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Review Article

**ROLE OF NURSE IN TREATMENT OF ACUTE STROKE-
REVIEW**

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Abstract:

The acknowledgement of stroke as a critical medical condition, the availability of specialized services, and advancements in treatment have collectively resulted in a reduction in fatality rates associated with stroke. However, the occurrence and impact of stroke are still on the rise. A stroke is a critical medical occurrence that poses a significant threat to life and imposes long-term limitations. However, the timely recognition and initiation of treatment can effectively decrease the risk of death and disability, while also improving the prospects for recovery and rehabilitation among individuals who have experienced a stroke. A comprehensive examination of the literature was conducted using electronic databases to identify all pertinent publications published till the conclusion of 2022. Nurses employed in acute stroke services assume a comprehensive range of responsibilities encompassing assessment, identification, and monitoring, with the provision of rehabilitation, psychological assistance, and end-of-life care.

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INTRODUCTION:

A cerebrovascular accident, frequently referred to as a "stroke," is generally categorized into two main types: ischemic and hemorrhagic. In all categories, the outcome is a reduction in blood flow, nutrients, and oxygen to a specific area of the brain, leading to neuronal damage and consequent neurological impairments [1].

According to the World Health Organization (WHO) in 1978, stroke is characterized as a clinical illness that manifests as a rapid onset of focal or worldwide impairment of brain function, with symptoms persisting for a minimum of 24 hours or resulting in death, and with no discernible cause other than of vascular origin. The aforementioned definition of stroke continues to be employed. According to the second source,

When faced with a potential stroke case, it is imperative to do a thorough assessment of the patient's medical history and physical condition, in addition to promptly conducting neurological imaging, before initiating any therapy interventions. By implementing timely and targeted interventions that align with the underlying causes of stroke, engaging in rehabilitation programs, and adopting lasting modifications to one's lifestyle, individuals can optimize their prospects for a significant recuperation [3].

There are numerous etiologies that can contribute to the occurrence of a stroke. Plaque formation resulting from the accumulation of low-density lipoprotein cholesterol (LDL) within the arteries is a frequently observed etiological factor. The prevailing risk factors encompass hypertension, diabetes mellitus, and smoking. Thrombi may also form at the bifurcation sites of the internal carotid, middle cerebral arteries, and basilar arteries. Emboli leading to strokes are thrombi that are generated at a remote location and then become lodged within a cerebral artery. Embolic strokes frequently arise from emboli that originate from the heart, particularly in individuals with preexisting heart rhythms such as atrial fibrillation, valvular disease, structural defects such as atrial and ventricular septal defects, and rheumatic fever. Emboli tend to become lodged in regions characterized by preexisting stenosis [4].

Strokes that manifest in tiny arteries are predominantly attributed to the prolonged and unregulated presence of hypertension and arteriosclerosis. The occurrence

of these strokes is observed in the basal ganglia, internal capsule, thalamus, and pons. Small hemorrhages can also occur as a result of uncontrolled hypertension in these regions (5).

Approximately 20% of all instances of strokes are categorized as hemorrhagic, with uncontrolled hypertension being the predominant cause. Additional factors contributing to the occurrence of hemorrhagic strokes are cerebral amyloid angiopathy, a pathological condition characterized by the accumulation of amyloid plaques within the small and medium-sized blood arteries. This deposition of plaques leads to increased vascular rigidity and susceptibility to ruptures. Deposition can manifest in several locations, however it is predominantly observed on the surfaces of the frontal and parietal lobes. The assessment of vascular structural integrity is an essential factor to consider in the context of hemorrhagic stroke. Hemorrhagic strokes can be attributed to various common causes, including aneurysms, arteriovenous malformations, cavernous malformations, capillary telangiectasias, venous angiomas, and vasculitis [6].

In the acute stages following a stroke, nursing interventions typically focus on the prevention of secondary brain injury, specifically intracranial hypertension. Additionally, these interventions aim to address the paralysis of the pharynx muscles by maintaining the airways, provide general body support by monitoring vital signs and ensuring fluid and electrolyte balance, and anticipate potential complications such as atelectasis and pneumonia. Stroke is a significant contributor to mortality and morbidity in industrialized countries, ranking as the third most common cause of death and a major reason for hospitalization and long-term disability [7].

DISCUSSION:

It is crucial to prevent an elevation in intra-cranial pressure (ICP) during the acute phase of a stroke. Undoubtedly, the management of increased intracranial pressure (ICP) following a stroke in individuals with extensive cerebral infarctions is an essential component of acute stroke treatment and has the potential to save lives. Ischemic infarcts typically exhibit the presence of intracranial pressure (ICP) within the initial four days. Typically, the manifestations are a fast deterioration in cognitive function and the emergence of symptoms indicative of brain herniation [8]. The control of intracranial

pressure (ICP) entails the utilization of hyperosmolar drugs such mannitol and hypertonic saline. These agents create a moderately hypertonic intravascular environment, facilitating the outward movement of osmotic flow from the brain parenchyma [9].

Hypertension commonly presents during the acute phase of stroke, with roughly 80% of patients exhibiting this clinical feature, even in the absence of a prior history of hypertension. Furthermore, elevated blood pressure (BP) serves as a primary risk factor and a prominent observation in the context of acute stroke. Therefore, standard nursing interventions during the initial phase of an ischemic thromboembolic stroke also encompass the preservation of normotensive blood pressure (BP) levels, refraining from administering hypotensive medications till the systolic BP (SBP) exceeds 220 mm Hg or the diastolic BP surpasses 120 mm Hg. The nursing personnel involved in stroke care should remain vigilant for the presence of significant arterial hypertension, as it has the potential to exacerbate cerebral edema and increase the likelihood of a hemorrhagic transformation occurring inside the infarcted stroke region. Nevertheless, empirical data from the last three decades has indicated that there is typically a natural decrease in blood pressure following an acute ischemia event within the initial 48-72 hours [10].

While it was previously customary to consider elevated blood pressure (BP) upon the outset of a stroke as an unfavorable indicator for the ultimate outcome, a comprehensive multinational study has demonstrated that both excessively high and low BP levels at the time of commencement do not serve as reliable predictors. Therefore, it is important for nurses to be aware of the clinical abnormalities associated with severe arterial hypotension, as it can lead to fast declines in mean arterial and cerebral perfusion pressures, potentially causing ischemic brain tissue areas. Nurses should accurately record and report blood pressure measurements in order to address this issue [11].

In the context of intracerebral hemorrhage, compelling evidence exists to support the notion that a proactive approach to lowering blood pressure is warranted when systolic blood pressure exceeds 200mmHg. When the systolic blood pressure (SBP) exceeds 180mmHg and the intracranial pressure (ICP) is also raised, it is recommended to closely monitor the patient and aim for a controlled reduction in blood pressure to reach a cerebral perfusion pressure within the range of 60-80 mm Hg [12].

It is crucial to promptly administer treatment for hyperglycemia, particularly due to its frequent occurrence as a risk factor and its established association with the severity of stroke and a poorer prognosis [13]. Approximately 50% of patients experience hyperglycemia during the acute phase of stroke, with half of these individuals having a pre-existing diagnosis of diabetes. Therefore, it is not recommended to use glucose infusions as a standard practice [13,14].

In general, there exists a dearth of definitive agreement among medical professionals specializing in stroke about the administration of oxygen following an acute stroke. Furthermore, if oxygen is indeed recommended, there is uncertainty regarding the appropriate dosage and the preferred method of delivery [15]. Singhal (2016) proposes an alternate advantage of early oxygen administration in cases of acute stroke, known as the "buy time" effect. This effect allows for an extended timeframe in which thrombolytic or neuroprotective medications can be administered. However, it has been underlined that patients with an oxygen saturation level below 90% and a lowered degree of consciousness should receive supplementary oxygen [16].

However, due to contradictory research, it is important for nurses providing care to stroke patients in the acute phase of the disease to be aware that patients with oxygen saturation levels below 95% should get supplemental oxygen. However, it is advisable to refrain from the regular utilization of supplementary oxygen. The user has provided a numerical reference without any accompanying text.

It is crucial to promptly administer treatment for hyperglycemia, since it is a prevalent risk factor that has been linked to the severity of stroke and a poorer prognosis [14,18]. Approximately 50% of patients experience hyperglycemia during the acute phase of stroke, with half of these individuals having a pre-existing diagnosis of diabetes. Therefore, it is not recommended to use glucose infusions as a standard practice. There is a burgeoning recognition that the potential for neurological decline may significantly escalate in both hyperglycemic and hypoglycemia conditions. Moreover, a plethora of studies have demonstrated that elevated blood glucose levels worsen the extent of neuronal injury following a cerebrovascular accident. However, despite the significant prevalence of neurological or medical problems and general clinical decline linked to both high or low blood glucose levels after a stroke, there is

still a lack of specific guidelines for the optimal management of euglycemia following a stroke [12,19]. Hence, it is imperative for the efficient nursing care of stroke patients to have a comprehensive grasp of the clinical symptomatology in relation to neuroanatomy and the clinical variables that contribute to problems [17]. In general, existing research indicates that the provision of intensive nursing care, characterized by vigilant monitoring and timely intervention, has significant promise in terms of improving the well-being of stroke patients. The aforementioned factors encompass the timely identification of hypoxia, hypoglycemia, hypotension, cardiac arrhythmias, and increased body temperature, particularly within the initial 48 to 72 hours following the beginning of a stroke [19].

Hypoxia is a significant clinical issue following a stroke and has the potential to result in substantial consequences and hindered recuperation. According to current guidelines, it is recommended to deliver supplementary oxygen as a standard procedure during the acute phase of a stroke. According to contemporary standards and established nursing protocols, it is recommended to uphold oxygen saturation levels at 95% or above following an acute stroke. This can be achieved by administering oxygen through nasal cannulae at a rate of 2-4 L/min [20]. However, it is important to exercise caution when addressing anomalous findings, as conflicting evidence and recommendations lacking controlled clinical research may warrant a more measured approach. According to a study conducted by researchers [21], individuals who have suffered from less severe strokes may encounter more unfavorable results when undergoing oxygen therapy.

However, there has been a significant advancement in the understanding of acute stroke care, as evidenced by nursing study conducted in Australia. This research highlights the significance of applying protocols that are based on empirical evidence. Nurses are responsible for initiating the management of fever, hyperglycemia, and swallowing difficulties. All of these interventions were demonstrated to result in enhanced patient outcomes upon discharge [18].

The aforementioned discussion highlights the evident distinctions among various interventional techniques in terms of their objectives, assumptions, principles, underlying theories, and subsequently, their implications for education, practice, and research. Nevertheless, it is important to acknowledge that every technique has its own set of benefits and drawbacks,

and is supported or opposed by various individuals [20].

The majority of scholarly literature supports the notion that the conventional practice of exclusively concentrating on the unaffected side is superfluous. This is due to the repetitive nature of the activities, their segmented approach, and their limited scope since they are essentially an extension of basic nursing care provided to all patients regardless of their medical diagnosis. These activities lack a comprehensive framework or rehabilitative reasoning that is crucial for ensuring the continuity of care required by stroke patients. The user's text does not contain any information to rewrite in an academic manner.

In the field of nursing, there is a longstanding assumption that nurses have the major duty for ensuring optimal bladder function. Consequently, the choices made about the management of bladder issues after a stroke should be grounded in the specific form of incontinence experienced by the patient. Regrettably, in instances when there is a scarcity of nurses, bladder catheterization is frequently employed as a first approach to address urine incontinence [21]. Fecal incontinence is a prevalent condition observed in stroke survivors, with a prevalence rate ranging from 30% to 40% during their in-patient stay, and a prevalence rate of 7% to 9% at the 6-month mark following the stroke event. The assessment to ascertain potential causes that may contribute to the condition encompasses several aspects such as dietary habits, adverse effects of medication, and weakening in the rectal muscles. However, the most influential factor that independently increases the likelihood of fecal incontinence three months after experiencing a stroke is the inability to reach the toilet without assistance. According to Teasell *et al.* (22), there is evidence (class I, level B) suggesting the importance of regular evaluation of bowel function in order to identify cases of persistent constipation or bowel incontinence. The nurse plays a crucial role in recognizing patients who are experiencing such issues and addressing them through the assessment and mitigation of underlying causes.

The diagnosis and management of constipation necessitate an interdisciplinary approach, as the underlying causes might be multifaceted and may manifest before to a stroke or as a result of medication. Various pharmacological interventions have been found to be efficacious in addressing constipation, including the administration of bulk-forming laxatives, bisacodyl suppositories, stool softeners, osmotic agents, and/or stimulant laxatives.

Nevertheless, it is imperative for nurses to exercise caution when utilizing the aforementioned readily accessible treatments, since their suitability may vary depending on the specific characteristics of each patient. Additional therapies include ensuring enough consumption of dietary fiber and fluids, as well as initiating prompt reestablishment of regular bowel habits. Ultimately, in instances of heightened severity involving fecal impaction, therapeutic interventions such as enemas or digital evacuation may be necessary [23].

It is imperative to inform nurses that in addition to the apparent and measurable physical consequences of stroke, depression is a frequently overlooked and inadequately addressed complication, with prevalence estimates ranging from 25% to 79%. Additionally, it has been observed that poststroke depression is correlated with increased death rates, hindered functional recovery, and diminished social engagement [24].

Given the constant proximity of nurses to patients within hospital environments, they frequently have the opportunity to be the primary observers of indications or manifestations of depression. Consequently, it is imperative that nurses possess the capability to conduct an initial evaluation utilizing standardized screening tools and, if deemed appropriate, seek a consultation. Additional evaluation methods may involve conducting a clinical interview and gathering information about the patient's history from both family members and caregivers [23,24]. Therefore, it is imperative for nurses who are caring for such patients to remain vigilant for signs of tearfulness and despair, and to promptly report any observations. The active participation of nurses in patient re-education, involving the teaching of coping techniques and the utilization of straightforward monitoring instruments to assess progress, has been shown to augment the efficacy of pharmacological therapy [24].

Efficient and effective acute stroke care necessitates the collaboration of a cohesive team to provide optimal treatment decision-making and implementation. Nurses have been recognized as crucial stakeholders and integral elements of a comprehensive stroke care system [20,24]. Nurses possess a significant opportunity to establish positions of leadership and enhance the efficiency of treatment decision-making by advocating for a coordinated response to acute stroke alerts/codes across both emergency department and acute care settings. The numerical value "8" is provided by the user.

The utilization of pit crew models in the emergency department has been adopted as a means to execute parallel evaluation and intervention protocols, with the aim of reducing the duration of time between the onset of a stroke and the initiation of treatment [25]. The Quality Care Improvement With Nursing-Driven Acute Stroke Care model employs stroke nurses who have received extensive training to serve as facilitators in evaluating, organizing, and ensuring simultaneous procedures in an effective manner with the goal of minimizing the time it takes to do computed tomography scans and make treatment decisions. When combined with telemedicine, the implementation of nurse-driven stroke coding guidelines has the potential to be a viable and efficient treatment strategy for reducing the time interval between a patient's arrival at the hospital and the decision to administer intravenous alteplase. In addition, the implementation of a system where qualified nurses are given the authority to initiate standardized order sets with a care protocol, which includes imaging, prior to involving physicians, has the potential to reduce the time it takes to perform imaging procedures and make treatment decisions [26].

Stroke coordinators, typically registered nurses (RNs) or advanced practice nurses (APNs), assume leadership roles within acute stroke teams. Stroke coordinators have the responsibility of coordinating the care provided to patients with stroke within the acute care environment. Coordinators engage in collaborative efforts with several stakeholders, including emergency medical services, emergency departments, transferring hospitals, inpatient unit personnel, case management, and auxiliary services. The aim of this collaboration is to promote the provision of evidence-based care that aligns with the latest stroke guidelines. In addition, they bear the responsibility of overseeing the code stroke or stroke alert process, gathering data to identify possibilities for quality improvement, and developing educational programs for staff, patients, and families to enhance recovery and prevent strokes [26].

Alongside the stroke coordinator, advanced practice clinicians, such as Advanced Practice Nurses (APNs) and Physician Assistants (PAs), fulfill various responsibilities within the acute stroke treatment environment, encompassing the emergency department, interventional radiology suite, intensive care unit, and mobile stroke units. The implementation of interdisciplinary teams of neurologists and advanced practice providers to provide comprehensive patient care has the potential to alleviate the workload

faced by neurologists and other specialists, who are frequently faced with limited availability. The publication of a position document by the Advanced Practice Providers Work Group of the American Academy of Neurology aims to provide neurologists with education on the implementation and benefits of this effective care model [27].

COCNLUSION:

This review emphasizes the significance of consistently identifying crucial aspects to enhance stroke outcomes and educate nurses in the right skills for stroke care. However, recent studies have continued to identify a lack of sufficient stroke awareness and knowledge among students undergoing training. It is advocated that it is imperative for all nursing students to engage in direct interaction with patients who have experienced a stroke. Additionally, it is acknowledged that stroke survivors and their families also necessitate nursing involvement. Hence, it is imperative to allocate stroke education resources commensurate with the magnitude of stroke as a prominent health concern within specific nations. Additionally, it is recommended to implement innovative and evaluative training interventions tailored for nurses. Stroke nurses must prioritize the continuous updating of Evidence Based Practice, as current research in the field provides valuable insights into enhanced management abilities that are particularly relevant to their professional status. The current treatment for thromboembolic stroke during its acute phase is the administration of recombinant tissue plasminogen activator (rt-PA), which has been proven to be both well established and effective. However, the effectiveness of this treatment is constrained by a limited time frame between the appearance of symptoms and the commencement of therapy. Additionally, the utilization of rt-PA requires significant resources and may pose potential risks for certain individuals. The provision of support to stroke survivors and their caregivers during the transition between various care settings and integration into the community necessitates specialized nursing expertise and competencies. The implementation of standardized stroke nursing competences along the continuum represents a crucial measure towards enhancing the quality of stroke care.

REFERENCES:

1. Hankey GJ. Stroke. *Lancet*. 2017 Feb 11;389(10069):641-654.
2. George MG, Fischer L, Koroshetz W, Bushnell C, Frankel M, Foltz J, Thorpe PG. CDC Grand Rounds: Public Health Strategies to Prevent and Treat Strokes. *MMWR Morb Mortal Wkly Rep*. 2017 May 12;66(18):479-481.
3. Katan M, Luft A. Global Burden of Stroke. *Semin Neurol*. 2018 Apr;38(2):208-211.
4. Ding C, Wu Y, Chen X, Chen Y, Wu Z, Lin Z, Kang D, Fang W, Chen F. Global, regional, and national burden and attributable risk factors of neurological disorders: The Global Burden of Disease study 1990-2019. *Front Public Health*. 2022;10:952161.
5. Struijs JN, van Genugten ML, Evers SM, Ament AJ, Baan CA, van den Bos GA. Future costs of stroke in the Netherlands: the impact of stroke services. *Int J Technol Assess Health Care*. 2006 Fall;22(4):518-24.
6. Luengo-Fernandez R, Violato M, Candio P, Leal J. Economic burden of stroke across Europe: A population-based cost analysis. *Eur Stroke J*. 2020 Mar;5(1):17-25.
7. Christensen H, Boysen G. Blood glucose increases early after stroke onset: a study on serial measurements of blood glucose in acute stroke. *Eur J Neurol* 2002;9:297-301.
8. Broderick J, Hacke W. Treatment of acute ischemic stroke, part II: neuroprotection and medical management. *Circulation* 2002;106:1736-40.
9. Singh V, Edwards N. Advances in the Critical Care Management of Ischemic Stroke. *Stroke Res Treat* 2013;2013: 510481.
10. Britton M, Carlsson A, de Faire U. Blood pressure course in patients with acute stroke and matched controls. *Stroke* 1986; 17:861-4.
11. Leonardi-Bee J, Bath P, Phillips S, et al., IST Collaborative Group. Blood pressure and clinical outcomes in the International Stroke Trial. *Stroke* 2002;33:1315-20.
12. Aiyagari V, Gorelick P. Management of Blood Pressure for Acute and Recurrent Stroke. *Stroke* 2009;40(6):2251-6.
13. Mazighi M, Amarenco P. Hyperglycemia: a predictor of poor prognosis in acute stroke. *Diabetes Metab* 2001;27(6): 718-20.
14. Jauch E, Saver J, Adams H, et al. Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke* 2013; 44(3):870-947.
15. Mehta S. The glucose paradox of cerebral ischaemia. *J Post-grad Med* 2003;49:299-301.
16. Singhal A. A review of oxygen therapy in ischaemic stroke. *Neurol Res* 2007;29(2):173-83.

17. Rocco A, Pasquini M, Cecconi E, et al. Monitoring after the acute stage of stroke: a prospective study. *Stroke* 2007;38: 1225-8.
18. Williams J, Perry L, Watkins C, editors. *Acute stroke nursing*. West Sussex: Wiley-Blackwell; 2010.
19. Burton C, Gibbon B. Expanding the role of the stroke nurse: a pragmatic clinical trial. *J Adv Nurs* 2005;52(6):640-50.
20. Jones S, Leathley M, McAdam J, et al. Physiological monitoring in acute stroke: a literature review. *J Adv Nurs* 2007; 60(6):577-94.
21. Roffe C. Hypoxia and stroke. *Age and Aging* 2002;31(S2): 10-2.
22. Teasell R, Foley N, Salter K, et al. A blueprint for transforming stroke rehabilitation care in Canada: the case for change. *Arch Phys Med Rehabil* 2008;89(3):575-88.
23. Duncan PW, Bushnell C, Sissine M, Coleman S, Lutz BJ, Johnson AM, Radman M, Pvr Bettger J, Zorowitz RD, Stein J. Comprehensive stroke care and outcomes: time for a Paradigm Shift. *Stroke*. 2021; 52:385–393.
24. Miller KK, Lin SH, Neville M. From hospital to home to participation: a position paper on transition planning poststroke. *Arch Phys Med Rehabil*. 2019; 100:1162–1175.
25. Mainali S, Stutzman S, Sengupta S, Dirickson A, Riise L, Jones D, Yang J, Olson DM. Feasibility and efficacy of Nurse-Driven Acute Stroke Care. *J Stroke Cerebrovasc Dis*. 2017; 26:987–991.
26. Schwegel C, Rothman N, Muller K, Loria S, Raunig K, Rumsey J, Fifi J, Oxley T, Mocco J. Meeting the evolving demands of neurointervention: Implementation and utilization of nurse practitioners. *Interv Neuroradiol*. 2019; 25:234–238.
27. Hubbard IJ, Harris D, Kilkenny MF, Faux SG, Pollack MR, Cadilhac DA. Adherence to clinical guidelines improves patient outcomes in Australian audit of stroke rehabilitation practice. *Arch Phys Med Rehabil*. 2012; 93:965–971.