MERCED COUNTY	EMERGENCY MEDICAL SERVICES AGENCY	POLICY NUMBER	700
	A Division of the Merced County Department of Public Health	**Effective Date**	**11/2025**
Authority: Health and Safety Code, Division 2.5, and California Code of Regulations, Title 22, Division 9, Chapter 4, 1797.220		Initial Date:	11/2025
		Review Date:	10/2028

GENERAL PROCEDURES

Overview of how to use the Treatment Protocols:

- The standard of care and scope of practice for EMTs and Paramedics in Merced County, and the procedures for the EMTs and Paramedics to follow.
- The treatment protocols for both Medical and Trauma emergencies. Each individual protocol outlines which treatment can be performed as a standing order and which treatment will need Base Hospital Physician Order.
- Protocols where a monitor is suggested allows for the paramedic to treat rhythm if appropriate.
- Switching protocols due to changes in patient condition should only occur after development of a new patient complaint that changes therapy as designated in the specific protocol or after Base Hospital consultation.
- During an interfacility transfer, a paramedic may utilize the scope of practice for which s/he is trained and accredited.

Medical Control

Treatment Protocols:

- Adult – 15 years of age and older
- Pediatric – 14 years of age and younger

Standing Orders:

- Standing Orders are “treatments a licensed and accredited Paramedic, and/or certified EMT, and/or certified First Responder can perform without Base Hospital permission”.

The following are considered Standing Orders:

- All BLS / ALS skills and treatment EXCEPT those limited to Base Hospital Physician Orders

Base Hospital Physician Orders:

- Base Hospital Physician Orders are treatment procedures that require a direct order from a Base Hospital Physician.
- The Base Hospital Physician may order any medication or procedure within the State Paramedic Scope of Practice regardless of the local treatment protocol.
- The Paramedic must call the Merced County Base Hospital for Base Hospital Physician Orders regardless of hospital transporting to or regardless of transporting out of County.
- The physician’s name must be documented in the Pre-Hospital Patient Care Report.
- An MICN may RELAY a verbal “Base Hospital Physician Order” from the Base Hospital Physician in accordance with any of the approved protocols.

Signatures on File

Approved By: Tim Williams, EMS Administrator

Ajinder Singh, MD, EMS Medical Director

Table of Contents

I-gel Supraglottic Airway Device (SAD)

Indications

- Cardiac arrest
- Respiratory arrest with no immediate reversible cause (i.e., hypoglycemia or opioid overdose)
- Patients in need of an advanced airway and/or unable to be adequately ventilated with a BVM when endotracheal intubation is unavailable or unsuccessful
- Adult patients in need of rapid advanced airway control when endotracheal intubation is anticipated to be difficult
- **EMT Optional Scope of Practice (EMT – OS)** - Patients, 12 years of age and older, in need of airway protection or unable to be adequately ventilated by BVM

Procedure

- Pre-oxygenate with 100% oxygen
- Select appropriately sized SAD
- Have suction available and ready to use
- Apply chin lift and introduce the SAD into the mouth
- Follow the curvature of the airway while pushing the SAD until the SAD stops
- Attach BVM and ventilate
- Secure with commercial tube holder

Verify placement by ALL the following

- Rise and fall of the chest
- Bilateral lung sounds
- Negative epigastric sounds
- Condensation in the tube
- Application of Waveform $EtCO_2$ (Colorimetric EtCO2, EMT – OS) detector in **1 minute or less**

Reassessment

- All SAD patients must be continuously assessed using Waveform $EtCO_2$ (Colorimetric EtCO2, EMT – OS) Capnography
- Any significant movement, emesis, or change in clinical condition should be reassessed using Waveform $EtCO_2$ (Colorimetric EtCO2, EMT – OS) Capnography and physical examination
- If at any time, clinical indicators suggest that the SAD is not in communication with the trachea, the airway must be immediately removed, and reinsertion of the SAD attempted

Documentation

- Securing of the SAD, confirmatory indicators, continuous Digital and Waveform $EtCO_2$ Capnography reading must be documented in the Prehospital Care Report

Contraindications

- Age 11 years of age or less for EMT – OS
- Patient weight < 2 kg
- Patient with known esophageal disease
- Extensive airway burns

- Suspected foreign body obstruction

I-gel Size Chart		
I-gel Size	**Patient Size**	**Estimated Patient Weight (kg)**
1	Neonate	2 – 5 kg
1.5	Infant	5 – 12 kg
2	Small Pediatric	10 – 25 kg
2.5	Large Pediatric	25 – 35 kg
3	Small Adult	30 – 60 kg
4	Medium Adult	50 – 90 kg
5	Large Adult	90 + kg

Oral Endotracheal Intubation (ETT)

Indications

- Adult patients 15 years of age and older in cardiac or respiratory arrest
- Spontaneously breathing adult patients with GCS of 8 or less, who are unable to maintain their own airway or without gag reflex
- Spontaneously breathing adult patients with a GCS of 8 or less who have a respiratory rate less than 8 per minute

Procedure

- Prepare, position, and pre-oxygenate the patient with 100% oxygen
- Evaluate for difficult airway
- Select proper ETT
- **The use of a Bougie device is required with all ETT intubation attempts**
- Intubate the trachea via direct laryngeal visualization
- Inflate ETT cuff
- Secure with commercial tube holder

Verify placement by ALL the following

- Rise and fall of the chest
- Bilateral lung sounds
- Negative epigastric sounds
- Condensation in the tube
- Application of Waveform $EtCO_2$ in **1 minute or less**

Reassessment

- All intubated patients must be continuously assessed using Waveform $EtCO_2$ capnography
- Any significant movement, emesis, or change in clinical condition should be reassessed using waveform capnography and physical examination
- If at any time, capnography indicates that the tube is not in communication with the trachea, the airway must be immediately removed, and reintubation attempted

Documentation

- The number of centimeters at which the tube is secured
- Confirmatory indicators
- Continuous Digital and Waveform $EtCO_2$ readings must be documented in the Prehospital Care Report

PEDIATRIC ENDOTRACHEAL INTUBATION IS <u>NOT</u> AN APPROVED SKILL FOR PARAMEDICS

NASAL ENDOTRACHEAL INTUBATION IS <u>NOT</u> A LOCALLY APPROVED SKILL FOR PARAMEDICS

Stomal / Tracheostomy Intubation

Indication

- Patient requiring intubation who has a mature stoma and does not have a replacement tracheostomy tube available

Procedure

- Select the largest endotracheal tube (ETT) that will fit through the stoma without force; check the cuff and remove the stylet
- Pre-oxygenate the patient with 100% oxygen using a BVM
- It is not necessary to lubricate the ETT
- Suction if necessary
- Pass the ETT and inflate the cuff
- The pharynx has been bypassed, so the ETT will protrude from the neck by several inches
- Hold the tube in place and attach the BVM
- While ventilating the patient, watch for equal rise and fall of the chest
- Secure the tube and ventilate with 100% oxygen
- Auscultate for bilaterally equal lung sounds. Examine the neck for subcutaneous emphysema indicating false passage
- Do not take longer than 30 seconds to perform this procedure

Verify placement by ALL the following

- Rise and fall of the chest
- Bilateral lung sounds
- Negative epigastric sounds
- Condensation in the tube
- Application of Waveform $EtCO_2$ in **1 minute or less**

Reassessment

- All intubated patients must be continuously assessed using Waveform $EtCO_2$ capnography
- Any significant movement, emesis, or change in clinical condition should be reassessed using waveform capnography and physical examination
- If at any time, capnography indicates that the tube is not in communication with the trachea, the airway must be immediately removed, and reintubation attempted

Documentation

- The number of centimeters at which the tube is secured
- Confirmatory indicators
- Continuous Digital and Waveform $EtCO_2$ readings must be documented in the Prehospital Care Report

Tracheostomy Care / Suctioning

- Suctioning of surgical airways is often required to attempt to clear and maintain an open airway
- Administration of inhaled medications will need to be given via the stomas or tracheostomy tubes

Procedure

- Remove the T-tube if a tracheostomy patient is on humidified oxygen
- Ventilate the patient with 100% oxygen
- Insert the suction catheter into the stoma or tracheostomy opening with the suction off (the thumb hole open). The short length of the tracheostomy tube facilitates suctioning
- Apply suction by occluding the thumb hole while slowly withdrawing the catheter in a twisting motion
- Suction of a tracheostomy tube should take no longer than 5 to 7 seconds for the adult patient, and 3-4 seconds for the pediatric patient
- If mucus plugs or thick secretions are present, the use of 3-5 cc of sterile saline may be helpful
- Ventilate with 100% oxygen
- Check breath sounds
- Suctioning can stimulate a cough reflex. Allow the patient to cough. Be prepared to suction or catch secretions from the tracheal opening.
- Recheck lung sounds

Needle Thoracostomy (Pleural Decompression)

Indication – Tension Pneumothorax

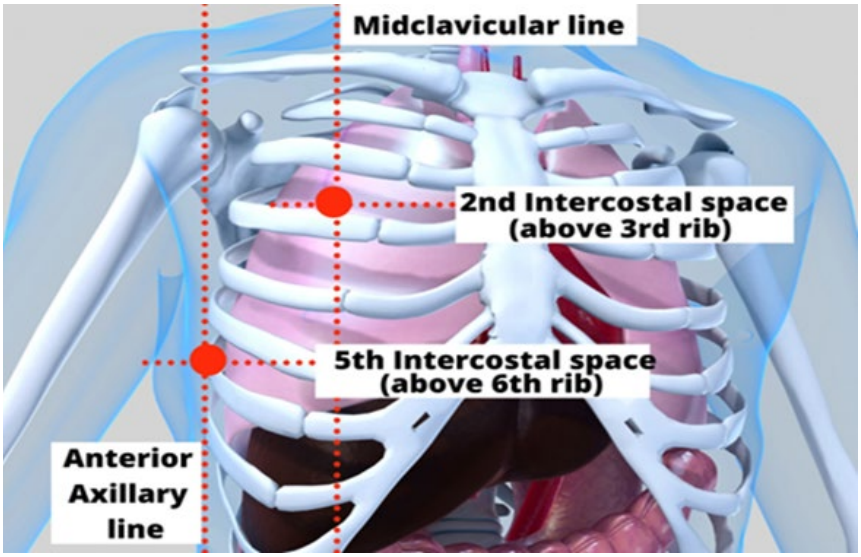
Signs and symptoms of Tension Pneumothorax and indication of Needle Thoracostomy must include at least one (1) clinical sign in ALL three (3) categories:

1. **Severe Respiratory Distress** - As evidenced by apnea, severe dyspnea with tachypnea, oxygen saturation less than 94%, or difficulty in bagging
2. **Lateralizing Exam** – Decreased or absent lung sounds on one side, asymmetric chest wall rise, positive JVD (late sign), or tracheal deviation (late sign)
3. **Hemodynamic Compromise** – Systolic Blood Pressure less than 90 for adults or hypotension as indicated for pediatrics by length-based assessment tape or application

Procedure

- Use a 10-gauge IV catheter at least 3¼ inches long for an adult patient and 14-gauge catheter at least 1¼ inches long for a pediatric patient
- The site preference for needle thoracostomy is
  - Primary Site – Mid-axillary at the fifth intercostal space on the affected side
  - Secondary Site – Above the third rib (second intercostal space), mid- clavicular line on the affected side
- When air returns, advance the catheter and remove the needle
- Attach a one-way valve to the catheter hub if spontaneous respirations are present
- Stabilize the catheter securely to the chest
- Reassess the patient, including lung sounds and vital signs every 5 minutes and every time the patient is moved
- If the patient does not improve, repeat procedure on opposite side

Repeat the procedure with additional needle upon Tension Pneumothorax recurrence



Complete Airway Obstruction by Foreign Body Laryngoscopy

If manual airway maneuvers and Basic Life Support (BLS) fail to dislodge a foreign body causing complete airway obstruction:

1. The Paramedic shall visualize the airway with laryngoscope
    a. If the object is visible, remove obstruction with Magill forceps
    b. Attempt to remove foreign body with laryngoscopy for up to **one minute**
2. If unsuccessful:
    a. Repeat ventilation attempts
    b. Manual airway maneuvers
    c. Initiate transtracheal jet insufflation via Needle Cricothyrotomy according to protocol

Needle Cricothyrotomy

Indication

- Complete airway obstruction not relieved by manual procedures and airway visualization with laryngoscope
- Inability to intubate and inability to successfully ventilate using BVM ventilation

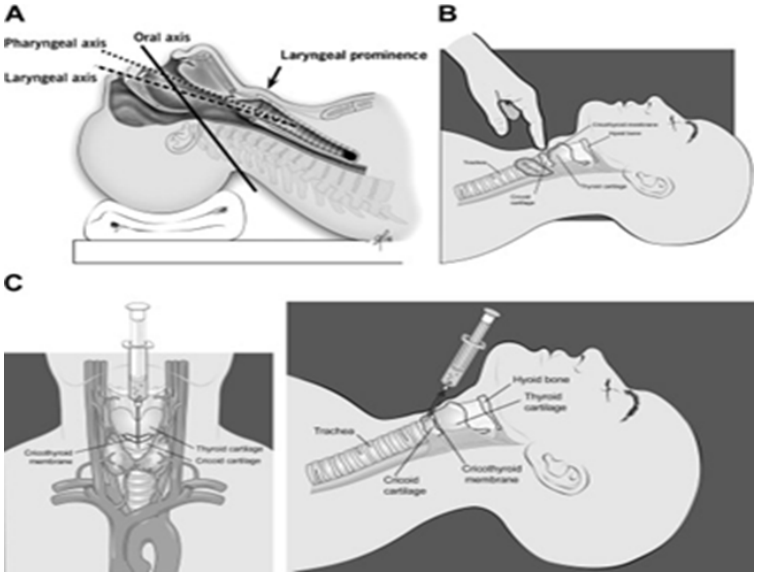
Procedure

- Locate cricothyroid membrane
- Insert 10-gauge IV catheter through the membrane at a 45^{o} angle, directed toward the feet
- Aspirate for air return with a syringe to check placement
- Remove needle from catheter
- Stabilize the catheter securely to neck
- Supply 100% oxygen via oxygen-powered breathing device (Transtracheal Jet Insufflation)

Check for proper placement in the following order

- Assess chest rise
- Check absence of gastric sounds
- Check the adequacy of lung sounds
- Assess for complications, including subcutaneous air
- Reassess placement every time a patient is moved
- Sometimes proper placement is difficult to assess.
    - Do not just rely on the indicators listed above

Continual clinical reassessment of adequate oxygenation and ventilation is essential



<u>NOTE</u>: SURGICAL CRICOTHYROTOMY IS NOT A LOCALLY APPROVED PARAMEDIC SKILL

Continuous Positive Airway Pressure (CPAP)

Indications

- Severe Shortness of Breath with Bronchospasm (Including COPD and Asthma)
- Severe Shortness of Breath with Pulmonary Edema (Including Congestive Heart Failure)
- Allergic Reactions with severe bronchospasm
- Conscious, breathing spontaneously, and able to follow commands

Contraindications

- Pediatric patients (less than 8 years)
- Agonal Respirations
- Respiratory or Cardiac Arrest
- ALOC and Inability to Maintain Airway
- Major Trauma
- Actively vomiting
- Hypotensive (SBP less than 90 for Adults or SBP below length-based assessment tape or application for Pediatrics)
- Suspected of having a pneumothorax
- An inability to achieve a good facial seal with the CPAP mask

Procedure

- Do not delay medication administration to apply CPAP
- The patient must be continuously monitored for development of respiratory failure or vomiting
    - If either occurs, remove the CPAP circuit, clear the airway as necessary to prevent any aspiration, and provide respiratory assistance with either BVM or other advanced airway adjunct
- CPAP will be delivered at a continuous pressure of 5 to 10 cm H_2O utilizing 100% oxygen
    - Administer CPAP at 10 cm H_2O and decrease if possible
    - Administer oxygen at 100% and titrate for oxygen saturation greater than 95% if possible
- CPAP may introduce transient hypotension via decreased venous return secondary to elevated intrathoracic pressure
    - Remove if hypotension occurs

Capnography

Advanced Airway

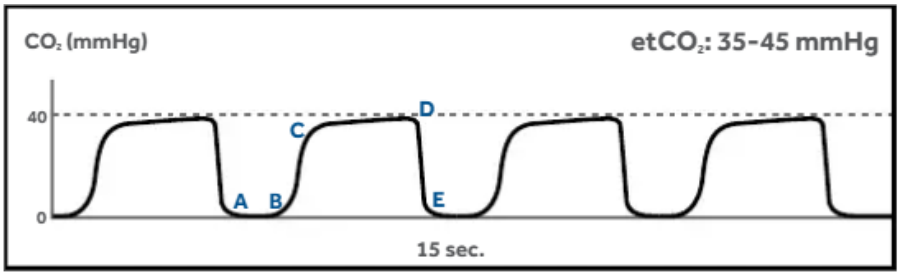
- Capnography will be used to confirm every presumed successful advanced airway placement regardless of the provider's confidence of placement (within 1 minute or less)
- After application of the capnography sensor/device the provider will ventilate the patient.
- If there is development of a continuous capnography waveform then the placement of the endotracheal tube can be confirmed.
- The target range will be between 35-45 mmHg, in patients with a pulse, while providing adequate ventilation

Nasal Capnography

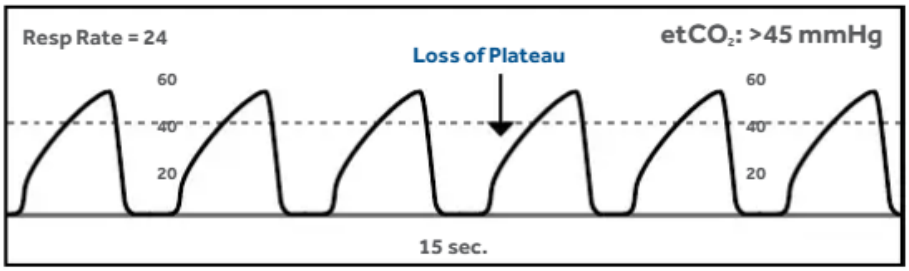
- Nasal Capnography will be placed on all patients that the protocol specifies
- $EtCO_2$ readings of 25 mmHg or less are suggestive of poor organ perfusion

Normal Waveform $EtCO_2$

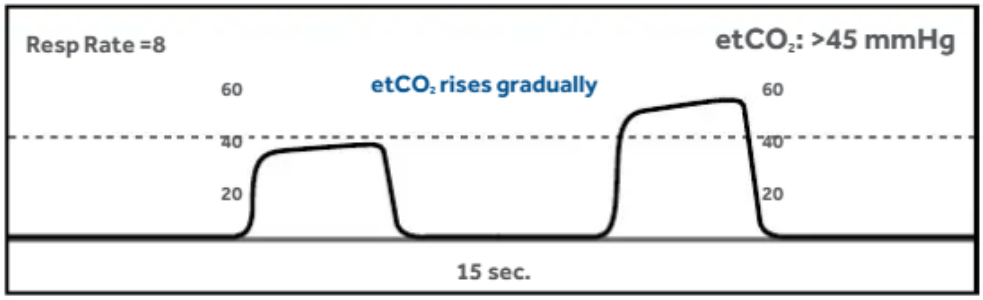
A – B: Baseline / B – C: Expiratory Upstroke / C – D: Expiratory Plateau / D: End-Tidal Concentration / D – E: Inspiration



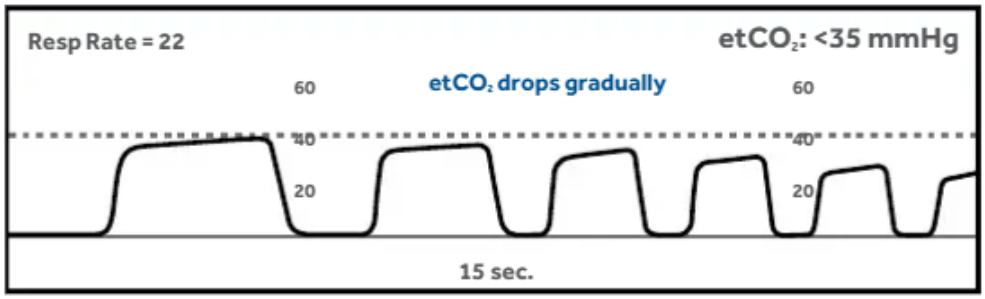
Bronchospasm $EtCO_2$



Hypoventilation $EtCO_2$



Hyperventilation $EtCO_2$



12-Lead ECG

Purpose

- The purpose of this policy is to identify patients that require 12-lead electrocardiogram (ECGs) and describe the process of obtaining and identifying the patients that require direct transport to a STEMI receiving facility
- Electrocardiogram's (ECGs) are utilized by prehospital personnel when a patient is suspected of having abnormal cardiac function.
- The use of a 12-lead ECG is essential to identify a patient experiencing an ST-elevation MI (STEMI)
- The criteria for ST elevation should be at least 1mm ST segment elevation in inferior lead, or at least a 2mm ST segment elevation in anterior or lateral leads, or 2 or more contiguous leads

The result of a "Negative STEMI" ECG **DOES NOT** exclude the patient from having a cardiac event and/or cardiac complaint

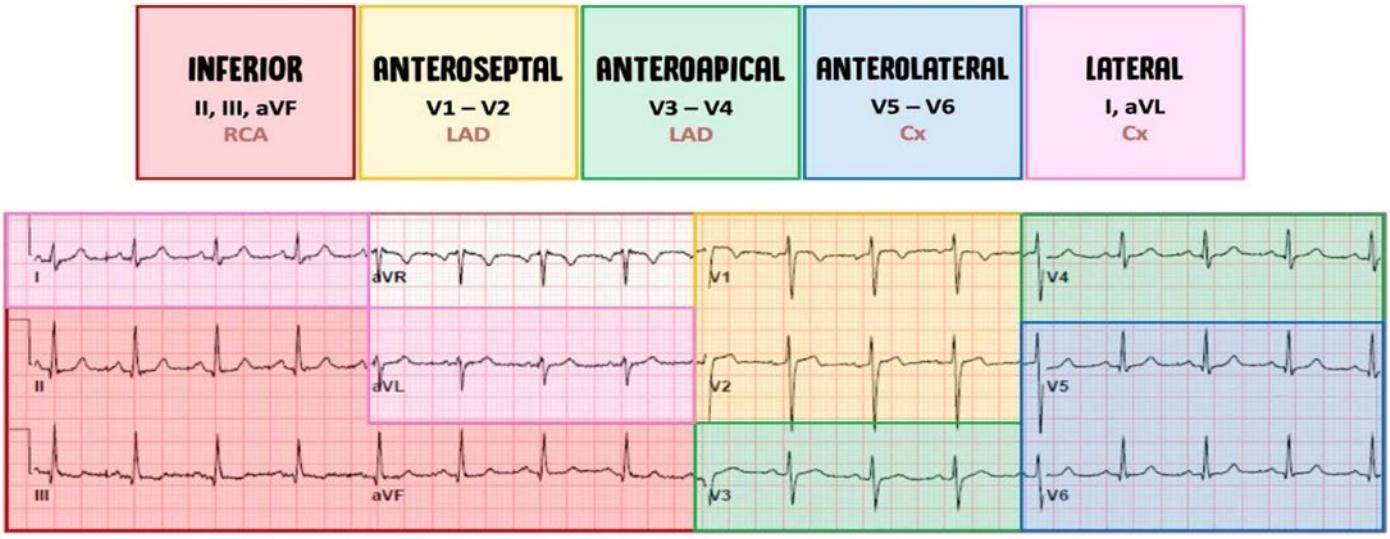
Indication

- Obtain a 12-lead ECG on any adult patient with one or more of the following findings
  - Substernal pain
  - Discomfort or tightness radiating to the jaw, left shoulder or arm
  - Palpitations
  - Symptoms indicating cardiogenic shock
  - Bradycardia or Tachycardia
  - Epigastric pain
  - Diaphoresis
  - Dyspnea
  - Pulmonary edema
  - Anxiety with feeling of impending doom
  - Syncope/dizziness
  - Atypical presentation such as generalized weakness, nausea, vomiting especially in women, elderly and diabetics
  - As identified in any other Merced County EMSA Policy
  - Paramedic discretion with **HIGH** evidence/suspicion of a cardiac event not stated above

Procedure

- Expose chest and prep area ECG electrodes will be applied. Ensure the area is dry, free of jewelry or other items (shaving may be necessary)
- Ensure ECG electrodes are not dry and make good contact with skin
- Attach extremity and chest ECG leads to the patient using the following landmarks
  - V1: right 4th intercostal space
  - V2: left 4th intercostal space
  - V3: halfway between V2 and V4
  - V4: left 5th intercostal space, mid-clavicular line
  - V5: horizontal to V4, anterior axillary line
  - V6: horizontal to V5, mid-axillary line

- Ensure the patient holds still to prevent artifact
- Review ECG reading to ensure it is good quality with minimal or no artifact
- Serial 12-lead EKGs, enroute, are encouraged but do not need to be transmitted once STEMI Receiving Center is notified
- ECG criteria for STEMI Alerts
  - Please note that depending on the manufacturer of the cardiac monitor, STEMI indicators may vary
  - It is incumbent on the provider to know what indicators your manufacturer uses
  - Most manufacturers define a STEMI with three (3) asterisks before and after the text and use capitalized and bolded text
  - If the ECG monitor reading identifies a STEMI
    - Immediately notify the receiving hospital with a STEMI ALERT and transmit the 12-Lead ECG to the STEMI receiving hospital
    - Transmission of the ECG can dramatically reduce the door to balloon time
    - **Transmission shall be completed as soon as possible**



Transcutaneous Pacing (TCP)

Indications

- Symptomatic Bradycardia defined by **ALL** the following:
  - Heart rate < 50 beats per minute
  - SBP < 90 mmHg
  - Associated signs and symptoms including ALOC, signs of shock, chest pain, acute pulmonary edema, syncope, extreme weakness
- Patients in asystole who are victims of electrocution with a down time of less than 10 minutes
- TCP may be used on the order of a physician who is initiating an interfacility transfer or on the order of a Base Hospital Physician in a case where the paramedic has requested on-line medical control

  NOTE: Do not delay TCP if the patient is severely symptomatic or Paramedic has difficulty establishing IV/IO access

Contraindications

- Non-intact skin at the site of the electrode/pad placement
- Asystole, confirmed in three (3) leads and who was not electrocuted < 10 minutes
- Patients with no signs and symptoms of Symptomatic Bradycardia related to Bradycardia rhythm

Procedure

- Place pads on patient's chest and back
- Set to Demand Pacing
- **Set rate at 80 beats/minute**
- Initiate TCP and increase current in 10 mA increments until mechanical capture with pulses are noted
- Once mechanical capture is confirmed, adjust current output up to 5-10 mA
- If capture is maintained but the patient remains symptomatic of inadequate tissue perfusion (B/P less than 90 systolic, altered level of consciousness), consider increasing the rate by 10 bpm until 100 bpm is reached
- If TCP stops, reassess patient. TCP may have ceased due to patient improvement in condition
  - If patient condition has not improved, check cardiac monitor for failure

Troubleshooting

- Make sure the pads are properly placed and have good contact with the skin
- Check the batteries of the pacer
- Use adequate energy to capture the rhythm
- Use adequate analgesia and sedation to minimize patient discomfort

Push Dose Epinephrine

Procedure:

This policy is intended for mixing instructions only.

Refer to EMS Policy for Push Dose Epinephrine indications.

Push Dose Epinephrine Solution Mixing Instructions:

IV Line Method:

- Take Epinephrine 1:10,000 concentration (1 mg/10 ml) and waste 9 ml of Epinephrine
- In the same syringe draw 9 ml of saline from the patient's IV bag and shake well
- Mixture now provides 10 ml of Epinephrine at 10mcg/ml (0.01 mg/ml) 1:100,000 concentration
- Label syringe "Epinephrine 10 mcg/ml"

3 – Way Stopcock Method:

- Obtain Epinephrine 1:10,000 syringe, Normal Saline Flush, and 3-way stopcock
- Close the patient port of the 3-way stopcock and attach the Normal Saline Flush to the 3-way stopcock
- Flush and waste 1 ml of Normal Saline through the 3-way stopcock to purge the 3-way stopcock and syringe of air. There should be 9 ml Normal Saline in the syringe
- Expel and purge any air in the Epinephrine 1:10,000 syringe. Attach the Epinephrine 1:10,000 syringe to the remaining open port of the 3-way stopcock
- With both syringes attached, push 1 ml of Epinephrine 1:10,000 into the 9 ml of Normal Saline. Shake well
- Mixture now provides 10 ml of Epinephrine at 10mcg/ml (0.01 mg/ml) 1:100,000 concentration
- Label syringe "Epinephrine 10 mcg/ml"

Ventricular Assist Device (VAD / LVAD)

Procedure

- Assess the patient – There may be no palpable pulse, therefore, utilize other parameters for patient assessment (e.g., mental status, skin signs, capillary refill, and $EtCO_2$)
- Assess the device
  - Device information and VAD Coordinator contact number may be on the device
  - If caregiver is present, yield to their advice
  - For continuous flow devices (no palpable pulse), auscultate over the left upper quadrant of the abdomen or over the heart and listen for the "hum" of the device
  - Determine if the device has power (If the device has power, it does not necessarily mean it is working properly). A malfunctioning pump should beep or may have a blinking or solid red light
  - Check the device for secure connections
- If the patient's condition appears to be related to their VAD, and it is safe and reasonable, it is preferred to transport the patient to the facility in which their VAD Coordinator works (DMC, MMC, CRMC, etc.). If the patient condition warrants transport to a closer or more appropriate hospital, follow patient destination criteria according to **Merced County EMSA Policy #402 - Patient Destination.**

Special Considerations

- Prehospital providers should rely upon the patient's level of consciousness, skin signs, capillary refill, respirations, and $EtCO_2$ to make clinical decisions. Pulse-oximetry and blood pressure will not be obtainable in patients with a second-generation VAD device
- Patients may be cardioverted or defibrillated if symptomatic
- There are no absolute medication contraindications for VAD patients
- Chest compressions are not contraindicated and can be performed, but only if you are certain the pump is not working and/or there is not any flow through the VAD
  - **Mechanical CPR devices (e.g. Lucas Device) are <u>CONTRAINDICATED</u>**
- Treatment should follow appropriate treatment protocols
- Contact the Base Hospital as needed
- If possible, the patient's family member or caregiver should accompany the patient to the hospital. All related VAD equipment, including spare batteries, should be transported with the patient.
- In arrest situations, determine if a POLST/DNR or Advanced Directive is available

Pit Crew CPR

Indications:
All Medical / Traumatic Cardiac Arrest.
Pediatric Medical Cardiac Arrest – Perform a minimum of 10 minutes of CPR before considering transport.

Procedure:

- Pre-charge the monitor at least 15 seconds before pulse check (femoral pulse) – Continue chest compressions during charging
- Minimize chest compression pause to less than 10 seconds
- Switch compressors every 2 minutes if not using mechanical compression device
- Ventilations:
  - BVM / OPA – 1 breath every 30 seconds
  - Advanced Airway – 1 breath every 6 – 8 seconds

Two Rescuers

Rescuer 1 (Right Torso)	Rescuer 2 (Left Torso)
• Quick Assessment • Move to Floor • Open Airway • Begin Chest Compressions	• Move to Floor • Cut Clothing • Attach AED / Defibrillator • Place OPA • O_2 via Non-Rebreather Mask 15 LPM Only – **No Ventilations** • Switch Compressors Every 2 Minutes

Three Rescuers

Rescuer 1 (Right Torso)	Rescuer 2 (Left Torso)
• Quick Assessment • Move to Floor • Open Airway • Begin Chest Compressions	• Move to Floor • Cut Clothing • Attach AED / Defibrillator • Switch Compressors Every 2 Minutes

Rescuer 3 (Head)

- Assemble BVM / Insert OPA / Attach $EtCO_2$ – If ALS On Scene or Advanced Airway Applied
- Maintains Mask Seal With 2 Thumbs Up Technique
- Chest Compression Coach and Timer

Four Rescuers ALS

Rescuer 1 (Right Torso)	Rescuer 2 (Left Torso)
• Quick Assessment • Move to Floor • Open Airway • Begin Chest Compressions	• Move to Floor • Cut Clothing • Attach AED / Defibrillator • Switch Compressors Every 2 Minutes

Rescuer 3 (Head)	ALS Rescuer 4
• Assemble BVM / Insert OPA / Attach $EtCO_2$ • Maintains Mask Seal With 2 Thumbs Up Technique • Chest Compression Coach and Timer	• Waveform $EtCO_2$ – Within 2 Minutes of Patient Contact • IV/IO – Medications • Advanced Airway As Needed • Gather Patient Information - History
Five or More Rescuers ALS	
Rescuer 1 (Right Torso)	Rescuer 2 (Left Torso)
• Quick Assessment • Move to Floor • Open Airway • Begin Chest Compressions	• Move to Floor • Cut Clothing • Attach AED / Defibrillator • Switch Compressors Every 2 Minutes
Rescuer 3 (Head)	ALS Rescuer 4
• Assemble BVM / Insert OPA / Attach $EtCO_2$ • Maintains Mask Seal With 2 Thumbs Up Technique • Chest Compression Coach and Timer	• Waveform $EtCO_2$ – Within 2 Minutes of Patient Contact • IV/IO – Medications • Advanced Airway As Needed • Gather Patient Information – History
Additional Resources	
• Logistics and Preparation • Switches with Chest Compressors As Needed	

Mechanical Chest Compression Device (LUCAS)

If available, the approved mechanical chest compression device shall be deployed by an EMT level or higher on any patient that meets the indications listed in this policy when the device is available, and the approved training has been completed.

Indications

- Patients 15 years of age or older
- Medical Cardiac Arrest where manual CPR is indicated

Contraindications

- Patients 14 years of age or younger
- If unable to correctly position the device due to size of the patient's chest
- Traumatic Cardiac Arrest
- 3rd Trimester Pregnancy
- If patient has a Ventricular Assist Device (VAD / LVAD) inserted

Procedure

- Initiate resuscitative measures according to **Merced County EMSA Policy #702 – Cardiac Arrest**
- **DO NOT** attempt placement of the mechanical chest compression device until at least three (3) rescuers are available to limit interruptions in chest compressions
- **DO NOT** delay any interventions such as: Defibrillation, Intravenous or Intraosseous access, medication administration for placement of the mechanical chest compression device
- Limit interruption in chest compressions to 10 seconds or less
- Remove all clothing from the front and back of patient's torso
- Follow all manufacturers' recommendations for application and use of the mechanical compression device
- Defibrillation can be performed with the mechanical chest compression device in place. There is no need to stop the device for the purpose of defibrillation
- In the event of disruption or malfunction of the mechanical chest compression device, immediately revert to manual CPR
- If a cardiac arrest patient is transported, the mechanical chest compression device shall remain in place to continue or resume CPR as necessary
- Personnel that deploy a mechanical chest compression device shall ensure that a person trained and qualified to use the device accompanies the patient to the hospital, even if they are not the primary patient caregiver
- All mechanical compression devices will be set at a rate of 100-120 compressions per minute. Changes will only be made with approval of the Merced County EMS Agency Medical Director.

Vascular Access

Establishing IV Access

- Consider establishing IV access in any patient when there is a reasonable chance that the patient's condition may deteriorate enroute, IV medication may be given, or the specific treatment protocol specifies it
- Pre-existing saline lock IVs on the extremities may be used for fluid or medication administration
- If multiple doses of medication are anticipated, consider attaching an IV bag, with tubing to the saline lock with a transfer needle using sterile technique

External Jugular Venipuncture

- Paramedics may use the external jugular vein for IV insertion, if unable to establish an IV via other peripheral routes, and the IV is essential for patient care

Pre-Vascular Access Device (PVAD) – (e.g., arteriovenous shunt, tunneled catheters, and Peripherally Inserted Central Catheters (PICC lines)

- A PVAD should only be used when a life-threatening condition requires immediate fluid therapy or IV medications
- A Base Hospital MICN or Physician should be consulted if the paramedic is unfamiliar with the type of indwelling catheter
- Aseptic technique must be followed
- Attempt to withdraw and discard 5 cc of blood from the device prior to infusion. If unable to withdraw, proceed with the infusion
- Use a Huber-type non-coring needle, whenever possible
- Follow manufacturers recommended settings and insertion techniques

Intraosseous Access

Indications

- In critically ill patients, where IV access is essential, and when one initial IV attempt is unsuccessful, or when no vein is immediately apparent, obtain intraosseous access without further IV attempts
- All prehospital medications administered via the intravenous route may be administered through intraosseous access according to specific protocols

Contraindications

- Fracture of the targeted bone
- Infection at the insertion site
- Burns that disrupt actual bone integrity at the insertion site
- Inability to locate landmarks or excessive tissue over the insertion site

Procedure

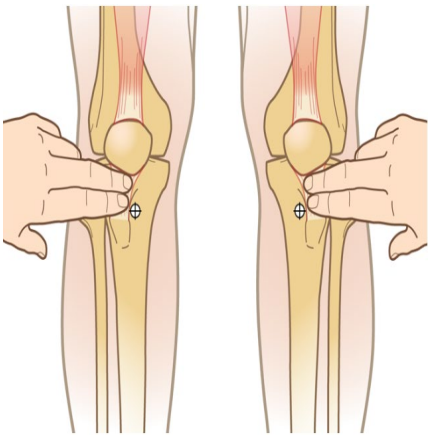
- Approved sites for intraosseous infusion
  - Pediatrics
    - Proximal Tiba – The flat, medial surface of the anterior tibia, 1-2 cm below the tibial tuberosity
    - Distal Femur – Distal anterior femur, midline 3 cm above the patella
  - Adults
    - Proximal Tiba – The flat, medial surface of the anterior tibia, 1-2 cm below the tibial tuberosity
    - Proximal Humerus – Palpate deeply up the humerus to the surgical neck. This may feel like a golf ball on a tee – the spot where the "ball" meets the "tee" is the surgical neck. The insertion site is 1 to 2 cm above the surgical neck, on the most prominent aspect of the greater tubercle
- Proximal Tibia
  - Extend the leg
  - Insertion site is approximately 2 cm medial to the tibial tuberosity, or approximately 3 cm below the patella and approximately 2 cm medial, along the flat aspect of the tibia
  - Aim the Needle Set at a 90-degree angle to center of the bone
  - Gently press the needle through the skin until the tip touches the bone. The 5 mm black mark must be visible above the skin prior to insertion
  - Squeeze the trigger and apply gentle steady pressure. In the event of Driver failure, disconnect the Power Driver, grasp the Needle Hub by hand and advance into the medullary space while twisting back and forth
  - Stabilize hub and remove Driver and Stylet. Place Stylet in an appropriate sharps' container
  - Attach primed extension set firmly secure to Catheter hub with clamp open
  - Confirm placement. Flush the EZ-IO Catheter with normal saline (5–10 ml for adults; 2–5

ml for infants/children)

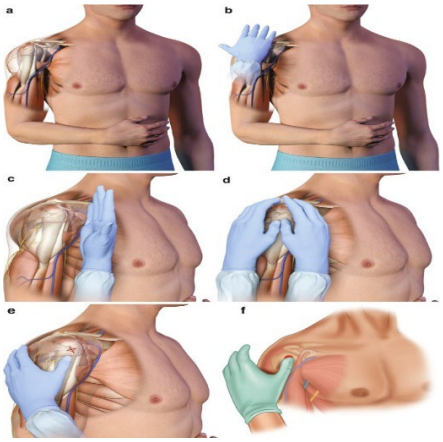
- Proximal Humerus
  - Place the patient's hand over the abdomen (elbow adducted and humerus internally rotated). Place your palm on the patient's shoulder anteriorly. The area that feels like a "ball" under your palm is the general target area. You should be able to feel this "ball" area, even on obese patients, by pushing deeply
  - Place the ulnar aspect of your hand vertically over the axilla. Place the ulnar aspect of your other hand along the midline of the upper arm laterally
  - Place your thumbs together over the arm. This identifies the vertical line of insertion on the proximal humerus
  - Palpate deeply up the humerus to the surgical neck. This may feel like a golf ball on a tee – the spot where the "ball" meets the "tee" is the surgical neck. The insertion site is 1 to 2 cm above the surgical neck, on the most prominent aspect of the greater tubercle
  - Point the needle set tip at a 45-degree angle to the anterior plane and posteromedial
  - Gently press the needle through the skin until the tip touches the bone. The 5 mm black mark on the needle set must be visible above the skin prior to insertion
  - Squeeze the trigger, apply gentle steady pressure. In the event of Driver failure, disconnect the Power Driver, grasp the Needle Set Hub by hand and advance into the medullary space while twisting
  - Stabilize hub and remove driver and stylet. Place stylet in an appropriate sharps' container
  - Attach primed extension set, firmly secure to catheter hub with clamp open
  - Confirm placement. Flush the EZ-IO Catheter with 5-10 mL normal saline
- Distal Femur
  - Secure the leg outstretched to ensure the knee does not bend
  - Identify the patella by palpation. The insertion site is just proximal to the patella (maximum 1 cm) and approximately 1–2 cm medial to midline
  - Aim the Needle Set tip at a 90-degree angle to the center of the bone
  - Gently press the needle through the skin until the tip touches the bone. The 5 mm black mark must be visible above the skin prior to insertion
  - Squeeze the trigger and apply gentle steady pressure. In the event of Driver failure, disconnect the Power Driver, grasp the Needle Hub by hand and advance into the medullary space while twisting back and forth
  - Stabilize hub and remove Driver and Stylet. Place Stylet in an appropriate sharps' container
  - Attach primed extension set firmly secure to Catheter hub with clamp open
  - Confirm placement. Flush the EZ-IO Catheter with 2–5 ml normal saline

- For Conscious Patients
  - IO infusion is very painful for conscious patients
  - If conscious, administer Lidocaine to the patient via the IO for local anesthesia prior to fluid administration
    - Adult: 40 mg slow IVP over 30-45 seconds
    - Pediatric: 0.5 mg/kg slow IVP over 30-45 seconds, max dose 40 mg

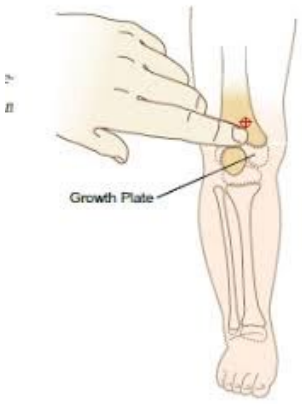
Proximal Tibia



Proximal Humerus



Distal Femur



Routine Newborn Delivery

Birth may be imminent if the patient is having regular contractions/low back pain, bloody show, rupture of membranes or feels like bearing down/pushing/or having a bowel movement. Attempt to provide privacy and psychosocial support. Allow position of comfort and encourage controlled breathing.

Obtain pertinent history:

- Last menstrual period (LMP)
- Determine gestational weeks in the pregnancy
- Gravida (G) = how many pregnancies
- Para (P) = how many live births

Determine the length of contractions or change in vision (signs of eclampsia).

Always ask permission before visualizing the vaginal opening for signs of crowning or abnormal presentations.

Control the decent

- Place hand over the head to prevent explosive delivery
- Apply gentle pressure to the perinium to possibly prevent tearing and ease of delivery

Suction the mouth and nose

- This should be accomplished before the first breath is taken

Check for the cord looped around the neck

- If present, slip the cord over the head or across the shoulder
- If the cord is tight around the neck and is preventing descent or oxygenation, double clamp and cut between clamps

Head rotates laterally

- This step should happen spontaneously

Deliver anterior shoulder

- Gently lower the head to deliver the anterior (upper) shoulder
- If the anterior shoulder does not deliver, attempt to deliver posterior shoulder by gently raising the head. Alternate between the two until one shoulder delivers

After delivery of the shoulders, the body should then deliver smoothly

Suction mouth and nose

- Immediately suction the mouth and nose with a bulb syringe. Hold the baby in a slightly head down position

Cut cord

- Double clamp the cord at approximately 7 inches and 10 inches from newborn's navel and cut between clamps
- May delay clamping cord (30 to 60 seconds)

Dry newborn

- Place the infant in a blanket to keep warm. Place newborn on mother's abdomen or breast

- If the blanket is wet, replace it with dry blanket to prevent heat loss

Assess newborn

- Assess infant for APGAR scoring at one (1) and five (5) minutes: continually reassess CAB
- **Refer to EMS Policy #749 - Newborn Resuscitation if indicated**

Massage the fundus

- Following the delivery of the baby, put the baby to mother's breast and massage the fundus

Placenta delivery

- When the placenta is delivered, transport it in a plastic bag. Do not pull the cord to deliver the placenta
- The placenta should be delivered approximately 20 minutes after the birth

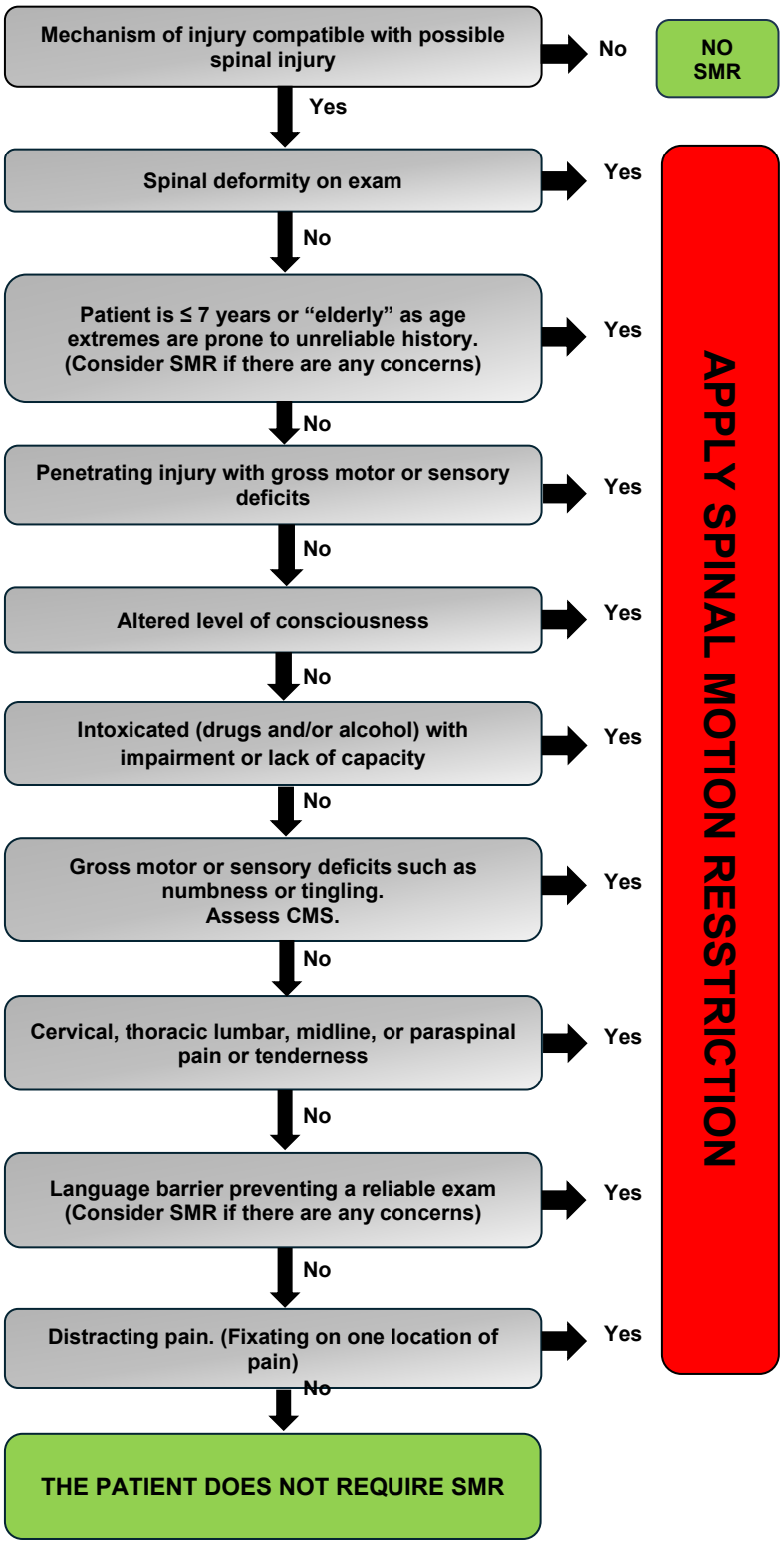
Hemorrhage – For Severe post-partum hemorrhage post-delivery, **refer to EMS Policy #758 –TXA / Bleeding Control**

APGAR Sign	0	1	2
Appearance (Skin Color)	Bluish gray or pale skin	Pink body with blue hands and/or feet	Entire body is pink
Pulse (Heart Rate)	No pulse	<100 bpm	At least 100 bpm
Grimace (Reflexes)	No response	Grimaces	Grimaces and coughs; cries; pulls away or sneezes
Activity (Muscle Tone)	Limp or weak movements	Some movement of arms and legs	Active movement
Respiration (Breathing)	Not breathing	Slow or irregular breathing; a weak cry	Normal breathing rate and effort; strong cry

Spinal Motion Restriction (SMR)

PEARLS

- A rigid cervical collar should not be placed or shall be removed if:
  1. The collar creates an airway compromise
  2. The appropriately sized collar is unavailable
  3. The collar increases pain
  4. The patient's anatomy precludes fitting a collar (i.e. severe curvature of the spine)
  5. The patient is combative & fighting the application of the collar
- Patients already immobilized should remain immobilized
- Patients with penetrating injuries do not require SMR unless they meet specific criteria in the algorithm
- Long Spine Boards should be avoided in ambulatory patients
- Elderly or kyphotic individuals requiring SMR may require vacuum immobilization devices
- SMR does not take precedence over airway or cardiovascular stabilization
- Leave helmets and shoulder pads in place unless they interfere with resuscitation
- Ambulatory patients and those that can self-extricate, are cooperative, can follow instructions, and who have only midline cervical or thoracic pain may be placed in a rigid collar and secured to the ambulance gurney (No Long Spine Board Necessary)



Tourniquet

Indications:

1. Life threatening extremity hemorrhage that cannot be controlled by other means.
2. May be appropriate for use to control hemorrhage in multi-casualty incidents.

Contraindications:

1. Non-extremity hemorrhage.
2. Hemorrhage that can be controlled with pressure or dressings.

Procedure:

1. Place tourniquet proximal to wound.
2. Tighten until hemorrhage stops or distal pulses in affected extremity disappear.
3. Secure the tourniquet and mark the time of application on extremity.
4. Note the time of tourniquet application in the electronic medical record and communicate this to the receiving facility.
5. Dress wounds as necessary.
6. If one tourniquet is not sufficient or not functional to control hemorrhage, consider the application of a second tourniquet more proximal to the first.