



# Clinical Update

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## Malignant Pleural Effusions

There are approximately 150,000 cases of malignant pleural effusion in the U.S. each year. Malignant pleural effusions are fluid accumulations associated with primary, concurrent or distant neoplasms. Nurses can expect to see the number of patients with this condition grow in coming years, as the incidence of lung and breast cancer approaches epidemic proportions.

### Pathophysiology

Malignant pleural effusions are most commonly associated with cancer of the breast, lung, gastrointestinal tract, ovary, and with lymphomas. Malignant effusions also occur with:

- Pleural metastases
- Direct extension of lung cancer to the pleurae
- Impaired lymphatic drainage from mediastinal tumors without direct pleural invasion (particularly in lymphoma)

The mechanisms that cause the effusions include:

- Increased capillary permeability that allows fluid leakage into the pleural space
- Decreased oncotic pressure that normally holds fluid in the intravascular space due to hypoalbuminemia
- Increased negative pressure in the pleural space as a result of atelectasis.

Pleural effusions can be classified as transudative or exudative. *Transudative effusions* occur when there is an imbalance between the intravascular pressure and the pressure within the pleural space. If the intravascular pressure is unusually high X as it often is in congestive heart failure, for example X fluid will move from the intravascular space to the pleural space. Transudates tend to be watery, clear to pale yellow in color, and contain few cells.

*Exudative effusions* are caused by inflammation, infection, and/or cancer. Unlike transudates, exudates are cloudy, pale yellow in color, and filled with white blood cells and protein. If the patient does not have an infection, and the pleural fluid is bloody (and the thoracentesis is atraumatic) the effusion is probably malignant.

### Pleural Fluid Tests

Various tests can be done on pleural fluid to determine the cause of a pleural effusion. If a malignant effusion is suspected, the fluid will be sent for cytology analysis. About 50% to 60% of cytology tests on pleural fluid are positive for malignancy in patients already known to have cancer. At least 250 mL of pleural fluid is needed for a proper cytologic examination. Other tests done on pleural fluid include protein, LDH, glucose, pH, and cell counts.

If a patient has cancer, but the pleural cytology is negative and there is no other obvious cause of the effusion (as will occur in about 25% of cases), thoracoscopy can be performed to confirm the diagnosis through a pleural biopsy of abnormal areas of the pleurae under direct visualization. Thoracoscopy is diagnostic in at least 90% of patients with malignant pleural effusion.

### Examination Findings

The predominant feature of pleural effusion, regardless of etiology, is dyspnea. Initially patients will experience dyspnea with exertion, which can gradually progress to dyspnea at rest, depending on the underlying lung's condition. You will often note asymmetrical breath sounds with decreased aeration on the side of the effusion. The percussion note will be dull, and you may hear a pleural friction rub (which sounds like squeaky leather shoes). There will be a blunting of the costophrenic angle on chest radiograph; radiographic changes may be the first clue in asymptomatic patients. Computed tomography may show a small effusion not seen on a traditional radiograph.

### Treatment Options

Treatment for patients with malignant pleural effusion should first be directed at relieving dyspnea. The method by which the fluid is removed and the patient is made more comfortable is dictated by the patient's underlying condition and the expected time of survival. Options are:

- Chemotherapy to treat the underlying malignancy (particularly lymphoma, breast cancer, or ovarian cancer)
- Intermittent thoracentesis if the fluid does not re-accumulate rapidly; however, repeated percutaneous drainage may allow tumor formation along the needle track
- Chest tube drainage with instillation of a sclerosing agent.
- Thoracoscopic drainage with direct placement of a sclerosing agent

The goal of pleurodesis with a sclerosing agent is to irritate the pleurae, which will stimulate the formation of scar tissue. This scar tissue essentially glues the two pleural surfaces together so there is no longer a pleural space in which fluid can collect. Before pleurodesis can be done, the pleural space must be drained. When a chest tube is used, the sclerosing agent can be instilled when there is less than 100 mL drainage in a 24-hour period.

Stripping the pleural tissue off the lung and inside the chest wall is 100% effective in controlling malignant pleural effusions, but morbidity is severe so it is rarely done now that thoracoscopic surgery is readily available.

### Check Your Knowledge...

- Q.** A patient with known lung cancer is admitted for increasing shortness of breath and fever. A diagnostic workup reveals a right lower lobe pneumonia and a pleural effusion on the right side. A chest tube is placed for drainage. The drainage in the collection chamber is dark yellow, thick and opaque. What condition is this drainage consistent with?

*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.

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



## In The Literature

### ***Violence is Not in the Job Description***

Unless you're a new graduate, you probably have had the experience of feeling your personal safety threatened by a patient, family members or co-workers while you were on the job. In fact, nurses are three times more likely to experience workplace violence than any other professional group.

In the current issue of *Dimensions of Critical Care Nursing*, author Beth Keely first describes how to recognize the potential for a violent situation, including characteristics of people who may be prone to violence. She provides tips for patient assessment, including assessing for mental illness or physical abuse. The article continues with a comprehensive list of causes of workplace violence, broken down into patient factors and organizational factors. After describing the risks, the author offers a number of recommendations to reduce these risks in the healthcare setting.

Being subjected to verbal or physical abuse is **not** a part of a nurse's job description. If you want to be a change agent in your workplace and take the lead in educating your colleagues about workplace violence, this article is an ideal place to start.

Keely BR: Recognition and prevention of hospital violence. *DCCN* 2002;21(6):236-241.

### ***Implementing Family-Centered Care***

While many of us believe in the theory of family-centered care and realize that nursing research supports this approach, it can be very hard to implement in a busy ED or critical care unit. The current issue of *Critical Care Nurse* contains a must-read article on how to make this happen in your practice area.

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There are 10 key steps to making family-centered care happen: knowing what it is, knowing what the needs of families really are, how you can integrate this philosophy into standards and policies, how to use hospital resources effectively, how to create helpful tools, how to maintain security and confidentiality, how to maintain consistency, making family-centered care a multidisciplinary reality, providing ongoing attention and support, and finally, being patient and letting nurses grow within a well-designed system. This practical, how-to guide will help you get started.

Henneman E, Cardin S: Family-centered critical care: a practical approach to making it happen. *Critical Care Nurse* 2002;22(6):12-16,18-19.

### ***More Info on Non-Credentialed Assistive Workers***

It's hard to find a hospital today that is not using non-credentialed assistive (NCA) workers in nursing care areas. These are not certified nurse's aides who have taken a standardized course and passed an examination. Rather, they are support personnel whose function is determined strictly by the employer, and that function varies considerably from one health system to another.

The current issue of *Nursing Economic\$* includes an article that examines retention issues and ways to let prospective NCA employees know what they are getting themselves into. Currently turnover rate is high, defeating the underlying purpose of introducing this category of worker -- to save health care costs. The author describes the technique of *realistic job preview*, which helps prospective employees understand job

## On the World Wide Web...



At this festive time of the year, these Web sites give us an opportunity to take a moment to remember our colleagues who are no longer with us C nurses who have died in-the-line-of-nursing-care. Some were victims of workplace violence, others died as a result of crashes of aircraft used for transport of critically ill patients, and others died in traditional military service. We owe them all a debt of gratitude.

### **The Virtual Nurses' Memorial**

[http://www.geocities.com/vegas\\_maxwell/](http://www.geocities.com/vegas_maxwell/)

This is perhaps the most comprehensive memorial tribute site to nurses on the Web. Nurse's names are categorized by circumstances of death; for example, did you know that 11 nurses were lost on September 11, 2001 at the World Trade Center? Bob McCarthy has put a tremendous amount of work into this tribute to our fallen sisters and brothers. If you know of a nurse who should be included in this online memorial, you can send the information in for inclusion.

### **Air Memorial Wings**

<http://hultgren.org/assoc/kyaams/mem-wing.htm>

The Kentucky Chapter of the Association of Air Medical Services came up with the idea of designing air memorial wings that can be worn as a tribute to colleagues who have died, similar to the symbolism when police and firefighters wear a black band on their badges. Information about the wings and ordering instructions are available from this site. In addition, the Kentucky Chapter provides a complimentary set of pins to flight services when a fatal accident occurs.

Your favorite

demands, set realistic job expectations, and facilitate a match between the applicant and the organization. This approach can reduce turnover and enhance retention.

While this article is about non-credentialed assistive personnel, this technique would also work when interviewing students or nurses thinking about changing their specialty, such as moving from a medical-surgical unit into the ED or critical care.

Kupperschmidt BR: Unlicensed assistive personnel retention and realistic job previews. *Nursing Economic\$* 2002;20(6):279-283.

## Check Your Knowledge...

**A** Thick yellow pleural drainage in a patient with pneumonia is consistent with empyema, an infection of the pleural fluid. It is treated with chest tube drainage and antibiotics.

### References:

- Carroll P: Mobile chest drainage: coming soon to a home near you. *Home Healthcare Nurse* 2002;20(7):434-441
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- Sahn SA: Malignant pleural effusions. *Seminars in Respiratory and Critical Care Medicine* 2001;22(6):607-615.