



Clinical Update

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The Nurse's Role In Chest Tube Removal

The bedside nurse is an important patient advocate when a chest tube is removed. The nurse can encourage the proper use of pain medication, assess for clinical signs indicating the time is right to remove the tube, and monitor for complications following tube removal.

What The Patient Feels

Patients who have had heart surgery have told me that the most painful aspect of the whole process (at least the most painful element they remembered!) was the removal of their mediastinal chest tubes. A few nursing research studies^{1,2,3} have examined patients' perceptions of the sensations associated with chest tube removal. Patients use words such as burning, pain, hurting, pulling and yanking. Intensity is almost universally moderate to severe, with no clear distinction between pleural and mediastinal tubes.

One study examined typical practices for chest tube removal in critical care units in the US⁴. Only 16% of the respondents reported that a prescription for pain medication was routinely available before chest tube removal. Dr. Kinney and her colleagues advise caregivers to develop practice policies to guide decisions about acute pain management in these patients. Nurses are traditionally the bedside patient advocates. In that role, we should be actively asking for orders to medicate patients before and after chest tube removal if orders are not already present in the chart. We can also encourage attending surgeons and residents to notify us about an hour before they plan to remove a chest tube, so we can prepare the patient by describing the procedure and the sensations they might feel, and medicating as needed.

When Can Chest Tubes Be Removed?

To date, there are no clinical practice guidelines for chest tube use and management of patients with chest tubes. New guidelines will be published in *Chest* in early 2001, and we will review those recommendations in a future issue of *Atrium Clinical Update*. The following criteria have been mentioned in the literature as indicators for chest tube removal:^{4,5,6,7}

- The patient's overall status is stable
- Decreased bloody drainage (< 100ml in the last 8 hours)
- Re-expansion of lung(s) on chest radiograph without other abnormalities
- Bilateral breath sounds present
- Improved respiratory status
- Absence of fluctuations or bubbling in the water seal chamber
- Normal coagulation studies (if ordered)

Some physicians advocate clamping the chest tube when these clinical signs are evident. Clamping the tube simulates chest tube removal and allows for careful assessment of the patient's response to the elimination of drainage. Clamping may be done for as few as four or as many as 24 hours⁷. The advantage to this approach is that if the patient develops respiratory distress (pleural tube) or hemodynamic changes (mediastinal tube), the problem can usually be solved by simply removing the clamp. If the tube is removed without a trial of clamping and the patient's condition then deteriorates, it is much more complicated to get another

tube inserted. In fact, the *Cardiac Surgery Intern Survival Guide*⁵ tells interns never to pull a chest tube before 7:30 am or after 5:00 pm, so that any complications can be addressed when there are plenty of people around to help.

Preparing The Patient

When a pleural chest tube is clamped, explain that the clamp is put on the tube to see how the patient will feel when the tube is removed. Instruct the patient to notify you immediately if he or she has trouble breathing or develops chest pain. Also monitor for objective changes in the patient's respiratory status such as an increased respiratory rate or oxygen desaturation. It's a good idea to place the patient on continuous pulse oximetry monitoring during this clamping trial. Set the alarms to notify you quickly of a change of as little as 5% in the patient's saturation, so you can do a personal assessment.

Complications To Look For

Complications of chest tube removal are uncommon, but they can occur. Careful patient monitoring after the procedure is essential. Traditionally, chest radiographs have been done on all patients immediately after tube removal to detect complications, but there is no evidence to guide that practice. A recent article in the *American Journal of Surgery*⁸ described a retrospective review of 73 patients with tube thoracostomy. Of the 73 patients, only 8 patients' radiology reports changed after the chest tube removal. Of those, two required chest tube reinsertion (2.7%), but in both cases the decision was a clinical one not based on radiographic findings. In today's climate of evidence-based practice going hand-in-hand with cost-effective care, this tradition is likely to fade in the coming years. In the future, expect post-procedure chest radiographs to be ordered selectively, based on the patient's risk factor(s) for complications.

Assess for these complications of chest tube removal:

- pneumothorax
- bleeding
- skin necrosis at the suture site
- infection at the insertion site

In most cases physicians, APRNs and PAs remove chest tubes, but the bedside nurse is key in assuring that the patient has adequate pain management and understands the procedure. In addition, it's the nurse's responsibility to carefully assess for potential complications following chest tube removal.

Check Your Knowledge...

Q. A patient is scheduled for chest tube clamping before tube removal following lobectomy. Before clamping the tube, the nurse helps the patient get out of bed to use the bathroom. When the patient moves, 200ml of dark red blood spills into the chest drain. Does this mean the tube cannot be clamped?

Answer on other side

In The Literature

APRNs Still Practice Nursing

Many nurses believe that when an advanced practice nurse becomes a nurse practitioner, he or she essentially leaves the nursing world and enters the medical world, practicing from a medical model rather than a nursing model. A recent study in *Nursing Diagnosis* disputes that notion. Researchers reviewed 3,733 visits by nurse practitioner (NP) students and classified what the NPs did according to nursing diagnosis and the Nursing Interventions Classification (NIC) system. The top 12 interventions according to NIC were: patient education, drug management, information management (documentation, referral, consultation), risk management (screening, surveillance, risk identification), nutritional support, activity and exercise management, communication enhancement, coping assistance, physical comfort promotion, health system management (laboratory data interpretation), behavior therapy and skin/wound management.

These distinctly nursing interventions corresponded with medical diagnoses of hypertension, diabetes and sinusitis, and nursing diagnoses of health-seeking behavior, altered health maintenance and knowledge deficit. The researchers compared both NIC interventions and patient outcomes within the two taxonomy systems: nursing diagnosis and medical diagnosis. Which language and which practice model best describes the patients' needs and the NPs interventions to meet those needs? My vote is for nursing taxonomy.

This article is a must-read for anyone interested in comparing medical diagnoses with the language and philosophy of nursing in adult primary care. It validates the use of both NIC and nursing diagnosis at all levels of nursing practice.

Source: O'Connor NA, Hameister AD, Kershaw T: Application of standardized nursing language to describe adult nurse practitioner practice. *Nursing Diagnosis* 2000;11(3):109-120.

Leading Outside Your Comfort Zone

As institutions continue to downsize in management, nurse managers are being assigned responsibility for areas in which they have no clinical experience. Once this would have been unheard of; today it is commonplace. A recent article in *Dimensions of Critical Care Nursing* provides tips for nurse managers who find themselves in this situation. First, author Pamela Hunt suggests seven actions to ease the transition, such as: meeting with new staff, making yourself visible, identifying key employees in the new area, and using delegation to empower the staff. Next, she gives pointers to analyze the value of your added responsibility so you can position yourself for a raise. Finally, she describes 12 transferable leadership skills such as: treating people with compassion, managing by walking around, controlling your emotions, communicating clearly and decisively, and building successful teams.

While this article is designed for the manager who now has responsibility for multiple areas, it provides an excellent review of key attributes of any successful nurse manager.

Source: Hunt P: How to lead departments outside your clinical competence. *Dimensions of Critical Care Nursing* 2000;19(6):30-33.

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On the World Wide Web...



http://www.nursingworld.org/ojin/infocol/info_3.htm

Many nurses are not aware that there are credible, full-text nursing publications on the Web. One of them, the *Online Journal of Issues in Nursing* is part of the ANA's web site. The address above is for an article titled "Using e-journals: desktop nuts and bolts." From this site, you can learn about reading nursing journals online and link to e-zines and e-journals.

<http://www.nurseshealthstudy.org>

If you're a nurse, you may be a part of the Nurses' Health Study at Brigham & Women's Hospital in Boston. Researchers send extensive questionnaires to approximately 125,000 nurses every two years. They chose nurses so that they could monitor women's health over time, and because they thought nurses would be more likely to stay in the study, understanding the importance of collecting data over the years. Their response rate from the initial selection of 125,000 nurses has remained at approximately 90% for those who initially committed to the study. This web site describes the data collection and lists the articles that have been published with data collated from responses to the surveys.

References: Nurse's Role in Chest Tube Removal

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7. Baumann MH, Strange C: Treatment of spontaneous pneumothorax. *Chest* 1997;3:789-804.
8. Palesty JA, McKelvey AA, Dudrick SJ: The efficacy of x-rays after chest tube removal. *American Journal of Surgery* 2000;179(1):13-16. [abstract]

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

Check Your Knowledge...

A is not uncommon for a collection of blood to suddenly flow into the chest drain when a patient moves. One isolated episode of 200ml of dark, bloody drainage does not indicate active bleeding.