



Clinical Update

Atrium Medical Corporation 5 Wentworth Drive, Hudson, New Hampshire 03051

Phone (603)880-1433 Fax (603)880-6718

Latex-Free Chest Drains

In recent years, there has been increasing concern about patients and health care workers developing allergies to latex and latex-containing products. Globally, there is a demand for latex-free products in health care.

In the general population, approximately 1% to 2% of all people will have a Type I reaction to latex, which consists of an immediate hypersensitivity reaction occurring less than an hour after exposure. Health care workers are at higher risk, with 10% to 15% developing Type I reactions to latex. Frequent exposure to latex products increases the risk of becoming sensitized.

Latex-Free Products

Medical manufacturers have been working diligently to develop latex-free products to protect both patients and health care workers. Today, Atrium Medical Corporation offers latex-free chest drains.

But, changing to a latex-free environment can mean slight changes in how products are used at the bedside. For example, if a sensitized nurse switches to vinyl gloves, double-gloving is often recommended because vinyl gloves do not block HIV and herpes as well as latex gloves do. Stopcocks may be used instead of latex injection ports in IV tubing, and this, too, will require a change in technique.

When a chest drain is latex-free, the most noticeable change is in the tubing that connects the chest tube to the drain itself. Instead of a natural latex rubber tube, the new drains have connecting tubing made of a special synthetic rubber. While this material is safer for patients and nurses in the long run, there is a slight trade-off because it is more difficult to strip.

Test Your Knowledge...

Q. A trauma patient comes into the Emergency Department. He has been shot and is bleeding from the chest. The bullet entrance wound is in the right lower quadrant of the abdomen; the exit wound is from the chest under the left arm. Is this patient an ideal candidate for autotransfusion from the chest tube? Why or why not?

Answer on other side

Research-Based Nursing Practice

When your hospital switches to latex-free chest drains, it is an ideal time to review your policies and procedures for chest drainage to see if they need to be updated based on advances in nursing research. A list of studies about milking and stripping is on page 2; they are available from your Atrium representative.

A classic research study was done by Carol Duncan and Roberta Erickson in 1982. They discovered that routine chest tube stripping resulted in negative pressures as high as $-400\text{cmH}_2\text{O}$ pressure being transmitted to the chest. This occurred in patients whose chest drains were applying $-20\text{cmH}_2\text{O}$ pressure to the chest. The high pressures from stripping can result in lung entrapment in the chest tube eyelets and persistent air leaks.

Blood Clots

Blood that comes in contact with the pericardium or pleural membranes becomes defibrinogenated, so the blood routinely does not clot. That's why autotransfusion from the chest works well. But, if the patient has a massive injury such as pulmonary artery tear, the blood may rush out of the tube so fast that it does not come in contact with the membrane; therefore, the blood may clot. In other cases, drugs may be administered postoperatively to enhance clotting; these may result in blood clotting in the chest drainage tubing as well. These patients may require some gentle tube manipulation in order to promote drainage of the blood clots. Or, you might want to investigate whether switching to heparin-coated chest tubes will promote better drainage.

In routine care, research shows that there is no need to manipulate chest tubes, particularly when there is not a lot of bloody drainage.

As latex-free chest drains are integrated into patient care, the routine practice of stripping and milking tubes should be reviewed. The switch from a latex rubber tube to a latex-free tube presents an opportunity not only to provide safer bedside care, but also to update routine care of patients with chest tubes to a more research-based practice.

Clinical Update is an educational newsletter provided by Atrium Medical Corporation and is edited by Patricia Carroll, RN,C, CEN, RRT, MS.

Using Nursing Research at the Bedside

A recent study of California nurses reported in the *Journal of Continuing Education in Nursing* examined how nurses participated in and used nursing research in patient care.

The most common way nurses participated in research was by collecting data for a study. It was particularly encouraging that the second most common way nurses participated in research was by applying research findings to their own practice. Seventy one percent of nurses surveyed used research findings for a particular patient's care, and 66% used research to change practice on their unit.

While this aspect was not examined in this study, other authors cited in this article stated that a key to implementing research findings at the bedside was wide-ranging support from managers and peers. Among barriers to research use were the lack of authority to change practice, insufficient time on the job, and lack of support.

Chest drainage policies and procedures have often been based on tradition and directions from chest surgeons. This area of nursing practice has seen more research in recent years and presents an ideal opportunity for clinical nurse specialists, educators and managers to implement research-based practice at the bedside.

Early Extubation After CABG

In recent years, changes in postoperative care have allowed CABG patients to be extubated rapidly after surgery. This change in practice has been instrumental in allowing CABG patients to go home sooner.

A study in the most recent issue of the *American Journal of Critical Care* examined the factors that delay post-operative extubation beyond six hours. The two key factors that differentiated early and late extubation patient groups were age and early hemodynamic instability.

The authors suggest that with advancing age, patients will have reduced cardiac reserve and the presence of chronic illnesses. Older patients may also have decreased skeletal muscle mass and tone, which can lead to weakness and fatigue of the respiratory muscles.

Patients in this study who demonstrated hemodynamic instability within three hours after surgery were likely to remain unstable at six hours, which precluded extubation. Aggressive management of hemodynamic instability should be directed toward optimizing myocardial oxygen supply in order to limit ischemia and possible sequelae.

On the World Wide Web...



Here are some sites where you can get additional information about latex allergies. Keep in mind that not all latex-free product listings on these sites are completely up-to-date since latex-free versions of common products are being released regularly. Check with your manufacturer if their product does not appear on the lists on these pages.

<http://www.latexallergyhelp.com>
Provides a large listing of latex-free products.

<http://www.latex.org>
Delaware Valley Latex Allergy Support Network
Excellent source for links to other organizations and governmental sites.

<http://www.flare.org>
Foundation for Latex Allergy Research & Education
Excellent bibliography that lists more than 50 articles about latex allergy.

<http://www.exepe.com/~alert>
Allergy to Latex Education and Resource Team
Many pages have not been updated in a couple of months, but does provide some good information.

Source on Nursing Research:

Brown DS: Nursing education and nursing research utilization: is there a connection in clinical settings? *Journal of Continuing Education in Nursing* 1997;28(6):258-262

Source on Early Extubation:

Doering LV, Imperial-Perez F, Monsein S, Esmailian F: Preoperative and postoperative predictors of early and delayed extubation after coronary artery bypass surgery. *American Journal of Critical Care* 1998;7(1):37-44

Sources on Chest Tube Stripping & Milking:

Duncan C, Erickson R, Pressures associated with chest tube stripping. *Heart & Lung* 1982;11(2):166-171
Gordon P, Norton JM: Managing chest tubes: what is based on research and what is not? *Dimensions of Critical Care Nursing* 1995;14(1):14-16
Gordon P, Norton JM, Merrel R: Refining chest tube management: analysis of the state of practice. *Dimensions of Critical Care Nursing* 1995;14(1):6-13
Gross SB: Current challenges, concepts and controversies in chest tube management. *AACN Clinical Issues In Critical Care Nursing* 1993;4(2):260-275
Lim-Levy F, Babler SA, DeGroot-Kosolcharoen et al: Is milking and stripping chest tubes really necessary? *Annals of Thoracic Surgery* 1986;42:77-80
Teplitz L: Update: Are milking and stripping chest tubes necessary? *Focus on Critical Care* 1991;18(6):506-511

Test Your Knowledge...

A With that bullet path, bacteria from the bowel could have been carried into the chest. Bacterial contamination is a contraindication to autotransfusion. But, it is a relative contraindication. If the patient will bleed to death without the transfusion, the risk of bacterial contamination may be worth taking.