The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynyk and Fineout-Overholt (2011).

I Evidence obtained from a systematic review of all relevant randomised control trials.

II Evidence obtained from at least one well designed randomised control trial.

III Evidence obtained from well-designed controlled trials without randomisation.

IV Evidence obtained from well designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case- series

V Evidence obtained from systematic reviews of descriptive and qualitative studies

VI Evidence obtained from single descriptive and qualitative studies

VII Expert opinion from clinicians, authorities and/or reports of expert committees or based on physiology

Melynyk, B. & Fineout-Overholt, E. (2011). Evidence-based practice in nursing & healthcare: A guide to best practice (2nd ed.). Philadelphia: Wolters Kluwer, Lippincott Williams & Wilkins.

National Health and Medical Research Council (2009). NHMRC levels of evidence and grades for recommendations for developers of guidelines (2009). Australian Government: NHMRC. http://www.nhmrc.gov.au/_files_nhmrc/file/guidelines/evidence_statement_form.pdf

OCEBM Levels of Evidence Working Group Oxford (2011).The Oxford 2011 Levels of Evidence. Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=1025

Databases searched:	✔ CINAHL (Ebsco)	☐ Medline (Ebsco)	☐ Pubmed (NLM)	☐ Nursing (Ovid)	☐ Emcare (Ovid)	☐ Other List: _____
Keywords used:	Chest drain management, nursing					
Search limits:	2007-2022, English					
Other search comments:						

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Reference (include title, author, journal title, year of publication, volume and issue, pages)	Evidence level (I-VII)	Key findings, outcomes or recommendations
Simons, E., & Ramesh, P. (2019). A General Paediatrician's Guide To Managing Chest Drains in Children and Young People. *Paediatrics and Child Health, 29*(4), 190-192.	VII	• Troubleshooting UWSD when not functional • Required nursing observations in relation to UWSD • Importance of medical imaging after inserting an UWSD but no information of imaging post a removal of a chest drain
Richards, A., & Evans, J. (2020). Are routine chest X-rays required after removal of chest drains in children? *Archives of Disease in Childhood, 105*(7), 700-702.	V	• Possible complications after removal includes air or fluid accumulation in the pleural space, bleeding, infection and retained foreign body fragments. • Extensive summary of six findings/studies that indicate a chest x-ray after removal of chest drains in paediatrics • Some studies found that a chest x-ray may not be indicated unless the patient is symptomatic post removal. • Factors to consider for the need of an x-ray includes limiting radiation exposure and fear/anxiety provoking for some paediatric patients • Recommended that X-ray only be performed on patients who are symptomatic after removal to change clinical management appropriately
Lu, C., Jin, Y. H., Gao, W., Shi, Y. X., Xia, X., Sun, W. X., ... & Si, J. (2018). Variation in nurse self-reported practice of managing chest tubes: A cross-sectional study. *Journal of clinical Nursing, 27*(5-6), 1013-1021.	IV	• Lack of research-based evidence to support nursing management of chest drains • There is very little studies that supports best timing or frequency of drain dressing changes • Manipulation of drains may cause possible tissue damage if unnecessary • Nurses are the main healthcare professionals that often manages patients with chest drains therefore play a key role in decision making • There is insufficient evidence to support timing and frequency of changing chest drain canisters

Kane, C. J., York, N. L., & Minton, L. A. (2013). Chest tubes in the critically ill patient. *Dimensions of Critical Care Nursing, 32*(3), 111-117.	VI	• Detailed respiratory assessment is required for any patient with a pleural chest tube • Appropriate pain management, along with repositioning and relaxation techniques, can assist patients with their deep breathing and coughing exercises, thereby reducing hypoventilation, atelectasis, and pneumonia • Dressing changes are performed when the dressing becomes loose or saturated with drainage – skin irritation can occur with frequent dressing changes; surrounding skil should also be evaluated for maceration during every dressing change • Tubing should be looped horizontally on the bed but never secure to the bed or patient's gown • Clamping can result in an obstruction that precipitates a tension pneumothorax as the escape route for air and fluid is lost
Halm, M. A. (2007). To strip or not to strip? Physiological effects of chest tube manipulation. *American Journal of Critical Care*, *16*(6), 609-612.	V	• Intrathoracic pressure increased to -400cm H2 when the full length of chest tube is stripped • Excessive pressure can be detrimental due to damaging tissues, increased risk of bleeding and also impact left ventricular functions due to increased negative intrathoracic pressures. • No clear benefits in enhancing patency when chest drain tubes are manipulated
Durai, R., Hoque, H., & Davies, T. W. (2010). Managing a chest tube and drainage system. *AORN journal*, *91*(2), 275-283.	VII	• Drain containers are often replaced when full or when there is a loss of vacuum • To drain fluid e.g. blood, pus or lymph from the pleural cavity, the drain is often inserted at a slightly lower intercostal space e.g. sixth or seventh whilst to drain air from the pleural cavity, it is often inserted in the slightly higher intercostal e.g. second. • During patient transport, the chest tube must not be clamped and the canister remains upright and attached safely to the bedside and ensuring the chamber remains below the patient's chest level to present backflow into the pleural cavity