Dressings for Chest Tubes

Chest tube dressing care is the one aspect of care for patients with chest drainage that is repeatedly questioned, yet completely lacking in research for guidance. Anecdotally, published reports recommend fenestrated gauze wrapped around the tube and covered with adhesive tape\(^1\) or using Bioclusive (a transparent film dressing) after tube removal to cover the suture and allow for showering.\(^2\)

**Petroleum Gauze**

However, a few weeks ago, the first article on potential negative effects of petroleum gauze was published online. Many surgeons insist on using petroleum gauze at chest tube sites even though no evidence supports this practice.\(^1,3\) Now, we have a small study in which researchers explored the effect of petroleum gauze on suture integrity.\(^4\) Researchers exposed suture knots tied with four different materials – polydioxanone (PDS-II), silk, glycolide/lactide copolymer (Polysorb), and polyglyconate – to either petroleum gauze or to normal saline-soaked gauze. Some knots failed by untying rather than breakage; 5 of 6 that untied were exposed to petroleum. Knots exposed to petroleum broke at significantly lower tensile strength than those exposed to saline, with silk and polydioxanone failing at statistically significantly lower tensile loads. This is an in vitro study so it may or may not translate directly to chest tube dressings. But, it’s a start.

**Postoperative Dressings**

Since there is no research on chest tube dressings specifically, the next option is considering the literature relating to sternotomy incisions for some guidance. Various dressing materials have been evaluated: dry absorbent pad, hydrocolloid, hydroactive, Bioclusive, and medicated pad or film.\(^5-9\) The ideal dressing should maintain a moist environment, be gas permeable, protect from contamination, allow ongoing assessment, be comfortable, cost effective, and removed without causing tissue trauma.\(^5,9\) Postoperative dressings should stimulate superficial epithelialization at the wound surface.\(^5,8,9\) The table on page 3 summarizes the study findings.

Hydrocolloid dressings allow for the best seal around the wound and are waterproof for bathing. They are not transparent, so clinicians need to be comfortable with other assessments, because frequent dressing changes defeat the purpose of the hydrocolloid material.\(^8\)

Another factor to consider is skin damage related to adhesive removal with repeated dressing changes\(^9\) because impaired skin integrity is a significant risk factor for infection. Hydroactive film caused more tissue damage compared with traditional paper tape or hydrocolloid.\(^8\) As few as four tape stripplings can cause cellular damage to the epidermis, and irritation can also alter the skin’s protective properties even if the skin appears intact. A study on CABG patients compared paper tape (Micropore) with polyethylene tape (Transpore); the tapes’ adhesives were the same.\(^10\) Initially, a dry gauze dressing was anchored with cloth tape in the OR; at the first dressing change, patients were randomly assigned to one of the two study tapes for dressing changes on POD 2 & 3. The paper tape resulted in significantly less irritation and significantly less stripping. Researchers attributed the differences to the paper tape’s gas permeability that also allowed moisture to evaporate. In another study, skin covered with occlusive tape that prevented water loss increased bacterial growth from 1000/cm\(^2\) to millions.\(^10\)

**Recommendations for Practice**

General surgical site care guidelines recommend protecting the incision with a sterile dressing for 24 to 48 hours and using an aseptic no-touch technique or full sterile technique for removing or changing dressings after performing proper hand hygiene. Use sterile saline for wound cleansing for the first 48 hours postop, avoid topical antimicrobial agents when wounds are healing by primary intention, and aggressively manage postoperative glucose levels.\(^11-13\)

While it’s important to consider cost of the dressing, a single infection (minimum $8118, up to five times the baseline cost of surgery) can easily wipe out any savings between dressing types.\(^6,7\) Not only do frequent dressing changes cost more in nursing time and in supplies used as well as causing skin stripping with tape removal, but each dressing change also increases the risk for wound contamination and subsequent infection.\(^5\) Taking all of this into consideration, the literature supports these recommendations:

- Do not routinely change dressings unless the dressing is compromised in some way or there is a significant need to visualize the tube insertion site based on changes in the patient’s condition.
- Use a dry, sterile dressing and secure the dressing with wide paper tape.
- Once the tube is removed, a transparent film dressing would be preferable if the patient plans to shower.

While the current body of research does not specifically examine chest tube dressings, we can begin to develop an evidence-based approach with these studies on postoperative dressings in the same patient population.

**Sources on page 2**

Check out Ask the Expert now available at AtriumU.com. You can submit a question about caring for patients with chest drainage and read questions from your colleagues with the evidence-based answers.
In the Literature

**M&Ms Not Just for Docs**

One hallmark of professional practice is engaging in reflective practice and learning from errors. Nurses naturally think about every little thing that might have contributed to error, but a guided forum among colleagues can examine root causes, identify patterns and systems issues and identify topics for further investigation. The current issue of *AACN Advanced Critical Care* describes such a program at Lucile Packard Children’s Hospital in Palo Alto, CA. Once nurses reflect and discuss at the M&M conference, issues are identified. These are then reviewed in the literature, synthesized and presented as an educational session for the rest of the staff. These cycles of inquiry and learning are constructive, support patient safety, enhance professional autonomy and responsibility, and foster evidence-based interdisciplinary practice in the cardiovascular ICU. Team members were able to successfully move from error finding and blame to an evidence-based systems analysis through continuous quality improvement.

Source: Staveski S, et al.: Nursing mortality and morbidity and journal club cycles. *AACN Advanced Critical Care* 2012;23(2):133-141. PubMed Citation

**Bringing Evidence to a Practice Island**

The current issue of *Worldviews on Evidence-Based Nursing* focuses on the role of technology for enhancing evidence-based practice in nursing care. Researchers in Wisconsin report on a pilot online journal club as a strategy for bringing isolated school nurses together with other school nurse colleagues with whom they did not share a building for on-site workplace collaboration, consultation and support. Meetings were held virtually at the end of the school day for one hour; nurses logged in to a meeting site to participate in the discussions.

The researchers provide a great description of their process and how it could be used or adapted in other practice settings in which nurses are physically isolated from professional colleagues. Their project not only encouraged participation, but also had nurses asking for more.

Source: Sortehadl C: Effect of online journal club on evidence-based practice knowledge, intent and utilization in school nurses. *Worldviews on Evidence-Based Nursing* 2012; 9(2):117-125. PubMed Citation

Sources from page 1

1. Dressing up for a change: chest tube insertion site. *Nursing* 96. 1996;26(7):44-46. PubMed Citation


**Your Lung Operation**

The American College of Surgeons has developed a patient education programs called “Your Lung Operation” that explains thoracic surgery to patients. Clinicians can order the whole toolkit online, but the video program is available online at no cost. It does a terrific job telling patients what they can expect and showing the tubes and monitoring used postoperatively.

http://www.facs.org/patienteducation/skills/lung/index.html
### Evidence Summary Median Sternotomy Dressings

<table>
<thead>
<tr>
<th>First author</th>
<th>Material</th>
<th>Days</th>
<th>Material</th>
<th>Days</th>
<th>Findings</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teshima⁵</td>
<td>Hydrocolloid</td>
<td>7</td>
<td>Film with iodophor then Absorbent pad</td>
<td>2</td>
<td>91% complete healing hydrocolloid, 98% complete healing with film</td>
<td>Both dressings were occlusive. Hydrocolloid did not require change. Hydrocolloid less cost with less nursing time.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>9% did not complete time with hydrocolloid; 6% film had dermatitis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Significantly more SSI with film</td>
<td></td>
</tr>
<tr>
<td>Segers⁶</td>
<td>Adhesive drape over dry gauze pad</td>
<td>2 then changed daily</td>
<td>Absorbent knitted cellulose pad with adhesive frame</td>
<td>1 changed daily</td>
<td>No difference</td>
<td>After 72 hours if no exudate or infection, uncovered.</td>
</tr>
<tr>
<td>Alvarez⁷</td>
<td>Absorbent pad with adhesive frame</td>
<td>5</td>
<td>Transparent polyurethane</td>
<td>14</td>
<td>Significantly reduced sternal and leg wound infection for CABG with polyurethane.</td>
<td></td>
</tr>
<tr>
<td>Wynne⁹</td>
<td>Absorbent pad with adhesive frame</td>
<td>2</td>
<td>Hydrocolloid OR Transparent adhesive film</td>
<td>5</td>
<td>No difference in infections between three dressing types</td>
<td>Patients generally not aware of dressing nor found moving limited, were satisfied.</td>
</tr>
<tr>
<td>Wikblad⁸</td>
<td>Absorbent pad</td>
<td>Changed only if leaking or exudate</td>
<td>Hydrocolloid OR Hydroactive film</td>
<td>Changed only if leaking or exudate</td>
<td>Hydroactive: significantly poorer wound healing 52% Pad: 90% Hydrocolloid: 77%</td>
<td>Absorbent pad easier to change &amp; less painful, slightly more nursing time, but overall preferred.</td>
</tr>
</tbody>
</table>

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