I. Purpose:

A. To establish indications, guidelines, and the standard procedure for performing a needle thoracostomy in the pre-hospital setting by paramedics.

II. Authority:

A. Health and Safety Code, Section 1797.220, 1798. Title 22, Section 100170.

III. Policy:

A. Needle Thoracostomy may be established under the following indications:

1. Recently intubated or patients placed on NIPPV
2. Rapidly deteriorating patient with severe respiratory distress who has signs and symptoms of life-threatening tension pneumothorax such as:
    a. Progressively worsening dyspnea
        i. Hypotension, for adults SBP < 90 mmHg with evidence of poor perfusion (symptoms listed below)
    b. Shock with evidence of poor perfusion including:
        i. Altered Mental Status
        ii. Tachycardia
        iii. Pallor
        iv. Diaphoresis
    c. Decreased or diminished breath sounds on affected side (required)
    d. Distended neck veins (JVD)
    e. Tracheal deviation away from the affected side
    f. Traumatic cardiac arrest with tension pneumothorax suspected per guidelines set out in **Traumatic Cardiac Arrest Policy.**

B. Contraindications:

1. Inability to locate landmarks
2. Tension pneumothorax is not suspected

C. Risks and complications associated with pleural decompression include but are not limited to:

1. Lacerated lung tissue
2. Pneumothorax
3. Subcutaneous emphysema
4. Intercostal vein and/or artery hemorrhage

5. Skin infection at the site of tube thoracotomy

D. Document the following in the patient care record:
   1. Signs and symptoms indicating need for procedure
   2. Location, number of attempts, size needle used
   3. Complications
   4. Response to treatment

E. **Adult patients (≥ 15 years old or larger than pediatric measurement tape) this procedure is a standing order**

F. **Pediatric patients (< 15 years old or falls within the pediatric measurement tape) this procedure is a base hospital order**

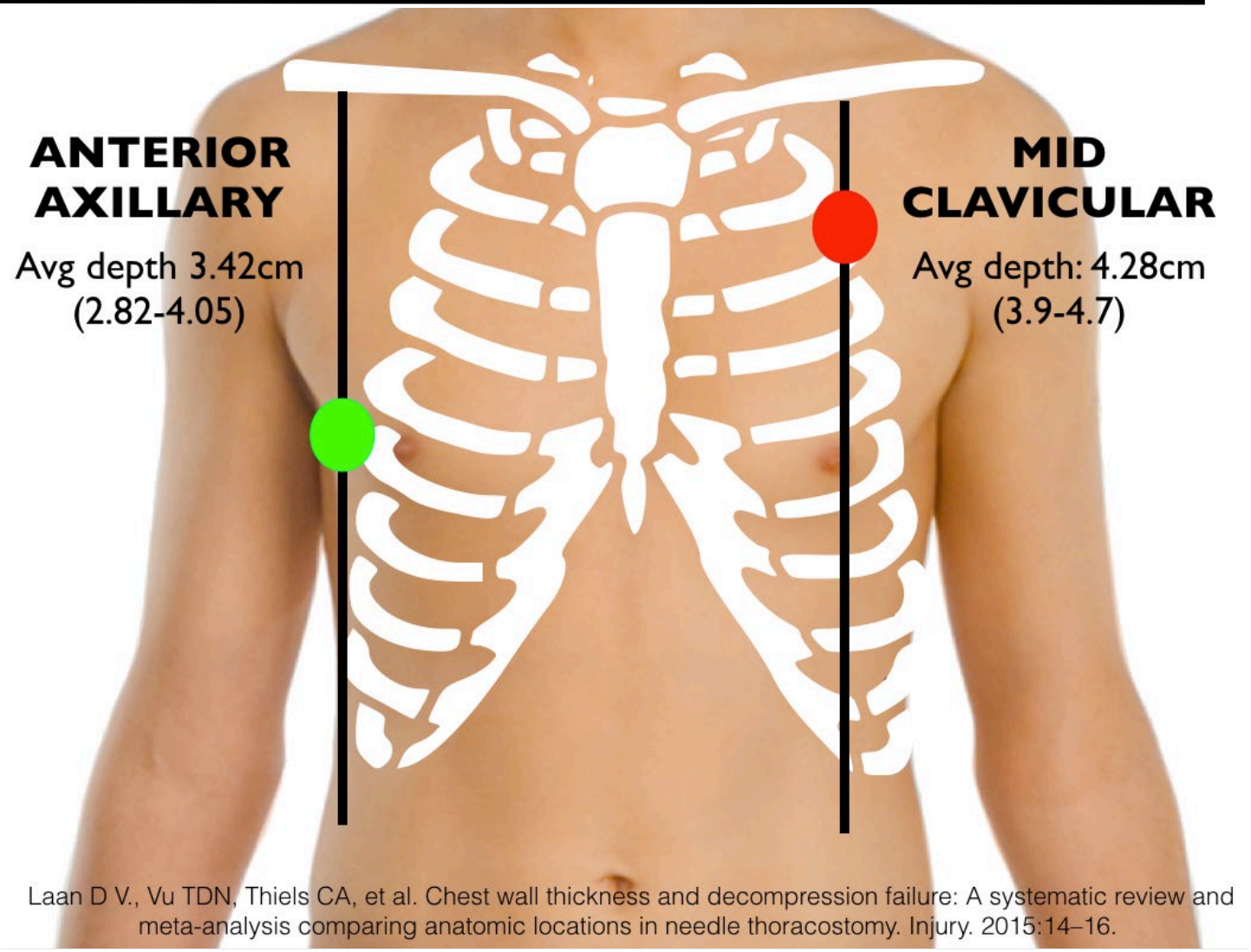
IV. Procedure:

A. Equipment needed:
   1. Alcohol pads
   2. 10–14-gauge angiocath or commercially available product (or smaller as is appropriate for pediatric sized patient)
   3. 10- or 20-ml syringe
   4. One way valve or cover
   5. Tape

B. Take universal precautions, including eye protection

C. Explain procedure to patient and place in upright position if tolerated

D. Prepare area with alcohol wipes, either:
   1. Between second and third intercostal space, midclavicular line, OR
   2. Between the fourth and fifth intercostal space, anterior axillary line
      a. Pregnant patients should have the procedure performed between the third and fourth intercostal spaces in the anterior axillary line



Laan D V., Vu TDN, Thiels CA, et al. Chest wall thickness and decompression failure: A systematic review and meta-analysis comparing anatomic locations in needle thoracostomy. Injury. 2015:14–16.

E. Insert needle perpendicular to the chest wall between in the intercostal space, just **above** the rib
   1. The neurovascular bundle runs along the inferior rib, and incorrect placement could result in life threatening bleeding

F. Advance the needle until the pleural space is entered, as evidenced by one or more of the following:
   1. A "popping" sound or "giving way" sensation
   2. A sudden rush of air
   3. Ability to aspirate free air into the syringe

G. Remove needle and leave cannula in place

H. Place a one-way valve, and secure to chest with tape

I. Evaluate the effectiveness of the procedure by:

1. Immediate and obvious improvement of respiratory status
2. Improved vital signs
3. Improved bilateral lung sounds

J. If no improvement noted, or there is no evidence of entering the pleural space, consider using the other LEMSA approved site on the same side of the patient

K. Secure cannula with dressing and tape allowing cannula to remain in place

L. May repeat procedure in second approved location if no improvement is seen, or symptoms recur
   1. Tension pneumothorax may recur if air is not able to escape the decompression site with the one-way valve

APPROVED:

SIGNATURE ON FILE

Katherine Staats, M.D. FACEP

EMS Medical Director