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:	Neonate, pain assessment					
Search limits:	2015-2020					
Other search comments:	N/A					

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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**
Bellieni, C. V., & Buonocore, G. (2018). What we do in neonatal analgesia overshadows how we do it. Acta Paediatrica, 107(3), 388-390. doi:10.1111/apa.14125	VII	Neonatal research on pain treatment needs to reflect what actually happens in neonatal clinics, and it is not enough to focus on just the timing and tools. We need to consider what the baby needs during a painful procedure and this means developing an insight into the baby, on the whole procedure and on the baby's overall state and family. Environmental analgesic strategies that require staff to respect the physiological mother–infant relationship are more effective than mere oral sucrose, for example using breastfeeding or sensorial saturation to promote a multisensory and humanised approach.
Burton, J., & MacKinnon, R. (2007). Selection of a tool to assess postoperative pain on a neonatal surgical unit. *Infant, 3*(5), 188-196. Retrieved from http://www.infantgrapevine.co.uk/default.html	V	Behaviours may be more specific to pain than physiological responses, however they are generally less objective and less quantifiable. An important consideration with behavioural indicators is their degree of specificity for detecting the presence of pain as opposed to other states such as hunger or fear. Ventilation, sedation, paralysis, and extreme illness/weakness are factors, which would affect the assessment of neonatal behaviours. Physiological indicators such as heart rate and blood pressure do have the advantage of objective assessment in the clinical setting and measurement postoperatively may be facilitated by standardised monitoring. Furthermore, in paralysed neonates, clinicians may have to rely on such indicators. However, physiological indicators are non-specific for pain, vary between individuals, and are reflexive in nature, and therefore should be carefully interpreted within clinical context. Factors such as blood loss, fluid intake and body temperature may limit the usefulness of physiological indicators for assessing neonates following surgery.
Devsam, B. U., & Kinney, S. (2020). *The Clinical Utility of the Pain Assessment Tool (PAT) in Ventilated, Sedated and Muscle-Relaxed Neonates*. Australian Critical Care *(in press)*.	VI Clinical Utility	The clinical utility of the PAT is acceptable for minimally sedated neonates, however, it decreases the more sedated a neonate becomes, and the PAT's usefulness is extremely poor in the muscle-relaxed neonate. A better understanding of the timing and interpretation of the pain score in relation to the neonate's clinical status may enable improved decision-making and pain management. The PAT requires further validity, reliability and clinical utility research, particularly in critically ill and muscle-relaxed neonates.

Devsam, B. U., & Crellin, D (2019). *The Reliability and Clinical Utility of the Modified Pain Assessment Tool (mPAT) in Ventilated, Sedated and Muscle-Relaxed Neonates*. (Unpublished Manuscript).	VI	The mPAT is a clinically useful and reliable pain assessment tool for ventilated, sedated, and muscle-relaxed neonates. It is utilised in conjunction with the nurse's clinical judgement and critical thinking skills to allow for correct pain assessment and management. Although the mPAT was only recently modified, it seems to be a good option as a neonatal pain assessment tool to implement in the NICU. It also seems to be useful for pain assessment in sedated and muscle-relaxed neonates to allow for appropriate pain management. Unfortunately, there is limited research on how sedated and muscle-relaxed neonates express pain for accurate pain assessment.
Eriksson, M., & Campbell-Yeo, M. (2019). Assessment of pain in newborn infants. Seminars in Fetal & Neonatal Medicine, 24(4), 1-7. doi:10.1016/j.siny.2019.04.003	VII	Each unit should have a pain assessment tool that covers the patients that they are caring for and the types of pain that they are experiencing. Pain assessment should be recorded and reported regularly with clear action steps for each level of pain experienced. Continue to validate pain assessment tools that currently exist and gain a deeper understanding of the pain that is experienced by neonates. Health care professionals need to continually assess the uptake and consistency of pain assessment tools in clinical practice.
Giordano, V., Edobor, J., Deindl, P., Wildner, B., Goeral, K., Steinbauer, P., . . . Olischar, M. (2019). Pain and Sedation Scales for Neonatal and Pediatric Patients in a Preverbal Stage of Development: A Systematic Review. JAMA Pediatrics, 173(12), 1186-1197. doi:10.1001/jamapediatrics.2019.3351	V	According to the present systematic literature research results, various scales assessing pain or sedation have been published with different levels of validity and reliability. We suggest the use of scales that are validated for construct validity, internal consistency, and interrater reliability and further suggest choosing a particular scale based on the population of interest and the construct intended to measure. The PAT is validated to be used in preterm and term neonates for post-operative and prolonged pain.
Hodgkinson. K, Bear. M, Thorn. J, Blaricum. S.V, Measuring Pain in Neonates: Evaluating an Instrument and Developing a Common Language, the Australian Journal of Advanced Nursing, 1994, Vol.12, No.1 17-22	VI Pilot Study	This article explains the development and evaluation of the pain assessment tool (PAT). The PAT scoring system explained as well as an explanation of the scoring terms. Pilot study was undertaken to evaluate the effectiveness of the tool. Article recommended the use of the PAT scoring system to evaluate pain in post-operative and other neonates. Tool was found to be useful and workable.
O'Sullivan, A. T., Rowley, S., Ellis, S., Faasse, K., & Petrie, K. J. (2016). The Validity and Clinical Utility of the COVERS Scale and Pain Assessment Tool for Assessing Pain in Neonates Admitted to an Intensive Care Unit. *The Clinical Journal of Pain, 32*(1), 51-57.	VI Validation Study	The original PAT has 10 undefined response options—1 for each of the 10 items. Therefore, minor additions were made to these items on the scale to help staff to complete the measure and to improve its consistency. The mPAT is a reliable and valid measure of acute pain in neonates as premature as 24 weeks gestation.

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Ranger.M, Johnston.C, and Anand.K.J.S, Current Controversies Regarding Pain Assessment in Neonates. Seminars in Perinatology, 2007, 31: 283-288.	VII	Ascending pathways conducting painful stimuli may develop by 20 weeks gestation while the descending pathways that can inhibit incoming pain impulses do not mature until last trimester, increasing premature infant's sensitivity to pain. Pain assessment described as a vital sign. Neonates who have neurological impairment may have altered pain processing and modulation. Vulnerable infants will sometimes learn to become helpless in order to restore energy if constant attempts to communicate pain are unrecognised.