



Clinical Update

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Chest Tube Insertion: Part Two

In this issue of Clinical Update we'll let you know what authors of two new papers on chest tube insertion and management have to say about placing the tube, securing the tube, and when to remove it.^{1,2} To learn about indications, site selection and tube size, see the September, 2003 issue of *Clinical Update*.

Premedication, Positioning, and the Pleural Space

Patients have reported that chest tube insertion is extremely painful, rating it as 9 or 10 on a 1-10 pain scale. Thus, unless it is an emergency situation, the nurse at the bedside – as patient advocate – should ask about administering, at minimum, an opioid analgesic, and optimally, procedural sedation (with a benzodiazepine) to reduce patient anxiety and discomfort.² However, before administering medication, check to see that the patient has signed a consent form for chest tube insertion, according to hospital policy.

The patient may be placed in a sitting position, leaning forward on an overbed table with two or three pillows on it. This will maximize gravity's effect on the pleural space – allowing air to move to a superior location and fluid to move to an inferior location. Alternatively, the patient can be positioned on his back with the arm on the affected side extended over the head, and the head turned to the unaffected side. A pillow or two may be placed behind the hemithorax on the affected side to elevate the insertion site slightly.

In all but the most emergent situations, aseptic technique is critical to reduce the risk for empyema. This infection occurs in about 2.5% of patients whose chest tubes were placed to treat chest trauma.²

Local anesthetic, such as lidocaine, is used to infiltrate the skin before tube insertion. There is no evidence that adding epinephrine to the lidocaine for vasoconstriction is of any benefit in this procedure.²

Inserting the Drainage Catheter

The technique used for tube insertion will depend on the size of the tube. Blunt dissection is the most familiar approach, but with guidance from medical imaging in real time, smaller bore tubes are being used on more patients with simple pneumothorax. The Seldinger technique can be used for small catheters.²

Blunt dissection is recommended for larger bore tubes. After the incision is made in the skin, a closed clamp is gently placed into the muscle. The clamp is then opened to separate the intercostal mus-

cle fibers, creating a tunnel through the chest wall. Once this tunnel is created, the clinician inserting the tube explores with a finger closest to the size of the tube, feeling for adhesions or any structures that may impede tube insertion. Once the tunnel is established, the tube can be placed in the pleural space without the use of excessive force, which can cause lung damage.²

Wrapping it Up

Once the tube is inserted, the clinician usually places two sutures: One closes the incision through which the tube was placed, and the other anchors the tube so it will not fall out. There are no data that address whether petrolatum gauze should be wrapped around the tube at the tube-skin interface. Proponents of this technique believe the special gauze reduces the potential for air leaks around the tube. Opponents express concern that the moist gauze can macerate the skin under the dressing, making it more difficult to close the wound after the tube is removed.

Dressings should be simple and occlusive. A transparent dressing such as that used at IV sites may be sufficient for small-bore catheters. Large bore catheters are usually supported with gauze. Gauze designed for use around tracheostomy tubes, manufactured with a fenestration, is ideal. Do not cut square cotton gauze with scissors to fit around the tube; loose threads can cause local tissue reactions in the wound. Once a dressing is applied, there are no data supporting regular dressing changes unless the dressing is soiled or otherwise contaminated.

An ideal dressing will support the tube as it exits the chest wall and reduce the risk for tube kinking at the insertion site.

Are Antibiotics Appropriate?

Given the concerns about inappropriate use of antibiotics and development of resistant strains of bacteria, should antibiotics be used routinely in patients who have chest tubes placed but no evidence of infection? Since a meta-analysis was published in 1992, the trauma literature has supported antibiotic use (cephalosporin or clindamycin) for patients whose chest tubes are inserted in generally emergent, less controlled conditions.^{1,2} There are no data to support the routine use of antibiotics for patients with chest tubes inserted for other reasons.

Evidence-based Practice

A number of nursing research studies have explored ways to reduce the pain of chest tube removal. These papers, along with the practice guidelines on treatment of spontaneous pneumothorax from the American College of Chest Physicians³, provide more evidence on which we can base our practices when caring for patients who need chest tubes.

References on next page.

Check Your Knowledge...

Q. Technical advances in smaller, more portable chest drains have the potential to decrease length of stay after bypass surgery by enhancing patient mobility. What surgical technique has been shown to reduce length of stay?

Answer on other side

Clinical Update is an educational newsletter provided by Atrium Medical Corporation and is edited by Patricia Carroll, RN,BC, CEN, RRT, MS.

In The Literature

Owww! Is That Pain Score Reliable?

Researchers at Baystate Medical Center in Springfield, MA, used a cutaneous nerve stimulator to evaluate healthy adults' response to pain. Participants were given an increasing stimulus and asked to state when the stimulus caused "intolerable pain." Subjects also recorded the pain on a 0 (no pain) to 100mm (worst pain imaginable) visual analog scale (VAS).

"Intolerable pain" ranged from 8mm to 73mm on the VAS, and the level of stimulus that produced intolerable pain ranged from 4 to 9 on a 1 to 9 scale. Because of this wide variation, researchers administered subsequent shocks with the same level of stimulus. However, subjects identified only 51% of these shocks as "the same" intensity. This may mean that when we use these scales to evaluate increasing or decreasing pain, half the time, the patient can be ranking pain that feels the same as higher or lower. This is a small study that raises important questions for future research.

Source: Mader TJ: How reliable are pain scores? A pilot study of 20 healthy volunteers. *Journal of Emergency Nursing* 2003;29(4):322-325.

What Do Surgical Nurses Know About Pain Management?

A study reported in *MedSurg Nursing* in 2001 has important clinical applications today. Orthopedic / surgical nurses were surveyed, and key barriers to pain management were identified. Nurses' number one barrier was their responsibility for caring for many acutely ill patients. This explains the other identified barriers: not having enough time to adequately assess patients' pain and the effects of interventions for pain control. Nurses also believed patients were reluctant to report pain.

Researchers learned that clinical practice guidelines are not always making it to the bedside nurse (or the prescriber, for that matter). Researchers recommend surveying all patients about their pain management experience while hospitalized. Apart from traditional customer service-type questionnaires, a targeted pain survey will provide more immediate feedback and provide evidence needed to modify pain management practices in your setting.

Source: Puls-McColl PJ, Holden JE, Buschmann MT: Pain management: assessment of surgical nurses' knowledge. *MEDSURG Nursing* 2001;10(4):185-191.

Thumbs Up For Nurses...Again!

In November, 2003, the Gallup Organization conducted its annual survey of honesty and ethics of various professions. Nurses, we are delighted to report, came out on top – 83% of those surveyed rated nurses' honesty and ethical standards "high" or "very high." This compares with doctors and veterinarians at 68%, pharmacists at 67% and dentists at 61%.

This was the fifth time nurses were included as a profession in the poll. Nurses have been at the top of the ranking four out of five times – they slipped to number two behind firefighters in November, 2001.

You can read about the study at <http://www.gallup.com/poll/releases/pr031201.asp>

Sources:

1. Baumann MH: What size chest tube? What drainage system is ideal? And other chest tube management questions. *Current Opinions in Pulmonary Medicine* 2003;9:276-281.
2. Laws D, et al: BTS [British Thoracic Society] guidelines for the insertion of a chest drain. *Thorax* 2003;58(Suppl II):ii53-ii59.
3. Baumann MH, Strange C, Heffner JE et al: Management of spontaneous pneumothorax: an American College of Chest Physicians Delphi consensus statement. *Chest* 2001;119(2):590-602.

On the
World Wide Web...



Learn About the Healthcare System
<http://www.facct.org>

The Foundation for Accountability is an organization with the goal of improving healthcare by empowering consumers and establishing accountability. At this site, you will see their E-health initiatives, and quality projects and the clearinghouse for consumer-centered healthcare materials, resources and information.

Directory of America's Hospitals
http://www.usnews.com/usnews/health/hospitals/hosp_home.htm

This site, a collaboration between US News and the American Hospital Association provides a wealth of information about more than 6,000 hospitals. Each hospital's profile lists number of beds, type of hospital, key services and in the "by the numbers" section, statistics on patients and professional staff.

Nieman Foundation for Journalism
<http://www.nieman.harvard.edu/>

When you visit this site, click on Nieman Reports Magazine on the left, and then on "explore the contents." The summer 2003 issue devotes more than half its pages to medical reporting and the Spring 2003 issue to reporting on health. You can download individual articles that look interesting. Many of these articles explain that the journalists often face the same frustrations about limitations on coverage as we do.



*Your friends at Atrium wish you and yours
a happy and safe holiday season!*



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Check Your Knowledge...

A Off-pump coronary artery bypass grafting was studied in 200 patients randomly assigned to off-pump or traditional bypass surgery. Off-pump patients had a mean length of stay one day less than those who had traditional surgery.

Source: Puskas JD, et al: Off pump coronary artery bypass grafting provides complete revascularization with reduced myocardial injury, transfusion requirements, and length of stay. *Journal of Thoracic and Cardiovascular Surgery* 2003;125(4):797-808.