Score	Performance Steps	Additional Information
1		Evaluate the efficacy of PPV following BLS airway insertion.*	Chest rise and fall symmetrically, lung sounds auscultated bilaterally, absent epigastric sounds with ventilations, patient's skin signs improve.
1		Limit suction attempts to 10 seconds. *	
1		Limit interruption of PPV to 30 seconds.*	
1		Consider and treat reversible causes of airway obstruction, hypoventilation and hypoxia. *	I.e. opiate overdose, hypoglycemia
1		Rapidly determine the need for Advanced Life Support airway adjuncts when airway patency or ventilations cannot be effectively supported by BLS means.*	

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 or keeping an oropharyngeal airway in the patient when gag reflex returns
____Failure to properly identify ineffective ventilations
____Any procedure that would have harmed the patient

[i] AHA

CPAP

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

Terminal Performance Objective

Decreased venous return, increased alveolar recruitment, and decreased pulmonary edema resulting in the restoration of adequate cardiac output, gas exchange, and tissue perfusion.

Before applying continuous positive airway pressure (CPAP) paramedics must:

1. Assess the patient's ABC's
2. Determine the patient is a candidate for CPAP:
    a. Confirm the patient is experiencing dyspnea with pertinent findings suggestive of CHF, suspected exacerbation of COPD, asthma or non-fatal drowning
    b. Confirm that patient is awake, alert and able to maintain their own airway
    c. Confirm that assisted ventilation and/or OTI is not indicated
    d. Recognize contraindications to CPAP:
        i. Apneic
        ii. Unconscious
        iii. Unable to maintain own airway
        iv. Pediatric (appearing to be 14 years of age or less)
        v. Suspected Pneumothorax
        vi. Vomiting
        vii. Pump failure due to severe bradycardia or non-compensatory tachycardia (treat rate first)
        viii. Systolic blood pressure of 90 mmHg or less
3. Place the patient sitting upright with lower extremities dependent to encourage pulmonary function and venous pooling
4. Provide supplemental oxygen as clinically indicated
5. Provide clinically indicated treatment following the applicable treatment protocol
6. Continue clinically indicated treatment, including pharmacologic interventions, while preparing equipment
7. Explain to the patient what they can expect to experience, while avoiding delays in treatment

While applying continuous positive airway pressure (CPAP) paramedics must:

1. Prepare for application of the Pulmodyne™ O2-MAX™ system
    a. Select and prepare the appropriate size mask
    b. Set pressure to 5 cmH_2O CPAP
    c. Prepare the head strap and circuit
    d. Attach the system to an oxygen supply
    e. Ensure the availability of suction, airway, and assisted ventilation supplies
    f. Prepare to increase and titrate pressure in 2.5 – 5 cmH_2O increments as clinically indicated
2. Apply the oxygen charged Pulmodyne™ O2-MAX™ system to the patient without securing the head strap
3. Coach the patient to:
    a. Hold the mask firmly to their own face
    b. Inhale through nose and exhale through mouth
    c. Continue to breathe evenly against the increasing pressure
4. Troubleshoot for leaks and adjust the mask to maintain a complete seal while applying the head strap
5. Confirm the integrity of the circuit, mask seal, and oxygen delivery to the patient
6. Immediately reassess the patient:
    a. Pulmonary assessment including: inspiratory expiratory time ratio (normal adult I:E = 1:2), SpO_2, lung sounds, and respiratory rate
    b. Cardiovascular assessment including: blood pressure and heart rate

7. Consider the need to medicate for anxiety "Related to CPAP Mask"
8. Increase CPAP in 2.5 – 5 cmH_2O increments, up to 15 cmH_2O maximum CPAP, as clinically indicated by the patient's response to therapy (see "Critical Success Targets for CPAP" below)
9. Immediately re-assess the patient following each change in pressure
    a. Pulmonary assessment including: inspiratory expiratory time ratio (normal adult I:E = 1:2), SpO_2, lung sounds, and respiratory rate
    b. Cardiovascular assessment including: blood pressure and heart rate
10. Titrate CPAP in 2.5 – 5 cmH_2O increments to relief of dyspnea while continuously assessing patient's tolerance of CPAP
11. Provide clinically indicated treatment following the applicable REMSA Treatment Protocol(s)
12. Consult online medical direction if exceeding 15 cmH_2O CPAP is clinically indicated

Critical Success Targets for CPAP

1. Normalizing inspiratory expiratory time ratio (normal adult I:E = 1:2)
2. SpO_2 greater than 94%
3. Improved signs of perfusion
4. Improvement in patient's perceived work of breathing
5. Resolution of, or improvement in, patient's dyspnea

System Benchmark

Percentage of patients receiving CPAP with relief of, or improvement in, dyspnea

Core Competency Requirements to be Covered during Education and Training on CPAP

1. Pulmonological and Cardiovascular Anatomy & Physiology
2. Pulmonology and Cardiology – Pathophysiology of congestive heart failure
3. Assessment of respiration and recognition of respiratory instability
4. Assessment of circulation and recognition of hemodynamic instability
5. Identification of need for CPAP and contraindications to its application
6. Proper application of device on patient
7. Patient communication techniques
8. Concurrent medication for anxiety "Related to CPAP Mask"
9. Demonstrates proper technique for use of the Pulmodyne™ O2-RESQ™ system
10. Post application recognition of deterioration and appropriate alternative treatment
11. Reassessment of patient

Equipment Requirements

1. PPE
2. Model patient
3. Stethoscope
4. Blood pressure cuff
5. Oxygen equipment (tank, regulator with DISS, nasal cannula, non-rebreather mask, Pulmodyne™ O2-RESQ™ system)
6. Midazolam, as needed
7. Medication equipment (IV access, IM equipment)
8. Intubation equipment (BVM, suction, laryngoscope with selection of blades, ET tubes, etc.)

Instructor Resource Materials

1. Pulmodyne™ O2-RESQ™ training materials
2. Applicable REMSA Treatment Protocols
3. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

Continuous Positive Airway Pressure Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Before applying continuous positive airway pressure, the paramedic must:

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation	Selection: gloves, goggles, mask, gown, booties, P100 as needed
1		Assess the patient's ABC's *	
1		Determine the patient is a candidate for CPAP: *	1. Confirm the patient is experiencing dyspnea with pertinent findings suggestive of CHF, suspected exacerbation of COPD, or asthma; or non-fatal drowning 2. Confirm that patient is awake, alert and able to maintain their own airway 3. Confirm that assisted ventilation and/or OTI is not indicated 4. Recognize contraindications to CPAP: a. Apneic b. Unconscious c. Pediatric (appearing to be 14 years of age or less) d. Suspected Pneumothorax e. Vomiting f. Pump failure due to severe bradycardia or non-compensatory tachycardia (treat rate first) g. Systolic blood pressure of 90 mmHg or less
1		Place the patient sitting upright with lower extremities dependent to encourage pulmonary function and venous pooling	
1		Provide supplemental oxygen as clinically indicated *	
1		Provide clinically indicated treatment following the applicable treatment protocol *	
1		Continue clinically indicated treatment, including pharmacologic interventions, while preparing equipment	
1		Explain to the patient what they can expect to experience, while avoiding delays in treatment	

While applying continuous positive airway pressure, the paramedic must:

Points	Score	Performance Steps	Additional Information
1		Prepare for application of the Pulmodyne™ O2-MAX™ system *	1. Select and prepare the appropriate size mask 2. Set pressure to 5 cmH_2O CPAP 3. Prepare the head strap and circuit 4. Attach the system to an oxygen supply 5. Ensure the availability of suction, airway, and assisted ventilation supplies 6. Prepare to increase and titrate pressure in 2.5 – 5 cmH_2O increments as clinically indicated

1		Apply the oxygen charged Pulmodyne™ O2-MAX™ system to the patient without securing the head strap *	
1		Coach the patient	1. Hold the mask firmly to their own face 2. Inhale through nose and exhale through mouth 3. Continue to breathe evenly against the increasing pressure
1		Troubleshoot for leaks and adjust the mask to maintain a complete seal while applying the head strap	
1		Confirm the integrity of the circuit, mask seal, and oxygen delivery to the patient *	
1		Immediately reassess the patient*	1. Pulmonary assessment including: inspiratory expiratory time ratio (normal adult I:E = 1:2), SpO2, lung sounds, and respiratory rate 2. Cardiovascular assessment including blood pressure and heart rate
1		Consider Midazolam for anxiety related to CPAP	
1		Sequentially increase CPAP in 2.5 – 5 cmH2O increments, up to 15 cmH2O maximum CPAP, as clinically indicated by the patient's response to therapy *	1. Normalizing inspiratory expiratory time ratio (normal adult I:E = 1:2) 2. SpO2 greater than 94% 3. Improved signs of perfusion 4. Improvement in patient's perceived work of breathing resolution of, or improvement in, patient's dyspnea
1		Immediately re-assess the patient following each change in pressure*	1. Pulmonary assessment including: inspiratory expiratory time ratio (normal adult I:E = 1:2), SpO2, lung sounds, and respiratory rate 2. Cardiovascular assessment including blood pressure and heart rate
1		Titrate CPAP in 2.5 – 5 cmH2O increments to relief of dyspnea while continuously assessing patient's tolerance of CPAP *	
1		Provide clinically indicated treatment following the applicable REMSA Treatment Protocol(s)	
1		Consult online medical direction if exceeding 15 cmH2O CPAP is clinically indicated	
1		Accurately document all assessment findings, therapeutic treatments, and the patient's response to therapy	

Critical Failure Criteria

____Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
____Failure to assess the patient's ABC's
____Failure to determine the patient is a candidate for CPAP
____Failure to provide supplemental oxygen as clinically indicated
____Failure to provide clinically indicated treatment following the applicable treatment protocol
____Failure to prepare for application of the Pulmodyne™ O2-MAX™ system
____Failure to apply the oxygen charged Pulmodyne™ O2-MAX™ system to the patient
____Failure to confirm the integrity of the circuit, mask seal, and oxygen delivery to the patient
____Failure to immediately reassess the patient
____Failure to sequentially increase CPAP in 2.5 – 5 cmH_2O increments as clinically indicated by the patient's response
____Failure to immediately re-assess the patient following each change in pressure
____Failure to titrate CPAP in 2.5 – 5 cmH_2O increments to relief of dyspnea
____Any procedure that would have harmed the patient

i-Gel Supraglottic Airway Device (SGA)

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

Terminal Performance Objective

Ensure the secure placement of the i-gel supraglottic airway device to facilitate positive pressure ventilation.

Indications for Use

Patients must meet **ALL** of the following criteria:

- Apnea or inadequate respirations (usually less than eight (8) breaths per minute)
- Unresponsive to verbal and/or tactile stimuli
- Absence of a gag reflex
- Airway management is unsuccessful using BLS maneuvers (BVM with oral/nasal adjuncts)
- Airway management is unsuccessful after oral endotracheal intubation (OTI)
- An appropriately sized airway is available

i-gel Size Chart

Color	Patient Weight	i-gel Size	OG Tube Size
Yellow	**65 – 130 lbs/30 – 60 kg**	**3**	**12**
Green	**110 – 200 lbs/50 – 90 kg**	**4**	**12**
Orange	**200+ lbs/90+ kg**	**5**	**14**

Contraindications for Use

Introduction of the i-gel supraglottic airway device is contraindicated if **ANY** of the criteria below exist:

1. The patient is conscious and has an intact gag reflex
2. Known ingestion of caustic substances
3. Unresolved upper foreign body airway obstruction (FBAO)
4. Severe facial or esophageal trauma, bleeding or swelling of the airway or an unstable jaw fracture
5. The patient has a known esophageal disease or diseases (e.g., cancer, varices, surgery, etc.)
6. The patient weighs less than 30 kg/65 lbs.
7. The patient's airway can be maintained using less invasive methods (i.e., BVM with oral/nasal adjuncts)

Evaluate the need to perform insertion of the i-gel supraglottic airway device by:

1. Recognizing a difficult airway that precludes the direct visualization of the patient's glottic opening (e.g., airway edema, arthritis, scoliosis of the spine, significant overbite, small mandible, short neck, morbid obesity, cervical spine immobilization, face, or neck trauma); and
2. Two (2) UNSUCCESSFUL attempts have been made to manage the patient's airway using OTI
   - An OTI attempt is defined as the laryngoscope blade insertion into the oral cavity to assist with visualization of the laryngopharynx.

ePCR Documentation

Minimum documentation elements:

- Size of the i-gel supraglottic airway device
- Number of placement attempts and whether the placement was successful
- Lung sounds
- Change of colorimetric device
- Continuous SpO_2 and $EtCO_2$ monitoring results
- Patient response to intervention

i-gel Supraglottic Airway Device Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Before performing the i-gel Supraglottic Airway Device placement, the paramedic must:

<table>
<tr><th>Points</th><th>Score</th><th>Performance Steps</th><th>Additional Information</th></tr>
<tr><td>1</td><td></td><td>Take or verbalize body substance isolation. *</td><td>Selection: gloves, goggles, mask, gown, booties, N95 PRN</td></tr>
<tr><td>1</td><td></td><td>Methodically complete an assessment of the airway and breathing, identifying inadequate ventilation and/or signs of hypoxia within the first 30 seconds. *</td><td>Inadequate ventilation and/or signs of hypoxia include, but are not limited to:
• Pale/cyanotic/diaphoretic skins
• Altered level of consciousness
• Increased work of breathing or apnea
• Poor chest rise and fall</td></tr>
<tr><td>1</td><td></td><td>Verbalize the need to perform insertion of the i-gel supraglottic airway device. *</td><td>Reasons should include:
1. Recognition of a difficult airway that precludes the direct visualization of the patient's glottic opening (e.g., airway edema, arthritis, scoliosis of the spine, significant overbite, small mandible, short neck, morbid obesity, cervical spine immobilization, face, or neck trauma); AND
2. Two (2) UNSUCCESSFUL attempts have been made to manage the patient's airway using OTI</td></tr>
<tr><td>1</td><td></td><td>Verbalize the need for continued airway management utilizing BLS techniques, in addition to high flow oxygen administration and SpO_2 monitoring, while the i-gel supraglottic airway device is being prepared for insertion. *</td><td></td></tr>
<tr><td>1</td><td></td><td>Determine the appropriately sized i-gel supraglottic airway device and OG tube size based on the patient's estimated weight. *</td><td>
<table>
<tr><th>Color</th><th>Patient Weight</th><th>i-gel Size</th><th>OG Size</th></tr>
<tr><td>Yellow</td><td>65 – 130 lbs/30 – 60 kg</td><td>3</td><td>12</td></tr>
<tr><td>Green</td><td>110 – 200 lbs/50 – 90 kg</td><td>4</td><td>12</td></tr>
<tr><td>Orange</td><td>200+ lbs/90+ kg</td><td>5</td><td>14</td></tr>
</table>
</td></tr>
<tr><td>1</td><td></td><td>Open the i-gel supraglottic airway device package, then apply a small layer of water-based lubricant to the back, sides, and front of the cuff. Place the i-gel supraglottic airway device back into the protective cradle. *</td><td></td></tr>
<tr><td>1</td><td></td><td>Confirm that the patient has been adequately pre-ventilated prior to an insertion attempt. *</td><td></td></tr>
<tr><td>1</td><td></td><td>Confirm that $EtCO_2$, and suction, are readily available for post-insertion monitoring and care. *</td><td></td></tr>
<tr><td>1</td><td></td><td>Demonstrate and/or verbalize removal of BLS airway adjuncts. *</td><td></td></tr>
<tr><td>1</td><td></td><td>Apply appropriate, clinically required technique to manually position the head and mandible of the patient to open the upper airway. *</td><td>• Medical – Head tilt/chin lift
• Trauma – Jaw thrust or modified chin lift</td></tr>
</table>

1		Grasp the i-gel supraglottic airway device at the integral bite block with the dominant hand, then gently open the patient's mouth with the other hand.	

While performing i-gel Supraglottic Airway Device placement, the paramedic must:

1		Insert the i-gel supraglottic airway device into the patient's mouth, directing it towards the hard palate.	The cuff outlet should be facing the patient's chin.
1		Advance the i-gel supraglottic airway device with gentle but continuous pressure until definitive resistance is felt.	The integral bite block should rest at the incisors (front teeth) with the optimal position noted by the horizontal guideline present just below the i-gel supraglottic airway device size identifier.

After performing i-gel Supraglottic Airway Device placement, the paramedic must:

1		Attach $EtCO_2$ to the BVM, then the BVM to the i-gel supraglottic airway device, then begin ventilations. *	
1		Assess and ensure: *	• Bilateral breath sounds • Equal rise and fall of the chest • $EtCO_2$ measurements are appropriate • SpO_2 is adequate
1		Secure the i-gel supraglottic airway device using the support strap (if included) or tape. *	Taping from maxilla to maxilla is recommended when the support strap is unavailable.
1		Verbalize reassessment of respiratory status: *	1. When the patient's condition changes 2. Every time the patient is moved
1		Verbalize documentation of the following: *	• Lung sounds • Continuous SpO_2 and $EtCO_2$ monitoring • Patient response to intervention
1		Verbalize the following troubleshooting solutions: 1. If excessive air leakage is encountered, then… 2. If the i-gel has been repositioned correctly, or reinserted entirely, and air is still leaking then…	1. Consideration should be made that the placement of the i-gel supraglottic airway device is either too high or too low and it needs to be repositioned or reinserted. 2. Consider reinserting an i-gel device that is one (1) size larger.

Critical Failure Criteria

____Failure to take or verbalize BSI before performing the skill
____Failure to recognize the need for i-gel supraglottic airway device insertion
____Failure to verbalize the indications for i-gel supraglottic airway device
____Failure to determine the appropriate size i-gel supraglottic airway device **AND** OG tube
____Failure to use the appropriate i-gel supraglottic airway device insertion technique
____Failure to use $EtCO_2$ immediately after i-gel supraglottic airway device insertion
____Failure to verbalize when i-gel supraglottic airway device reassessments should occur
____Failure to verbalize how to appropriately troubleshoot issues after i-gel supraglottic airway device insertion

Laryngoscopy and Magill

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

Terminal Performance Objective

An open unobstructed airway able to support spontaneous respiration or positive pressure ventilation (PPV).

Before 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. Clear secretions or other obstructions using appropriate method (manually, log rolling, suctioning, etc.) maintaining spinal stabilization controls as patient's condition indicates.
5. Utilize the appropriate technique per the American Heart Association standards to insert the appropriate BLS airway within 10 seconds.
    a. NPA is the preferred BLS airway
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 chest compressions and rescue breaths to clear a persistent obstruction.

While performing laryngoscopy and use of Magill forceps, paramedics must:

1. Repeat assessment of airway and breathing to determine if the airway is still obstructed.
2. Prepare equipment for laryngoscopy and FBAO removal using Magill forceps within 30 seconds.
3. Appropriately position the patient based on presentation and condition (medical vs. trauma).
4. Use good technique with the laryngoscope to directly visualize anatomical structures of the airway and minimize oral trauma.
5. Recognize and remove a foreign body with the Magill forceps.
6. Recognize persistent airway obstruction with inability to perform PPV and consider the following:
    a. Rapid transport to the closest most appropriate hospital
7. 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. SpO_2 of greater than 95% in the patient with spontaneous circulation
    a. In patients with COPD/pulmonary disease, it may not be possible or desirable to attain a SpO_2 of 95%.

System Benchmark

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

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)

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. Cardiac monitor

Instructor Resource Materials

1. AHA ACLS Provider Manual
2. AHA PALS Provider Manual
3. Current AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
4. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

Laryngoscopy and Magil Forceps Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Before performing laryngoscopy and use of Magil forceps, the paramedic must:

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation.	Selection: gloves, goggles, mask, gown, booties, N95 PRN
1		Methodically complete an assessment of the airway and breathing within 30 seconds. *	Follow respiratory assessment sequence.
1		Identify inadequate ventilations and/or signs of hypoxia within the first 30 seconds. *	Pale/cyanotic, altered level of consciousness, diaphoresis, increased work of breathing or apnea, poor chest rise and fall
1		Apply appropriate, clinically required technique to manually position the head and mandible of the unconscious patient to open the upper airway.*	• Medical – Head tilt/chin lift • Trauma – Jaw thrust or modified chin lift
1		Manually clear blood, vomit, and foreign bodies when present. *	• Clear secretions or other obstructions using appropriate method (manually, log rolling, suctioning, etc.) maintaining spinal stabilization control as patient condition indicates. • Use a rigid pharyngeal tip, if available, for suctioning oropharynx.
1		Employ the indicated BLS airway adjunct. *	• NPA is the preferred BLS airway
1		Provide positive pressure ventilation (PPV) with oxygen at 10–15 LPM*	Indicated for the hypo ventilating or apneic patient.
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 chest compressions and rescue breaths to clear a persistent obstruction.*	

While performing laryngoscopy and use of Magil forceps, the paramedic must:

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, pulse oximetry
1		Appropriately position the patient based on presentation and condition (medical vs. trauma). *	• Medical – Head/chin lift • Trauma – Jaw thrust or modified chin lift

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	Makes contact with receiving hospital 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 compressions/ventilations 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

Orogastric Tube

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

Terminal Performance Objective

To facilitate passive gastric decompression after orotracheal intubation (OTI) or the insertion of an i-gel supraglottic airway device.

Indications for Use

- After successful placement of an ETT or i-gel supraglottic airway device.

Contraindications for Use

Introduction of the OG tube is contraindicated if **ANY** of the criteria below exist:

- The patient's airway is NOT being managed with an ETT or i-gel supraglottic airway device.

Orogastric (OG) Tube Placement Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items with an *

Before placing an OG tube, the paramedic must:

<table>
<tr><th>Points</th><th>Score</th><th>Performance Steps</th><th>Additional Information</th></tr>
<tr><td>1</td><td></td><td>Take or verbalize body substance isolation. *</td><td>Selection: gloves, goggles, mask, gown, booties, N95 PRN</td></tr>
<tr><td>1</td><td></td><td>Recognize and indicate the need for OG tube placement. *</td><td></td></tr>
<tr><td>1</td><td></td><td>Select and/or verbalize how to choose an appropriate OG tube size. *</td><td>i-gel:
<table><tr><th>Color</th><th>Patient Weight</th><th>i-gel Size</th><th>OG Size</th></tr><tr><td>Yellow</td><td>65 – 130 lbs/30 – 60 kg</td><td>3</td><td>12</td></tr><tr><td>Green</td><td>110 – 200 lbs/50 – 90 kg</td><td>4</td><td>12</td></tr><tr><td>Orange</td><td>200+ lbs/90+ kg</td><td>5</td><td>14</td></tr></table>
OTI: 16fr or 18fr, whichever size is readily available</td></tr>
<tr><td>1</td><td></td><td>Demonstrate and/or verbalize the appropriate measuring technique to ensure proper placement. *</td><td>Combined distance between the corner of the mouth to the ear lobe to the xiphoid process</td></tr>
<tr><td>1</td><td></td><td>Demonstrate and/or verbalize where to mark the appropriate termination location on the OG tube using a piece of tape. *</td><td></td></tr>
<tr><td>1</td><td></td><td>Demonstrate and/or verbalize how to lubricate the OG tube using an appropriate technique prior to insertion. *</td><td>i-gel: place a small bolus of lubricant directly over the gastric port then insert the tube a short distance. Move the tube in and out, without completely withdrawing it from the port, multiple times to ensure maximum lubrication has been applied prior to completely inserting it into the stomach.

OTI: lubricate the distal third of the gastric tube.</td></tr>
</table>

While placing an OG tube, the paramedic must:

<table>
<tr><td>1</td><td></td><td>Continuously monitor the oral cavity for secretions and suction as needed.</td><td></td></tr>
<tr><td>1</td><td></td><td>**FOR USE WITH THE i-gel SUPRAGLOTTIC AIRWAY DEVICE**: Insert the tube into the integrated gastric port adjacent to the ventilation tube, advancing it until the premeasured (“taped off”) portion of the tube meets the top of the i-gel supraglottic airway device. *

***FOR USE WITH OTI**: Insert the tube into the oral cavity and pass it along the floor, advancing it until the pre-measured (“taped off”) portion meets the corner of the mouth. *</td><td></td></tr>
</table>

1		If resistance is met during insertion, stop advancement, and adjust direction slightly before reattempting.	

Immediately after placing an OG tube, the paramedic must:

1		Confirm proper placement. *	VERBALIZE: to confirm placement is correct - • Introduce 30 - 60ml of air into the large OG tube lumen while auscultating over the stomach. If a "*swooshing*" sound is heard, placement is appropriate. If placement cannot be confirmed, the OG tube must be removed immediately • Gastric contents may erupt from the tube
1		Secure the tube. *	Secure the tube to the side of the patient's face using tape
1		Reassess placement as needed.	
1		Document procedure appropriately.	• Size of OG tube • Placement (orally or in the i-gel supraglottic airway device port) • Number of attempts • Any encountered complications

Critical Failure Criteria

____Failure to take or verbalize BSI prior to performing the skill
____Failure to recognize and indicate the need for OG tube placement
____Failure to select the appropriate OG tube size
____Failure to measure the OG tube using the appropriate technique(s)
____Failure to mark the appropriate termination location on the OG tube
____Failure to lubricate the OG tube using the appropriate technique(s)
____Failure to insert the OG tube in the appropriate manner
____Failure to confirm proper placement
____Failure to appropriately secure the tube
____Failure to verbalize that reassessment would occur as needed

Orotracheal Intubation (OTI)

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

Terminal Performance Objective

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

Before performing orotracheal intubation (OTI), paramedics must:

1. Determine BLS airway management is inadequate for effective PPV and confirm the need for Orotracheal Intubation (OTI)[1] [2].
    a. **NOTE: OTI is approved only if the patient's length exceeds the length-based resuscitation tape. A REMSA approved, commercially available and standardized length-based resuscitation tape must be used to identify patient's height and weight. Clinical assessment should take into account anatomic and genetic conditions that may affect patient stature and weight.**
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. ET Introducing Stylet).
    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, arthritis or scoliosis of the spine, significant overbite, small mandible, short neck, morbid obesity, cervical spine immobilization, face or neck trauma).
3. Correctly assemble all equipment required for OTI within 60 seconds.
4. Provide optimal ventilation and oxygenation (minute volume) to the patient while OTI equipment is prepared.
5. Test the cuff of the ETT by inflating it with air and ensuring that there is no leak in the cuff.

While performing OTI, paramedics must:

1. Position the patient with their anatomy to best facilitate the intubation. Align the ear canal with the anterior shoulder, pad as clinically indicated. As a last resort. Consider having a team member 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. Inflate the cuff with enough air to seal the trachea; estimating inflation pressure by palpation of the pilot balloon.

Immediately after OTI, paramedics must:

1. Confirm placement of the ETT in the trachea by:
    a. Direct visualization of the tube passing through the cords.
    b. IMMEDIATELY attaching a colormetric device to confirm correct placement of the ETT prior to use of waveform / digital capnography
        i. Note color change of $EtCO_2$ detector for documentation in the ePCR.
        ii. In the event of digital waveform capnography failure, a colormetric device is required for airway patency monitoring.
    c. If ETT placement is correct, then attach waveform capnography and commence assisted ventilations.

[1] 2015 AHA Guidelines for CPR and ECC, Part 8 Adult Advanced Cardiovascular Life Support, pp S730-S735

[2] PHTLS , Seventh Edition, Chapter 7 Airway and Ventilation pp 144-145

    d. Confirm appropriate rectangular waveform is present **AND** capnography number is present and consistent with clinical condition.
    e. Auscultate lung fields and epigastrium, visualize adequate chest rise and fall.
    f. Print strip of capnogram and retain for documentation. Alternatively, clinicians may mark event in cardiac monitor to import to ePCR retain for documentation. Capnogram strip is required to be attached to the ePCR.
    g. Observe for appropriate chest rise and fall.
    h. If only right lung sounds heard, carefully adjust ETT as necessary by slowly withdrawing ETT and listening for onset of left lung sounds. Once bilateral lung sounds occur, secure the tube.
    i. Remove ETT immediately if esophageal placement suspected.
        i. The ETT MUST have a clinically relevant capnography number AND waveform to remain in place.
2. Immediately re-establish PPV at the clinically required rate and tidal volume (minute volume) and oxygen at 10-15 LPM following ETT placement.
3. Resume BLS PPV within 10 seconds following unsuccessful OTI attempts.
    a. Passing the laryngoscope past the teeth with the intent of placing an ETT is considered an intubation attempt.
    b. A maximum of two (2) attempts per patient is permitted.
4. Secure the ETT in the trachea at the correct depth with tape or a commercial device.
5. Stabilize the patient's airway and prevent tube migration by using a device to prevent rotation, flexion, or extension of patient's head.
6. Efficiently employ post-OTI 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 SpO_2 is greater than or equal to 95% if spontaneous circulation is present.
        i. In patients with COPD/pulmonary disease, it may not be possible or desirable to attain a SpO_2 of 95%, pulse oximetry readings of 88-94% may be clinically adequate, assess thoroughly.
    c. Monitor $EtCO_2$ for appropriate waveform morphology and target CO2 levels.
        i. The target range for $EtCO_2$ level is between 30 – 45 mmHg if spontaneous circulation is present.
        ii. In cardiac arrest, metabolic derangements will significantly alter $EtCO_2$ values and waveform morphology. Target range for $EtCO_2$ level is between 15mmHg – 45mmHg during CPR.
        iii. Recognize that in a patient with traumatic brain injury, $EtCO_2$ less than 35 mmHg due to hyperventilation may cause harm. Minute volume should be adjusted accordingly while maintaining optimal oxygenation, reserving hyperventilation for those patients showing signs of cerebral herniation only.[3]
    d. Monitor ECG for dysrhythmia due to vagal stimulation or other treatable causes.
    e. Frequent auscultation of lung fields and epigastrium, at minimum after every patient movement.
    f. Constant evaluation of ventilatory compliance and resistance during PPV
7. Immediately identify malfunctioning equipment, ineffective techniques or changes in post-OTI PPV compliance/resistance and employ alternative measures to achieve effective ventilations.
8. Reconfirm correct ETT placement each time the patient is moved and before transfer of care to hospital staff.
    a. Record and/or print the waveform $EtCO_2$ strip: after every patient movement, AND just prior to transfer of care to the hospital staff and attach the recording strip to the completed PCR.
9. Provide direction to personnel that have been delegated management of post-OTI PPV.
10. Maintain effective ventilation and oxygenation throughout the entire prehospital treatment period.
11. Maintain calm and effectively lead a team-based approach to resuscitation under all conditions.
12. Accurately document all assessment findings, diagnostic results, therapeutic treatments, and the patient's response to therapy.

Critical Success Targets for OTI

1. ETT securely placed in the trachea followed by effective PPV

[3] The Brain Trauma Foundation's Guidelines for Prehospital Management of Severe Traumatic Brain Injury, Second Edition, Sections IV and VI

2. Chest rise and fall with each ventilation cycle
3. Ventilatory rate and tidal volume appropriate for patient condition and response
4. SpO_2 of greater than 95% in patients with spontaneous circulation
5. Recognition of an esophageal intubation
6. Limited interruption of PPV (30 seconds maximum)
7. Evaluation and Documentation of $EtCO_2$ morphology and values

System Benchmark

ETT securely placed in the trachea within two (2) attempts in 90% of the indicated patients
Recognition of misplaced or dislodged ETT in 100% of the occurrences
Use of colorimetric $EtCO_2$ detectors with every OTI
Appropriate clinical interpretation of digital waveform capnography with every OTI

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

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 OTI
9. Selection of correct equipment required for OTI (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. Stabilization of patient's head to prevent dislodgement of airway
14. Post-placement OTI monitoring
15. Complications, risks, consequences of failure to complete post-placement OTI monitoring
16. Auscultation and diagnostic differentiation of lung sounds
17. Use of diagnostic tools, i.e.: $EtCO_2$ detection through color change AND capnography
18. Recognition of complications (**D**islodgement, **O**bstruction, **P**neumothorax, **E**quipment Failure, or **DOPE**)
19. Team Leadership and Patient Safety
20. Documentation

Adjunctive Performance Standards

1. Positive Pressure Ventilation
2. Laryngoscopy with FBAO Removal/Magill forceps
3. BLS Airway Adjuncts
4. Post OTI Confirmation and Monitoring
5. 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 (multiple sizes)
9. Appropriate size 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 (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. Current AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
6. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

Orotracheal Intubation Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items with an *

Before performing orotracheal intubation, the paramedic must:

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation.	Selection: gloves, goggles, mask, gown, booties, N95 PRN
1		Determine BLS airway management is inadequate for effective positive pressure ventilation (PPV) and confirm the need for Orotracheal Intubation (OTI). *	No or inadequate rise and fall of chest, no improvement in patient's color or condition.
1		Recognize signs of a difficult airway and select, prepare, and employ the appropriate alternative tools and techniques (e.g., ET Introducing Stylet)*	• A difficult airway is defined as the presence of anatomic conditions which preclude direct visualization of the patient's glottic opening. • Signs of a difficult airway include, but are not limited to: 1. Airway edema 2. Arthritis or scoliosis of the spine 3. Significant overbite 4. Small mandible 5. Short neck 6. Morbid obesity 7. C-spine immobilization 8. Face or neck trauma
1		Correctly assemble all equipment required for OTI within 60 seconds*	ETT, stylet, laryngoscope with functioning bulb, Magill forceps, suction, suction catheters (flexible and rigid), 10 mL syringe, stethoscope, waveform capnography, pulse oximeter, BVM with manometer
1		Provide optimal ventilation and oxygenation to the patient while OTI equipment is prepared. *	
1		Test the cuff of the ETT by inflating it with air, and ensuring that there is not a leak in the cuff*	

While performing OTI, the paramedic must:

1		Consider having a team member apply cricoid pressure during 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.
1		Properly position the patient for intubation. *	"Sniffing" position, if not a trauma patient
1		Visualize anatomical structures including the glottic opening (vocal cords) during direct laryngoscopy. *	
1		Minimize oral trauma during laryngoscopy by utilizing correct technique. *	Do not use the patient's teeth as a fulcrum.

1		Place the appropriately sized ETT securely in the trachea at the correct depth within 30 seconds. *	• 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
1		Inflate the cuff with enough air to seal the trachea; estimating inflation pressure by palpation of the pilot balloon.*	

Immediately after performing OTI, the paramedic must:

1		Immediately re-establish PPV with the appropriate rate, tidal volume, and oxygen at 10 – 15 LPM following ETT placement. *	
1		Confirm ETT is in the trachea *	a. Direct visualization of the tube passing through the cords. b. IMMEDIATELY attach a colormetric device to confirm correct placement of the ETT prior to use of waveform / digital capnography c. If ETT placement is correct, then attach waveform capnography and commence assisted ventilations. d. Confirm appropriate rectangular waveform is present **AND** capnography number is present and consistent with clinical condition. e. Auscultate lung fields and epigastrium f. Observe for appropriate chest rise and fall. g. If only right lung sounds heard, carefully adjust ETT as necessary by slowly withdrawing ETT and listening for onset of left lung sounds. Once bilateral lung sounds occur, secure the tube. h. Remove ETT immediately if esophageal placement suspected.
1		Immediately re-establish PPV at the clinically required rate and tidal volume (minute volume) and oxygen at 10 – 15 LPM following ETT placement. *	• Passing the laryngoscope past the teeth with the intent of placing an ETT is considered an intubation attempt.
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 OTI attempts.	• Passing the laryngoscope past the teeth with the intent of placing an ETT is considered an intubation attempt.
1		Stabilize the patient's airway and prevent tube migration by using a device to prevent rotation, flexion, or extension of patient's head.	
1		Efficiently employ post-OTI diagnostic tools to thoroughly assess overall effectiveness of ventilatory support throughout the duration of respiratory management efforts. *	• Symmetrical rise and fall of the chest with PPV • Monitor pulse oximetry – the target SpO_2 is greater than or equal to 95% if spontaneous circulation is present ○ In patients with COPD/pulmonary disease, it may not be possible or desirable to attain a SpO_2 of 95%. • Monitor $EtCO_2$ for appropriate waveform morphology and target CO2 levels.

			○ The target range for $EtCO_2$ level is between 30 – 45 mmHg if spontaneous circulation is present. ○ In cardiac arrest, metabolic derangement will significantly alter $EtCO_2$ values and waveform morphology. Target range for $EtCO_2$ levels is between 15 mmHg – 45 mmHg during CPR. ○ Recognize that in a patient with traumatic brain injury, $EtCO_2$ less than 35 mmHg due to hyperventilation may actually cause harm. Minute volume should be adjusted accordingly while maintaining optimal oxygenation, reserving hyperventilation for those patients showing signs of cerebral herniation only. • Monitor ECG for dysrhythmia due to vagal simulation or other treatable causes. • Frequent auscultation of lung fields and epigastrium. • Constant evaluation of ventilator compliance and resistance during PPV.
1		Immediately identify malfunctioning equipment, ineffective techniques, or changes in post-OTI 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 $EtCO_2$ 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-OTI PPV. *	
1		Maintain effective ventilation and oxygenation throughout the entire pre-hospital treatment period. *	Target $SpO_2$is greater than 95%; target $EtCO_2$ is 30 – 45 mmHg in a patient with spontaneous circulation.
1		Maintains calm. Effective in leading a team-based approach to resuscitation in all conditions. *	
1		Accurately document all assessment findings, therapeutic treatments, and the patient's response to therapy.	

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 CO_2 cap or waveform capnography
____If used, stylet extends beyond end of tube
____Failure to recognize an esophageal intubation
____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

Bougie

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

PURPOSE
This skill verification standard is supplemental to the skill verification standard for adult orotracheal intubation (OTI).

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 management is inadequate for effective PPV and confirm the need for orotracheal intubation (OTI).[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 (i.e., airway edema, arthritis, scoliosis of the spine, significant overbite, small mandible, short neck, morbid obesity, cervical spine immobilization, face or neck trauma)
3. Correctly assemble all equipment required for OTI within 60 seconds.
4. Provide optimal ventilation and oxygenation (minute volume) to the patient while OTI equipment is prepared.

Complications
Complications of the ET introducing stylet may include tracheal/esophageal perforation, hemopneumothorax, mediastinal emphysema and/or right sided pneumothorax

Procedure
1. Consider having a team member apply cricoid pressure while attempting intubation.
2. Perform laryngoscopy as per OTI skill standards and obtain the best possible laryngeal view.
3. While holding the ET introducing stylet in one hand, ensure the angled tip is pointing upward then gently advance anteriorly (under the epiglottis) to the glottic opening (cords).
    a. If able to visualize the vocal cords, direct the ET introducing stylet through the cords.
    b. If unable to visualize the vocal cords, direct the ET introducing stylet to the anatomical area where the cords should be and feel for a "washboard" sensation as the stylet tip ratchets on the tracheal rings.
4. 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 stylet is inserted, the device is in the esophagus.**
5. 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.
6. Once the stylet is positioned, advance the ET tube over the stylet and into the trachea.
7. If resistance is encountered, withdraw the ET tube slightly, rotate 90 degrees and re-attempt. If unsuccessful, attempt with a smaller tube
8. Once the ET tube is placed, maintain tube placement while removing introducer stylet.

[1] 2010 AHA Guidelines for CPR and ECC, Part 8 Adult Advanced Cardiovascular Life Support, pp S730-S735
[2] PHTLS , Seventh Edition, Chapter 7 Airway and Ventilation pp 144-145

Post-OTI Confirmation and Monitoring

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

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 ongoing 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. Monitor $EtCO_2$ for appropriate waveform morphology and target CO_2 levels:
    a. The target range for $EtCO_2$ level is between 30 – 45 mmHg if spontaneous circulation is present.
    b. In cardiac arrest, metabolic derangements will significantly alter $EtCO_2$ values and waveform morphology. Target range for $EtCO_2$ levels is between 15 mmHg – 45 mmHg during CPR.
    c. Recognize that in a patient with traumatic brain injury, $EtCO_2$ less than 35 mmHg due to hyperventilation may actually cause harm. Minute volume should be adjusted accordingly while maintaining optimal oxygenation, reserving hyperventilation for those patients showing signs of cerebral herniation only.[1]
    d. If the waveform capnography monitor malfunctions, a colorimetric end tidal CO_2 detector shall be used, and the malfunction reported to the organization's QI Coordinator.
5. Directly visualize ETT placement with laryngoscope blade to ensure tracheal placement as clinically indicated.
6. Utilize pulse oximetry to evaluate for adequate O_2 saturation during PPV.
    a. Target range is a SpO_2 greater than 95% if spontaneous circulation is present.
        i. In patients with COPD/pulmonary disease, it may not be possible or desirable to attain a SpO_2 of 95%.
7. Confirm the absence of gastric contents in the ETT during PPV.
8. Ensure the ETT remains inserted at the correct depth within the trachea during PPV.
9. Stabilize patient's airway and prevent tube migration by using a device to prevent rotation, flexion, or extension of patient's head.
10. Continuously monitor and re-verify tube placement after each and EVERY move, looking for signs of tube dislodgement and migration out of the trachea.
11. Rapidly identify 100% of the occurrences when an ETT is misplaced or an ETT has migrated out of the trachea after placement.
12. Once identified as misplaced, or if there is significant doubt of the tube's placement, remove the tube at once and provide PPV.
13. Re-intubate or consider insertion of a Rescue Airway if unable to control the airway with BLS adjuncts.
14. Record and print the waveform $EtCO_2$ strip following initial placement, after every patient movement and prior to transfer of care to the hospital staff and with any change in patient condition. Attach the recording strips to the completed PCR, alternatively clinicians may import the capnograms and electronically attach the images to the ePCR. A procedure to $EtCO_2$ monitoring MUST be created for each capnogram, and capnogram(s) MUST be attached to the ePCR.

[1] The Brain Trauma Foundation's Guidelines for Prehospital Management of Severe Traumatic Brain Injury, Second Edition

Critical Success Targets for Orotracheal Intubation (OTI)

1. ETT securely placed in the trachea followed by effective PPV
2. Chest rise and fall with each ventilation cycle
3. SpO_2 greater than 95%
4. Limited interruption of PPV (30 seconds maximum)
5. Evaluation and Documentation of $EtCO_2$ morphology and values

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.
100% documentation of clinically required waveform capnography procedures
100% attachment of clinically required capnograms to ePCR

Core Competency Requirements to be covered during education/training on post-OTI 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. **D**islodgement, **O**cclusion, **P**neumothorax, **E**quipment Failure (**DOPE**)
10. Consequences, risks and complications of failure to complete post OTI confirmation and monitoring

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)
8. Laryngoscope blades (multiple 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. Current AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
5. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

Post-Orotracheal Intubation Confirmation and Monitoring Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation.	Selection: gloves, goggles, mask, gown, booties, P100 PRN
1		Verify symmetrical rise and fall of the chest with ongoing PPV. *	
1		Auscultate all lung fields to confirm the presence of airflow to the lower airway during PPV. *	
1		Auscultate over the epigastrium to confirm the absence of airflow to the stomach during PPV. *	
1		Utilize waveform capnography to evaluate for the presence of end tidal carbon dioxide ($EtCO_2$) during PPV. *	Monitor $EtCO_2$ for appropriate waveform morphology and target CO_2 levels. • The target range for $EtCO_2$ level is between 30 – 45 mmHg if spontaneous circulation is present. • In cardiac arrest, metabolic derangement will significantly alter $EtCO_2$ values and waveform morphology. Target range for $EtCO_2$ levels is between 15 mmHg – 45 mmHg during CPR. • Recognize that in a patient with traumatic brain injury, $EtCO_2$ less than 35 mmHg due to hyperventilation may actually cause harm. Minute volume should be adjusted accordingly while maintaining optimal oxygenation, reserving hyperventilation for those patients showing signs of cerebral herniation only. • If the waveform capnography monitor malfunctions, a colorimetric end tidal CO_2 detector shall be used, and the malfunction reported to the organization's QI Coordinator.
1		Utilize pulse oximetry to evaluate for adequate O_2 saturation readings during PPV. *	Target range is a SpO_2 greater than 95% if spontaneous circulation is present. • In patient with COPD/pulmonary disease, it may not be possible or desirable to attain a SpO_2 of 95%.
1		Confirm the presence of misting of the ETT during PPV. *	
1		Confirm the absence of gastric contents in the ETT during PPV. *	
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.	Stabilize the patient's airway and prevent tube migration by using a device to prevent rotation, flexion, or extension of patient's head.

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. *	a. After moving the patient from the scene to the back board. b. After moving the patient into the gurney. c. When the patient is loaded into the ambulance. d. After any significant bumps enroute to the hospital. e. When the patient is off-loaded from the ambulance. f. When the patient is moved from the ambulance gurney to the hospital gurney. g. Any time there is any concern that the tube might have become displaced.
1		Rapidly identify 100% of the occurrences when an ETT is misplaced or an ETT has migrated out of the trachea after placement. *	
1		Once identified as misplaced or if there is significant doubt of the tube's placement, remove the tube at once verbalize the need to manage the airway using BLS management techniques *	
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.	Record and print the waveform $EtCO_2$ strip following initial placement and prior to transfer of care to the hospital staff. Attach the recording strips to the completed PCR.

Critical Failure Criteria

____Failure to take or verbalize BSI appropriate to the skill prior to performing the skill
____Failure to recognize an esophageal intubation
____Failure to recognize a tube migrated out of the trachea
____Failure to re-check the tube placement following each movement
____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

Positive Pressure Ventilation (PPV)

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **October 23, 2024**

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.

Before performing positive pressure ventilation the PSFA*, EMT, AEMT, or paramedic must:

***PSFA Providers**, PPV is an optional skill and requires REMSA authorization for performance

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. 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. Clear secretions or other obstructions using appropriate method (manually, log rolling, suctioning, etc.) maintaining spinal stabilization controls as patient's condition indicates.
    a. Utilize the two rescuer BVM application technique to maintain an open airway wherever possible.
5. Utilize the appropriate technique per American Heart Association Standards to insert the appropriate BLS airway within 10 seconds.
    a. NPA is the preferred BLS airway
6. All ALS Provider agencies MUST have waveform capnography attached to the BVM.

While performing positive pressure ventilation the PSFA*, EMT, AEMT, or paramedic must:

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.
    a. Utilize the two rescuer BVM application technique to maintain an open airway wherever possible.
2. Initiate ventilatory support using an appropriately-sized BVM with supplemental oxygen at 10 – 15 LPM.
3. 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.
4. 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]
5. 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 IIa).
    b. Ventilate the adult patient with an advanced airway in place – Provide 8-10 unsynchronized ventilations per minute with enough tidal volume to produce visible chest rise and fall during pauses in compression cycles (Class IIa).

[1] 2015 AHA Guidelines for CPR and ECC, Part 5 Adult Basic Life Support, pp S692-S693.
[2] PHTLS, Seventh Edition, Chapter 7 Airway and Ventilation p 164.
[3] 2015 AHA Guidelines for CPR and ECC, Part 13, Pediatric Basic Life Support, p S868.
[4] 2015 AHA Guidelines for CPR and ECC, Part 15, Neonatal Resuscitation, p S912.

6. 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).
7. Avoid hyperventilation to minimize high airway pressures, hypocarbia and cerebral vasoconstriction. [5] [6]
    a. Monitor $EtCO_2$ for appropriate waveform morphology and CO2 levels in the non-intubated, intubated patient/patient with a Rescue Airway:
        i. The target range for $EtCO_2$ level is between 30 – 45 mmHg if spontaneous circulation is present.
        ii. In cardiac arrest, metabolic derangements will significantly alter $EtCO_2$ values and waveform morphology. Target range for $EtCO_2$ levels is between 15 mmHg – 45 mmHg during CPR.
        iii. Recognize that in a patient with traumatic brain injury, $EtCO_2$ less than 35 mmHg due to hyperventilation may cause harm. Minute volume should be adjusted accordingly while maintaining optimal oxygenation, reserving hyperventilation for those patients showing signs of cerebral herniation only. [7]
        iv. If the waveform capnography monitor malfunctions, a colorimetric end tidal CO_2 detector shall be used, and the malfunction reported to the organization's QI Coordinator.
8. 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 insufflations. [8]
    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.
9. Efficiently employ diagnostic tools such as pulse oximetry (target SpO_2 is greater than 95% when spontaneous circulation is present) and auscultation of lung fields to thoroughly assess overall effectiveness of ventilatory support.
    a. In patients with COPD/pulmonary disease, it may not be possible or desirable to attain a SpO_2 of 95%.
10. Immediately identify malfunctioning equipment or ineffective techniques and employ alternative measures to achieve effective ventilations.
11. Maintain effective ventilation and oxygenation throughout the entire prehospital period of treatment.
12. Maintain calm and effectively lead a team-based approach to resuscitation.
13. 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.
14. 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. SpO_2 of greater than 95% in patients with spontaneous circulation.
4. Management of secretions and other airway obstructions
5. Minimal gastric distension
6. Evaluation and Documentation of $EtCO_2$ morphology and values

System Benchmark

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

[5] PHTLS , Seventh Edition, Chapter 7 Airway and Ventilation p 164.
[6] 2010 AHA Guidelines for CPR and ECC, Part 9 Post–Cardiac Arrest Care, p S773.
[7] The Brain Trauma Foundation's Guidelines for Prehospital Management of Severe Traumatic Brain Injury, Second Edition, Sections IV and VI
[8] 2010 AHA Guidelines for CPR and ECC, Part 13, Pediatric Basic Life Support, p S868.

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. Assessment of PPV adequacy and efficacy
13. Application and use of waveform capnography with PPV procedure
14. Airway pressure secondary to PPV – mean versus 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
8. Magill forceps
9. Laryngoscope
10. Pulse oximeter
11. Waveform capnography (required for ALS units and CCT units only)
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. Current AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
6. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

Positive Pressure Ventilation Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items with an *

Before performing positive pressure ventilation, the PSFA*, EMT, AEMT, and paramedic must:

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation.	Selection: gloves, goggles, mask, gown, booties, N95 PRN
1		Methodically complete an assessment of the airway and breathing within 30 seconds. *	Follow respiratory assessment sequence.
1		Identify inadequate ventilations and/or signs of hypoxia within the first 30 seconds. *	Pale/cyanotic, altered level of consciousness, diaphoresis, increased work of breathing or apnea, poor chest rise and fall
1		Apply the appropriate, clinically required technique to manually position the head and mandible of the unconscious patient to open the upper airway. *	• Medical – Head tilt/chin lift • Trauma – Jaw trust or modified chin lift - Utilize the two rescuer BVM technique to maintain an open airway wherever possible.
1		Manually clear blood, vomit, and foreign bodies when present. *	• Clear secretions or other obstruction using appropriate method (manually, log rolling, suctioning, etc.) maintaining spinal stabilization control as patient condition indicates. • Use a rigid pharyngeal tip, if available, for suctioning oropharynx.
1		Utilize the appropriate technique per American Heart Association standards to insert the appropriate BLS airway within 10 seconds. *	NPA is the preferred BLS airway

While performing positive pressure ventilation, the PSFA*, EMT, AEMT, and paramedic must:

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		Initiate ventilatory support using an appropriately sized BVM with supplemental oxygen at 10 – 15 LPM. *	
1		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 ventilation cycle. *	• Give sufficient volume to cause chest rise.

1		Ventilate patients with spontaneous circulation (Rescue Breathing) as clinically required. *	• 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.
1		Ventilate cardiac arrest patients during CPR as clinically required.*	• 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).
1		Deliver positive pressure ventilations over a minimum of 1 second. *	This is to avoid hyperinflation and minimize gastric insufflations, high (peak) airway pressures, pulmonary barotraumas and compromise of venous return to the heart (Class IIa).
1		Avoid hyperventilation to minimize high airway pressures, hypocarbia, and cerebral vasoconstriction. *	Monitor $EtCO_2$ for appropriate waveform morphology and target CO2 levels in the intubated patient/patient with a Rescue Airway: • The target range for $EtCO_2$ level is between 30 – 45 mmHg if spontaneous circulation is present. • In cardiac arrest, metabolic derangement will significantly alter $EtCO_2$ values and waveform morphology. Target ranges for $EtCO_2$ levels are between 15 mmHg – 45 mmHg during CPR. • Recognize that in a patient with traumatic brain injury, $EtCO_2$ less than 35 mmHg due to hyperventilation may actually cause harm. Minute volume should be adjusted accordingly while maintaining optimal oxygenation, reserving hyperventilation for those patients showing signs of cerebral herniation only. • If the waveform capnography monitor malfunctions, a colorimetric end tidal CO2 detector shall be used, and the malfunction reported to the organization's QI Coordinator.
1		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. *	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.
1		Efficiently employ diagnostic tools such as pulse oximetry and auscultation of appropriate lung fields to thoroughly assess overall effectiveness of ventilatory support. *	SpO_2 target is greater than 95% when spontaneous circulation is present. • In patients with COPD/pulmonary disease, it may not be possible or desirable to attain a SpO_2 of 95%.

1		Immediately identify malfunctioning equipment or ineffective techniques and employ alternative measures to achieve effective ventilations. *	
1		Maintain effective ventilation and oxygenation throughout the entire pre-hospital period of treatment. *	
1		Maintain calm and effectively lead a team-based approach to resuscitation. *	
1		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.*	
1		Document all procedures and patient response to therapy on Patient Care Report (PCR).	

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 properly identify ineffective ventilations
____Any procedure that would have harmed the patient

	12- Lead EKG	
	Skills Verification form	
Last Reviewed: **January 1, 2021**		Last Revised: **July 31, 2023**

Purpose

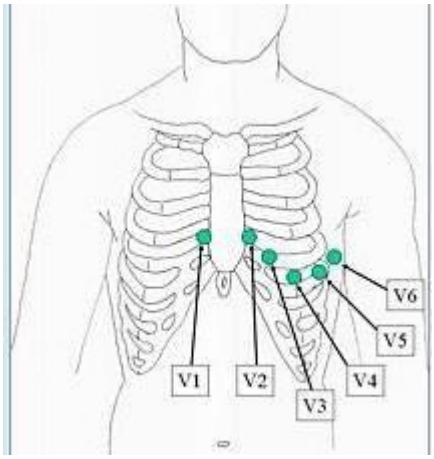
To identify guidelines for the acquisition and transmission of a 12-lead ECG in the prehospital setting.

12-lead Inclusion Criteria

1. A 12-lead ECG shall be performed when a patient presents with signs or symptoms suggestive of Acute Coronary Syndrome, including but not limited to:
    a. Chest pain, discomfort, pressure or tightness radiating to the jaw, shoulders, or arms
    b. New onset cardiac dysrhythmias (including adult cardiac arrest if return of spontaneous circulation)
    c. Palpitations
    d. Unexplained diaphoresis
    e. Dyspnea
    f. Syncope, near syncope, or dizziness
    g. Altered mental status
    h. Known history of Acute Coronary Syndrome (ACS)
    i. Epigastric pain
    j. General weakness
    k. Congenital heart problems
    l. Any patient the paramedic feels would benefit from a 12-lead ECG assessment
        i. Perform serial 12-lead ECGs when acute MI is suspected

Before performing a 12-lead ECG on a patient, the EMT, AEMT, or paramedic must: [1, 2]

1. Explain the procedure to the patient.
2. Properly clean and prepare the patient's skin.
    a. Care must be taken in patients with sensitive skin.
3. Properly apply electrodes to the prepared skin of the patient.
    a. Attach the lead wire to each electrode *before* applying the electrode for patient comfort.
    b. Place electrodes on flat, fleshy parts of the arms and legs, avoiding bony areas and major muscles, if possible, to minimize muscle and motion-related artifact and maximize the ECG signal strength.
    c. Apply the electrode by pressing around the entire edge of the electrode. Avoid pressing directly on the electrode center since it spreads the gel out and may create air pockets that contribute to artifact.
        i. Note: If you are using multifunction electrode defibrillator pads, you may need to reposition ECG electrodes to allow for correct pad placement to facilitate pacing or defibrillation therapy.
    d. Precordial ECG leads shall be placed as indicated below:
        i. V1: right 4th intercostal space, immediately adjacent to right border of sternum
        ii. V2: left 4th intercostal space, immediately adjacent to left border of sternum
        iii. V4: left 5th intercostal space, mid-clavicular line
        iv. V3: halfway between V2 and V4



[1] ECG Interpretation: How to obtain a good quality ECG, Lancashire and South Cumbria Cardiac Network

[2] Improving ECG Quality, Philips Healthcare

v. V6: horizontal to V4, mid-axillary line
vi. V5: horizontal to V4, anterior axillary line

e. Limb leads should be placed as per manufacturer's directions.

When a 12-lead ECG is indicated:

1. 12-lead ECG should be done early in the call and prior to transport. Post-ROSC cases require obtaining a 12-lead as soon as possible.[3]
    a. ECG should be obtained prior to administration of medications.
    b. Annotate on ECG and PCR if patient has received medications prior to ECG.
2. In order to record a good quality ECG, the patient must be as relaxed and comfortable as possible.
    a. Ensure privacy for the patient.
    b. Cover the patient with a sheet or blanket once leads have been placed to reduce shivering and ensure privacy.
3. Instruct the patient to breathe normally and not speak during the acquisition of the ECG. Note patient's position on ECG recording strip.
4. Acquire ECG tracing as per manufacturer's directions.
5. If ECG tracing quality precludes accurate interpretation, re-check and correct any problems with connections/electrodes, then re-attempt 12-lead acquisition.

Transmit ECGs when:

1. The machine reads, ***Acute MI Suspected*** or equivalent
    a. "Infarct suspected, age indeterminate" usually indicates an MI in the patient's past, and is usually not considered to be an acute MI.
2. The paramedic interprets the ECG as STEMI, even if the machine does not read ***Acute MI Suspected*** or equivalent
    a. STEMI is defined as 1 mm ST-elevation or greater in two or more contiguous leads with reciprocal depression.
3. The ECG is questionable or concerning.
4. When requested by a base hospital.
5. When contacting the STEMI receiving center or base hospital:
    a. In addition to standard ALS reporting format, include:
        i. Interpretation of the 12-lead ECG:
            1. Machine interpretation
                a. If the paramedic disagrees with machine interpretation, include that information in the report.
            2. Tell the STEMI receiving center or base hospital exactly what you are seeing on the ECG using the following format:
                a. Underlying rhythm (e.g. regular sinus rhythm, sinus tach)
                b. Noted abnormalities (e.g. ST changes, conduction errors/blocks, reciprocal changes)
                c. Anatomic location if applicable (e.g. "inferior leads" or "…in leads II, III and aVF")
                d. Machine interpretation
        ii. If a standard treatment(s), such as aspirin or oxygen, was withheld, include this information along with an explanation for why it was withheld.
        iii. Family history of heart disease
        iv. Patient's local cardiologist/local PMD
        v. Any request for orders.
        vi. ETA to arrival.

[3] Implementation and Integration of Prehospital ECGs into Systems of Care for Acute Coronary Syndrome, AHA Scientific Statement, August 13, 2008, Ting, HH; Krumholz, HM; Bradley, EH; Cone, DC; Curtis, JP; Drew, BJ; French, WJ; Gibler, WB; Goff, DC; Jacobs, AK; Nallmothu, BK; O'Connor, RE; Schuur, JD

b. Once a patient is identified as a STEMI patient, the focus must be on rapid transport to the nearest STEMI receiving center, while still ensuring optimal patient care en route.

Once the hospital has assumed care of the patient, the paramedic must:

1. Give all 12-lead ECG printouts to the MICN or accepting nurse. Ensure that each printout is identified with the patient's name, and that the date/time stamps are correct.
    a. The paramedic must make copies or take photos (if possible) of the 12-lead ECG (or multiple ECG's) and attach to his/her copy of the PCR/ePCR.
    b. Importing 12-lead ECG (ECGs, if serial procedures completed) to the ePCR is an alternative to printing/copying/attaching 12-lead ECGs.

Critical Success Targets for 12-lead ECG

1. Appropriately identify patients meeting criteria for obtaining a 12-lead ECG.
2. A diagnostic quality ECG will be obtained on above patients.
3. Results of ECG will be communicated to an appropriate hospital.

System Benchmark

% of appropriately identified patients having a diagnostic quality ECG performed and communicated to an appropriate hospital.

Core Competency Requirements to be covered during education/training [4]

1. Explain the placement and view of the heart provided by bipolar, unipolar (augmented) and precordial ECG leads.
2. Discuss QRS axis deviation and the effects of body position on the axis.
3. Explain the evolution and localization of acute myocardial infarction.
4. Discuss/define five STEMI "mimics" or imposters.
5. Explain prehospital 12-lead ECG monitoring procedure.
6. Describe the importance of skin preparation prior to the application of the electrodes.
7. Describe the proper placement of precordial and limb leads for a 12-lead ECG.
8. Discuss trouble shooting the ECG machine.
9. Describe methods to decrease artifact on the 12-lead ECG.
10. Discuss the importance of providing privacy for the patient while performing a 12-lead ECG.
11. Describe the criteria for interpreting a 12-lead ECG as a STEMI.
12. Emphasize that not all ACS patients are manifested as a STEMI.
13. The importance of pre/post treatment 12-leads.

Adjunctive Performance Standards

Patient Assessment

Equipment Requirements

1. PPE
2. Single-use razor
3. Sharps container
4. 12-lead ECG machine
5. Means to provide 12-lead ECG examples
    a. Rhythm generator or ECG strips
6. Electrodes
7. Sheet or blanket

[4] "Paramedic Care Principles & Practice", Volume 3, Third Edition, Bledsoe, Porter, Cherry

Instructor Resource Materials

1. Paramedic Care Principles & Practice, Volume 3, Third Edition, Bledsoe, Porter, Cherry
2. The 12-Lead ECG in Acute Coronary Syndromes, Second Edition, Tim Phalen, Barbara Aehlert
3. Rapid Interpretation of EKG's, 6th Edition, Dale Dubin, MD

12-lead Electrocardiogram Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *.

Before performing a 12-lead Electrocardiogram, the EMT, AEMT, or paramedic must:

Pts	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation.	Selection: gloves, goggles, mask, gown, booties, P100 PRN
1		Explain the procedure to the patient.	
1		Properly clean and prepare the patient's skin.	Care must be taken in patients with sensitive skin.
1		Properly apply electrodes to the prepared skin of the patient.	1. Attach the lead wire to each electrode *before* applying the electrode for patient comfort. 2. Place electrodes on flat, fleshy parts of the arms and legs, avoiding bony areas and major muscles, if possible, to minimize muscle and motion-related artifact and maximize the ECG signal strength. 3. Apply the electrode by pressing around the entire edge of the electrode. Avoid pressing directly on the electrode center since it spreads the gel out and may create air pockets that contribute to artifact. a. Note: If you are using multifunction electrode defibrillator pads, you may need to reposition ECG electrodes to allow for correct pad placement to facilitate pacing or defibrillation therapy.
1		Precordial ECG leads shall be placed as indicated: *	1. <u>V1</u> right 4th intercostal space, immediately adjacent to sternum 2. <u>V2</u> left 4th intercostal space, immediately adjacent to sternum 3. <u>V4</u> left 5th intercostal space, mid-clavicular line 4. <u>V3</u> halfway between V2 and V4 5. <u>V6</u> horizontal to V4, mid-axillary line 6. <u>V5</u> horizontal to V4, anterior axillary line Limb leads should be placed as per manufacturer's directions.

While performing a 12-lead Electrocardiogram, the EMT, AEMT, or paramedic must:

Pts	Score	Performance Steps	Additional Information
1		Acquire ECG ***<u>prior</u>*** to transport.	Early transport should be considered when a STEMI is identified. a. ECG should be obtained prior to administration of medications. b. Annotate on ECG and PCR if patient has received medications prior to ECG.
1		Acquire ECG tracing as per manufacturer's directions.	1. In order to record a good quality ECG, the patient must be as relaxed and comfortable as possible.

			a. Ensure privacy for the patient. b. Cover the patient with a sheet or blanket once leads have been placed to reduce shivering and ensure privacy. 2. Instruct the patient to breathe normally and not speak during the acquisition of the ECG. Note patient's position on ECG recording strip.
1		If the ECG tracing quality precludes a good interpretation, the tracing should be repeated. *	

Critical Failure Criteria

____Failure to place precordial ECG leads as indicated.

____Failure to repeat tracing if the ECG tracing quality precludes a good interpretation.

____Any procedure that would have harmed the patient.

While performing a 12-lead Electrocardiogram, paramedics must also:

Pts	Score	Performance Steps	Additional Information
1		Transmit ECG when the machine reads, ***Acute MI Suspected*** or equivalent. *	"Infarct suspected, age indeterminate" usually indicates an MI in the patient's past, and is usually not considered to be an Acute MI.
1		Transmit ECG when the paramedic interprets the ECG as STEMI, even if the machine does not read ***Acute MI Suspected*** or equivalent. *	***STEMI is defined as 1 mm ST-elevation or greater in two or more contiguous leads with reciprocal depression.***
1		Transmit ECG when the paramedic has questions or concerns. *	
1		Transmit ECG when requested by a base hospital. *	
1		Contact the closest STEMI receiving center directly for all patients identified as possible, or suspected, STEMI*	
1		Report additional pertinent information to the STEMI receiving center	In addition to standard ALS reporting format, include: 1. Interpretation of the 12-lead ECG: a. Machine interpretation i. If the paramedic disagrees with machine interpretation, include that information in the report. b. Tell the STEMI receiving center exactly what you are seeing on the ECG. c. Include the underlying rhythm and width of the QRS complex in the report. 2. If a standard treatment, such as aspirin, oxygen, or nitroglycerine was withheld, include this information along with an explanation why it was withheld. 3. Family history of heart disease 4. Patient's local cardiologist/local PMD 5. Any request for orders. 6. ETA to arrival.

1		Provide rapid transport of all STEMI patients: *	***Once a patient is identified as a STEMI patient, the focus must be on rapid transport to the nearest STEMI receiving center while still ensuring optimal patient care enroute.***
1		Provide treatment based upon reassessment findings.	
1		Accurately document all assessment findings, therapeutic treatments, and the patient's response to therapy.*	1. Give all 12-lead ECG printouts to the MICN or accepting nurse. Ensure that each printout is identified with the patient's name, and that the date/time stamps are correct. a. The paramedic must make copies or take photos (if possible) of the 12-lead ECG (or multiple ECG's) and attach to his/her copy of the PCR/ePCR. b. Importing 12-lead ECG (ECGs, if serial procedures completed) to the ePCR is an alternative to printing/copying/attaching 12-lead ECGs.

Critical Failure Criteria

____Failure to transmit ECG when indicated.
____Failure to provide rapid transport of all STEMI patients.
____Failure to accurately document all findings, treatments, and the patient's response.
____Any procedure that would have harmed the patient.

Defibrillation

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

Terminal Performance Objective

Termination of pulseless ventricular tachycardia or ventricular fibrillation using electrical therapy.

Before performing defibrillation, paramedics must:

1. Determine pulselessness within ten (10) seconds
2. Follow applicable REMSA protocols for CPR and resuscitation
3. Confirm that the patient is in a shockable rhythm (pulseless ventricular tachycardia or ventricular fibrillation)
    a. Confirm ECG monitor leads have been placed appropriately
4. Explain to patient's family what they can expect to see while avoiding delays in treatment.

While performing defibrillation, paramedics must:

1. Select and prepare the appropriate sites for application of the ECG monitor/defibrillator multifunction pads (MFPs).
    a. Proper pad placement on the patient's cleaned, dry skin is essential to maximize current conduction; the better the contact, the more effective attempts at defibrillation will be
2. Apply the MFPs 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 automatic internal cardiac defibrillator (AICD) 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. Ensure that the ECG monitor/defibrillator is not in the synchronize mode
5. Select the correct energy setting on the ECG monitor/defibrillator
    a. Per the REMSA Treatment Protocol: Calculation Chart
6. Assure everyone is clear from the patient and all possible energy conducting surfaces/contacts
7. Discharge the defibrillator
8. Immediately resume chest compressions for two (2) minutes without checking for a pulse
9. Treat subsequent rhythms per REMSA protocols

Critical Success Targets for Defibrillation

1. Successful delivery of electrical current at the proper setting to the heart of a patient in pulseless ventricular tachycardia or ventricular fibrillation
2. Safe and proficient use of the ECG monitor/defibrillator including lead and MFP placement

System Benchmark

% of patients receiving defibrillation with restoration of a stable perfusing rhythm

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

1. Cardiovascular A & P
2. Cardiology – pathophysiology of malignant ventricular dysrhythmias
3. Assessment of circulation and recognition of hemodynamic instability
4. ECG rhythm interpretation – ventricular tachycardia and ventricular fibrillation
5. Indications and contraindications for defibrillation
6. Proper placement of ECG electrodes on patient
7. Proper placement of multifunction pads on patient
8. Knowledge of the monitor/defibrillator

9. Joules used in each defibrillation
10. Methods to help eliminate impedance from chest walls
11. Early defibrillation in pulseless ventricular tachycardia and ventricular fibrillation
12. Defibrillation with a implantable cardioverter defibrillator

Adjunctive Performance Standards

Currently no adjunctive performance standards have been created

Equipment Requirements

1. Monitor/defibrillator
2. ECG electrodes
3. Multifunction pads
4. Razor
5. 4 x 4 gauze pads
6. Alcohol preps

Instructor Resource Materials

1. REMSA Protocol Manual
    a. REMSA Calculation Chart
2. ECG monitor/defibrillator manufacturer guidelines
3. Paramedic Care Principles & Practice, Third Edition, Bledsoe, Porter and Cherry
4. 2010 American Heart Association Guidelines for ECC and CPR

Defibrillation Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Before defibrillating, paramedics must:

Pts	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation	Selection: gloves, goggles, mask, gown, booties, P100 PRN
1		Determine pulselessness within 10 seconds *	
1		Follow applicable REMSA protocols for CPR and resuscitation	
1		Confirm that the patient is in a shockable rhythm (pulseless ventricular tachycardia or ventricular fibrillation) *	Confirm ECG monitor leads have been placed appropriately.
1		Confirm the ECG monitor leads have been placed appropriately *	
1		Explain to patient's family what they can expect to see while avoiding delays in treatment	

While defibrillating, paramedics must:

Pts	Score	Performance Steps	Additional Information
1		Apply the ECG monitor/defibrillator MFPs 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 • Proper pad placement on the patient's cleaned, dry skin is essential to maximizing conduction; the better the contact, the more effective attempts at defibrillation will be
1		Identify a patient with a pacemaker or automatic internal cardiac defibrillator (AICD) and place the MFP(s) in alternate position(s) to minimize damage to the device and to avoid disruption of current flow through the heart *	
1		Ensure that the ECG monitor/defibrillator is not in the synchronize mode *	
1		Select the correct energy setting on the ECG monitor/defibrillator *	Reference the REMSA Treatment Protocols and based on pt weight
1		Assure everyone is clear from the patient and all possible energy conducting surfaces/contacts *	
1		Discharge the defibrillator for unsynchronized delivery of electrical current *	

1		Immediately resume chest compressions for 2 minutes without checking for a pulse *	
1		Maintain calm and effectively lead a team-based approach to resuscitation under all conditions *	
1		Provide treatment based upon reassessment findings	
1		Accurately document all assessment findings, therapeutic treatments, and the patient's response to therapy *	

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 assure that everyone is clear prior to discharging the defibrillator.
____Failure to immediately begin chest compressions following defibrillation without checking for a pulse.
____Any procedure that would have harmed the patient.

Synchronized Cardioversion

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

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. Methodically assess the patient's ABC's within 30 seconds.
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 (including but not limited to hypotension, altered mental status, chest pain, dyspnea/tachypnea, diaphoresis, pale/cool skin).
    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.
    a. Print Lead II strip prior to performing any medical treatment as this could appear to be a wide complex rhythm when in fact it is a paced rhythm (some monitors do not show pacer spikes).
    b. Consider performing a 12 Lead ECG prior to cardioversion if such delay does not cause harm to the patient.
6. Strongly consider Versed for sedation/amnesic affect for alert patients while preparing cardioversion equipment, 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).
    a. 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.
    a. Proper pad placement on the patient's cleaned, dry skin is essential to minimize pain (heat generated from passage of current through the skin) and maximize current conduction. The better the contact, the more effective attempts at cardioversion will be.
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 automatic internal cardiac defibrillator (AICD) 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.
    a. 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

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 Versed for sedation and amnesic effect
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 electrodes
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. Current AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
4. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

Synchronized Cardioversion Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Before performing synchronized cardioversion, paramedics must:

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation.	Selection: gloves, goggles, mask, gown, booties, P100 PRN
1		Methodically assess the patient's ABC's within 30 seconds. *	

1		Determine the patient is hemodynamically unstable due to idiopathic (non-compensatory) tachycardia and is a candidate for immediate cardioversion. *	• Confirm the patient is exhibiting signs and symptoms of systemic poor perfusion:
			  ○ Hypotension
			  ○ Altered mental status
			  ○ Chest pain
			  ○ Dyspnea/tachypnea
			  ○ Diaphoresis
			  ○ Pale/cool skin
			• Confirm tachycardia is present on the ECG
			  ○ Heart rate greater than 150 in adults
			  ○ Heart rate greater than 180 in children
			  ○ Heart rate greater than 220 in infants
			• Confirm underlying causes of the dysrhythmia have been considered and reversible causes have been treated.

1		Provide supplemental oxygen in high concentration (10 – 15 LPM)	
1		Confirm the ECG monitor leads have been placed appropriately. *	
1		Differentiate between wide and narrow complex tachycardia. *	• Print a Lead II strip prior to performing any medical treatment as this could appear to be wide complex rhythm when in fact it is a paced rhythm (some monitors do not show pacer spikes) • Consider performing a 12 Lead ECG prior to cardioversion if such delay does not cause harm to the patient.
1		Strongly consider Versed for sedation/amnesic effect while preparing cardioversion equipment.	• Do not delay cardioversion in an unstable patient presenting with signs and symptoms of poor perfusion. • Use IN/IM route Versed for sedation/amnesic effect 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:

1		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. *	• Anterior-posterior placement is recommended, if possible. • Proper pad placement on the patient's cleaned, dry skin is essential to minimize pain (heat generated from passage of current through the skin) and maximize current conduction. The better the contact, the more effective conduction will be.

1		Identify a patient with a pacemaker or automatic internal cardiac defibrillator (AICD) 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 *	
1		Correctly place the ECG monitor/defibrillator in synchronize mode. *	
1		Confirm the monitor is tracking the R wave for delivery of synchronized current *	
1		Select the correct energy setting on the ECG monitor/ defibrillator. *	Reference the REMSA Treatment Protocols and based on pt weight
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. *	
		Immediately reassess the patient.*	
		Perform a 12 Lead ECG and print a rhythm strip.	Attach the rhythm strip to your PCR.
		Provide treatment based upon reassessment findings.	
		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. *	

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 assure that everyone is clear from the patient and all possible energy conducting surfaces/contacts.
____Failure to confirm efficacy of intervention
____Any procedure that would have harmed the patient

Transcutaneous Cardiac Pacing (TCP)

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

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 assess patient's ABC's within 30 seconds.
2. Determine the patient is hemodynamically unstable due to bradycardia and is a candidate for immediate TCP by confirming all the following are present:
    a. The patient is exhibiting signs and symptoms of systemic poor perfusion ***and***
    b. Significant 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 a baseline rhythm strip is printed.
        i. Consider performing a 12 Lead ECG prior to initiating TCP if such delay does not cause harm to the patient.
3. Identify contraindications for TCP:
    a. Children less than or equal to 12 years old (brady dysrhythmias 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. Explain to patient/family what they can expect to feel and to see but do not delay immediately needed treatment.
6. While setting up for TCP, <u>strongly</u> consider Versed for sedation and amnesic effect of conscious patient; and Fentanyl for pain control if needed.
    a. Use IN/IM route for sedation if IV access is poor and would delay TCP.

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.
    a. Proper pad placement on the patient's cleaned, dry skin is essential to minimize pain (heat generated from passage of current through the skin) and maximize current conduction. The better the contact, the more effective pacing will be.
2. Identify a patient with a pacemaker or automatic internal cardiac defibrillator (AICD) 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. Accurately determine and utilize *minimum* electrical current needed to maintain capture (i.e. decrease current by 5 mA increments until pulses/capture lost, increase current by 5 mA increments until capture/pulses regained).
6. Confirm mechanical capture by palpating pulses that match pacemaker (70 bpm).

7. Evaluate the effectiveness of TCP by assessing the patient's level of consciousness and vital signs for improvement.
8. Identify continuing signs and symptoms of poor perfusion (including but not limited to hypotension, altered level of consciousness, chest pain, dyspnea/tachypnea, diaphoresis, pale, cool skin) 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 Versed for sedation and amnesic effect as clinically required per protocol.
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. Properly document procedure, printing paced rhythm strip and attach 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)

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), 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 pads on patient
5. Assessment for and recognition of hemodynamic instability
6. Verbalize possible treatments for hemodynamically unstable bradycardias other than TCP
7. Explain procedure to patient (where applicable)/pre-medicate patient (where applicable)
8. Demonstrate proper technique for setting rate and current
9. Demonstrate proper technique for gaining electrical capture with minimum required current
10. Demonstrate/explain concept of mechanical capture
11. Describe how to obtain mechanical capture if not gained with initial electrical capture
12. Cardiac monitoring/rhythm recognition and treatment

Equipment Requirements

1. PPE
2. CPR mannequin(s)
3. Stethoscope
4. Cardiac monitor/ECG/Defibrillator
5. ECG Rhythm Generator
6. ECG electrodes
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. Current AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
4. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

Transcutaneous Cardiac Pacing Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Before performing transcutaneous cardiac pacing, paramedics must:

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation.	Selection: gloves, goggles, mask, booties, gown, N95 PRN
1		Methodically assess patient's ABC's within 30 seconds. *	
1		Determine the patient is hemodynamically unstable due to bradycardia and is a candidate for immediate Transcutaneous Pacing (TCP).*	Confirm that ***all*** of the following are present: • The patient is exhibiting signs and symptoms of systemic poor perfusion; ***and*** • Significant bradycardia (HR less than 60) is present on the ECG; ***and*** • Underlying causes of the dysrhythmia have been considered and reversible causes have been treated; ***and*** • No contraindications of TCP are present.
1		Place cardiac monitoring equipment on the patient correctly and print a baseline rhythm strip.	Consider performing a 12 Lead ECG prior to initiating TCP, if such delay does not cause harm to the patient.
1		Identify contraindications for TCP.	• Children less than or equal to 12 years old (brady dysrhythmias in children are usually respiratory related) • Asystolic arrest, unless approved by base hospital
1		Prepare for TCP.	• Administer two (2) doses of Atropine while preparing pacer. ○ Do not delay TCP if there is difficulty establishing an IV. • Use TCP without delay for high-degree block (type II second-degree block or third-degree block)
1		Explain to patient/family what they can expect to feel and to see. *	Do not delay immediately needed treatment.
1		Strongly consider Versed for sedation/amnesic effect while preparing TCP equipment.	Use IN/IM route for Versed for sedation/amnesic effect if IV access is poor and would delay TCP.

While performing transcutaneous cardiac pacing, 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. *	• Anterior-posterior placement is recommended, if possible. • Proper pad placement on the patient's cleaned, dry skin is essential to minimize pain (heat generated from passage of current through the skin) and maximize current conduction. The better the contact, the more effective pacing will be.

1		Identify a patient with a pacemaker or automatic internal cardiac defibrillator (AICD) 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		Accurately determine and utilize *minimum* electrical current needed to maintain capture. *	i.e. decrease current by 5 mA increments until pulses/capture lost, increase current by 5 mA increments until capture/pulses regained
1		Confirm mechanical capture by palpating pulses that match pacemaker (70 bpm). *	
1		Evaluate effectiveness of TCP *	Assess the patient's mentation and vital signs for improvement.
1		Identify continuing signs and symptoms of poor perfusion despite effective mechanical capture and increase TCP rate in increments of 10 bpm to a maximum of 100 bpm to increase cardiac output.	Signs and symptoms of poor perfusion include but are not limited to: • Hypotension • Altered level of consciousness • Chest pain • Dyspnea/tachypnea • Diaphoresis • Pale/cool skin
1		Provide Versed for sedation/amnesic effect and Fentanyl for pain as clinically required per protocol.	If not done before, or if ineffective
1		Continuously reassess vital signs and level of consciousness throughout the prehospital period of treatment. *	Contact the base hospital if signs and symptoms of poor perfusion persist.
1		Maintain calm and effectively lead a team-based approach to resuscitation in all conditions. *	
1		Accurately document all assessment findings, therapeutic treatments, and the patient's response to therapy.	Print paced rhythm strip and attach it to the PCR.

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

Calculating and Preparing Medication Dosages

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 1, 2025**

Terminal Performance Objective

To correctly calculate, prepare and administer medication(s) to a patient.

Before administering a medication, the PSFA*, EMT, AEMT, or paramedic must:

***applies to REMSA authorized PSFA provider agencies and personnel only**

a. Calculate the patient's weight in kg
    1. The patient may be able to verbalize his or her weight when awake, alert and oriented
b. Review the six patient rights[1]:
    1. Right Medication
    2. Right Patient
    3. Right Dose
    4. Right Time
    5. Right Route
    6. Right Documentation
c. Some additional rights to consider:
    1. Right to refuse
    2. Right to be informed, including:
        i. Name of medication
        ii. Goal of administration
        iii. Possible results, both positive and negative
    3. Right indication
d. Ascertain the patient's allergies, including food, latex and medications
e. Medication Calculations
    1. Calculate patient's weight in kg (1 kg = 2.2 pounds)
    2. Ensure that all medications are in the same system of measurement (ex: gm, mg, mcg or mL)

Basic medication calculation:	$\frac{\text{Desired}}{\text{Have}}$	X	quantity on hand	=	dose

IV medication calculation:	Drip rate =	$\frac{\text{Total mL}}{\text{Total minutes}}$	X drip factory (in drops / mL)

f. Check medication for right Drug, Dose, Integrity, Clarity, and Expiration date (DDICE)[2] three (3) times:
    1. When you select the medication
    2. As you are drawing it up
    3. Just before administering medication

[1] Paramedic Care Principles & Practice, Volume 1, Third Edition, Bledsoe, Porter, and Cherry
[2] Paramedic Care Principles & Practice, Volume 1, Third Edition, Bledsoe, Porter, and Cherry

While administering a medication, the PSFA*, EMT, AEMT, or paramedic should:

1. Utilize appropriate body substance isolation
2. Maintain an aseptic environment
    a. If administering a parenteral medication, cleanse the site with an antiseptic, such as alcohol wipes or betadine
    b. Recap needles only as a last resort
        i. Never use two hands to recap; lay the cap on a flat surface, and aim the syringe with the open needle attached into the cap
3. Use the appropriate route of medication administration:
    a. Medication routes for the PSFA*: intranasal (as authorized by REMSA)
    b. Medication routes for the EMT, AEMT, and paramedic:
        i. Enteral
            1. Oral (PO)
            2. Buccal
        ii. Parenteral
            1. Intramuscular (IM)
            2. Autoinjection(s) in vastus lateralis
    c. Additional medication routes for the AEMT and paramedic:
        i. Enteral
            1. Sublingual (SL)
        ii. Parenteral
            1. Intravenous (IV)
                i. Intravenous Push (IVP) (Always flush with at least 3 mL of normal saline after administering a medication IV push)
            2. Intraosseous (IO)
                i. Intraosseous Push (IOP) (Always flush with at least 3 mL of normal saline after administering a medication IOP)
            3. Intranasal (IN)
                i. Adult maximum volume: 1 mL per nostril
                ii. Pediatric maximum volume: 0.5 mL per nostril
            4. Intramuscular (IM)
                i. 1 mL maximum in deltoid
                ii. 2 mL maximum in vastus lateralis
                iii. 2.5 mL maximum in gluteus
                iv. Needle gauge and length:
                    a. 20 – 23 ga, 1 – 1.5 inch
            5. Inhalation/Nebulized
    d. Additional medication routes for the paramedic:
        i. Parenteral
            1. Intravenous infusion (Always flush with at least 20 mL of normal saline after administering a medication IV Infusion)
            2. Intramuscular (IM)
                i. 5 mL maximum in gluteus or vastus lateralis in true emergencies ONLY when giving Magnesium Sulfate by the IM route for eclampsia
                ii. Needle gauge and length:
                    a. 20 – 23 ga, 1 – 1.5 inch
            3. Intranasal (IN)
                i. Adult maximum volume: Tranexamic Acid treatment for Epistaxis 2.5 ml atomized affected naris
            4. Topical

5. Reassess the patient after administration for response to medication

6. Documentation
    a. Document all information concerning the patient and the medication including:
        i. Indication for medication administration
        ii. Dosage and route delivered (PO, SL, Buccal, IV, IVP, IV Infusion, IM, IN, IO, IOP, topical, nebulized or inhaled, nasal atomizer device)
        iii. Patient response to the medication; positive, negative, or none
        iv. Patient's condition before and after medication administration
        v. Vital signs before and after medication administration

Critical Success Factors

Appropriate dose and volume of the correct medication is administered.
Appropriate route of medication was utilized and performed accurately.
Desired effect of the medication is achieved.
Adverse effects are identified immediately and addressed appropriately.

System Benchmark

1. Appropriate dose and volume of the correct medication is administered 100% of the time
2. Adverse effects of medication are identified and addressed appropriately 100% of the time

Core Competency Requirements

1. Differentiate among the chemical, generic, official, and trade names of a medication
2. Six patient "rights" of medication administration
3. Special considerations: pediatric patients, pregnant patients, geriatric patients
4. Medication routes (PO, SL, Buccal, IV, IVP, IV Infusion, IM, IN, IO, IOP, topical, nebulized or inhaled, nasal atomizer device)
5. Appropriate volumes for each route
6. Standard Precautions
7. Calculating IV drip rates
8. Complications of peripheral IV access
9. Conversion to metric system & metric equivalents
10. Calculating dosages for medications

Equipment Requirements

1. PPE
2. Needles (multiple sizes), syringes (multiple sizes), nebulizers, Nasal Atomizer Device (NAD), measurement paper (for Nitroglycerin paste), antiseptic equipment, Micro/Macro Drip tubing, Dial-O-Flow, extension tubing if applicable, volume control chamber (ex. Buretrol) tubing if applicable for pediatric drug/fluid administration, and the medication to administer

Instructor Resource Materials

Paramedic Care Principles & Practice, Volume 1, Third Edition, Bledsoe, Porter, and Cherry

Calculating and Preparing Medication Dosage Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Before administering a medication the PSFA*, EMT, AEMT, or paramedic must:

Points	Score	Performance Steps	Additional Information
1		Calculate the patient's weight in kilograms (kg) *	• The patient may be able to verbalize his or her weight when awake, alert and oriented • Length base resuscitation tape may be used for pediatric if weight is unknown • Divide the patient's weight in pounds by 2.2 to arrive at kg

1		Review the six patient rights *	1. Right medication
			2. Right patient
			3. Right Dose
			4. Right Time
			5. Right Route
			6. Right Documentation
			Additional "rights" to consider:
			• Right to refuse
			• Right to be informed of medication
			  ○ Name of medication
			  ○ Goal of medication administration
			  ○ What patient can expect from medication, positive and negative
			• Right indication

1		Ascertain the patient's allergies, including food, latex and medications *	
1		Calculate dosage *	a. Calculate patient's weight in kg (1 kg = 2.2 pounds) b. Ensure that all medications are in the same system of measurement (ex: gm, mg, mcg, or mL) c. Basic medication calculation as in standard above d. IV medication calculation as in standard above
1		Check medication for Drug, Dose, Integrity, Clarity, and Expiration date (DDICE) 3 times *	a. When you select the medication b. As you are drawing it up c. Just before administering medication

While administering a medication the PSFA*, EMT, AEMT, or paramedic must:

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation *	Selection: gloves, goggles, mask, gown, booties, P100 PRN
1		Maintain an aseptic environment*	1. If administering a parenteral medication, cleanse the site with an antiseptic, such as alcohol wipes or betadine 2. Recap needles only as a last resort a. Never use two hands to recap; lay the cap on a flat surface, and aim the syringe with the open needle attached into the cap

1		Use the appropriate route of medication administration *	Medication routes for the EMT, AEMT, and paramedic: i. Enteral 1. Oral (PO) 2. Buccal ii. Parenteral 1. Intramuscular (IM) 2. Autoinjection(s) in vastus lateralis
			Additional medication routes for the AEMT and paramedic: i. Enteral 1. Sublingual (SL) ii. Parenteral 1. Intravenous Push (IVP) i. Always flush with at least 3 mL of normal saline after administering a medication IV push 2. Intraosseous Push (IOP) i. Always flush with at least 3 mL of normal saline after administering a medication IO push 3. Intranasal (IN) i. Adult maximum volume: 1 mL per nostril ii. Pediatric maximum volume: 0.5 mL per nostril 4. Intramuscular (IM) i. 1 mL maximum in deltoid ii. 2 mL maximum in vastus lateralis iii. 2.5 mL maximum in gluteus iv. Needle gauge and length: a. 20 – 23 ga, 1 – 1.5 inch 5. Inhalation/Nebulized Additional medication routes for the paramedic: iii. Parenteral 1. Intravenous Infusion i. Always flush with at least 20 mL of normal saline after administering a medication IV Infusion ii. If hanging with a primary infusion, have the medication bag at the same level or higher than the mainline IV bag and have the mainline IV bag tubing locked. 2. Intramuscular (IM) i. 5 mL maximum in gluteus or vastus lateralis in true emergencies such as when giving Magnesium Sulfate by the IM route for eclampsia ii. Needle gauge and length: a. 20 – 23 ga, 1 – 1.5 inch 3. Intranasal (IN) i. Adult maximum volume: Tranexamic Acid treatment for Epistaxis 2.5 ml atomized affected naris 4. Topical

1		Reassess the patient after administration for response to medication *	
1		Perform documentation *	Document all information concerning the patient and the medication including: 1. Indication for medication administration 2. Dosage and route delivered (PO, SL, Buccal, IV, IVP, IV Infusion, IM, IN, IO, IOP, topical, nebulized or inhaled, nasal atomizer device) 3. Patient response to the medication; positive, negative, or none 4. Patient's condition before and after medication administration 5. Vital signs before and after medication administration

Critical Failure Criteria

____Failure to calculate the patient's weight in kilograms (kg).
____Failure to review the six patient rights.
____Failure to ascertain the patient's allergies.
____Failure to calculate dosage.
____Failure to check medication (DDICE) three times.
____Failure to take or verbalize BSI appropriate to the skill prior to performing the skill.
____Failure to maintain an aseptic environment.
____Failure to use the appropriate route of medication administration.
____Failure to reassess the patient after administration for response to medication.
____Failure to perform documentation.
____Any procedure that would have harmed the patient.

Intraosseous access (IO)

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **July 31, 2023**

Terminal Performance Objective

To establish, maintain, and ensure intraosseous vascular access for the delivery of drugs and fluids as allowed by the advanced emergency medical technician (AEMT) or paramedic scope of practice.

Before establishing intraosseous access, AEMTs and paramedics must:

1. Confirm that intraosseous access is clinically indicated and required for emergency stabilization.
2. Do not place if any of these contraindications to intraosseous access are present:
    a. Fracture of insertion site bone
    b. Inability to clearly identify insertion site (absence of anatomical landmarks/excess tissue/other problem)
    c. Infection at insertion site
    d. Previous orthopedic procedure at insertion site (IO attempt within last 48 hours/joint replacement/ prosthetic)

While establishing intraosseous access AEMTs and paramedics must:

1. Select the most appropriate insertion site based on clinical needs, operational requirements, and the available device:
    a. AEMTs:
        i. EZ-IO Power Driver may be used by AEMTs while following a standing order at these insertion sites:
            Distal tibia <u>in pediatrics only</u>
            Proximal tibia <u>in pediatrics only</u>
        ii. Waismed's Bone Injection Gun (B.I.G.) may be used by AEMTs while following a standing order at these insertion sites:
            Proximal tibia <u>in pediatrics only</u>
    b. Paramedics:
        i. EZ-IO Power Driver may be used by paramedics while following a standing order at these insertion sites:
            Distal tibia in adults & pediatrics
            Proximal humerus/humeral head in adults Proximal tibia in adults & pediatrics
        ii. Waismed's Bone Injection Gun (B.I.G.) may be used by paramedics while following a standing order at these insertion sites:
            Proximal tibia in adults & pediatrics
        iii. Any clinically indicated insertion site may be used by paramedics in any patient following discussion with the base hospital physician concerning the risks and benefits, the operator's training and experience, and limitations of the available device.
2. Identify the insertion site using anatomical landmarks.
3. Select the size of needle set or device based on patient size, the selected insertion site, and tissue depth.
4. Cleanse and prepare the insertion site using aseptic technique.
5. Assemble and prepare equipment using aseptic technique.
6. Establish intraosseous access by following the manufacturer's instructions for the available device:

a. AEMTs:
    i. EZ-IO with pink or blue needle sets: https://www.teleflex.com/usa/en/product-areas/emergency-medicine/intraosseous-access/arrow-ez-io-system/clinical-resources/index.html
    ii. B.I.G. red device: https://persysmedical.com/wp-content/uploads/2018/03/big-educational-video-links.pdf

b. Paramedics:
    i. EZ-IO with pink, blue, or yellow needle sets: https://www.teleflex.com/usa/en/product-areas/emergency-medicine/intraosseous-access/arrow-ez-io-system/clinical-resources/index.html
    ii. B.I.G. red device / B.I.G. blue device: https://persysmedical.com/wp-content/uploads/2018/03/big-educational-video-links.pdf

7. Verify Intraosseous placement:
    a. Needle is free standing, without support
    b. Aspiration of blood/marrow
    c. Infusion without extravasation
8. Attach IV set and adjust infusion rate as clinically indicated.
    a. Despite proper placement, pressure infusion may be needed to achieve the required flow rates.
    b. Give Lidocaine 2% PRN for infusion pain in the conscious patient. See calc chart for correct dosing.
9. Secure the insertion site and splint the limb to maintain intraosseous vascular access despite scene activity, patient movement, and transport.
10. Routinely reassess the insertion site to ensure vascular access.
11. Document the procedure.

Critical Success Targets for IO

1. Aspiration of blood/marrow from the intraosseous access site.
2. Infusion without extravasation.

System Benchmark

Number of intraosseous access attempts successfully established.

Core Competency Requirements to be covered during education/training on IO infusion

1. Assessment
2. Anatomy and physiology
3. Differences between neonatal, pediatric, adult, and bariatric patients
4. Indications and contraindications
5. Device specific:
    a. Equipment and site selection
    b. Precautions and complications

Equipment Requirements

1. Personal protective equipment
2. An intraosseous access device:
    a. AEMTs, either:
        i. EZ-IO with pink (15 ga/15 mm) or blue (15 ga/25 mm) needle sets
        ii. B.I.G. red (18 ga pediatric) device
    b. Paramedics, either:
        iii. EZ-IO with pink (15 ga/15 mm), blue (15 ga/25 mm), and yellow (15 ga/45 mm) needle sets
        iv. B.I.G. red (18 ga pediatric) and blue (15 ga adult) devices
3. 10 mL syringe containing 3 to 5 mL of normal saline
4. Normal saline

5. IV administration set
6. Tape
7. Antiseptic
8. Gauze
9. Any other equipment required by the device manufacturer

Instructor Resource Materials

1. Paramedic Care Principles & Practice, Third Edition, Bledsoe, Porter, Cherry

Intraosseous Infusion Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Before establishing intraosseous infusion the AEMT or paramedic must:

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation. *	Selection: gloves, goggles, mask, gown, booties, P100 PRN
1		Confirm that intraosseous access is clinically indicated. *	
1		Do not place if contraindications to intraosseous access are present. *	1. Fracture of insertion site bone 2. Inability to clearly identify insertion site (absence of anatomical landmarks/excess tissue/other problem) 3. Infection at insertion site 4. Previous orthopedic procedure at insertion site (IO attempt within last 48 hours/joint replacement/prosthetic)

While establishing intraosseous infusion the AEMT or paramedic must:

Points	Score	Performance Steps	Additional Information
1		Select the most appropriate insertion site based on clinical needs, operational requirements, and the available device.	1. AEMTs: a. EZ-IO Power Driver may be used while following a standing order at these insertion sites: Distal tibia in pediatrics only Proximal tibia in pediatrics only b. Waismed's Bone Injection Gun (B.I.G.) may be used while following a standing order at these insertion sites: Proximal tibia in pediatrics only 2. Paramedics: a. EZ-IO Power Driver may be used while following a standing order at these insertion sites: Distal tibia in adults & pediatrics Proximal humerus/humeral head in adults Proximal tibia in adults & pediatrics b. Waismed's Bone Injection Gun (B.I.G.) may be used while following a standing order at these insertion sites: Proximal tibia in adults & pediatrics
1		Identify the insertion site using anatomical landmarks. *	
1		Select the size of needle set or device based on patient size, the selected insertion site, and tissue depth. *	1. AEMTs, either: a. EZ-IO with pink (15 ga/15 mm) or blue (15 ga/25 mm) needle sets b. B.I.G. red (18 ga pediatric) device 2. Paramedics, either: a. EZ-IO with pink (15 ga/15 mm), blue (15 ga/25 mm), and yellow (15 ga/45 mm) needle sets b. B.I.G. red (18 ga pediatric) and blue (15 ga adult) devices
1		Cleanse and prepare the insertion site using aseptic technique. *	

1		Assemble and prepare equipment using aseptic technique. *	
1		Establish intraosseous access by following the manufacturer's instructions for the available device. *	
1		Verify Intraosseous placement. *	1. Needle is free standing, without support 2. Aspiration of blood/marrow 3. Infusion without extravasation
1		Attach IV set and adjust infusion rate as clinically indicated. *	1. Despite proper placement, pressure infusion may be needed to achieve the required flow rates. 2. Paramedics may give Lidocaine 2% PRN for infusion pain in the conscious patient. See calc chart for correct dosing.
1		Secure the insertion site and splint the limb to maintain intraosseous vascular access despite scene activity, patient movement, and transport. *	
1		Routinely reassess the insertion site to ensure vascular access. *	
1		Document the procedure.	

Critical Failure Criteria

____Failure to take or verbalize BSI appropriate to the skill prior to performing the skill.
____Failure to confirm that intraosseous access is clinically indicated.
____Placement when any contraindication to intraosseous access is present.
____Failure to identify the insertion site using anatomical landmarks.
____Failure to select the size of needle set or device based on patient size, the selected insertion site, and tissue depth.
____Failure to cleanse and prepare the insertion site using aseptic technique.
____Failure to assemble and prepare equipment using aseptic technique.
____Failure to follow the manufacturer's instructions for the available device.
____Failure to attach IV set and adjust infusion rate as clinically indicated.
____Failure to secure the insertion site and splint the limb.
____Failure to routinely reassess the insertion site to ensure vascular access.
____Any procedure that would have harmed the patient

ABNORMAL DELIVERY WITH NEWBORN CARE SKILLS LAB

Student Name: _____ Date: _____

Instructor Evaluator: _____ Student Evaluator: _____
Signature Signature

SCORING	
N/A	Not applicable for this patient
0	Unsuccessful; required critical or excessive prompting; inconsistent; not yet competent
1	Not yet competent, marginal or inconsistent, this includes partial attempts
2	Successful; competent; no prompting necessary

Actual Time Started:	**SCORE**
Takes appropriate PPE precautions	N/A
Obtains a history relevant to the pregnancy	
Estimated date of confinement	N/A
Frequency of contractions	N/A
Duration of contractions	N/A
Intensity of contractions	N/A
Rupture of amniotic sac (time and presence of meconium)	N/A
Previous pregnancies and deliveries (complications, vaginal delivery, C-section)	N/A
Pre-existing medical conditions (HTN, DM, seizure, cardiac)	N/A
Medications taken prior to labor	N/A
Prenatal care (identified abnormalities with pregnancy)	N/A
Vaginal bleeding	N/A
Abdominal pain	N/A
Assessment	
Vital signs (BP, P, R, Temperature)	N/A
Evidence of imminent delivery (crowning, contractions, urge to push, urge to defecate)	N/A
Prepares for delivery	
Prepares appropriate delivery area	N/A
Removes patient's clothing	N/A
Opens and prepares obstetric kit	N/A
Places clean pad under patient	N/A
Prepares bulb syringe, cord clamps, towels, newborn blanket	N/A
Delivers newborn	
During contractions, urges patient to push	N/A
Delivers and supports the emerging fetal presenting part if not the head	N/A
Recognizes abnormal presentation that requires immediate care and transport (prolapsed cord, hand, foot, shoulder dystocia)	N/A
Delivers legs and body if possible and continues to support fetus	N/A
Delivers head	N/A
If fetal head is not promptly delivered, inserts gloved fingers/hand to establish a space for breathing/relieve pressure on umbilical cord	N/A
Assesses for and notes the presence of meconium	N/A
Initiates rapid transport	N/A
Delivers the shoulders if not previously delivered	N/A
Delivers the remainder of the body if not previously delivered	N/A

Places newborn on mother's abdomen or level with mother's uterus	N/A
Notes the time of birth	N/A
Controls hemorrhage as necessary	N/A
Reassesses mother's vital signs	N/A
Newborn care (Birth – 30 seconds postpartum):	
Warm, dry, and stimulate the newborn	N/A
Clears airway if obvious obstruction to spontaneous breathing or requires PPV	N/A
Wraps newborn in blanket or towels to prevent hypothermia	N/A
Newborn care (30 – 60 seconds postpartum):	
If heart rate is less than 100, gasping or apneic:	
Provides PPV without supplemental oxygen	N/A
Monitors SpO_2 in neonate	N/A
Clamps and cuts umbilical cord	N/A
Places on mother's chest to retain warmth (if not actively resuscitating the neonate)	N/A
Determines 1 minute APGAR score	N/A
Newborn care (after 1 minute postpartum):	
If heart rate is less than 100:	
Takes ventilation corrective steps and continues PPV with supplemental oxygen	N/A
If heart rate is less than 60:	
Considers intubation if no chest rise with PPV	N/A
Begins chest compressions	N/A
If heart rate remains less than 60 after chest compressions and PPV:	
Administers epinephrine IO	N/A
Determines 5 minute APGAR score	N/A
Affective	
Accepts evaluation and criticism professionally	N/A
Shows willingness to learn	N/A
Interacts with simulated patient and other personnel in professional manner	N/A

Actual Time Ended: _____

TOTAL	0 /98

Critical Criteria

____Failure to take or verbalize appropriate PPE precautions
____Failure to identify or appropriately manage an abnormal presentation
____Performs any dangerous activity during delivery (pulls on fetus, places fetus in a dangerous position, pulls on umbilical cord to deliver placenta, handles newborn inappropriately)
____Failure to provide appropriate newborn care (correct sequence and within recommended time limits)
____Failure to manage the patient as a competent EMT
____Exhibits unacceptable affect with patient or other personnel
____Uses or orders a dangerous or inappropriate intervention
____Failure to receive a total score of 74 or greater

STUDENT SELF-EVALUATION (The examiner is to ask the student to reflect on his/her performance and document his/her response to the following question:)

Were you successful or unsuccessful in this skill? ❑ Successful
❑ Unsuccessful

Needle Chest Decompression

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **September 13, 2024**

Terminal Performance Objective

Relieve intrathoracic pressure due to tension pneumothorax to improve cardiac output, ventilation and oxygenation.

Prior to Needle Chest Decompression

Assess the patient

- Be suspicious of tension pneumothorax in the context of known or suspected torso trauma
- Be suspicious of tension pneumothorax during prolonged artificial ventilation
- Must have signs of compromised cardiac output (i.e. hypotension, hypoxemia, etc.)

Recognize and differentiate the signs and symptoms of tension pneumothorax:

- Hypotension
- Chest pain
- Air hunger
- Respiratory distress
- Tachycardia
- Neck vein distension
- Tracheal deviation away from the side of the injury
- Unilateral absence of breath sounds
- Elevated hemithorax without respiratory movement
- Cyanosis (late manifestation)

Treat hypoxemia and inadequate ventilation:

- Position the patient as clinically indicated to meet physiologic requirements
- Assist breathing as clinically indicated:
    - Give only sufficient volume to cause chest rise
    - Monitor the manometer during bag-valve-mask (BVM) ventilation
- Use minimum titratable oxygen to reach 95% SpO_2

Recognize and correct confounding factors:

- Occlusive dressing of open pneumothorax
- Misplaced endotracheal tube

Confirm the indication for unilateral needle chest decompression:

- Signs and symptoms of tension pneumothorax with compromised cardiac output AND rapidly progressing respiratory distress unrelieved by less invasive means

Confirm one of the indications for bilateral needle chest decompression:

- Cardiac arrest with known/suspected torso trauma
- Cardiac arrest with a presentation suggesting spontaneous pneumothorax

Assemble equipment required for needle chest decompression

Identify and aseptically mark the appropriate side(s), approach(es), and insertion site(s):

- Left, right, or bilateral
    - The side(s) requiring needle chest decompression

- Anterior approach:
    - Second intercostal space at the midclavicular line immediately above the third rib
      (2 ICS @ MCL)
    - Third intercostal space at the midclavicular line immediately above the fourth rib
      (3 ICS @ MCL)

- Anterolateral approach:
    - Fourth intercostal space at the anterior axillary line immediately above the fifth rib
      (4 ICS @ AAL)
    - Fifth intercostal space at the anterior axillary line immediately above the sixth rib
      (5 ICS @ AAL)

- Lateral approach:
    - Fourth intercostal space at the midaxillary line immediately above the fifth rib
      (4 ICS @ MAL)
    - Fifth intercostal space at the midaxillary line immediately above the sixth rib
      (5 ICS @ MAL)

Note: Inability to positively identify the insertion site is a contraindication to needle chest decompression.
Prepare the insertion site:

- Use aseptic technique
- Swab the site with alcohol, povidone iodine, and/or ChloraPrep
- Confirm use of the clinically indicated personal protective equipment (PPE)
- Remove the Luer lock or slip tip fitting from the end of the IV needle-catheter set
    - Alternatively attach a syringe partially filled with Normal Saline

Needle Chest Decompression

Perform needle chest decompression:

- Insert the IV needle-catheter set at a 45° angle, bevel up, just superior to the inferior rib
- Advance the IV needle-catheter set into the intercostal space while rapidly transitioning to a 90° angle
- Advance the needle-catheter set through the parietal pleura while listening for a rush of air
    - Alternatively while watching for a rush of bubbles in the partially filled syringe
- If air is released:
    - Withdraw the needle while leaving the catheter in place
    - Secure the catheter as needed using bandages and tape
    - Reassess signs and symptoms of tension pneumothorax
    - Monitor patency of catheter
- If air is not released:
    - Advance the needle-catheter set up to approximately 5 mm and stop
    - Withdraw the needle-catheter set and dress the insertion site with a petrolatum gauze dressing
    - Reassess signs and symptoms of tension pneumothorax
    - Monitor for iatrogenic pneumothorax

Note: If air is released and signs and symptoms improve this indicates temporary relief of the tension pneumothorax. Repetition of the procedure may be indicated.

Note: If air is not released repetition of the procedure may be indicated.

Critical Success Targets

- Improved cardiac output; including return of pulses, improved skin color, improved BP, improved level of consciousness
- Chest rise and fall with each breathe or ventilation
- SpO_2 of 95%
- Improved $EtCO_2$

System Benchmark

The percentage of patients with improved tissue perfusion, ventilation and oxygenation following needle chest decompression.

Competency & Proficiency Standards

- Team leadership, patient safety, and use of diagnostic tools
- Respiratory anatomy, physiology, and pathophysiology
- Assessment of airway, breathing, and circulation
- Differentiation between adequate and inadequate breathing/ventilation
- Auscultation and diagnostic differentiation of lung sounds
- Differentiation between a simple pneumothorax and a tension pneumothorax
- Needle chest decompression indications and contraindications
- The procedure for needle chest decompression

Equipment Requirement

The following required equipment is included in the REMSA Drug and Equipment List:

- Hand Sanitizer
- Multiple-Use Eye Protection
- Respiratory Protection
- Barrier Garment
- Medical Exam Glove
- Stethoscope
- Monitoring and Resuscitation Equipment
- Alcohol, Povidone Iodine, and/or ChloraPrep Swab
- Syringe and Hypodermic Needle
- Normal Saline 0.9% — 10 mL Prefilled Syringe or Vial
- 3.25 inch 14 ga IV Catheter(s) for Needle Chest Decompression
    - 3.25 inch 16 ga IV Catheter(s) for Needle Chest Decompression (optional)
- 1.75-2 inch 18 ga IV Catheter(s) for Needle Chest Decompression
- Portable Sharps Container
- Gauze Sponge, Pad, Bandage, and/or Dressing
- Tape
- Petrolatum Gauze Dressing
- Biohazard Bag
- Waste Bag

Instructor Resource Materials

1. Advanced Trauma Life Support, 9th Edition
2. Prehospital Trauma Life Support 7th Edition
3. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

Validation of Needle Chest Decompression

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Before performing needle chest decompression, the paramedic must:

Points	Score	Performance Steps	Additional Information
1		Use standard, contact, and droplet precautions	Personal protective equipment includes multiple-use eye protection, respiratory protection, barrier garment, and medical exam gloves
1		Assess the patient	• Be suspicious of tension pneumothorax in the context of known or suspected torso trauma
1		Recognize and differentiate the signs and symptoms of tension pneumothorax *	• Chest pain • Air hunger • Respiratory distress • Tachycardia • Hypotension • Tracheal deviation away from the side of the injury (late manifestation) • Unilateral absence of breath sounds • Elevated hemithorax without respiratory movement • Neck vein distension • Cyanosis (late manifestation)

1		Treat hypoxemia and inadequate ventilation *	• Position the patient as clinically indicated to meet physiologic requirements
			• Assist breathing as clinically indicated:
			  ○ Give only sufficient volume to cause chest rise
			  ○ Monitor the manometer during bag-valve-mask (BVM) ventilation
			• Use minimum titratable oxygen to reach 95% SpO_2

1		Recognize and correct confounding factors *	• Tension pneumothorax due to occlusive dressing of open pneumothorax • Misplaced endotracheal tube
1		Confirm the indication for needle chest decompression *	Unilateral: • Signs and symptoms of tension pneumothorax with rapidly progressing respiratory distress unrelieved by less invasive means with s/s compromised cardiac output Bilateral: • Cardiac arrest with known/suspected torso trauma
1		Assemble equipment required for needle chest decompression	• Hand Sanitizer • Multiple-Use Eye Protection • Respiratory Protection • Barrier Garment • Medical Exam Glove • Stethoscope • Monitoring and Resuscitation Equipment • Alcohol, Povidone Iodine, and/or ChloraPrep Swab • Syringe and Hypodermic Needle • Normal Saline 0.9% — 10 mL Prefilled Syringe or Vial

			• 3.25 inch 14 ga IV Catheter(s) for Needle Chest Decompression ○ 3.25 inch 16 ga IV Catheter(s) for Needle Chest Decompression (optional) • 1.75-2 inch 18 ga IV Catheter(s) for Needle Chest Decompression (optional) • Portable Sharps Container • Gauze Sponge, Pad, Bandage, and/or Dressing • Tape • Petrolatum Gauze Dressing • Biohazard Bag • Waste Bag
1		Identify and aseptically mark the appropriate side(s), approach(es), and insertion site(s) *	Left, right, or bilateral • The side(s) requiring needle chest decompression Anterior approach: • Second intercostal space at the midclavicular line immediately above the third rib (2 ICS @ MCL) • Third intercostal space at the midclavicular line immediately above the fourth rib (3 ICS @ MCL) Anterolateral approach: • Fourth intercostal space at the anterior axillary line immediately above the fifth rib (4 ICS @ AAL) • Fifth intercostal space at the anterior axillary line immediately above the sixth rib (5 ICS @ AAL) Lateral approach: • Fourth intercostal space at the midaxillary line immediately above the fifth rib (4 ICS @ MAL) • Fifth intercostal space at the midaxillary line immediately above the sixth rib (5 ICS @ MAL) Note that the inability to positively identify the insertion site is a contraindication to needle chest decompression.
1		Prepare the insertion site	• Use aseptic technique • Swab the site with alcohol, povidone iodine, and/or ChloraPrep • Confirm use of the clinically indicated personal protective equipment (PPE) • Remove the Luer lock or slip tip fitting from the end of the IV needle-catheter set ○ Alternatively attach a syringe partially filled with Normal Saline

While performing needle chest decompression, the paramedic must:

1		Perform needle chest decompression *	• Insert the IV needle-catheter set at a 45° angle, bevel up, just superior to the inferior rib
			• Advance the IV needle-catheter set into the intercostal space while rapidly transitioning to a 90° angle
			• Advance the needle-catheter set through the parietal pleura while listening for a rush of air
			  ○ Alternatively while watching for a rush of bubbles in the partially filled syringe
			• If air is released:
			  ○ Withdraw the needle while leaving the catheter in place
			  ○ Secure the catheter as needed using bandages and tape
			  ○ Reassess signs and symptoms of tension pneumothorax
			  ○ Monitor patency of catheter
			• If air is not released:
			  ○ Advance the needle-catheter set up to approximately 5 mm and stop
			  ○ Withdraw the needle-catheter set and dress the insertion site with a petrolatum gauze dressing
			  ○ Reassess signs and symptoms of tension pneumothorax
			  ○ Monitor for iatrogenic pneumothorax

Critical Failure Criteria

____Failure to use standard, contact, and droplet precautions
____Failure to recognize and differentiate the signs and symptoms of tension pneumothorax
____Failure to treat hypoxemia and inadequate ventilation
____Failure to recognize and correct confounding factors
____Failure to confirm the indication for needle chest decompression (must have compromised cardiac output)
____Failure to identify and aseptically mark the appropriate side(s), approach(es), and insertion site(s)
____Failure to prepare the insertion site
____Failure to perform clinically indicated needle chest decompression
____Failure to reassess and monitor
____Any procedure that would have harmed the patient

Tourniquets

Skills Verification form

Last Reviewed: **January 1, 2021**	Last Revised: **October 23, 2024**

Terminal Performance Objective

Hemorrhage control via the appropriate use, and correct application, of an extremity arterial tourniquet. Tourniquets for use include those approved by the Co-TCCC and the SWAT-T, follow specific manufacturers recommendations as clinically indicated.

Before applying an arterial tourniquet:

1. Determine presence of probable life-threatening bleeding extremity injury(ies).
2. Immediately attempt to control bleeding using dressings and direct pressure.
3. **Tourniquets are *only* to be used if direct pressure does not control the hemorrhage.**
4. Remove any other articles of clothing and jewelry from the affected extremity(ies).

Application of an arterial tourniquet must be accomplished as soon as possible—blood lost cannot be replaced:

1. ***Do not*** delay tourniquet application to extricate/load patient, establish IVs, or other treatments.
2. Place tourniquet at least 2"-4" proximal to site of hemorrhage. [1]
    a. Tourniquets that are narrow and band-like should be avoided. Wider tourniquets are more effective at controlling bleeding, and they control hemorrhage at a lower pressure. [2]
    b. Avoid obvious fractures—place tourniquet proximally to avoid creating further injury/pain.
    c. If joint is closer than 4" to hemorrhage site, apply tourniquet 2"- 4" proximal to that joint.
3. Tighten tourniquet until bleeding is stopped, then secure it in place.
4. Leave the tourniquet uncovered so that the site can be monitored for recurrent hemorrhage.
5. Pain management should be considered unless clinically contraindicated.
6. Note the time of tourniquet application.
    a. Clearly identify location of tourniquet(s) on turnover to other care providers.
    b. Document the time of tourniquet application and results on the PCR/ePCR.
    c. In multi-patient situations (i.e. MCI) clearly mark triage tags with a "T" (for tourniquet) and the time using 24-hour format, e.g. T-13:40 Aug. 6, 2011. Label or otherwise identify the tourniquet(s) the same way.
7. Provide oxygen at 10-15 LPM.
8. Initiate transport to a trauma center or as otherwise directed by base hospital.
9. If a tourniquet was applied appropriately prior to the arrival of ALS providers, keep the tourniquet in place.
    a. If bleeding control has not been achieved, ALS providers should be prepared to apply a tourniquet proximal to existing tourniquet.

Critical Success Targets for Application of an Arterial Tourniquet

1. Recognize probable life-threatening extremity hemorrhage.
2. Bleeding control is not possible via any other methods (i.e., direct pressure).
3. Successful hemorrhage control within two (2) minutes is achieved using an arterial tourniquet.

[1] Www.ArmyStudyGuide.com, retrieved 11/09/11

[2] PHTLS , Seventh Edition, Chapter 8 Shock p 200

System Benchmark

% of patients whose critical extremity hemorrhage is controlled via treatment with arterial tourniquet.

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

1. Hemorrhagic shock—recognizing critical patients requiring immediate bleeding control.
2. Definition of arterial vs. constricting band vs. venous tourniquets.
3. Indications/contraindications for arterial tourniquet application.
4. Review of current research on tourniquets.
5. Proper application of tourniquets.
6. Importance of complete bleeding control.
7. Importance of securing the windlass.

Equipment Requirements

1. PPE
2. Commercially available tourniquets (e.g. CAT) or blood pressure cuff
3. Trauma dressings

Instructor Resource Materials

1. Applicable manufacturer's guidelines
2. Applicable REMSA Treatment Protocols
3. Prehospital Trauma Life Support (PHTLS), seventh edition

Application of Tourniquets Validation

PERFORMANCE CRITERIA: 100% accuracy required on all items marked with an *

Before applying a tourniquet, the PSFA, EMT, AEMT, or paramedic must:

Points	Score	Performance Steps	Additional Information
1		Take or verbalize body substance isolation. *	Selection: gloves, goggles, mask, gown, booties, P100 PRN
1		Determine the presence of probable life-threatening bleeding extremity injury(ies). *	
1		Immediately attempt to control bleeding using dressings and direct pressure. *	***Tourniquets are only to be used if direct pressure does not control the hemorrhage.***
1		Remove any other articles of clothing and jewelry from the affected extremity(ies).	
1		Do not delay tourniquet application to extricate/load patient, establish IVs, or other treatments.	

While applying a tourniquet, the PSP, EMT, AEMT, or paramedic must:

Points	Score	Performance Steps	Additional Information
1		Place tourniquet at least 2" – 4" proximal to site of hemorrhage. *	• Tourniquets that are narrow and band like should be avoided. Wider tourniquets are more effective at controlling bleeding, and they control hemorrhage at a lower pressure. • Avoid obvious fractures – place tourniquet proximally to avoid creating further injury/pain. • If joint is closer than 4" to hemorrhage site, apply tourniquet 2" – 4" proximal to that joint.
1		Tighten tourniquet until bleeding is stopped then secure it in place.*	
1		Leave the tourniquet uncovered so that the site can be monitored for recurrent hemorrhage. *	
1		Pain management should be considered unless clinically contraindicated.	
1		Note the time of tourniquet application. *	• Clearly identify location of tourniquet(s) on turnover to other care providers. • Document the time of tourniquet application and results on the PCR • In multi-patient situations (i.e. MCI) clearly mark triage tags with a "T" (for tourniquet) and the time using 24-hour format, e.g. T-13:40 Aug. 6, 2011. Label or otherwise identify the tourniquet(s) the same way.
1		Provide oxygen at 10 – 15 LPM.	

1		Initiate transport to a trauma center or as otherwise directed by base hospital.	
1		If a tourniquet was applied appropriately prior to the arrival of ALS provides, keep the tourniquet in place. *	If bleeding control has not been achieved, ALS providers should be prepared to apply a tourniquet proximal to existing tourniquet.

Critical Failure Criteria

____Failure to take or verbalize BSI appropriate to the skill prior to performing the skill.
____Failure to recognize probably life-threatening extremity hemorrhage.
____Failure to attempt to control hemorrhage via the use of dressings and direct pressure prior to use of tourniquet.
____Any procedure that would have harmed the patient.