

## 2.7 THORACENTESIS

Thoracentesis is a procedure involving the withdrawal of fluid from the pleural cavity to determine the etiology of or to treat the effects of a pleural effusion. It is a frequently performed bedside procedure for both diagnostic and therapeutic purposes. The most common clinically important complication is pneumothorax. With the advent of ultrasound guidance, the rate of pneumothorax after thoracentesis in nonventilated patients is less than 2%.<sup>1-3</sup> Hospitalists may identify pleural effusions during the history and physical examination and should use clinical expertise and evidence-based decision-making to determine whether a thoracentesis is required in the diagnosis and management of the patient's illness.

### KNOWLEDGE

*Hospitalists should be able to:*

- Describe the normal anatomy of the chest wall, thorax, and lung.
- Define and differentiate the disease processes that may lead to the development of pleural effusion.
- Define and differentiate transudative from exudative pleural effusions.
- Explain indications and contraindications of thoracentesis and its potential risks and complications.
- Describe the proper use of ultrasonography in guiding thoracentesis.
- Explain the appropriate diagnostic tests to accurately characterize pleural fluid and identify the underlying disease process.
- Recognize indications for specialty consultations, which may include interventional radiology, pulmonary medicine, infectious disease, or cardiothoracic surgery.

### SKILLS

*Hospitalists should be able to:*

- Elicit a thorough and relevant medical history to identify potential disease processes and risk factors for the development of pleural effusions.
- Perform a chest examination including specific maneuvers to assess for the presence and size of the pleural effusion.
- Demonstrate the optimal patient position for safely performing a thoracentesis.
- Perform a time-out before the procedure.
- Perform a competent diagnostic and/or therapeutic thoracentesis with standard use of ultrasound guidance.

- Select the necessary equipment to perform a thoracentesis safely at the bedside.
- Use appropriate sterile technique and necessary precautions throughout the procedure to minimize the risk of complications for patients and providers.
- Order and interpret the results of pleural fluid analyses to determine an appropriate management plan.
- Anticipate and manage complications of thoracentesis after the procedure, which may include pneumothorax, bleeding, leakage, or infection.
- Obtain informed consent and effectively communicate with patients and families to explain the procedure, its expected diagnostic or therapeutic benefits, and potential complications.

### ATTITUDES

*Hospitalists should be able to:*

- Demonstrate awareness of and ability to address periprocedural emotional and physical discomfort.

### SYSTEM ORGANIZATION AND IMPROVEMENT

*To improve efficiency and quality within their organizations, hospitalists should:*

- Lead, coordinate, and/or participate in multidisciplinary initiatives to optimize resource use.
- Lead, coordinate, and/or participate in efforts to develop strategies to minimize institutional complication rates of thoracentesis.
- Lead, coordinate, and/or participate in patient safety and quality improvement programs to monitor hospitalists' performance and/or supervision of procedural competence.
- Lead, coordinate, and/or participate in patient safety programs designed to coordinate care transition and the handoff of pending test results at the time of hospital discharge.

### References

1. Cavanna L, Mordenti P, Berle R, Palladino MA, Biasini C, Anselmi E, et al. Ultrasound guidance reduces pneumothorax rate and improves safety of thoracentesis in malignant pleural effusion: report on 445 consecutive patients with advanced cancer. *World J Surg Oncol*. 2014;12:139.
2. Duncan DR, Morgenthaler TI, Ryu JH, Daniels CE. Reducing iatrogenic risk in thoracentesis: establishing best practice via experiential training in a zero-risk environment. *Chest*. 2009;135(5):1315-1320.
3. Mercaldi CJ, Lanes SF. Ultrasound guidance decreases complications and improves the cost of care among patients undergoing thoracentesis and paracentesis. *Chest*. 2013;143(2):532-538.