

- bougie.
  - g. If a new tube is not available, insert an ETT 0.5 size smaller than patient's tracheostomy over the bougie and into stoma and ventilate with BVM ensuring bilateral breath sounds.
  - h. If unable to insert an ETT through stoma, cover the stoma with gauze and BVM via mouth.
  - i. If unable to BVM, consider orotracheal intubation.
  - j. Call on-line medical director for further orders.
2. Dislodged tracheostomy
- a. If tracheostomy is dislodged, assess the patient for respiratory distress.
  - b. If patient is not in distress, provide supplemental O<sub>2</sub> per guideline and initiate transport to hospital.
  - c. If patient is in respiratory distress after tracheostomy is removed, insert a bougie into the stoma and attempt to reinsert a new tracheostomy tube over the bougie. Note: for tracheostomy tubes size 5.5 or smaller, do not use a bougie as the tube will not fit over the bougie.
  - d. If a new tube is not available, insert an ETT 0.5 size smaller than patient's tracheostomy over the bougie and into stoma and ventilate with BVM.
  - e. If unable to insert an ETT through stoma, cover the stoma with gauze and BVM via mouth.
  - f. If unable to BVM, consider orotracheal intubation.
  - g. Call on-line medical director for further orders.

### 7.03 Medication Administration

#### A. Airway Administration – Aerosol [BLS/ALS]

1. Pour medication from storage bottle into medication cup portion of nebulizer and reattach lid.
2. Turn on oxygen and adjust flow rate (6-8 LPM) to generate a mist coming out of the nebulizer.
3. Place the nebulizer mask over the patient's mouth and instruct the patient to breathe as deeply as possible.
4. For patients receiving assisted ventilations (BVM, ET Tube, supraglottic airway or CPAP therapy), utilize the T-Piece to administer nebulized medications if needed.
5. EMT's shall administer Albuterol only to patients who routinely use Albuterol for treatment of their asthma or COPD exacerbations.
6. Albuterol and Ipratropium Bromide can be mixed together in the medication cup portion of the nebulizer if both medications are to be administered.

#### B. Intraosseous – EZ-IO® [ALS]

1. Indications
  - a. Inability to obtain an IV after two attempts by two separate paramedics.
  - b. Patient is unconscious, seizing or suffering from cardiac or respiratory arrest.
  - c. Patient has no contraindications to IO placement.
  - d. Only with approval of on-line medical control, an EZ-IO® may be placed in a conscious or semi-conscious patient who requires emergent medical therapy. Contact medical control early for these situations.
2. Contraindications
  - a. Fracture of the humerus, tibia or fibula. Consider the opposite side if not fractured.
  - b. Previous orthopedic procedures (i.e. knee replacement) at site.
  - c. Any infection over the insertion site.
  - d. An extremity that is compromised by a pre-existing medical condition such as tumor or peripheral vascular disease.
  - e. Inability to locate anatomical landmarks.
  - f. Excessive tissue over the insertion site. This can be determined by powering the needle set

through the skin and up to but not into the bone. At this point, the 5 mm mark (black line closest to the hub) on the EZ-IO catheter should be visible. If this mark is not visible, then there is excessive tissue over the site.

3. Insertion Site Identification – Humeral Head (Preferred for adults)
  - a. Patient should be in the supine position.
  - b. Expose shoulder and adduct humerus (place patient’s arm against patient’s body) leaving elbow resting on the stretcher or ground. (With the patient in this position you may note the humeral head on the anterior-superior aspect of the upper arm or lateral shoulder).
  - c. Identify the acromion or “bump” on the patient’s shoulder. Identification of the anterior aspect of the acromion can be accomplished by placing one hand on the lateral superior aspect of the patient’s shoulder and palpating for the protrusion. Identifying the acromion can also be accomplished by “walking” your index and middle finger along the clavicle to the shoulder’s lateral end.
  - d. Identify the greater tubercle insertion site two finger widths inferior to the anterior aspect of the acromion. One can envision the location of this site by creating an inverted triangle. – The base of this triangle should be running between two points on the lateral shoulder or “scapular hood” (the coracoid process & the acromion) and one point inferior by two finger widths.
  - e. Confirm identification and level of the greater tubercle insertion site. Leave one finger on the insertion site as defined in step d. above. Use your free hand to grasp and then flex the patient’s forearm 90 degrees – leaving the adducted elbow resting on the stretcher or ground. Rotate the forearm laterally then medially using the elbow as the axis point. This process will allow you to positively identify the intertubercular sulcus or groove (a key confirmation point), which is located between the greater and lesser tubercle. The insertion site is one finger width lateral to the intertubercular groove.
  - f. Place the patient’s forearm on their abdomen (leaving the elbow on the ground or stretcher). Following this final medial rotation your finger will once again be resting on the greater tubercle insertion site – Two finger widths inferior to the acromion and one finger width lateral to the intertubercular groove.
  - g. Important: Superior to the greater tubercle insertion site is the bursa (tissue surrounding the humeral joint). Located within the intertubercular groove are tendons. Medial to the lesser tubercle (and a safe distance from the insertion site) are vessel and nerves. **For this reason it is important that you do not attempt insertion of any IO device without positive, confirmed identification of the greater tubercle and the intertubercular groove.**
  - h. Do not attempt insertion medial to the greater tubercle at any time.
4. Insertion Site Identification – Proximal Tibia (Preferred for pediatrics, Backup for adults)
  - a. Locate the patella on the front surface of the leg just below the femur.
  - b. Locate the tibial tuberosity, 2 finger widths below the patella.
  - c. The proper insertion site is the flat part of the tibia, approximately 2 cm medial to the tibial tuberosity.
5. Insertion
  - a. Locate the insertion site as described above.
  - b. Clean the insertion site with an alcohol swab.
  - c. Open the EZ-IO® case and remove the driver and one EZ-IO® cartridge. Ensure usage of the Pink Pediatric cartridge for pediatric patients or the Blue Adult cartridge or the Extra Large needle for adult patients. Open the cartridge and attach the needle set to the driver. Remove the needle set from the cartridge and remove the safety cap from the needle.
  - d. Holding the EZ-IO® in one hand, stabilize the patient near the insertion site. Position the driver at the insertion site with the needle at a 90 degree angle to the surface of the bone.

- e. Insert the needle set into the skin at the insertion site until you feel the needle set tip encounter the bone itself. Verify the 5 mm mark is visible on the needle.
  - f. Apply firm and steady pressure on the driver and power through the cortex of the bone, ensuring the driver is maintained at a 90 degree angle at all times.
  - g. Stop when the needle flange touches the skin or a sudden decrease in resistance is felt. This indicates entry into the bone marrow cavity.
  - h. While supporting the needle set in one hand, gently pull straight up on the driver and lift away to remove the driver. Return the driver to its case.
  - i. While grasping the hub firmly with one hand, rotate the stylet counter-clockwise, pulling the stylet out of the catheter and place it into the empty cartridge. Discard it into a biohazard sharps container.
  - j. Proper placement of the IO catheter tip can be confirmed through the following:
    - The IO catheter stands straight up at a 90 degree angle and is firmly seated in the bone, or
    - Blood at the tip of the stylet, or
    - Aspiration of a small amount of bone marrow with a syringe, or
    - A free flow of drugs or fluid without difficulty and with no evidence of extravasation underneath the skin.
  - k. If the insertion fails confirmation or cannot be flushed, remove and dispose of the needle set. Repeat the procedure in the opposite arm or leg.
  - l. Attach the primed EZ-Connect extension set to the EZ-IO® hub.
  - m. For unconscious patients, flush with 5-10 ml Normal Saline.
  - n. For conscious or semi-conscious patients, administer IO Lidocaine [40 mg in adults, 0.5 mg/kg (max of 40mg) in pediatric patients] into the intraosseous space, over 60 seconds, to provide pain relief. After lidocaine, flush with 5-10 ml Normal Saline.
  - o. Administer the infusion or medication as per guideline or on-line medical direction. A pressure infuser (or BP cuff) can be used to maintain adequate flow rates.
  - p. Apply the wristband to the patient and secure the EZ-IO® as an impaled object.
6. Removal
- a. Attach a sterile syringe to the catheter hub.
  - b. Support the patient's arm or leg while rotating the catheter clockwise and gently pull out the catheter while maintaining a 90 degree angle.
  - c. Place removed catheter in a biohazard sharps container.
  - d. Dress the insertion site with an appropriate dressing.
7. Cleaning and Disinfecting
- a. Wipe clean with moistened cloth. Remove large contaminants.
  - b. Spray with antimicrobial solution, following the solution instructions.
  - c. Momentarily depress trigger several times during cleaning.
  - d. Clean around drive shaft with cotton applicator as needed and wipe driver dry.
  - e. Inspect driver and return to case.
  - f. Never submerge the EZ-IO® driver in any liquid at any time.

### C. Intranasal (IN) - Mucosal Atomization Device

1. Intranasal administration of medication is performed by the atomization of medication to 30 micron particle size which adheres to the nasal mucosa over a larger surface area allowing for effective absorption.
2. Half the medication volume should be administered in each nostril with no more than 1.0 ml administered per nostril.
3. Airborne PPE should be worn when administering medication via this route due to a sneeze