

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>

Reference (include title, author, journal title, year of publication, volume and issue, pages)	Evidence level (I-VII)	Key findings, outcomes or recommendations
1. Adelson. P., et al.(2003). Intracranial pressure monitoring. Paediatric Critical Care, 4(3) (suppl.):S28–S30	VII	ICP monitoring is accurately done via external ventricular catheters or from catheter tip pressure transducers. Overall safe practice, clinically significant complications occur infrequently,
2. Bisnaire D, Robinson L. (1997). Accuracy of Leveling Intraventricular Collection Drainage Systems. Journal of Neuroscience Nurses 29(4):261–268	VII	Studies found that nurses were unable to accurately level an evd using visual means only, use of a tool such as a carpenter’s level/ laser level improved accuracy dramatically. Laser level for EVD height improved patient safety.
3. Iacono L. (2000). Exploring the guidelines for the management of severe head injury.Journal of Neuroscience Nurses 32(1): 54–60	VI	This guideline discusses the management of severe head injury, and focuses on the aims of preventing secondary brain injury. The largest single group of patients that require ICP monitoring are those patients with severe head injury.
4. Institute for healthcare Improvement. (2012). IHI central Line Bundle: Chlorhexidine Skin Antisepsis.	VII	Using chlorhexidine solution use a back and forth friction scrub at least 30 seconds , and allow the solution time to dry completely, can take up to 2 minutes
5. Pope W.(2007). External Ventriculostomy: a practical application for the acute care nurse. American Association of Neurosciences Nurses 30(3):185–195	VII	EVD’s are catheters placed into the ventricular space, used to drain off excess CSF that causes issues such as hydrocephalus and ICP , causes of hydrocephalus include tumors, hemorrhage. Nursing aims when nursing patient with an EVD need to monitor for infection, bleeding, and document hourly drainage, colour, dressing appearance.

<p>6. Richardson. J., et al.(2012) External ventricular device guideline (EVD). Royal Hospital for Sick Children PICU-Neurosurgery: 1-16</p>	<p>VII</p>	<p>Common indications for raised ICP include head injury, subarachnoid haemorrhage, posterior fossa tumours, acute hydrocephalus and meningitis. Ventricular system anatomy included, flow of CSF, secretion and amount discussed. Signs and Symptoms of raised ICP for infants and Children discussed. Procedure documentation with rationale, sampling of CSF from an EVD.</p>
<p>7. Royal Children’s Hospital. (2008). Central venous access device insertion and management. Royal Children’s Hospital, Hospital Clinical Guidelines: 1-7</p>	<p>VII</p>	<p>RCH hospital guideline on Central Venous Access Device Insertion and Management, evidence of cleaning practice relates to principles used in cleaning practice of an EVD, and sampling.</p>
<p>8. Slazinski. T., et al. (2011) Care of the patient undergoing intracranial pressure monitoring/external ventricular drainage or lumbar drainage. American Association of Neuroscience Nurses: 1-37</p>	<p>VII</p>	<p>Discussions on prevention of infection and the strict adherence to aseptic technique required. No specific studies on the cleaning of evd access ports; research is needed on this topic, this literature states the best evidence/data supporting cleaning of EVD ports are from CVAD literature. Lumbar drain devices , equipment and patient assessment</p>
<p>9. Tippett. N. (2006). Intracranial pressure (ICP) monitoring and extraventricular drains (EVD). Bayside Health, Alfred ICU: 1-19</p>	<p>VII</p>	<p>Documentation on setup and priming of EVD systems, how to zero evd, with transducer, transporting and positioning of patient. Codman express monitors and its use in ICP monitoring.</p>
<p>10. Western Health Sydney. (2003). Collection of CSF from a ventricular drain: Intensive care, evidence based practice guideline.</p>	<p>VII</p>	<p>Collection of CSF from a Ventricular Drain, practice and equipment required, cleaning product chlorhexidine 0.5% in alcohol 70% used, to clean access ports on EVD’s</p>
<p>11. Williams. DG, Hayes. J, McCoo.I S. (1996). Shunt infections in children; presentation and management. Journal of Neuroscience Nursing 28(3):155–163</p>	<p>VII</p>	<p>For assessment and Care the Neuroscience nurse needs to be able to recognize signs of infection, in children with shunts. Most frequent organisms found from shunt related infections include gram positive (staphylococcus epidermis and staphylococcus aurous.)</p>

12. Yanko.J, Mitcho. K.(2001). Acute management of severe traumatic brain injuries. Critical Care Nurses 23(4):1–23	VII	Resuscitation priorities of a traumatic brain injury cases.
13. Alfred Health. (2014). Intracranial Pressure (ICP) Monitoring and Extraventricular Drains.	VII	Alfred Hospital’s guideline for the nursing management of a patient with an EVD or ICP monitor. Discusses the procedure for safe transportation of a patient with an EVD
14. O’Connor, Jody, (2015). Great Ormand Street Hospital. External Ventricular Drainage.	VII	Supportive guideline for CSF sampling technique that is current to RCH current practice (not for CSF aspiration by registered nurses). Current method is drop technique; current CSF required is 10 drops/ 1 ml.
15. Waldron, S. Director of Acute Operations, RCH.	VII	Recommendation and implementation of the procedure for transporting and accompanying a patient, with an EVD, off the ward setting.
16. Muralidharan, R. (2015). External ventricular drains: Management and complications. International Journal of Neurosurgery and Neurosciences. 6(suppl 6): S271-S274.	V	Discusses the anatomy of the ventricles, indications, nursing assessments and continuous observations of a patient with and EVD/ICP monitoring. Also identifies EVD associated complications. Coincides with the RCH clinical guideline.
17. The Children’s Hospital, Weastmead (2013). Intracranial Pressure (ICP) Monitoring via Rickham Reservoir, Codman Monitor or Lumbar Catheter- CHW.	VII	Provides instructions for the monitoring of ICP and zeroing of the Codman monitor. The Codman monitor is currently used to monitor ICP levels within the RCH.