Clinical Update for the Professional Nurse June 2000

atrium

Clinical Update

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New Technology in Chest Drainage - The Dry Control Drain

The latest advancement in chest drainage development is the dry control drain. In these units, the traditional water seal chamber is replaced with a mechanical one-way valve, and a dry suction control chamber is present. No water is required for the chest drain to operate properly.

Sound good? It is. But these drains are not necessarily the best choice for every patient situation. Here's why.

Where's My Water Seal Manometer?

In traditional chest drains, the water seal chamber is actually a U-tube manometer. The numbers on this chamber measure negative pressure in the chest in cmH_2O. By monitoring the level of water in this chamber, you actually have a window into the pleural space. If a high level of intrathoracic negative pressure occurs, the water level will rise, alerting you to this condition.

In the dry control drain, the water seal chamber is replaced by a mechanical one-way valve. Therefore, the drain no longer *must* remain upright in order to maintain the water seal's one-way valve. This "knockover protection" is a terrific concept, but it has a price: you can no longer see pressure changes in the chest.

For patients with mediastinal chest tubes, this change may not be as critical. But for patients who have pleural tubes for pneumothorax, chest trauma, or lung surgery, it is important for the nurse to be able to monitor intrapleural pressure with a traditional water seal chamber.

How Dry Control Drains Work

The Atrium Express™ drain, for example, replaces the traditional water seal with a vacuum protection valve that allows air to escape from the chest and prevents air from going back into the chest. It also has the dry, self-regulating suction control regulator. The drain is not position-sensitive; the patient will benefit from this technology regardless of the position of the drain.

Since there is no true water seal chamber, how can you tell if the patient has an air leak? The Express™ drain has an air leak monitor. To activate it, add 30cc of sterile fluid (saline or water) through a needleless injection port on the front of the drain. If there is an air leak from the patient, bubbling will appear in this monitor.

Check Your Knowledge...

Q. How much fluid must be present before a pleural effusion or hemothorax appears on an upright chest radiograph?

Answer on other side

Understanding Dry Suction Is Critical with Dry Control

With a drain like the Express™, it is *critical* to understand that when the level of suction set on the drain is *decreased*, the drain must be vented in order for the new, lower level of suction to be transmitted to the patient. With a traditional water seal chamber, if the nurse forgets to manually vent the drain after decreasing the suction level, the water level in this chamber will immediately begin to rise, reflecting the increased negative pressure. The rise of the water alerts the nurse to release the pressure, using the manual high negativity vent on the top of the drain. The nurse simply presses on the button, and the excess negative pressure leaves the unit.

However, in a dry control drain without a water seal chamber, if the nurse forgets to depress the manual high negativity vent after decreasing the level of suction on the drain, there is no indication of the increased negative pressure in the chest.

Is Dry Control for Everybody?

Nurses must carefully evaluate these new drains to determine if the drains are right for their patient population. Dry control drains are ideal in patient transport situations. They are well-suited for air rescue programs where flight nurses are the first on the scene; chest tubes may be placed in the field, and a small, non-position-sensitive drain is needed. This technology is also appropriate for critical care transport situations where critically ill patients who may require chest tubes are transported to other facilities for more specialized care. In these situations, where drains are likely to be knocked around, quick set-up may be essential, and careful assessment of pressure changes in the chest are not as critical.

Think about your setting. If you need to monitor for air leaks, you probably won't save any time during set-up because you'll still need to add water to the air leak monitor. If immediate set-up is critical, such as in the ER for a trauma patient, maybe dry control is right for your patients. Is drain knockover an ongoing problem in your practice setting? If so, you may need a dry control drain. But in most cases it is not a common occurrence – just an occasional inconvenience.

Individualize Your Choices

Is dry control an appealing new technology? Yes. The simplicity and new, smaller design is attractive. But, as with so many aspects of healthcare today, these new drains don't come in a "one size fits all" configuration. To gain benefits such as knockover protection and ease of set-up, you lose other important features, such as the U-tube manometer water seal. Only you and your colleagues can decide which chest drain is best for your patients. Carefully evaluate what you gain and what you give up so you can decide which option allows you to provide the best possible care to your patients requiring chest drainage.

In The Literature

Follow Up For Trauma Patients

An article in the *International Journal of Trauma Nursing* from St. Louis University Hospital examined how patients were followed up as outpatients after they had been admitted to the hospital for traumatic hemothorax or pneumothorax and treated with a chest tube. Traditionally, chest radiographs had been taken before discharge and during the postdischarge visit to the outpatient clinic.

The author, Pam Golden, reports that all patients who returned for their postdischarge visit were released from the thoracic service without further treatment. Three patients had a small residual apical pneumothorax, and two had a resolving hemothorax. However, none required treatment.

Golden reports that in this facility an algorithm will now be used to guide the ordering of chest radiographs. We hope there is a follow-up study in another year or so to report on the financial savings of this evidence-based new practice.

Source:
Golden P: Follow-up chest radiographs after traumatic pneumothorax or hemothorax in the outpatient setting: a retrospective review. *International Journal of Trauma Nursing* 1999;5(3):88-94.

A New Century, And Patients Are Consumers

In a recent issue of *Nursing Economic$*, Karlene Kerfoot writes about how nurse executives need to consider the needs of every patient as a unique consumer. Our colleagues in birthing centers have been operating under this paradigm for years. Parents want to customize their birth experience with music, deciding who will be present to share the event, and discussing with great knowledge the type and amount of pharmacological intervention they desire.

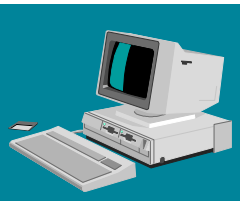
Kerfoot cites a study that reports 97% of people believe they should have a right to be with family members when they are patients in critical care, even when life or death treatment is being administered. The Emergency Nurses' Association has been at the forefront of promoting research on family presence during resuscitation.

Kerfoot outlines four major methods nurse executives can employ to use the power of the knowledgeable consumer in today's healthcare environment. She also offers tips on changing from a procedure-centered to a consumer-centered model of care.

If you're looking for a quick read about making the shift to consumer-focused care, don't miss this column.

Source:
Kerfoot K: 'Customerizing' in the new millennium. *Nursing Economic$* 2000;18(2):95- 97.

On the World Wide Web...



In honor of Nurses' Week in May, we provide some nurses' own web sites which are part of the Nurse's Web Ring. You can get more information about the Ring by visiting any of these sites.

http://members.xoom.com/chrismck/
This site, called "The Unofficial ACLS Web Page" is owned by Chris McKintosh and provides a review of meds, algorithms, rhythm strips and links to other ACLS web sites.

http://www.geocities.com/sarah_rn_2000/nurse1.html
This site, owned by Sarah Stringer, has a beautiful graphical design with a classic photo of a nurse from long ago. She provides links to other nursing sites, including those focusing on nursing humor, for when we need a little laugh.

http://www.internetnurse.freeserve.co.uk/intnetwk.html
This site is the home of the UK nurses' web ring. By visiting this site, you can click on to web sites designed by nurses in the United Kingdom.

http://web.ukonline.co.uk/anneau/
Anne Austin's site from the UK provides us with documents, software, links and commentary on nursing in the 21st century.

Check Your Knowledge...

A. 300 to 500 cc. If radiologic technologists are coming to your unit to take a portable chest film, explain to them that the purpose of the film is to look for fluid. They will adjust the exposure accordingly to provide the best diagnostic radiograph. In addition, it is essential that the patient be as close to fully upright as possible in order for the fluid to collect at the base by gravity. It will appear on the film as a blunting of the costophrenic angle.

Source:
Source:Dettenmeier PA: Radiographic assessment for nurses. Mosby-Year Book, Inc. St Louis, MO 1995: 57-61.

If you have any technical questions about chest drainage, or if you need product information or educational support materials, please call or fax Atrium's hotline anytime.

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