

Reference (include title, author, journal title, year of publication, volume and issue, pages)	Evidence level (I-VII)	Key findings, outcomes or recommendations
<p>Australian and New Zealand Neonatal Network (ANZNN), Best Practice Clinical Guideline- Assessment and Management of Neonatal Pain, September 2007</p>	<p>II National Guideline</p>	<p>Explain the steps of how to use a pain assessment tool; Observe the infant, assess muscle tone by gently touching the infants limb</p> <p>Frequency of assessment; at least once per nursing shift/ every 4-6 hours</p>
<p>Burton, J., & MacKinnon, R. (2007). Selection of a tool to assess postoperative pain on a neonatal surgical unit. <i>Infant</i>, 3(5), 188-196. Retrieved from http://www.infantgrapevine.co.uk/default.html</p>	<p>V</p>	<p>Behaviours may be more specific to pain than physiological responses, however they are generally less objective and less quantifiable.</p> <p>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.</p> <p>Ventilation, sedation, paralysis, and extreme illness/weakness are factors which would affect the assessment of neonatal behaviours.</p> <p>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</p> <p>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.</p>

<p>Devsam, B. U., & Kinney, S. (2017). <i>Nurses' Utilisation of the Pain Assessment Tool (PAT) Score when assessing pain in ventilated, sedated and/or muscle-relaxed neonates</i>. Unpublished Manuscript. Royal Children's Hospital, Victoria, Australia.</p>	<p>VI</p>	<p>The majority of RCH NICU nurses found that the PAT score was clinically useful, easy to use, clear to understand, and accurately reflected pain, in neonates that were ventilated and minimally sedated; but not in neonates that were ventilated and heavily sedated or muscle-relaxed. Further investigation revealed that there was confusion about 'when and how to PAT score' a neonate, as well as difficulties associated with assessing pain in a muscle-relaxed neonate. The 'nurses perception of pain' and the perception that the PAT score was 'just a number only' were also key findings. The 'nurses logic and rationale' and 'clinical judgement or critical thinking processes' were also emphasised when assessing pain in neonates. This research was utilised to inform the 'Neonatal Pain Assessment' guideline content.</p>
<p>Gibbins, S., & Stevens, B. (2001). State of the Art: Pain Assessment and Management in High-Risk Infants. <i>Newborn and Infant Nursing Reviews</i>, 1(2), 85-96. doi:10.1053/nbin.2001.24558</p>	<p>V</p>	<p>Facial expression, cry, and body movement are the most widely documented behavioral responses to pain. Irrespective of gestational age or maturation, brow bulge, eye squeeze, and nasolabial furrow are consistent facial actions that are present after painful stimuli. Facial activity is the most reliable and consistent indicator of pain and is considered the gold standard of behavioral responses for pain in infants. Cry has been used as an indicator of pain.</p> <p>The most common physiologic pain responses include those observed with the stress response; these include increases in heart rate, respiratory rate, blood pressure, intracranial pressure, and palmar sweating; decreases in vagal tone, heart rate variability, oxygen saturation, carbon dioxide levels, and peripheral blood flow; and autonomic changes such as changes in skin color, nausea, vomiting, and dilated pupils.</p> <p>Studies have shown that analgesics administered intraoperatively to term infants decreased physiologic disturbances (increased heart rate, blood pressure, and intracranial pressure) and improved overall clinical outcomes</p>

		including decreased incidence of sepsis, metabolic acidosis, hyperglycemia, and disseminated intravascular clotting.
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	IV Pilot study	<p>Article explains the development and evaluation of the pain assessment tool (PAT).</p> <p>Pain assessment tool scoring system explained as well as an explanation of the scoring terms.</p> <p>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.</p> <p>Tool was found to be useful and workable.</p>
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. <i>The Clinical Journal of Pain</i> , 32(1), 51-57. doi:10.1097/AJP.0000000000000228	VI	<p>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.</p> <p>The mPAT is a reliable and valid measure of acute pain in neonates as premature as 24 weeks gestation.</p>
Ranger.M, Johnston.C, and Anand.K.J.S, Current Controversies Regarding Pain Assessment in Neonates. <i>Seminars in Perinatology</i> , 2007, 31: 283-288.	II	<p>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.</p> <p>Pain assessment described as a vital sign. Neonates who have neurological impairment may have altered pain processing and modulation.</p> <p>Vulnerable infants will sometimes learn to become helpless in order to restore energy if constant attempts to communicate pain are unrecognised.</p>

<p>Royal Australasian College of Physicians, Guideline Statement: Management of Procedure-Related Pain in Neonates, 2005</p>	<p>Guideline statement</p>	<p>Consequences of neonatal pain. Newborns may experience greater sensitivity to pain / more susceptible to the long-term effects. Sedation may mask symptoms of neonatal pain, while not providing pain relief.</p>
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