

LOYOLA EMERGENCY MEDICAL SERVICES SYSTEM



Procedure Manual 2012

Procedure Manual

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12 Lead ECG Monitoring

Indications

- See SOP – *Adult Suspected Cardiac Patient with Chest Pain*

Absolute contraindications

- None

Potential Complications

- None

Equipment needed

- 12 Lead capable monitor

Procedure

1. Lead placement
 - RA: right arm
 - LA: left arm
 - LL: left leg
 - RL: right leg
 - V1: 4th intercostal space, right of sternum
 - V2: 4th intercostal space, left of sternum
 - V3: between V2 and V4 over 5th rib or 5th intercostal space
 - V4: 5th intercostal space, at the midclavicular line
 - V5: 5th intercostal space, at the anterior axillary line
 - V6: 5th intercostal space, at the mid-axillary line
2. Interpret data
3. Select appropriate facility
4. Transmit 12 Lead (if available)
5. Continue appropriate care, documentation and assessment

Nasopharyngeal Airway Insertion

Indications

- Unresponsive patients, with a gag reflex, who are unable to maintain own airway
- Unresponsive patients being ventilated with a bag-valve mask

Contraindications

- Facial/head trauma
- Anomalous facial features
- Deviated septum
- Bleeding disorders (use with caution)

Potential Complications

- May cause trauma to nasal mucosa
- Wrong size may cause esophageal intubation
- Rarely, vomiting may occur if gag reflex is stimulated

Procedure

1. Consider appropriate body substance isolation
2. Select appropriate sized airway
 - Measure the airway from the nostril to the earlobe or angle of the jaw
3. Lubricate device using water soluble jelly
4. Slowly insert the airway into right nostril with the bevel toward the septum
5. Continue to advance the airway straight down, perpendicular to the face following the shape of the nose
6. Maintain the airway and continue ongoing assessment by frequently checking for proper position

Paramedic Care: Principals & Practice 3^d Edition
Brady, 2009

Oropharyngeal Airway Insertion - Adult

Indications

- Unresponsive patients who are unable to maintain own airway
- Unresponsive patients being ventilated with a bag-valve mask
- To be used as a bite block to protect endotracheal tube

Contraindications

- Patients with an intact gag reflex
- Patients with foreign body airway obstruction

Potential Complications

- Improper size/insertion may displace tongue and obstruct hypopharynx
- May cause aspiration

Adult Procedure

1. Consider appropriate body substance isolation
2. Select appropriate sized airway
 - Measure airway from the corner of the mouth to the earlobe or angle of the jaw
3. Open patient's mouth using jaw thrust or cross-finger techniques
4. Insert airway with the tip pointed toward patient's hard palate
5. Rotate airway 180° when no resistance is felt and the airway reaches the soft palate
6. Monitor, suction and ventilate patient as necessary

Oropharyngeal Airway Insertion - Pediatric

1. Consider appropriate body substance isolation
2. Select appropriate sized airway
 - Measure airway from the corner of the mouth to the earlobe or angle of the jaw
3. Open patient's mouth using jaw thrust or cross-finger techniques
4. Utilizing a tongue depressor, depress patient's tongue and insert airway following normal curvature of airway to protect undeveloped hard palate
5. Monitor, suction and ventilate patient as necessary

ALS Combitube (Dual lumen airway device)

Indications

- If unable to obtain endotracheal tube placement via direct visualization of the vocal chords in the following situations:
 - Respiratory or Cardiac Arrest
 - Unresponsive/Unconscious patient with risk of aspiration

Absolute contraindications

- Responsive patients with an intact gag reflex
- Patients with known esophageal disease
- Patients who have ingested caustic substances
- Patients under 4ft (122 cm) tall

Potential Complications

- Equipment malfunction
- Hypoxia
- Ventilation through incorrect lumen

Equipment needed

- Bag-valve-mask
- Oxygen source
- Combitube
 - 1. 37fr for patients 4' to 6' tall
 - 2. 41fr for patients 5' tall and above
- 100cc syringe
- 15cc syringe
- Water soluble lubricant
- Suctioning equipment

Procedure

1. Consider appropriate body substance isolation
2. Open airway utilizing appropriate manual airway maneuver
3. Insert correct oropharyngeal or nasopharyngeal airway
4. Ventilate patient using BVM and 100% oxygen for 30 seconds prior to intubation attempt
5. Check equipment for air leaks in cuffs and lubricate device
6. Stop ventilations and remove oropharyngeal or nasopharyngeal airway
7. Open airway using tongue-jaw-lift technique
8. Insert Combitube into mouth along midline of body until patients teeth are in-between black lines assuring proper depth
9. Inflate the 100cc cuff and remove syringe
10. Inflate the 15cc cuff and remove syringe
11. Ventilate through lumen marked "1". This lumen terminates through the fluted end

12. Assess placement via auscultation over epigastrium and lungs.
Check patient for chest rise and fall
 - a. If epigastric sounds noted and/or lung sounds absent, IMMEDIATELY STOP VENTILATIONS AND CONTINUE TO STEP 13
 - b. If epigastric sounds are absent and equal lung sounds noted, SKIP TO STEP 14

13. Ventilate through lumen marked "2". This lumen terminates through the distal end. Assess for placement of tube via auscultation over epigastrium and lungs
 - a. If epigastric sounds present and/or absent lung sounds, IMMEDIATELY STOP VENTILATIONS AND RETURN TO STEP 11 TO RECONSIDER PLACEMENT
 - b. If epigastric sounds are absent and lung sounds present continue to step 14

14. Resume ventilations, secure combitube and continue ongoing assessment

If unable to confirm placement and use of appropriate lumen, extubate patient and continue mechanical ventilations using BVM and BLS airway adjunct.

Tyco Healthcare Combitube insert

*Paramedic Care: Principals & Practice 3rd Edition
Brady, 2009*

Application of an Auto-Injector

Indications

- Review indications specific to medication

Contraindications

- Review contraindications specific to medication

Equipment needed

- Correct auto-injector

Procedure

1. Review the "5 Rs" of medication administration
 - a. **R**ight medication
 - b. **R**ight patient
 - c. **R**ight indications
 - d. **R**ight date of medication
 - e. **R**ight color of medication
2. Remove the auto-injector from any protective outer casing
3. Remove bulky clothing from patients thigh
4. Remove grey safety from top of auto-injector
5. Firmly press black tip of auto-injector into patients thigh and hold in place for 10 seconds
6. Continue ongoing assessment and document administration of medication

BLS Skills Review

Jones and Bartlett Publishing
2009

Capnography

Indications

- Capnography shall be used when available with all endotracheal or Combitube airways.

Procedure

1. Attach capnography sensor to combitube or endotracheal tube.
2. Note CO₂ level and waveform changes. These will be documented on each respiratory failure or cardiac arrest patient.
3. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
4. Any loss of CO₂ detection or waveform indicates an airway problem and should be documented.
5. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
6. Document the procedure and results on/with the Patient Care Report (PCR).

Port-o-Vent CPAP Device

Indications

- Hypoxemia secondary to Congestive Heart Failure/Pulmonary Edema
 - For relief of Hypoxemia and Shortness of Breath/Dyspnea
 - An adequately, spontaneous breathing patient

Absolute contraindications

- Respiratory Arrest
- Agonal respirations
- Unconscious
- Shock associated with cardiac insufficiency
- Pneumothorax
- Penetrating chest trauma
- Persistent nausea/vomiting
- Facial anomalies / Stroke/ Facial Trauma

Potential Complications

- Respiratory Fatigue
- Equipment malfunction
- Patient inability to tolerate

Equipment needed

- Port-o-Vent CPAP unit
- Oxygen source
- CPAP circuit with tubing/mask/hepa filter

Procedure

1. Connect green oxygen hose to the inlet of the CPAP unit. Start with a full tank or at a minimum of 1000 psi. A full "D" tank at 2200PSI will last 25 to 35 minutes based on patients tidal volume and breathing rate. When the tank reaches below 500 PSI disconnect the tank and transfer to a new one.
Unit does not have a back up battery and operates on a 40-70 PSI oxygen regulator. If a minimum of 40 PSI in not given unit will shut off.
2. Place the distal end of the circuit into the CPAP black o-ring outlet. Turn tight and lock into position. Attach white bacterial/viral filter (Hepa), then place appropriate size face mask on the proximal end of the circuit.
3. Assess vital signs
4. Attach heart monitor and pulse oximeter
5. Turn regulator on and allow oxygen to free flow. The patient will immediately access demand oxygen and trigger unit.

6. Coach patient to place and hold the mask on their face and instruct them to breathe in through their nose slowly and exhale through their mouth as long as possible. This is essential to improve patient compliance. **A good seal must be maintained.**
7. Initial setting **is 5 cmH₂O**. Allow patient to obtain comfort level and reassess. Obtain vital signs and pulse ox.
8. Explain to patient that you will begin to slowly increase the pressure and to continue exhaling out against the pressure as long as possible. Maximum pressure is **10 cmH₂O**
When appropriate attach the head strap to the mask by placing each of 4 straps over each of the 4 posts on the mask and secure comfortably on patient.
9. Treatment should be maintained throughout transport to ED.
10. In event of change in mental status or patient condition, discontinue use and follow appropriate SOP.

Note: **Gauge is color coded**

Green is good

Yellow is caution

Red is for Danger If gauge goes into red, lower the pressure or discontinue use

Immediately

Unit has internal machine pop-off at 22 cmH₂O.

Wide swings or fluctuations in the gauge indicate that the patient is not getting adequate CPAP.

Emergent Respiratory Products CPAP Instructions for Use (www.eresp.com)
Emergent Port-o-Vent Protocol (rev 12.01 2004)

Needle Cricothyrotomy

Indications

- Pediatric patients under the age of 15
- Foreign body airway obstruction following unsuccessful attempts to remove object using abdominal thrusts
- Foreign body airway obstruction following unsuccessful attempts to remove object using direct laryngoscopy
- Tracheal/laryngeal closure due to severe edema secondary to trauma, allergic reaction or smoke inhalation
- Facial trauma that inhibits oral endotracheal intubation
- Anomalous facial features that inhibit oral endotracheal intubation

Contraindications

- An unobstructed airway that can be maintained utilizing other less invasive techniques
 - Oropharyngeal airway with head-tilt-chin-lift
 - Nasopharyngeal airway with head-tilt-chin-lift
 - Orotracheal intubation
 - Nasotracheal intubation

Complications

- Incorrect needle placement into a false passage
- Cricoid and/or thyroid cartilage damage
- Thyroid gland damage
- Severe bleeding
- Laryngeal nerve damage
- Subcutaneous emphysema
- Vocal cord damage
- Infection

Equipment needed

- Alcohol wipe
- 14 ga. 3 inch angiocath
- 10cc syringe
- Adapter from #3 ET tube
- Tape
- Suction

Needle Cricothyrotomy, continued

Procedure

1. Consider appropriate body substance isolation, including sterile gloves
2. Attempt to ventilate the patient with BVM
3. Attach empty syringe to 14ga angiocath
4. Stabilize thyroid cartilage
5. Locate the cricothyroid membrane
6. Clean the site using alcohol wipe utilizing a sterile technique
7. Directing needle caudally at a 45 degree angle, slowly insert angiocath into cricothyroid membrane while aspirating syringe (upon entering the airway, air will be drawn into syringe signaling proper placement).
8. Remove needle and syringe while holding catheter in place
9. Attach #3 ET tube adapter to catheter
10. Attach appropriate sized BVM onto ET tube adapter
11. Ventilate and confirm placement by listening for the absence of breath sounds over the epigastrium and the presence of breath sounds in bilateral lung fields
12. Secure angiocath
13. Continue ventilations and perform ongoing assessment

*Critical Care Transport
Jones and Bartlett, 2011*

Surgical Cricothyrotomy

Indications

- Foreign body airway obstruction following unsuccessful attempts to remove object using abdominal thrusts
- Foreign body airway obstruction following unsuccessful attempts to remove object using direct laryngoscopy
- Tracheal/laryngeal closure due to severe edema secondary to trauma, allergic reaction or smoke inhalation
- Facial trauma that inhibits oral endotracheal intubation
- Anomalous facial features that inhibits oral endotracheal intubation

Contraindications

- Pediatric patients under the age of 12 (see needle cricothyrotomy)
- An unobstructed airway that can be maintained utilizing other less invasive techniques
 - Oropharyngeal airway with head-tilt-chin-lift
 - Nasopharyngeal airway with head-tilt-chin-lift
 - Oraltracheal intubation
 - Nasotracheal intubation

Complications

- Incorrect tube placement into a false passage
- Cricoid and/or thyroid cartilage damage
- Thyroid gland damage
- Severe bleeding
- Laryngeal nerve damage
- Subcutaneous emphysema
- Vocal cord damage
- Infection

Equipment needed

- Sterile gloves
- Povidon-iodine solution
- Sterile 4"X4" gauze pads
- Curved hemostat
- #10 disposable scalpel
- #6 size Endotracheal tube
- 10cc syringe
- Tape
- Suction

Surgical Cricothyrotomy, continued

Procedure

1. Consider appropriate body substance isolation, including sterile gloves
2. Locate the cricothyroid membrane
3. Clean the site using povidon-iodine solution utilizing a sterile technique
4. Stabilize the larynx and make a 1 to 2cm, vertical incision through the skin, directly over the cricothyroid membrane
5. Visualize the cricothyroid membrane and make a 1cm incision through the membrane
6. Insert the curved hemostat into the opening and spread the membrane incision open
7. Insert the #6 ET tube through the incision opening
8. Inflate the distal cuff to 10cc of air
9. Ventilate and confirm placement by listening for the absence of breath sounds over the epigastrium and the presence of breath sounds in bilateral lung fields
10. Secure the ET tube and dress incision using tape and sterile 4"X4" gauze
11. Reconfirm placement and evaluate patient

ALS Skills Review
AAOS Publications, 2009

Critical Care Transport
AAOS Publications, 2011

Needle Decompression

Indications

- Tension Pneumothorax
 - Difficult ventilation despite an open airway
 - JVD
 - Signs of impending cardiovascular collapse
 - Traumatic arrest
 - Absent or diminished breath sounds on the affected side

Absolute contraindications

- None when used to treat a tension pneumothorax

Potential Complications

- Bleeding or nerve damage if inappropriately placed

Equipment needed

- 14 ga x 2" or larger angiocath (ARS)
- Alcohol wipes
- 10cc syringe
- 2cc saline
- Asherman Chest Seal or latex glove tip to create flutter valve (optional)

Procedure

1. Consider appropriate body substance isolation
2. Attach angiocath to syringe filled with 2cc saline (flutter valve if desired)
3. Select appropriate site:
 - a. Midclavicular, 2nd intercostal space (above 3rd rib)
4. Clean site with alcohol wipe using sterile technique
5. Insert needle at 90 degree angle, above rib
6. Aspirate syringe looking for bubbles in the syringe
7. Remove needle and secure remaining catheter
8. Continue assessment of patient
9. During ongoing assessment, consider additional decompressions if repeat signs of tension pneumothorax develop

Critical Care and Transport
Jones and Bartlett, 2010

Defibrillation

Indications

- Ventricular Fibrillation
- Ventricular Tachycardia without a pulse

Absolute contraindications

- Ventricular Tachycardia with a pulse
- Patients with a spontaneous pulse

Potential Complications

- Accidental contact with patient by EMS provider
- Incorrectly sized pads/paddles
- Medication patches
- Expired defibrillation pads

Equipment needed

- Cardiac Monitor with defibrillation capabilities
- Appropriately sized defibrillation pads
- Appropriately sized defibrillation paddles
 - Conductive medium
 - Saline gel pads
 - Conductive jelly
- Razor

Procedure

1. Consider appropriate body substance isolation
2. Apply pads/paddles to patients bare chest ensuring correct placement as per monitor's manufacturer's recommendations. (Apex & Sternum, or, Anterior & Posterior)
 - a. Consider shaving patient's chest to obtain optimal contact between pad and skin
 - b. Use conductive medium between paddles and chest
 - c. Remove any transdermal medication patches in area and avoid pad/paddle placement over implanted pacemaker or AICD.
3. Select appropriate energy setting
 - a. 360 J for monophasic
 - b. Manufacturer's suggested biphasic setting
4. Charge device to appropriate energy setting
5. Ensure safety of self and other crew members by surveying patient to avoid accidental patient contact and announce a verbal warning that you will be discharging the defibrillator. "I'm clear, you're clear, we are all clear"
6. Discharge defibrillator by:
 - d. Paddles- depress both discharge buttons located on the paddles at the same time
 - e. Pads – locate and depress the discharge/shock button found on the monitor
7. Reevaluate patient and follow system protocols

EZ-IO

Indications

- Cardiac or traumatic arrest patients in need of IV/IO access for resuscitation
- Unresponsive or extremely altered mental status patients where cardiac arrest is imminent and patient is in need of IV/IO access

Absolute contraindications

- Patients who are responsive to verbal stimuli
- Patients < 3 kg
- Inability to locate anatomical landmarks
- Infection at site of procedure
- Fracture at site of procedure
- Prosthesis or signs of orthopedic surgery at site of procedure

Potential Complications

- Improper insertion

Equipment needed

- EZ-IO drill
- Proper sized needle
- Extension set
- Alcohol swabs
- Macro drip tubing
- .9% Normal Saline for infusion
- Pressure infuser
- 20 cc saline flush
- Appropriate body substance isolation equipment

Procedure

1. Select and don appropriate body substance isolation equipment
2. Prepare equipment
 - a. Assemble saline, extension sets and drip tubing, flushing line completely
 - b. Attach pressure infuser bag
 - c. Select appropriate sized needle dependent upon amount of patient tissue at insertion site
 1. < 3 kg to > 39 kg (15 mm)
 2. > 40 kg (25 mm)
 3. LD (45 mm) needle for humeral head placement or excessive tissue at desired site
 - d. Attach needle to drill
 - e. Prepare flush (flush extension set)

3. Locate anatomical landmark
 - a. Proximal humeral head placement
 1. Place distal arm across patient's abdomen to isolate proximal head
 - b. Proximal medial tibia placement
4. Cleanse selected site with alcohol swabs utilizing sterile technique
5. Insert appropriately sized needle, at a 90 degree angle, into skin until contact with bone is achieved
 - a. Ensure that a minimum of one depth mark on needle is visible above level of skin
 - b. If unable to locate depth marking, remove needle and select a larger size
6. Depress and hold trigger allowing natural weight of drill to drive needle into bone
7. Release trigger once IO needle **hub** flush with skin
8. Remove drill from needle
9. Grasp needle and unscrew and remove internal stylet
10. Attach saline flush to IO needle and attempt to aspirate bone marrow to confirm placement
11. Regardless of aspiration results, inject saline bolus into bone cavity with force creating a pocket within the marrow
 - a. Observe for indications of inappropriate placement such as swelling/fluid leakage around site
12. Remove empty saline flush and attach extension set/macro drip tubing to hub and inflate pressure infuser
13. Adjust drip rate to desired flow
14. Evaluate site during ongoing assessment to ensure proper needle placement

VidaCare EZIO Procedure Manual

Helmet Removal

Indications

- Confirmed or suspected spinal injury
AND one or more of the following:
 - The helmet obstructs airway assessment and treatment
 - The helmet inhibits in-line spinal immobilization

Contraindications

- None in the presence of airway compromise or the inability to maintain in-line spinal immobilization

Complications

- Cervical trauma if performed incorrectly
- Facial trauma if performed incorrectly

Procedure

1. Consider appropriate body substance isolation
2. Position Rescuer 1 above or behind the patient, then manually place and maintain the patient's head in the neutral, in-line position
3. Rescuer 2 is positioned to the side of the patient and removes the chin strap
4. Rescuer 2 then assumes cervical stabilization by placing one hand behind the neck and the second hand on the anterior neck
5. Rescuer 1 now pulls the helmet laterally to free patient's ears while pulling up to remove the helmet. Full face helmets may require a small tilt backwards to clear the patient's nose.
6. As the helmet is removed, Rescuer 2 slides their hand up the back of the head to support the weight of the patient's head after helmet is removed.
7. Once helmet is completely removed, Rescuer 1 now reassumes manual in-line stabilization
8. Rescuer 1 must gently guide patients head down to ground to achieve true, neutral, in-line stabilization. Rescuer 1 must stop if the patient experiences an increase in pain or there is resistance in the neck.
 - If resistance is met or patient experiences an increase in pain, stop and place padding under head and immobilize in place.
9. Rescuer 2 then applies an appropriately sized cervical collar

Special considerations

- Football helmets do not need to be removed when the patient is wearing properly sized shoulder pads. The "grill" on the football helmet is easily removed by either unscrewing or cutting at the plastic keeper tabs.

Digital Intubation

Indications

- Cardiac arrest or near arrest
- When other techniques for intubation have failed, obese patient or the patient has a short neck and unable to provide adequate ventilations using BVM and BLS airway device
- Oral secretions are obscuring the view, and the head cannot be moved due to trauma, or immobilization equipment is complicating other techniques
- Massive trauma has made identification of intubation landmarks impossible

Contraindications

- Patients with a gag reflex
- Inability to open the mouth due to trauma, dislocation, fracture, or pathological condition

Potential Complications

- Hypoxia
- Esophageal placement

Procedure

1. Consider appropriate body substance isolation
2. Preoxygenate the patient with BVM and 100% oxygen for minimum of 30 seconds prior to intubation attempt
3. Select and check appropriate equipment
 - a. Correct size ET tube
 - b. Check ETT cuff for leaks
 - c. Stylet
 - d. Lubrication
 - e. Benzocaine
 - f. Bite block
4. Kneel next to the patient
5. Place patients head in neutral position
6. Stop ventilations, apply Benzocain (1 second spray to posterior pharynx, x2) and insert bite block
7. Insert your left index and middle fingers into the patient's mouth and shift the patient's tongue forward as you advance your fingers toward the larynx
8. Palpate and lift the epiglottis with your left middle finger
9. With right hand, advance tube between the fingers of your left hand and into the trachea. Guide it in between the vocal cords with your left index finger.
10. Remove stylet, inflate distal cuff and ventilate
11. Confirm tube placement by auscultation over the epigastrium and then chest.
12. Attach ETCO2 detector and secure ET tube
13. Reconfirm correct tube placement after any patient movement

Nasotracheal Intubation

Indications

- Patients who are awake and breathing but are in danger of respiratory failure
- Patients with a gag reflex
- Patients who are breathing but cannot open mouth

Contraindications

- Apneic or near-apneic patients
- Inability to pass tube through the nostril
- Blood clotting or anticoagulation therapy
- Signs of head injury

Potential Complications

- Equipment malfunction
- Soft-tissue trauma and bleeding to the nasopharynx
- Hypoxia
- Esophageal placement
- Vomiting

Procedure

1. Consider appropriate body substance isolation
2. Select and check appropriate equipment
 - a. Correct size ET tube
 - b. Check ETT cuff for leaks
 - c. Lubricant
 - d. Benzocaine
3. Form ET tube into a circle
4. Lubricate ET tube
5. Benzocaine to nostrils and pharynx (1 second spray x 2)
6. Gently insert ET tube into either nostril with bevel of the tube toward the septum
7. Advance the tube until the tip passes through the nasopharynx. Listen for breath sounds and look for condensation in the tube
8. As the tube approaches the larynx, breath sounds will be amplified. Gently and evenly push the tube into the larynx during inspiration. BVM adapter should be resting close to or on nostril
9. Inflate distal cuff with air
10. Connect bag-valve and ventilate
11. Check to assure absence of epigastric sounds and presence of bilateral lung sounds
12. Attach ETCO2 detector and secure ET tube
13. Reconfirm correct tube placement after any patient movement

Oral Endotracheal Intubation

Indications

- Respiratory or Cardiac Arrest
- Unresponsive/Unconscious patient with risk of aspiration
- Internal splinting for flail chest segments

Absolute contraindications

- None

Potential Complications

- Equipment malfunction
- Teeth breakage and soft-tissue trauma
- Hypoxia
- Esophageal placement

Procedure

1. Consider appropriate body substance isolation
2. Open airway utilizing appropriate manual airway maneuver
3. Insert correct oropharyngeal or nasopharyngeal airway
4. Ventilate patient using BVM and 100% oxygen for 30 seconds prior to intubation attempt
5. Select and check appropriate equipment
 - a. Correct size laryngoscope blade
 - b. Correct size ET tube
 - c. Check ETT cuff for leaks
 - d. Check laryngoscope for correct light and tight bulb
 - e. Stylet
 - f. Lubrication
6. Stop ventilations
7. Spray Benzocaine into oropharynx (1 second spray, x2)
8. Insert laryngoscope blade into right side of mouth, sweeping tongue to left, to the depth of the appropriate landmark
 - a. Curved blade to the vallecula
 - b. Straight blade to distal epiglottis
9. Lift laryngoscope up and away from patients face at 45 degree angle elevating patients jaw
10. Visualize vocal chords in glottic opening
 - a. Consider Sellick's Maneuver
11. Insert ET tube past vocal chords until the distal cuff is completely past vocal chords
12. Inflate distal cuff with air
13. Remove laryngoscope from mouth
14. Remove stylet
15. Connect bag-valve to proximal end of ET tube and ventilate
16. Check to assure absence of epigastric sounds and presence of bilateral lung sounds
17. Attach ETCO2 detector, for further confirmation of proper tube placement
18. Document number on tube at teeth and secure ET tube
19. Reconfirm correct tube placement after any patient movement

Morgan Lens

Indications

- Foreign Body removal
- Chemical eye injuries
- Thermal eye injuries

Absolute Contraindications

- Penetrating trauma to the globe of the eye
- Suspected or actual rupture of the globe

Potential Complications

- Discomfort during lavage

Equipment Needed

- Morgan lens
- 1000 ml normal saline
- IV drip tubing
- Tetracaine (optional)

Procedure

1. Remove contact lenses
2. Consider tetracaine
3. Consider preflush to remove large particles
4. Connect Morgan lens to drip tubing and flush
5. Instruct patient to look down and while lifting lower eyelid, insert lens under upper eyelid
6. Instruct patient to look up and while lifting lower eyelid, insert lens under lower eyelid
7. Secure lens tubing to patient
8. Lens must "float" over cornea and sclera. Do not allow the Morgan lens to run dry and make contact with eye

Nasal Atomizer

Indications

- Unable to obtain venous access
- Patient need for administration of
 - **Versed** for seizures/status epilepticus
 - **Narcan** for suspected opiate overdose

Contraindications

- Facial trauma
- Inappropriate volume/ concentration of medication
- Nose bleed, nasal congestion or nasal discharge

Procedure

1. Draw up the appropriate dose of medication in 2ml of fluid
 - Adult seizure – **Versed**: 10mg in 2ml fluid
 - Adult overdose – **Narcan**: 2mg in 2ml
 - Pediatric seizure - **Versed**: 0.2 mg/kg (diluted to 2ml)
 - Pediatric overdose – **Narcan**:
 - <20 kg, 0.1 mg/kg (diluted to 2ml)
 - >20kg, 2mg in 2ml of fluid
2. Attach atomizer to syringe
3. Insert atomizer 1.5 cm into one nostril
4. Briskly compress the syringe to administer half of medication (1ml total volume)
5. Remove and repeat in the other nostril until all of the medication has been administered
6. Monitor patient
7. Document medication, route, dose and fluid amount
8. Continue on-going assessment

NOTE: SPONTANEOUS RESPIRATIONS ARE REQUIRED TO ATOMIZE NARCAN

2010 SOP Manual

ALS Skills Review
AAOS Publications, 2010

Nitrous Oxide Administration

Indications

- The management of pain from musculoskeletal injuries

Absolute Contraindications

- Patients who cannot understand verbal instructions
- Suspected intoxication
- Altered mental status
- Patients with a medical history of COPD
- Thoracic injuries

Potential Complications

- Adverse effects: Dizziness, light-headedness, altered mental status, hallucinations, nausea and vomiting
- May potentiate the effects of CNS depressants including alcohol
- Effect of medication will quickly dissipate within 2-5 minutes

Equipment Needed

- Nitrous oxide/oxygen regulation device
- Delivery mask
- Oxygen supply
- Nitrous oxide supply

Procedure

1. Nitrous oxide is considered to be "self-administered." The patient must be allowed to begin and end the delivery of the medication.
2. Due to the variety of delivery devices, providers must follow the manufacturer's suggested procedure for use.
3. A ration of 50% nitrous and 50% oxygen is the most widely adopted mixture

Oxygen Administration

Indications

- Patients requiring oxygen include, but are not limited to:
 - Respiratory distress
 - Respiratory failure
 - Respiratory arrest
 - General hypoxia
 - Shock
 - Myocardial infarction
 - Stroke
 - Cardiac arrest

Contraindications

- None when the patient meets indications

Procedure

1. Consider appropriate body substance isolation
2. Assemble regulator to tank
3. Open tank
4. Check for leaks
5. Check tank pressure
6. Attach oxygen delivery device

Oxygen Delivery Devices

Device	Flow Rate	Use	Oxygen Delivered
Nasal Cannula	2-6 L/min	Used for basic oxygen supplementation or patient who cannot tolerate a mask	24% to 44%
Nonrebreather Mask (NRB)	12-15 L/min	Use in treating conditions of hypoxia and shock. Always prefill the reservoir prior to placing the mask on the patient	80% to 90%
Bag-Valve Mask Device	15L/min	Used when the patient's ventilatory status is insufficient. May begin ventilations without supplemental oxygen for 1 min. if necessary	-O2 without reservoir: 60% -O2 with reservoir tube: 90% -O2 with reservoir bag: 100% -Without O2: 21%

Transcutaneous Cardiac Pacing

Indications

- Unstable bradycardic rhythms (Systolic BP <100, altered mental status, systemic signs of hypoperfusion)
- Sinus Bradycardia
- 2nd Degree Type II AV Block
- 3rd Degree AV Block

Absolute contraindications

- None

Potential Complications

- Pain and discomfort to patient
- Inappropriate settings
- Unable to obtain capture
- Equipment malfunction

Equipment needed

- Cardiac monitor with pacing function
- ECG leads and electrodes
- Pacing pads
- Established IV access
- Versed

Procedure

- Refer to the manufacture's suggested procedure for your particular cardiac monitor. Use the rate and mA settings as below.
 1. Set rate at 70 bpm
 2. Begin procedure at lowest possible mA setting. Slowly increase mA until mechanical capture can be confirmed with pulse of 70bpm

Pneumatic Antishock Garments (PASG)

Indications

- Unstable Pelvic Fracture
 - Lower-body air splint
 - * There is little evidence to support the continued use of the PASG.
- If used at all, they should be used cautiously and limited to pelvic fractures or as a lower-body air splint.

Absolute contraindications

- Pulmonary Edema
- Incorrect sized device for patient
- Absent distal circulation, sensation or motor function due to trauma

Potential Complications

- Equipment malfunction
- Pulmonary Edema
- Accelerated blood loss

Equipment needed

- Appropriate body substance isolation equipment
- Appropriately sized PASG
- Long backboard
- Backboard straps

Procedure

1. Consider appropriate body substance isolation
2. Assess distal circulation, sensation, and motor function
3. Prepare PASG for use
 - a. Open PASG completely
 - b. Place on top of long backboard
4. Prepare patient for application of the PASG
 - a. Remove patient's clothing
 - b. Remove sharp objects from area
 - c. Position patient on PASG/long backboard
 - * Consider C-spine and use appropriate patient move technique
5. Position and align PASG
 - a. Position the top of the garment below the patient's lower ribs
 - b. Midsection should be carefully aligned along the spine
6. Secure leg sections by snugly wrapping garment around legs. Start with the left leg first, then right
7. Secure abdominal section by snugly wrapping abdominal section. If patient is too large for proper placement, either due to obesity or pregnancy, the PASG is contraindicated

8. Inflate PASG
 - a. Connect foot pump to desired compartment, open valve, and inflate section until either the pop off valve opens, or Velcro closures begin to fail
9. Close valves to prevent air loss
10. Transport patient

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Jones and Bartlett
2009

Spinal Immobilization-Seated Patient

Indications

- Confirmed spinal injury to the seated patient
- Suspected spinal injury due to mechanism of injury of the seated patient

Contraindications

- Initial assessment compromises requiring a rapid move of the patient
- Environmental or situational hazards in which rapid removal of the patient is indicated
- When moving a patient to gain access to other patients with initial assessment compromise

Complications

- Chest straps that are too tight may impede respiratory effort

Procedure

1. Consider appropriate body substance isolation
2. Manually place and maintain patient's head in the neutral, in-line position throughout entire procedure until head is appropriately secured to the short backboard or extrication device
3. Assess distal circulation, sensation, and motor function in each extremity
4. Apply an appropriately sized rigid extrication collar
5. Position the immobilization device behind the patient without compromising the integrity of the cervical spine
6. Secure the device to the patient's torso
 - Attach all straps smoothly and snugly in the following sequence
 - Middle chest strap
 - Bottom chest strap
 - Legs
 - Head
 - Top chest strap
7. Evaluate torso fixation
8. Evaluate and pad behind the patient's head as necessary
9. Secure the patient's head to the device
10. Move and secure the patient to a long backboard
11. Reassess distal circulation, sensation, and motor function in each extremity
12. Continue ongoing assessment

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Spinal Immobilization-Supine Patient

Indications

- Confirmed spinal injury
- Suspected spinal injury due to mechanism of injury

Contraindications

- None in the presence of suspected or confirmed spinal injury

Complications

- Impaled objects, patients with kyphosis/lardosis, or pregnancy may require additional padding and positioning
- Airway compromise due to aspiration of vomit
- Decubitus ulcers
- Back pain

Procedure

1. Consider appropriate body substance isolation
2. Manually place and maintain patient's head in the neutral, in-line position throughout entire procedure until head is appropriately secured to the long backboard
3. Assess distal circulation, sensation, and motor function in each extremity
4. Apply an appropriately sized rigid extrication collar
5. Position long backboard beside patient
6. Direct movement of the patient onto the long backboard without compromising the integrity of the spine
 - Utilize the log roll procedure
 - Do not compromise the integrity of the spine by avoiding twisting, shifting or later spinal movement
7. Apply padding to voids between the torso and the backboard as necessary
8. Secure the patient's torso to the backboard with a minimum of three straps
9. Evaluate and pad behind the patient's head as necessary to maintain neutral, in-line position
10. Secure the patient's head to the long backboard utilizing towel rolls or approved commercially available cervical immobilization devices
11. Secure the patient's legs to the backboard using a fourth strap
12. Secure the patient's arms to the backboard to protect them from flailing when the board is lifted and moved
13. Reassess distal circulation, sensation and motor function in each extremity
14. Continue ongoing assessment, monitoring for vomiting or other potential airway compromise

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Suctioning

Indications

- Removal of blood or secretions from the oropharynx
- Prevention of aspiration of secretions in patients without the ability to protect their own airway

Contraindications

- None

Complications

- Deep suctioning can stimulate the gag reflex, worsening vomiting and promoting bradycardia
- Suctioning can cause increased intracranial pressure
- Prolonged suctioning can promote hypoxia and anoxia
- Incomplete suctioning can lead to forced aspiration in nonbreathing patients ventilated by bag-mask device

Procedure

1. Consider appropriate body substance isolation
2. If no trauma, turn patients head to the side to facilitate the removal of liquids
3. Select suction catheter type, turn on suction unit and check for presence of mechanical suction
 - Ridged style catheter for suctioning the oropharynx
 - French style catheter for suctioning stomas, or ET tubes
4. Measure depth of catheter insertion from the patients earlobe to the corner of the mouth
5. Insert the suction to the measured depth without applying suction
6. Apply suction for no more than 15 seconds while removing catheter
7. Rinse suction catheter with sterile water prior to repeat suction attempts
8. Continue to monitor patient for the need for addition suctioning

Tourniquet Use (Combat Application Tourniquet)

Indications

- Major bleeding from amputation or appendage that cannot be controlled with direct pressure and/or pressure points.

Absolute contraindications

- None

Potential Complications

- Necrosis of underlying soft tissue

Equipment needed

- Orange Combat Application Tourniquet (C.A.T.)

-OR-

- Bandage material 4 inches in width, 4 to 6 layers thick
- Rod or other device to tighten material
- **Never use materials such as wire or belt under 4 inches in width as tourniquet may cut into underlying soft tissue**

Procedure

- * For Combat Application Tourniquet, see manufacturers two handed application instructions.
1. Wrap tourniquet around the extremity just proximal to the bleeding. Do not cover the wound with the tourniquet
 2. Tighten the tourniquet until the hemorrhage ceases
 3. Secure tightening rod or device
 4. Write the time of application on tourniquet
 5. Notify receiving facility that a tourniquet has been applied
 6. During On-going Assessment, continue to monitor wound for recurrent bleeding
 7. Ensure that tourniquet remains uncovered and not hidden
 8. Document application of tourniquet
 9. **Do not remove tourniquet once it has been applied**

Prehospital Emergency Care 9th ed.
Mistovich, Brady Publishing
2010

Hare Traction Splint

Indications

- Mid-shaft femur fracture

Contraindications

- Fractures of the proximal femur, hip or knee
- Fractures of the lower leg on the same side

Procedure

1. Consider appropriate body substance isolation
2. Assess distal motor, sensory and circulatory function
3. Rescuer 1 applies manual stabilization of the injured leg while Rescuer 2 assembles the splint and adjusts to appropriate length using uninjured leg
4. Rescuer 1 applies ankle hitch and then manual traction and elevation to the affected leg
5. Rescuer 2 assesses motor, sensory and circulatory function in the injured extremity
6. Rescuer 2 positions splint under injured leg and attaches the proximal (ischial) strap
7. Rescuer 2 attaches ankle hitch to splint and applies mechanical traction relieving Rescuer 1
8. Position and secure support straps and lower stand
9. Re assess motor, sensory and circulation function in the injured extremity
10. Secure torso and splint to long backboard

Note: Any mid-shaft femur fracture needs to be reduced in the field. A loss of distal motor, sensory or circulatory function is grounds for bypass to closest appropriate trauma center

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