



# Clinical Update

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## The Water Seal... a Window into the Pleural Space

It is said that the eyes are the windows to the soul. For patients with pleural chest drainage, the water seal is the window into the pleural space. Perhaps more than any other component of a chest drainage system, the water seal provides the most important diagnostic information about the condition of the patient's lung, the healing process and the all-important pleural pressures.

Water in the water seal chamber creates a one-way valve through which air can leave the pleural space. Today's chest drain provides the bedside clinician with an actual U-tube, calibrated manometer. The numbers on the water seal manometer reflect pressure changes in the pleural space in centimeters of water pressure. The baseline is zero, or atmospheric, pressure; the numbers above the baseline measure negative pressure.

### Bubbling In The Water Seal

If you see bubbling in the water seal and have determined that it comes from the lung, look for a pattern. Typically, bubbling will be greatest during inspiration, as the lung fills with air, particularly if the patient is receiving positive pressure mechanical ventilation. You are likely to see continuous bubbling if the patient is on a ventilator set to deliver positive end-expiratory pressure (PEEP).

If you don't see bubbling, and the patient is breathing spontaneously, ask the patient to cough. If there are no bubbles associated with coughing, it is likely that the lung has healed.

### Tidaling In The Water Seal

When bubbling is absent, look for movement of the water level with breathing; this oscillation is commonly referred to as tidaling. If the patient is breathing spontaneously, intrapleural pressure becomes more negative on inspiration and the water level will rise. If the patient is receiving positive pressure mechanical ventilation, intrapleural pressure becomes more positive on inspiration, and the water level will drop. During exhalation, the water level should return to baseline.

Monitoring the magnitude of these pressure changes is particularly important in patients who are breathing spontaneously. Patients who demonstrate large swings of negative pressure on inspiration may be developing airway obstruction; the high negative pressure is an attempt to overcome the blocked airways. Careful monitoring of these pressures can tip you off to a potential problem before the patient develops more serious signs and symptoms of respiratory distress.

### No Tidaling Or Bubbling

In some cases, tidaling is not seen. If you do not see tidaling, check to make sure the tubing is patent all the way from the chest to the chest drain. The tubing may be kinked or clamped, the patient may be lying on the tubing, or there may be a fluid-filled dependent loop which essentially blocks the tube. The water seal can tip you off to a potentially dangerous tubing occlusion. If the tubing is open, then, it is likely that the lung has completely healed and re-expanded, and the chest tube is snug between the pleurae. In this case, it may be time to remove the chest tube.

As nurses' understanding of chest drainage increases, more and more nurses rely on the water seal as that window into the chest. It is one more important piece of assessment data that can allow you to provide expert care to patients with pleural chest tubes.

### Test Your Knowledge...

**Q.** Patient JM had a left lower lobectomy 24 hours ago. During AM care, he rolls over from his right side to his left. Suddenly, 250cc of dark red blood drains into the chest drain. What could cause this to happen? What would your next nursing actions be?

*Answer on other side*

## Communicating With Intubated Patients

The most recent issue of *Nursing Diagnosis* provides a review of the diagnosis impaired verbal communication as it applies to surgical patients experiencing short-term intubation.

This research study was undertaken to describe the communication experiences of these critically ill patients and to identify common messages the patients wanted to communicate to their nurses.

The most important messages were:

- I am having pain.
- I am uncomfortable.
- I can't breathe.
- How long will the tube be in?
- When is the tube coming out?
- Please untie my hands.
- Where's my family?
- How am I doing?
- Please suction me to remove the secretions.

The researcher suggests these phrases be lettered in bold print on a laminated communication board. Patients can then point to the message that best describes their needs.

Not surprisingly, patients undergoing cardiac surgery who had extensive preoperative education about what to expect reported less negative emotions associated with impaired verbal communication. This evidence reinforces just how important comprehensive nursing care - particularly patient education - is to the psychological well-being of our patients.

Sources:

Fowler SB: Impaired verbal communication during short-term intubation. *Nursing Diagnosis* 1997;8(3):93-98

## A Critical Thinking Game

Many evaluation tools are designed to evaluate a learner's grasp of facts. It is more difficult to assess and develop the clinical decision-making skills critical care nurses need at the bedside.

In the most recent issue of *Nurse Educator*, Kathleen Walsh Free describes an interactive game she developed. The game quizzes students on the conclusions they reach about caring for a patient with a given set of problems. This decision-making is one aspect of the art of nursing that cannot be memorized from a book.

Free wrote three types of questions for each given case study. *What If?* questions ask for appropriate nursing inter-

## On the World Wide Web...



Believe it or not, you can get terrific heart & breath sounds on the Internet. If you're equipped with a sound card, you can visit these sites and listen to normal and abnormal sounds. A terrific resource for teaching purposes!

<http://www.umanitoba.ca/Medicine/Pediatrics/ILSA/sounds/ralrepos.html>

The R.A.L.E. Repository for abnormal breath sounds at the University of Manitoba in Canada. Other sites link to this site to use their breath sounds.

<http://www.med.ucla.edu/wilkes/intro.html>

Auscultation Assistant from UCLA MedNet. Both heart and breath sounds on a terrific site designed by a medical student for other students to practice with.

<http://www.hsc.missouri.edu/shrp/rtwww/rweb/docs/sounds.html>

A terrific site that lets you choose .wav or .au format. .wav files take about 30 seconds to download at 28.8 and are of better quality.

[http://www.umanitoba.ca/faculties/medicine/pediatrics\\_and\\_child\\_health/ILSA](http://www.umanitoba.ca/faculties/medicine/pediatrics_and_child_health/ILSA)

International Lung Sounds Association. Has great links to related sites and an extensive bibliography on breath sounds.

ventions, decisions and actions. *What Else?* questions ask the learner to take another look and think about alternatives to the initial responses. *What Then?* questions ask for additional nursing interventions, decisions or actions.

A richly detailed example is provided in the article. WHAT IF your patient refuses to get out of bed? WHAT ELSE would you ask the patient to complete your nursing assessment? You try one intervention, and it doesn't work - WHAT THEN?

This format is ideal for teaching and evaluating clinical decision making skills for critical care nurses. Less complex cases can be used during a critical care orientation course. More complex scenarios can be used to meet JCAHO requirements to evaluate nurses' competency at the bedside and to assess skills of new employees with previous critical care experience.

Sources:

Free KW: What If? What Else? What Then? A critical thinking game. *Nurse Educator* 1997;22(5):9-12

## Test Your Knowledge...

**A** Bloody drainage will often collect in the pleural space following lung surgery. Since the blood is defibrinogenated by its contact with the pleurae, the blood will not clot. An increase in drainage with position changes is not uncommon. Dark blood indicates it is not fresh, active bleeding. Other than monitoring, no additional nursing actions are needed.