WTA Multi-Center Chest Tube Observational Study

Form CT-A: Center Information

1. Trauma Center Designation
    a. Level 1
    b. Level 2
    c. Level 3
    d. No designation
2. ACS Verified?
    a. Yes
    b. No
3. Size of Hospital
    a. ≤ 250 beds
    b. 251-500 beds
    c. 501-750 beds
    d. ≥ 751 beds
4. Hospital Type:
    a. Academic Health Center
    b. Teaching Hospital Community
    c. Community Hospital
    d. Other _____
5. Annual Trauma Admissions:
    a. ≤ 1000
    b. 1001-2000
    c. 2001-3000
    d. 3001-4000
    e. ≥ 4001
6. Institutional Policy for Chest Tube Insertion?
    a. No
    b. Yes (attach copy)
7. Institutional Policy for Chest Tube Removal?
    a. No
    b. Yes (attach copy
8. Who inserts chest tubes in your institution? (check all that apply)
    a. Surgeons
    b. ED physicians
    c. Fellows
    d. Residents
    e. Mid-level clinicians
    f. Medical students (with supervision)
    g. Other _____
9. Who removes chest tubes in your institution? (check all that apply)

a. Surgeons
b. ED physicians
c. Fellows
d. Residents
e. Mid-level clinicians
f. Nursing staff
g. Medical students (with supervision)
h. Other _____

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Form CT-B: Chest Tube Insertion Information

1. Patient Age ____
2. Identified Patient Gender
    a. Male
    b. Female
3. Mechanism of Injury
    a. Blunt
    b. Penetrating
        i. GSW
        ii. Stab wound
        iii. Other (describe) _____
    c. Combination Blunt/penetrating
    d. Iatrogenic
4. Rib Fractures?
    a. Yes
        i. ≤ 2
        ii. 3-6
        iii. ≥ 7
    b. No
5. Flail chest?
    a. Yes
    b. No
6. Indication for chest tube insertion (at time of placement):
    a. Pneumothorax
    b. Hemothorax
    c. Combined Hemopneumothorax
    d. Empiric placement
    e. Prophylactic placement
7. Hospital location for chest insertion:
    a. ED
    b. OR
    c. ICU
    d. Ward
    e. Outside hospital
    f. Other (specify) _____

8. Who inserted chest tube?
    a. ED Physician
    b. ED Mid-level
    c. Attending surgeon
    d. Fellow
    e. Resident
        i. PGY 5
        ii. PGY 4
        iii. PGY 3
        iv. PGY 2
        v. PGY 1
    f. Surgery/Trauma Mid-Level
    g. Interventional Radiology
    h. Other (specify) _____
9. Prophylactic Antibiotics?
    a. Yes
        i. Specify antibiotic _____
    b. No
10. Size of chest tube:
    a. ≥ 36 F
    b. 28-32 F
    c. 22-24 F
    d. ≤ 20 F
    e. Pigtail catheter
11. Chest tube type
    a. Traditional
    b. Trocar
    c. Chest tube "gun"/device
    d. Pigtail (guidewire technique)
12. Chest tube side
    a. Right
    b. Left
    c. Bilateral
    d. Other _____
13. Chest tube location
    a. Mid-axillary
    b. Anterior axillary
    c. Sub clavicular
    d. Other _____
14. Tunneled?
    a. Yes
    b. No

15. Depth of Insertion at skin level
    a. ≤ 6 cm
    b. 7-10 cm
    c. 11-15 cm
    d. 16-20 cm
    e. ≥ 21 cm
    f. Not recorded
16. Tube fixation
    a. Suture
        i. Nylon
        ii. Silk
        iii. Other
    b. Tape
    c. Adhesive dressing (tegaderm)
    d. Other _____
17. Initial fluid output at time of insertion (recorded or estimate)
    a. ≤ 100 mL
    b. 101-250 mL
    c. 251-500 mL
    d. 501-750 mL
    e. 751-1000 mL
    f. ≥ 1000 mL
    g. No
18. Air leak?
    a. Yes
    b. No
19. Initial Post-Insertion CXR findings:
    a. Adequate position, indication for insertion improved
    b. Appropriate position, indication unchanged
    c. Inappropriate position
        i. Tube pulled back
        ii. Replaced tube (complete new form)
            1. Specify problem _____
    d. No initial CXR to check tube obtained

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Form CT-C: Chest Tube Daily Information (complete 1 form per day for each chest tube)

1. Date _____
2. Chest tube #:
    a. 1
    b. 2
    c. 3
    d. Other ____
3. Chest tube side:
    a. Right
    b. Left
4. Output in past day:
    a. ≤ 25 mL
    b. 26-50 mL
    c. 51-100 mL
    d. 101-150 mL
    e. ≥ 151 mL
5. CXR?
    a. No
    b. Yes
        i. Indication for CXR
            1. Check tube position
            2. Change in clinical condition
            3. Change in tube output
            4. Institutional routine
            5. Other _____
        ii. Number of CXR in prior 24 hrs:
            1. 1
            2. 2
            3. 3
            4. Other _____
6. Air leak?
    a. No
    b. Yes
7. Chest tube complication?
    a. No
    b. Yes
        i. Tube dislodged
        ii. Tube migrated
        iii. Tube replaced (complete new placement form)
        iv. Other _____

Form CT-D: Chest Tube Removal Information

1. Date of chest tube removal _____
2. Criteria for removal (check applicable criteria):
    a. Patient extubated
    b. Output < 200-210 mL/day (< 70 mL/8 hr, <100 mL/12 hr)
    c. Output < 150-160 mL/day (< 50 mL/8 hr, <80 mL/12 hr)
    d. Output < 90-100 mL/day (< 30 mL/8 hr, <50 mL/12 hr)
    e. Output < 50-60 mL/day (< 20 mL/8 hr, <30 mL/12 hr)
    f. No air leak
    g. Resolution of PTX
    h. No change in PTX
        i. Estimate size (%) ____
    i. Tube not functioning
    j. Tube dislodged
    k. Other _____
3. Water seal prior to removal?
    a. No
    b. Yes (if yes, indicate duration of water seal)
        i. ≤ 2 hr
        ii. < 3-6 hr
        iii. 7-12 hr
        iv. 13-24 hr
        v. > 24 hr
4. Experience of person removing tube
    a. Attending surgeon/physician
    b. Fellow
    c. Resident
        i. PGY 5
        ii. PGY 4
        iii. PGY 3
        iv. PGY 2
        v. PGY 1
    d. Surgery/Trauma Mid-Level
    e. Interventional radiology
    f. Other (specify) _____
5. CXR interval prior to removal?
    a. ≤ 30 min
    b. 31 min to 2 hr
    c. 3-6 hr
    d. 6-12 hr
6. ≥ 12 hr

7. Bedside breathing routine at time of tube removal (check all that apply):
    a. Spontaneous breathing
    b. Pt asked to hold breath
    c. Maximum inhalation
    d. Maximum exhalation
    e. Valsalva maneuver
8. CXRs immediately after tube removal (check all that apply):
    a. Immediate
    b. 6-12 hr after removal
    c. Next day
    d. Prior to discharge
    e. PRN based on clinical condition/respiratory distress
9. Post-pull pneumothorax?
    a. No
    b. Yes (check all that apply)
        i. Estimate size (%) _____
        ii. Chest tube replaced (complete new Form CT-B)
        iii. Percutaneous thoracostomy tube (complete new Form CT-B)
        iv. Follow/monitor clinical condition only
        v. Transfer to higher level of care (e.g., ICU, telemetry)
10. Suture at insertion site?
    a. No
    b. Yes
11. Dressing (check all that apply):
    a. Gauze
    b. Vaseline guaze
    c. Xeroform guaze
    d. Ointment
        i. Antibiotic (Bactracin, polysporin)
        ii. Antiseptic (Betadine)
    e. Tegaderm or other adhesive patch
    f. Other _____

Form CT-FINAL: Additional Hospitalization Information

1. Date of hospital admission _____
2. Date of hospital discharge _____
3. Hospital admission service:
    a. Trauma service
    b. Orthopedic surgery
    c. ICU service
    d. Neurosurgery
    e. Other _____
4. ICU Admission during hospitalization?
    a. No
    b. Yes
        i. Date of ICU admission _____
        ii. Date of ICU discharge _____
5. Need for mechanical ventilation?
    a. No
    b. Yes
        i. Date of intubation _____
        ii. Date of extubation _____
6. Retained hemothorax?
    a. No
    b. Yes (if yes, indicate interventions)
        i. Thoracoscopic
        ii. Thoracotomy
        iii. Observation
        iv. Other _____
7. Empyema/Infectious Complication?
    a. No
    b. Yes (if yes, indicate interventions)
        i. Percutenous drainage
        ii. Thoracoscopic procedure
        iii. Thoracotomy procedure
        iv. Other _____
    c.

Hypotheses:

It will be possible to identify differences in techniques, experience, and management of chest tubes,

Opportunities for improvement will be identifiable by comparing chest tube management.

Study design:

- Observational study
- Data points (see Data Collection sheet) will be obtained from medical record review of (all) eligible patients at the participating institutions within the timeframe of the study
- Each participating hospital will receive a hospital identification number. Each patient enrolled will be numbered sequentially starting with #1. Individual chest tube(s) will be noted sequentially with numbers, beginning with the number "1". Local participating investigators need to track individual chest tubes (e.g., upper right, lower right, left anterior superior, etc.).
- A maximum of 10 (total) chest tubes per patient per admission will be tracked
- Patient's names and hospital record numbers will be kept at the local sites, but not entered into the study database. No identifiable PHI will be entered into the study database or shared outside of the respective hospitals.
- Characteristics of participating centers (institutions) will be entered into the Center Information Form (Form CT-A)
- Information will be recorded for each individual subject who meets inclusion/exclusion criteria on the ~~Patient Data page~~: (Form CT-B) Chest Tube Insertion Form
- Information about each individual chest tube inserted (#1 up to #10) will capture information about the location, individual inserting tube, technique, etc. on the Chest Tube Insertion Information form. (Form CT-C)
- Daily information about each individual chest tube will be entered via the Chest Tube Daily Information form. (Form CT-D)
- Information will be collected about removal of each individual chest tube using the Chest Tube Removal Form (Form CT-E)
- De-identified information about the hospital course will be recorded on Hospitalization Additional Information page (Form CT-~~FINAL~~)
- C

Setting:

- Trauma centers, multi-institutional
- Included hospitals will be trauma centers that have been designated by State agencies or the American College of Surgeons

Methodology:

- A data collection form (see attached) will be used to obtain study-related information about chest tubes placed in trauma patients during the period May 14, 2018 through August 17, 2018 as outlined in the detailed study protocol (see below).
- Information for all trauma patients that meet inclusion/exclusion criteria during the study time frame should be included.
- Institutional description and characteristics will be recorded for each facility participating in the multi-center study.