Evidence Table: Intra abdominal pressure monitoring

Reference ***(include title, author, journal title, year of publication, volume and issue, pages)***	**Evidence level (I-VII)**	**Key findings, outcomes or recommendations**
• Cheatham M, Malbrain M, Kirkpatric A, Sugrue M, Parr M et al (2007). *Results from the international conference of experts on intra-abdominal hypertension and abdominal compartment syndrome. II Recommendations*. Intensive Care Medicine. 33:951-962.	VII	• International consensus group of critical care specialists who have developed consensus definitions and evidence based guidelines for recognition and management of intra abdominal hypertension (IAH) & abdominal compartment syndrome (ACS) • Risk factors for IAH & ACS identified • Positioning of patient when measuring intra abdominal pressure(IAP) needs to be consistent with each subsequent measurement taken. Elevated head of bed elevates IAP • Reduction of maximum fluid volume used during measurement to 25ml • Reference point for zeroing should be mid axilla rather than symphasis pubis as easier for staff to identify
• Davis P, Koottayi S, Taylor A, Butt W. (2005) *Comparison of indirect methods of measuring intra-abdominal pressure in children.* Intensive Care Medicine. 31:471-475	IV	• Prospective study in an Australian PICU (RCH) comparing methods of measuring intra abdominal pressure. • Compared measuring pressure via PD catheter, nasogastic tube or urinary catheter. Also compared volume of saline to instill when performing measure • Most accurate method was intra vesicular measuring bladder pressure via transducer after instilling 1ml/kg of normal saline. Higher levels of fluid instillation led to overestimation of IAP
• Ejike J, Bahjri K, Mathur M. (2008). *What is the normal intra-abdominal pressure in critically ill children and how should we measure it?* Critical Care Medicine. 36(7):2157-2162	IV	• Prospective observational study of 96 mechanically ventilated children in a PICU with aim to identify normal IAP in critically ill children • IAP measured by intra-vesical technique. Normal saline of pre determined volume instilled via urinary catheter & pressure transduced • Mean IAP in critically ill children is 7± 3mmHg. • IAP> 10mmHg should be observed very closely for development of IAH & ACS • Procedure was safe and no increase in nosocomial bacteriuria with the addition of the measurement system to the urinary catheter

Reference ***(include title, author, journal title, year of publication, volume and issue, pages)***	**Evidence level (I-VII)**	**Key findings, outcomes or recommendations**
• Ejike J, Kadry J, Bahjri K, Mathur M. (2010). Semi recumbent position and body mass percentiles: effects on intra-abdominal pressure measurements in critically ill children.	IV	• Prospective observational study in a PICU of 77 mechanically ventilated children with a range of diagnosis. Aim to determine effect of position and BMI on intra-abdominal pressure(IAP) • IAP measured by intra-vesical technique. Normal saline of pre determined volume instilled via urinary catheter & pressure transduced • Intra abdominal pressure increases significantly when head of bed is elevated from 0° to 30°. BMI has no correlation with IAP
• Gallagher JJ (2000) *Ask the Experts* Critical Care Nurse, 20, 1 p:87.	VII	• Description of procedure for measuring IAP including equipment required and how to assemble • Timing of measurement for end expiration
• Iberti TJ, Lieber CE, Benjamin E. (1989*) Determination on intra-abdominal pressure using a transurethral bladder catheter: clinical validation of the technique.* Anesthesiology, 70 (1): 47-50	IV	• Prospective study of 16 adults with urethral catheters and abdominal drain/parancentesis. Compared measuring IAP via bladder catheter & direct abdominal pressure • Clinical validation of bladder pressure monitoring of intra abdominal pressure as simple, minimally invasive method of measurement
• LCP Rao, CR Chaudhry, LCS Kumar (2006) *Abdominal Compartment Pressure Monitoring - a simple techniques.* MJAFI,Vol. 62, No. 3.	VII	• Description of a simple bedside method of measuring IAP via urinary catheter
• Moore A, Hargest R, Martin M, Delicata R.J, (2004) *Intra-abdominal hypertension and the abdominal compartment syndrome.* British Journal of Surgery, 91: 1102-10	VII	• Overview of intra-abdominal hypertension and abdominal compartment syndrome. • Used for the original guideline but now superseded by above work by Cheatham et al.

Reference ***(include title, author, journal title, year of publication, volume and issue, pages)***	**Evidence level (I-VII)**	**Key findings, outcomes or recommendations**
• Ravishankar N, Hunter J (2005) *Measurement of Intra-abdominal hypertension in intensive care units in the United Kingdom.* British Journal of Anaesthesia Volume 94, Number 6 Pp. 763-766.	VII	• Questionnaire to all ICUs in the UK regarding practices around IAP monitoring & recognition of IAH and ACS • Demonstrated more than half of ICUs don't measure IAP despite acknowledging high IAP is a serious problem, as they don't know how to (27.2%) or don't know how to interpret result (33.3%)
• Sugrue M, (2002)*Intra-abdominal pressure: time for clinical practice guidelines?*. Intensive Care Med 28: 389-91.	VII	• Call for development of clinical guidelines on IAP • Used for the original guideline but now superseded by development of international guidelines by Cheatham et al. (as referenced above)
• Balough Z, Jones B, Amours S, Parr M and Sugrue M (2004) *Continuous intra-abdominal pressure measurement technique.* The American Journal of Surgery.188(6):679-684	VI	• Prospective trial comparing continuous versus intermittent intra abdominal pressure monitoring • Continuous monitoring found to be equally accurate to intermittent but requires special 18G triple lumen urinary catheter to be inserted on admission

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