Readings on Chest Tube Stripping

Literature about whether the benefits of chest tube stripping outweigh the risks

Evidence-based practice requires a review of the literature, reflecting relevant scientific evidence; the clinician’s clinical judgement; and patients’ values and preferences.
Evidence-Based Practice

Evidence-based practice is replacing “tradition” as the foundation for much of our bedside practices here in the 21st century.

However, when it comes to surgeons and chest tube management, tradition still reigns. One survey discovered that 72% of nurses were not permitted to strip chest tubes by policy. At the same time, 74% of surgeons expected their patients’ chest tubes were being stripped.²

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Evidence-Based Practice

Chest Drain Literature

Since Duncan and Erickson¹ published their groundbreaking study on the pressures generated by stripping the connecting tubing between the patient’s chest tube and the chest drain, there have been debates about whether chest tubes should or should not be stripped routinely to maintain patency.

Gather 25 critical care nurses with some experience under their belts and you are sure to find at least one who swears to have stripped a chest tube, and removed a clot from the chest with no injury to the patient. That is informed judgement the nurse brings to an evidence-based practice of manipulating chest tubes to enhance drainage.

While evidence-based practice (EBP) is multifactoral, the literature review is the most challenging for most professional nurses. This document provides a list of articles published in the nursing and medical literature about chest tube stripping. A short summary of the contents is provided where appropriate to help nurses decide which resources would be most helpful for answering questions, developing policies and procedures, writing lesson plans, or other clinical applications.

Reviewing the literature is important because a national survey of physicians to determine factors in the selection and management of chest tubes after pulmonary lobectomy provides this nugget:

The surveyed surgeons “felt that clinical experience - rather than the teaching they received...or published journal articles - was the most important factor” that determines their chest tube management.³
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Nursing Literature

Systematic review of the literature relating to chest drain care, specifically: dressings, tube manipulation and positioning, and tube removal.

The classic reference that first identified very high negative pressures with chest tube stripping demonstrated pressures between -145 cmH2O and -370 cmH2O depending on length of tube compressed and -145 cmH2O -408 cmH2O when roller was compared to manual technique; pleural pressures were higher than mediastinal pressures. Study measurements were done on 20 men who had postoperative pleural or mediastinal chest tubes; measurements were taken at the juncture of the chest tube and the drainage tubing; suction to the drain was -20 cmH2O.

This study compared standard care with venting and sump drainage; all chest tubing was stripped with a roller. Chest drains today automatically vent excess negative pressure in the system. This study did not compare tube manipulation techniques.

Compares traditional practices with evidence-based practices relating to suction levels, manipulating chest drain tubing, positioning tubing.

This comprehensive, extensively referenced review examines the state of the art of nursing care in 1993, including indications; tube placement; drainage systems; principles relating to chest drainage; controversies including mediastinal bleeding, tube clearance, clamping, tube site care, antibiotics; chest tube removal complications; and autotransfusion.

This clinical evidence review examines the literature relating to drainage tube manipulation and finds no research supporting the practice.

Milking compared with stripping showed no difference in drainage in cardiac surgery patients; statistical analysis also showed no difference in drainage between suction pressures of -5 cmH2O and -20 cmH2O.
“Ask the Expert” recommends against routine tube manipulation

This classic study is one of the first to compare milking, stripping and no manipulation to CABG patients and determined there was no benefit to tube manipulation and recommended avoiding any dependent loops in the drainage tubing.

This study used fixed randomization within groups of (1) thoracotomy and/or radiation and (2) no such treatment, with 8 patients in each group; half of patients received chest tube stripping Q2 hr for the first 48 hours after thoracotomy, the control group had no tube manipulation. Tube manipulation had no effect on pain, fever or pulmonary complications between the two groups (pain was assessed after tube stripping, not during). Routine stripping is questioned.

Randomized trial compared milking (any compression with twisting or squeezing) with stripping (continuous compression with a roller) when a clot was visible in the drainage tubing. 78/200 patients had no clots; tube manipulation did not improve outcomes and is not recommended.

This literature review found no research in support of stripping or milking chest tube draining tubing to maintain patency.
Additional Literature


Randomized trial compared milking (1 min Q 2 hr x 48 hr) with observation and all patients had -20 cmH2O. Milking significantly increased drainage, but thought to be resulting from stimulation of pleura, not because tube was more patent; no clots were observed in tubes of any patients; advise against routine tube manipulation


“Best evidence review” examined the literature and only considered Issacson, Lim-Levy and Pierce to meet inclusion criteria; insufficient evidence to support tube manipulation; given risks illustrated by Duncan, tube manipulation is not recommended


Survey of North American cardiothoracic surgeons and nurses to identify problems with chest tube management; tube clogging was the leading concern; surgeons tend to choose larger tubes to reduce this risk; 74% of surgeons allow stripping, 23% discourage it and 4% forbid it; 28% of nurses' facilities allow stripping, while 72% do not allow; 75% of nurses agreed that managing chest tube clogging took them away from other important tasks.


Cochrane Review found 3 studies that met criteria but could not be combined in meta-analysis; no data to support tube manipulation (milking or stripping) to prevent cardiac tamponade; no evidence to support or reject tube manipulation

References


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