

<b>Reference (include title, author, journal title, year of publication, volume and issue, pages)</b>	<b>Evidence level (I-VII)</b>	<b>Key findings, outcomes or recommendations</b>
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<p>Patel, k., &amp; McCann, P. A. (2012). The emergent assessment of supracondylar fractures of the paediatric humerus. <i>Journal of Hand Surgery</i>, 17(2), 161-165. From Medline</p>	<p>VII</p>	<p><b>Key findings:</b></p> <ul style="list-style-type: none"> <li>• Adequate documentation of neurovascular assessment includes capillary refill time, presence or absence of pulses, normal or abnormal motor and sensory function.</li> <li>• Fracture classification by Wilkins modification of the Gartland system</li> <li>• Outlines upper limb nerves and expected outcomes</li> </ul> <p><b>Outcomes:</b></p> <ul style="list-style-type: none"> <li>• The analysis concluded inadequate documentation of neurovascular assessment throughout the hospital. Some areas documentation was less than adequate more than 50% of the time</li> <li>• The analysis concluded inadequate documentation of neurovascular assessment throughout the hospital. Some areas documentation was less than adequate more than 50% of the time</li> </ul> <p><b>Recommendations:</b></p> <p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• the article stated a clearly focused aim of the research and clearly stated the goal intended.</li> <li>• Method of the study was clearly stated</li> <li>• There is no bias in recruitment of participants because all participants suitable for inclusion were included in the study.</li> <li>• Documentation was taken in separate departments in the hospital allowing a larger scale on assessment</li> <li>• This study has 35 participants meaning it is a medium size scale study</li> <li>• This study is primarily focused on the paediatric population. Population clearly outlined</li> </ul> <p><b>Limitations</b></p> <ul style="list-style-type: none"> <li>• the conclusion of the study did not match up with the aim of the study. The results ended up being more focused on the documentation rather than the assessment of the fracture.</li> <li>• Retrospective analysis leads to the reader's interpretation of documentation, possibility of author bias and may be selective in what is included in the results.</li> <li>• study relies on documentation of other nurses, not all documentation is accurate</li> </ul>
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<p>Shields, C. J., Clarke, S. (2011). Neurovascular Observation and documentation for children within accident and emergency: A critical review. <i>International Journal of Orthopaedic and Trauma Nursing</i>, 15, 3-10</p>	<p>VII</p>	<p><b>Key findings:</b></p> <ul style="list-style-type: none"> <li>• Appropriate validated neurovascular charts should be utilized for simplicity</li> <li>• Definition of Compartment syndrome and noted as the most common complication of neurovascular compromise</li> <li>• Assessment should be based on the 5 P's pain, pulse, pallor, paraesthesia and paralysis</li> <li>• Bilateral comparison of limbs should be obtained and documented for the purpose of a baseline assessment.</li> <li>• Early detection of neurovascular deterioration is vital in avoiding long-term disability</li> </ul> <p><b>Outcomes:</b></p> <ul style="list-style-type: none"> <li>• pain is a reliable indicator for neurovascular deterioration</li> <li>• throughout literature the frequency of undertaking neurovascular assessment is inconclusive</li> <li>• Neurovascular assessment tools should be used due to their simplicity and are vital in determining neurovascular deterioration</li> </ul> <p><b>Recommendations</b></p> <ul style="list-style-type: none"> <li>• lack of literature on paediatric neurovascular assessment and availability of paediatric assessment tools, more information is needed for evidence base practice.</li> <li>• further studies should be conducted, particularly in providing more child friendly methods of assessment.</li> </ul> <p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• four databases were used in the search including CINAHL, Medline, PUBMED and British Nursing Index, this could be assumed to be a large scale systematic review.</li> <li>• The aim of this study is clearly outlined and consistent with the conclusion</li> <li>• This was a well written literature review that maintained good direction</li> <li>• Primary author is a practicing paediatric nurse who is undertaking further study in orthopaedic and fracture trauma. Expert experience in the field.</li> </ul> <p><b>Limitations:</b></p>
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<p>Ferlic, P. W., Singer, G., Kraus, T., &amp; Eberl. R. (2012). The acute compartment syndrome following fractures of the lower leg in children, <i>International Journal of Care Injured</i>, 43, 1743-1746 from Medline</p>	<p>VI</p>	<p><b>Key Findings:</b></p> <ul style="list-style-type: none"> <li>• Retrospective case series of all patients treated with an acute compartment syndrome following a fracture of the lower leg between the years 1998-2010.</li> <li>• Inclusion criteria includes less than eighteen years and complete documentation of the patients history</li> <li>• Exclusion criteria included compartment syndrome with absence of a fracture</li> <li>• 9 out of 31 participants were diagnosed solely on clinical symptoms</li> <li>• This study questions if the rates of compartment syndrome in the paediatric population may be lower, especially under the age of 12, this is out of the scope of this study</li> </ul> <p><b>Outcomes:</b></p> <ul style="list-style-type: none"> <li>• compartment syndrome can develop up to 65 hours post injury, early recognition of ACS can lead to positive outcomes and diagnosis is based on clinical symptoms</li> </ul> <p><b>Recommendations:</b></p> <ul style="list-style-type: none"> <li>• for further research because there is limited research on paediatric population in relation to development of compartment syndrome.</li> </ul> <p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• The study focused solely of the paediatric population which was clearly outlined to be below the ages of eighteen. The Median age is 14.6 years old, this is a strength because the results can be generalised to the paediatric population</li> <li>• There were 1038 fractures in the studies time period there were 31 participants who developed compartment syndrome. This is a large scale retrospective analysis</li> <li>• This retrospective case analysis helps identify the time between injury and presence of complication which was statistically significant</li> </ul> <p><b>Limitations:</b></p> <ul style="list-style-type: none"> <li>• study relies on documentation of other nurses and is done on the authors interpretation of notes</li> <li>• It is unclear but appears the study was taken from one hospital which limits generalisation</li> </ul>
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<p>Wright, E. (2009). Neurovascular impairment and compartment syndrome. <i>Journal of Paediatric Nursing</i>, 21(3), 26-29 from Medline</p>	<p>VII</p>	<p><b>Key Findings:</b></p> <ul style="list-style-type: none"> <li>• A database search of CINAHL and Medline was undertaken, a search on compartment syndrome had 2050 results and a search on neurovascular assessment returned 27 results.</li> <li>• Almost all articles indicated that compartment syndrome is a potential complication from trauma or orthopaedic surgery.</li> <li>• Pathophysiology of compartment syndrome is outlined</li> <li>• Causes of compartment syndrome are outlined</li> <li>• Early detection of neurovascular deterioration is essential in preventing long term complications</li> <li>• Acute compartment syndrome can occur up to fifty four hours after injury of surgery.</li> <li>• Observations include assessment of pain, warmth, sensation, and movement of the limb</li> <li>• Neurovascular observations is also known as the 5 P's pain, pulse, pallor, paraesthesia and paralysis</li> <li>• Neurovascular observations in the paediatric population should be carried out hourly and if any immediate concerns more frequently</li> </ul> <p><b>Outcomes:</b></p> <ul style="list-style-type: none"> <li>• delays in identification of deterioration in neurovascular status can lead to limb amputation</li> <li>• Discussed palpation of the limb as a sign of compartment syndrome different to other articles</li> </ul> <p><b>Recommendations:</b></p> <p>No recommendation for further studies was mentioned in this study</p> <p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• Aim of the study is clearly outlined and consistent with the conclusion</li> <li>• Wright the author of the article is an advanced nurse practitioner at Southampton University Hospital therefore she has experience in the area of health, it does not specify where her experience lies.</li> </ul> <p><b>Limitations:</b></p> <ul style="list-style-type: none"> <li>• Limited literature on paediatric population. Mixed population groups which was clearly outlined in the article</li> </ul>
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<p>Johnston-Walker, E., &amp; Hardcastle, J. (2011). Neurovascular assessment in the critically ill patient. <i>Journal in Critical Care</i>, 16(4), 170-177 from Medline</p>	<p>VII</p>	<p><b>Key Findings:</b></p> <ul style="list-style-type: none"> <li>Compartment syndrome is a well-documented complication associated with musculoskeletal trauma</li> <li>Outlines when neurovascular assessment is indicated</li> <li>Trauma can result in damage to blood vessels and nerves this can result in temporary or permanent deficit in function.</li> <li>Description and definition of acute compartment syndrome</li> <li>Patients that are at risk of compartment syndrome</li> <li>Neurovascular assessment involves assessing changes in oxygenation, circulation and nerve function</li> <li>Assessment of neurovascular status includes assessment of the 5P's pain, pallor (colour), peripheral pulses, paraesthesia (or sensation), and paralysis (or movement). And how to undertake these assessments</li> </ul> <p><b>Outcomes:</b></p> <ul style="list-style-type: none"> <li>Staff should recognize the context of neurovascular assessment and should communicate clinical concerns to the appropriate treating team</li> <li>Neurovascular status should be assessed every 1-2 hours for the initial 24 hours after surgery, trauma, or application of a cast</li> </ul> <p><b>Recommendations:</b></p> <p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>This article is a literature review of the current literature related to neurovascular assessment. It outlines the distinct assessment components and highlights the importance of its inclusion in nursing practice. This article introduces a clearly focused aim which is consistent with the conclusion and is a strength in this article</li> </ul> <p><b>Limitations:</b></p> <ul style="list-style-type: none"> <li>This article has no information about the search strategy or where the articles were gathered from or how many</li> <li>No specific population group was mentioned in the study</li> </ul>

<p>Judge, N. L. (2007). Neurovascular assessment. <i>Journal of Nursing Standards</i>, 21(45), 39-44 from CINAHL</p>	<p>VII</p>	<p><b>Key findings:</b></p> <ul style="list-style-type: none"> <li>• Applicators such as plaster, splints and tight bandages that restrict movement can cause damage to nerves and blood vessels which can lead to deficits in functions. This can be temporary or permanent and can deteriorate to the point of needing amputation.</li> <li>• Neurovascular assessment and what it involves is outlined this includes the 5P's pain, paralysis, paraesthesia, pulses and pallor. It also includes warmth and swelling into the neurovascular assessment</li> <li>• Compartment syndrome is a complication to neurovascular compromise</li> <li>• Step by step guide to performing neurovascular assessment</li> <li>• Pain assessment is outlined, including signs and symptoms of compartment syndrome including pain disproportionate to the injury</li> <li>• Paralysis assessment is outlined, including signs and symptoms of movement deficits and what deterioration indicates</li> <li>• Paraesthesia assessment is outlined including signs and symptoms of deterioration and what that indicates.</li> <li>• Pulses and capillary refill assessment is explained including signs and symptoms of deterioration, including what the deterioration indicates.</li> <li>• Pallor and temperature assessment is outlined including signs or deterioration and what it indicates.</li> <li>• Swelling assessment is outlined</li> </ul> <p><b>Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Information should be documented when conducted, if any decrease in neurovascular status contact medical team</li> <li>• Elevation of the limb will assist in decreasing swelling</li> <li>• Anything constricting the limb should be loosened to ensure it does not impede circulation</li> </ul> <p><b>Recommendations:</b></p> <p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• The summary is clear and sets a clear focus on the aim of the article. The conclusion sums up the aim of the article well.</li> <li>• Information in this article is consistent with other literature reviews gathered for the purpose of this clinical practice guideline. Especially assessment of the 5P's</li> </ul>
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<p>Schreiber, M.L. (2016). Neurovascular Assessment: An Essential Nursing Focus. <i>Medsurg Nursing</i>, 25(1), 55-57 from PubMed</p>	<p>VII</p>	<p><b>Key findings:</b></p> <ul style="list-style-type: none"> <li>• Clear descriptions of assessment of pulses, capillary refill, temperature, colour, sensation and motor function</li> <li>• Examples of frequency of assessments</li> <li>• Importance of communication of changes to neurovascular status</li> <li>• Importance of comparing affected and non-affected limbs</li> </ul> <p><b>Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Nursing staff have the opportunity to identify neurovascular compromise and reduce complications and prevent poor outcomes</li> <li>• Ensure documentation of what is normal for the patient and what is abnormal</li> </ul> <p><b>Recommendations:</b></p> <ul style="list-style-type: none"> <li>• Defaulting to changes in frequency of assessment of neurovascular status depending on patient's individual status</li> </ul> <p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• Clear focus and points made</li> <li>• Writer is faculty member of technical collage and health care speaker-expert in field.</li> <li>• Easy to understand</li> </ul> <p><b>Limitations:</b></p> <ul style="list-style-type: none"> <li>• Level VII evidence</li> <li>• Simple information does not go into much depth</li> </ul>
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