The Critical Role of Nursing Assessment in Clinical Outcomes of Acute Compartment Syndrome: An Integrative Literature Review

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The Critical Role of Nursing Assessment in Clinical Outcomes of Acute Compartment Syndrome

An Integrative Review of Literature

Background:
Although acute compartment syndrome (ACS) has been recognized as a critical medical condition since the 1800’s, it has only been in the past 20 years that its impact on patients has been thoroughly studied (Hunt, Frost, Hillman, Newton, & Davidson, 2014). Acute Compartment Syndrome is a medical emergency that occurs when pressure builds to dangerous levels within the various enclosed spaces of the human body that have little to no ability for tissue expansion (Mabvuure, M., & Cunningham, G. (2017). Clinical and radiographic predictors of acute compartment syndrome in the treatment of tibial fractures, Injury, 48(4), 706–712. doi:10.1016/j.injury.2016.12.016). ACS is most commonly caused by severe trauma, including car accidents and bone fractures. Bone fractures account for as much as 69% of ACS cases by inducing bleeding and edema that increases pressure in the enclosed spaces. Casting and bandaging used for treatment can also create a smaller space for tissue expansion, creating a higher pressure (Mabvuure et al., 2012). Additionally, ACS can be caused by badly bruised muscles, reestablished blood flow following blocked circulation, crush injuries, and anabolic steroid use (American Academy of Orthopaedic Surgeons, 2018). The spaces most prone to developing acute compartment syndrome are the legs, arms and the abdomen (American Academy of Orthopaedic Surgeons, 2018). Pressure build up in the enclosed compartment causes a decrease in blood flow to the area, resulting in deoxygenation to the nerves, muscle cells, capillaries, and organs in the area. Pressure in this manner needs to be quickly prevented permanent disability and tissue death, which can result in amputation or death (Mabvuure et al., 2012).

Problem Statement:
Nurses play a critical role in assessing for acute compartment syndrome. Ensuring that nurses are properly equipped to assess for these signs and symptoms is imperative, as delaying or failing to recognize ACS typically results in poor outcomes for patients (Mabvuure et al., 2012). Despite the improvements made in diagnosing and treating patients with this potentially deadly situation, as well as an increased awareness of ACS, nurses are falling short when required to display knowledge and identify patients with the syndrome. Along with identifying at-risk patients for developing ACS, nurses can aide the clinical diagnosis of ACS through assessing for the six cardinal features including: pain, pallor, paresthesia, pressure, and a persisting cold temperature (Mabvuure et al., 2012).

Methods:
A computerized search of literature was completed using online databases accessed through Rosalind Franklin’s library website. The databases searched included PubMed, Cumulative Index to Nursing and Health Literature, Academic Search Complete, Multiple text combinations used in the search include the following key words: acute compartment syndrome, compartment syndrome, ACS, nursing, nursing assessment clinical outcomes, and clinical judgment.

Inclusion criteria: sources reviewed were limited to peer-reviewed articles. Articles must be available in English and be of the nursing, medicine, or healthcare discipline. Additionally, articles must focus on reducing the risk and determining outcomes of acute compartment syndrome. Full-text links of articles for viewing were also required within the search criteria.

Exclusion criteria: articles reviewing abdominal compartment syndrome, as this literature review focuses specifically on studying acute compartment syndrome of the limbs. Additionally, this study focuses solely on acute cases of compartment syndrome, therefore articles centered on chronic conditions were also excluded.

Research Question:
What factors contribute to positive clinical outcomes associated with effective nursing assessment and the identification of patients at risk for acute compartment syndrome?

Conceptual Framework:
The conceptual framework that best outlines the nursing assessment skills and knowledge needed for early detection of acute compartment syndrome is Tanner’s Clinical Judgment Model (2006). As seen in Figure 1, nurses must recognize, interpret, respond, and reflect on the early signs and symptoms of acute compartment syndrome (Tanner, 2006). Doing so will allow nurses to better identify at-risk patients.

Results & Discussion:

Nursing Practice Implications:
Nurses play a critical role in early recognition of acute compartment syndrome. When properly educated on the how to assess for the critical signs and symptoms of acute compartment syndrome, as well as identifying those at the highest risk for ACS, nurses can prevent further nerve damage, vascular damage, and amputation from occurring. Through the use of early recognition and identifying at-risk patients, completing diligent assessments for escalation of pain and changes in sensation, in addition to identifying patients with tibial fractures, those of the male gender, and those between the ages of 12-19 years and 20-29 years, are key in preventing ACS from progressing.