



# Clinical Update

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## Chest Trauma Across the Lifespan

Approximately 20% of trauma cases each year in the U.S. include significant chest trauma. Two-thirds of major chest trauma cases are caused by motor vehicle crashes, and 25% of injuries occurring in motor vehicle crashes involve the structures in the chest.

One element of successful nursing management of chest trauma patients is ongoing monitoring and repeat assessments because patients may have injuries that are not evident during the initial patient evaluation. Careful nursing follow-up is essential to pick up subtle changes in a patient's cardiovascular and pulmonary status that could be early warning signs of injuries not apparent earlier in the patient's care.

### Understanding Mechanism of Injury

When you're caring for a chest trauma patient of any age, the following information should be a part of a nursing database:

- Were rapid deceleration forces applied to the chest, such as in a motor vehicle crash?
- Was there a high-velocity impact such as a vehicle-pedestrian collision?
- Did the patient fall from a significant height? (can also cause deceleration injury on impact)
- Was blunt force applied to the chest, such as a blow with a baseball bat, fist or other instrument?

### Chest Injuries

Rib and sternal fractures are the most common type of blunt chest injury. Potential injuries to the underlying tissue are usually of greater concern than the rib fractures themselves. Fractures of ribs 3 - 9 are most common and are associated with lung injury. Left lower rib fractures (ribs 9-12) may be associated with splenic injury, right lower rib fractures with liver injury, and sternal fractures with heart and great vessel injury.

In children, ribs remain primarily cartilage until about 8 years of age. It takes a lot more force to break a cartilaginous rib than a calcified rib. Rib fractures in young children should put you on alert to carefully monitor the child for changes in cardiovascular and pulmonary status that could result from underlying blunt force injury to organs in the chest.

In seniors, lower bone density makes rib fractures more common even though less force is applied to the chest; underlying organs may or may not be affected.

### Special Issues for Seniors

Compared with younger patients, seniors are much more likely to have pre-existing diseases such as COPD, heart disease, and diabetes that can complicate chest trauma treatment and recovery. In addition, seniors have less metabolic reserve to compensate for compromised pulmonary function, for example, that can occur with pneumothorax, rib fractures, and pulmonary contusions.

Seniors are more likely to sustain their chest trauma from falls. In addition, when seniors are involved in motor vehicle crashes, their injuries are more serious than younger patients'. Mortality rates are highest for chest trauma in adults over age 50.

A strong cough is important to clear the lungs and reduce the risk of atelectasis and pneumonia. Since the strength of the cough effort decreases with age, the ability to mobilize secretions is diminished, which can put seniors at greater risk for pulmonary complications.

### Children Need Extra TLC

Younger children are more likely to be injured during falls; older children are more often injured during motor vehicle crashes. Blunt chest trauma can also result from child abuse. Note carefully whether the caregiver's explanation of what happened is consistent with the pattern of injuries. Pay particular attention to the skin for evidence of old bruises.

Injuries most common in children are pulmonary contusions (which may not be symptomatic for the first 24 hours after injury), cardiac contusion, and pneumothorax.

Remember, too, that children need different nursing approaches based on their age and psychosocial development. Toddlers, for example, will respond to a playful approach to assessments. They understand simple, concrete terms, and they need constant reassurance. Tell them when a procedure or examination is over. Comforting objects such as a blanket or favorite toy may help with pain management.

Preschoolers have acquired the ability to anticipate pain, which can make their care a particular challenge if they think it will hurt every time you touch them. However, they don't always understand why they have pain, what is causing it, or how long it will last. Avoid telling a child that he is "good" if he doesn't cry or express his fear or pain. Tell him you need him to hold still, for example, but that it's OK to cry.

School-aged children often want privacy and may not want their caregiver present during assessments or treatments. Reassure these patients that their injuries are not punishment for wrongdoing, which is a common misconception. Distraction with music or videotapes may help with pain management.

Careful nursing assessments that anticipate injuries not already diagnosed and an understanding of how chest trauma affects children and seniors differently will help you provide more targeted care and help all your patients breathe just a little easier.

## Check Your Knowledge...

**Q.** A 12-year old is admitted with a chest tube for a pneumothorax after being involved in a motor vehicle crash. What assessment findings would you look for to know when the tube could be removed?

*Answer on other side*

## In The Literature

### Managing Cardiac Surgery Pain

The current issue of the *American Journal of Critical Care* includes an article describing how guidelines for pain management from the World Health Organization, the Canadian Consortium on Pain Mechanisms Diagnosis and Management, and the Joint Commission on Accreditation of Healthcare Organizations were synthesized into a clinical practice guideline for preventing pain after cardiac surgery. In this plan, patients are given non-opioids around the clock for pain management (acetaminophen and indomethacin), and they receive opioids before potentially painful procedures and to treat breakthrough pain. In a retrospective study of 133 patients, opioid dosing was highest on post op day one (38 morphine oral equivalents) and dropped sharply to less than 10 equivalents on day two. What role do non-opioids play in your post-operative pain management routine? This study showed this approach was cost-effective, simple, well-tolerated and presented low patient risk.

Source: Reimer-Kent JR: From theory to practice: preventing pain after cardiac surgery. *American Journal of Critical Care* 2003;12(2):136-143.

### Evidence-Based Pain Management for Seniors

Seniors experiencing acute pain are often under-assessed and under-treated. Cognitive impairment can reduce the patient's ability to communicate the need for pain relief, but it does not reduce his or her pain sensation. Appropriate pain management in this patient population is critical because research shows it will provide better patient outcomes, reduce length of stay, and reduce use of resources.

Nurse researchers at the University of Iowa reviewed and critiqued the literature on acute pain management in older adults and developed an evidence-based guideline on "Acute Pain Management in the Elderly." Key aspects focus on appropriate pain assessment, monitoring pain, teaching patients and families about proper pain management, an extensive review of pharmacologic options for managing and treating pain, and non-pharmacologic, complimentary approaches to enhancing patient comfort.

This comprehensive guideline is a must-read for all nurses caring for older adults.

Source: Ardery G, Herr KA, Titler MG, Sorofman BA, Schmitt MB: Assessing and managing acute pain in older adults: a research base to guide practice. *MEDSURG Nursing* 2003;12(1):7-18.

### How You Can Promote Lifelong Learning

Professional nurses must keep up with changes in research-based practice and advances in care. As hospitals revamp their service delivery models, nursing continuing education is often not at center stage, and this can be a serious handicap if a particular hospital or unit's staff does not have a lot of nursing experience.

An article in a recent issue of *Nursing Management* describes one hospital's experience with adding a mandatory continuing education requirement for nurses, which was added to job descriptions and incorporated into performance appraisals. Registered nurses were mandated to earn 15 CE credit hours per year.

Costs for implementing this new requirement were primarily related to paying staff for attending educational sessions. However, overall, the program saved money on off-site CE activities. Another advantage was that the content could be customized to the specific needs of the facility's nurses, and could follow up on hospital-specific equipment, for example, that might not be available in an outside CE seminar.

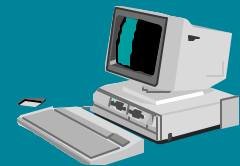
Lessons learned in the first year included:

- if the job description mandates continuing education, the employer needs to provide it and pay for it;
- you will probably need far more seminars than originally scheduled to meet the needs of all nurses on all shifts;
- the program needs to be synchronized with existing performance appraisal cycles, and
- managers need to be in the loop regarding the staff's completion of CE activities.

This is an informative article about the process of setting up a mandated CE program in an acute care hospital. It would be interesting to see if patient outcomes improve as a result of mandating continuing education.

Source: Postler-Slattery D, Foley K: The fruits of lifelong learning. *Nursing Management* 2003;34(2):35-37.

On the  
World Wide  
Web...



### Free? Really Free?

More and more literature is becoming available online. If you haven't checked your medical/nursing or public library recently, you might be surprised at the number of journals that are now available in full-text online. It is far less expensive than the paper version and presents a cost-effective way to disseminate information. Many medical/nursing libraries restrict off-site access to those affiliated with the school or hospital. But a number of Web sites provide links to full-text journals and books, and Medline now offers links to full-text articles from the citation when you perform a search at <http://www.ncbi.nlm.nih.gov/PubMed/>.

<http://amedeo.com/>

This gateway site allows you to subscribe to a weekly newsletter you customize by topic. You'll receive notification of new articles in your area of interest, whether or not they are available online to the public for free.

<http://www.freemedicaljournals.com/>

This site, also hosted by Amedeo, provides links to full-text journals online, even those that do not allow full-text access until a certain time-frame has passed (such as 6 to 12 months from date of publication). As of this writing, there are 990 journals you can check by title or specialty.

<http://www.freebooks4doctors.com/>

This third site from Amedeo, provides links to full-text medical books available free online. While the site calls itself "for doctors," there is a wealth of information here that can enhance any nurse's practice. Six hundred books are listed.

## Check Your Knowledge...

Signs that a chest tube may be removed include:

**A.** Any air leak has disappeared, fluctuations in the water seal chamber stop, the patient is breathing normally without any signs of respiratory distress, breath sounds are equal and at baseline for the patient, and chest radiograph shows the lung is re-expanded and there is no residual air or fluid in the pleural space.