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**NURSING INTERVENTIONS IN PATIENTS
WITH ISCHEMIC STROKE UNDERGOING THROMBOLYSIS:
A SCOPING REVIEW**

**INTERVENÇÕES DE ENFERMAGEM NO DOENTE
COM ACIDENTE VASCULAR CEREBRAL ISQUÉMICO
SUBMETIDO A TROMBÓLISE: SCOPING REVIEW**

**INTERVENCIONES DE ENFERMERÍA EN EL PACIENTE
CON ACCIDENTE CEREBROVASCULAR ISQUÉMICO
SOMETIDO A TROMBÓLISIS: SCOPING REVIEW**

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Abstract

Background: Ischaemic stroke is one of the leading causes of death and disability in Portugal. Thrombolysis is effective when administered promptly but requires specialised nursing care grounded in scientific evidence. Rapid recognition of symptoms, protocol activation, and a coordinated response are essential for treatment success. **Objective:** To map the nursing interventions implemented in patients with ischaemic stroke undergoing thrombolysis, with the aim of standardising care, identifying gaps in clinical practice, and guiding future research. **Methods:** A scoping review was conducted, following the Joanna Briggs Institute methodology and using the PCC mnemonic (Population, Concept, Context). The search was performed in the EBSCOhost® platform, and specific sources of grey literature were also consulted. After applying the eligibility criteria, six studies were included that addressed the research question. **Results:** Nursing interventions were identified and grouped into thematic areas: triage (rapid assessment scales, monitoring, and protocol activation); initial assessment (stabilisation, neurological evaluation, venous access, and diagnostic tests); severity assessment (NIHSS scale, level of consciousness); thrombolysis administration (protocol-based administration, close monitoring, and suspension criteria); complication prevention (neurological monitoring, swallowing assessment, positioning, glycaemic control, and surveillance); and care transfer (preparation and transfer to specialised units). **Conclusion:** Nursing care in the acute phase of ischaemic stroke is crucial for the effectiveness of thrombolysis and for preventing complications. A rapid, protocol-based response, combined with nurse training, is essential to achieve better outcomes and to deliver high-quality care.

Keywords: Nursing; Nursing Care; Stroke; Thrombolytic Therapy.

Resumo

Introdução: O Acidente Vascular Cerebral isquémico é uma das principais causas de morte e de incapacidade em Portugal. A trombólise é eficaz quando administrada atempadamente, mas requer cuidados de enfermagem especializados e baseados em evidências científicas. O reconhecimento rápido dos sintomas, a ativação de protocolos e uma resposta coordenada são essenciais para o sucesso do tratamento. **Objetivo:** Mapear as intervenções de enfermagem implementadas ao doente com AVC submetido a trombólise, visando a padronização dos cuidados e a identificação de lacunas na prática. **Metodologia:** Foi realizada uma *scoping review*, seguindo as etapas do Joanna Briggs Institute e utilizando a mnemónica PCC (População, Conceito, Contexto). A pesquisa foi conduzida na EBSCOhost®, tendo sido também consultadas fontes específicas para literatura cinzenta. Após aplicados os critérios de legibilidade obtiveram-se 6 estudos que responderam à questão de investigação. **Resultados:** Foram identificadas intervenções de enfermagem agrupadas em áreas temáticas: triagem (escalas rápidas, monitorização e ativação de protocolos); avaliação inicial (estabilização, avaliação neurológica, acessos venosos, exames); avaliação da gravidade (escala NIHSS, nível de consciência); administração da trombólise (administração protocolada, monitorização rigorosa e critérios de suspensão); prevenção de complicações (monitorização neurológica, avaliação da deglutição, posicionamento, controlo glicémico e vigilância); e transferência de cuidados (preparação e transferência para unidades especializadas). **Conclusão:** A padronização das intervenções de enfermagem na fase aguda do AVC isquémico submetido a trombólise pode otimizar os resultados clínicos, reforçando a segurança do doente e a eficácia terapêutica. É essencial investir em formação e na implementação de protocolos baseados em evidência.

Palavras-chave: Acidente Vascular Cerebral; Cuidados de Enfermagem; Enfermagem; Terapia Trombolítica.

Resumen

Introducción: El accidente cerebrovascular isquémico constituye una de las principales causas de muerte y discapacidad en Portugal. La trombólisis es eficaz cuando se administra de forma temprana, pero requiere cuidados de enfermería especializados y fundamentados en la evidencia científica. El reconocimiento rápido de los síntomas, la activación de protocolos y una respuesta coordinada son esenciales para el éxito del tratamiento. **Objetivo:** Mapear las intervenciones de enfermería implementadas en pacientes con accidente cerebrovascular isquémico sometidos a trombólisis, con el fin de estandarizar los cuidados, identificar vacíos en la práctica clínica y orientar futuras investigaciones. **Metodología:** Se realizó una *scoping review*, siguiendo la metodología del Joanna Briggs Institute y utilizando la mnemotécnica PCC (Población, Concepto, Contexto). La búsqueda se llevó a cabo en la plataforma EBSCOhost®, y también se consultaron fuentes específicas de literatura gris. Tras aplicar los criterios de elegibilidad, se incluyeron seis estudios que respondían a la pregunta de investigación. **Resultados:** Se identificaron intervenciones de enfermería agrupadas en áreas temáticas: triaje (escalas de evaluación rápida, monitorización y activación de protocolos); evaluación inicial (estabilización, valoración neurológica, accesos venosos y pruebas diagnósticas); evaluación de la gravedad (escala NIHSS, nivel de consciencia); administración de la trombólisis (administración protocolizada, monitorización estrecha y criterios de suspensión); prevención de complicaciones (monitorización neurológica, evaluación de la deglución, posicionamiento, control glucémico y vigilancia); y transferencia de cuidados (preparación y traslado a unidades especializadas). **Conclusión:** La estandarización de las intervenciones de enfermería en la fase aguda del accidente cerebrovascular isquémico sometido a trombólisis puede optimizar los resultados clínicos, reforzando la seguridad del paciente y la eficacia terapéutica. Es esencial invertir en la formación y en la implementación de protocolos basados en la evidencia.

Descriptores: Accidente Cerebrovascular; Atención de Enfermería; Enfermería; Terapia Trombolítica.

Introduction

In 2022, cerebrovascular diseases were the leading cause of death in Portugal, with 9,616 deaths (7.7% of the total), corresponding to a mortality rate of 92.1 per 100,000 inhabitants, slightly higher than in 2021 (92.2)⁽¹⁾. In 2023, the National Institute of Medical Emergency (INEM) activated the Stroke Fast-Track Pathway in 8,796 cases, an increase of 1,920 compared to the previous year, reflecting an average of 24 occurrences per day⁽²⁾.

The World Health Organization defines stroke as a sudden neurological deficit, with focal or global clinical manifestations persisting for more than 24 hours, of probable vascular etiology⁽³⁾. Stroke can be ischaemic, resulting from the occlusion of a vessel, or hemorrhagic, resulting from the rupture of a blood vessel⁽⁴⁾. Ischaemic stroke is the most prevalent, accounting for about 87% of cases⁽⁵⁾. The distinction between stroke subtypes is critical, as therapeutic strategies differ considerably. In ischaemic stroke, early reperfusion by intravenous thrombolysis or mechanical thrombectomy has shown significant benefits. In hemorrhagic stroke, the approach focuses on containing the bleeding and preventing complications⁽⁶⁾.

Early identification of warning signs, such as difficulty speaking, facial asymmetry, and sudden weakness in a limb, as well as the implementation of timely preventive and therapeutic measures, are crucial for prognosis⁽⁷⁾. Time is a critical factor: “time is brain”. With every minute without cerebral perfusion, irreversible neuronal death occurs⁽⁸⁾.

The effectiveness of interventions depends on rapid and coordinated responses in the pre-hospital and hospital settings. The activation of the Stroke Fast-Track Pathway, regulated by Standard No. 015/2017 of the Directorate-General for Health, represents a structured model of action, promoted by the National Program for Cerebrovascular Diseases⁽⁷⁾. In this context, the actions of healthcare professionals, particularly nurses, are crucial in the triage, stabilization, and rapid referral of patients to specialized centers⁽⁹⁾. International initiatives, such as the Angels Initiative, have contributed to the implementation of evidence-based protocols, highlighting the role of nurses in im-

proving clinical outcomes⁽⁸⁾. The Quality in Acute Stroke Care (QASC) study, associated with this initiative, demonstrated that nurse-led protocols significantly reduce mortality and disability⁽⁸⁾.

Despite the existence of protocols and guidelines that guide the treatment of ischaemic stroke, there is still considerable variability in nursing practices, as well as gaps in the systematization of specific interventions at each stage of the clinical pathway of the person undergoing thrombolysis. The complex nature of acute stroke, associated with constant therapeutic developments, reinforces the need to identify and map the nursing interventions currently implemented in this context. This mapping is essential to promote standardization of care, reduce variability in practice, and identify priority areas for improvement and professional development. The systematization of interventions thus contributes to the continuous improvement of the quality of care, enhancing the safety and recovery of people with ischaemic stroke.

This scoping review aims to address these gaps by mapping the nursing interventions described in recent literature and identifying good practices with a view to standardizing care and guiding future research. In this context, the following research question arose: “What nursing care is provided to critically ill individuals with ischaemic stroke undergoing thrombolysis?”.

Methods

This study follows the methodology of a scoping review. This approach is particularly suitable for mapping the extent, nature, and characteristics of the available evidence on a given phenomenon, identifying gaps in knowledge, and guiding future research. The review will be conducted in accordance with the recommendations of the Joanna Briggs Institute (JBI) and reported according to the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) checklist⁽¹⁰⁾.

The formulation of the research question was based on the PCC strategy recommended by the JBI for this type of review, which includes three essential elements: Population (P), Concept (C), and Context

(C). This approach provides a clear and focused structure for identifying, selecting, and critically analyzing relevant literature, with the aim of gathering the best available evidence for application in clinical practice⁽¹¹⁾.

- **Population (P):** Person with ischaemic stroke undergoing thrombolysis;
- **Concept (C):** Nursing care;
- **Context (C):** Intensive Care Unit and Emergency Department.

After choosing the topic and formulating the research question, the research phase began to identify the studies to be included in the review. The search was conducted using the EBSCOhost® platform, which provides access to scientific production and research databases in the field of nursing sciences. The following databases were selected: Complementary Index, CINAHL, MEDLINE, Academic Search Complete, Scopus, MedicLatina, and Science Citation Index Expanded. In addition to the scientific databases mentioned above, specific sources of gray literature were also consulted, namely the Open Access Scientific Repository of Portugal and Google Scholar, with the aim of including relevant documents not indexed in formal databases, such as reports, dissertations, and other relevant academic materials. The inclusion of gray literature aimed to ensure a more comprehensive approach, capturing relevant institutional recommendations and clinical practices that may not be published in indexed journals, given the current and specific nature of the topic.

To conduct the bibliographic search on the EBSCOhost® platform, descriptors validated in the Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH) vocabularies were used. The selected terms were then combined in a single search strategy, adapted to the specifics of the platform, using the Boolean operators AND and OR, in order to maximize the scope and relevance of the results.

The intersection between the descriptors resulted in the following Boolean equation: (“Thrombolytic Therapy” AND “Nursing care”) AND (“Stroke” OR “Ischaemic Stroke”) AND (“Intensive care unit” OR “Emergency Service”).

Table 1 shows the search strategy used in each indexed database consulted through the EBSCOhost® platform, as well as the number of studies identified:

Database	Search strategy	Number of Studies identified
Complementary Index	“Thrombolytic Therapy” AND “Nursing care”	55
CINAHL	AND “Stroke” OR	33
MEDLINE	“Ischemic Stroke” AND	
Academic Search Complete	“Intensive care unit” OR “Emergency Service”	8
Scopus		
MedicLatina		1
Science Citation Index Expanded		1

The inclusion criteria were defined as studies published between 2019 and 2024, with full text available, peer-reviewed, written in Portuguese, English, or Spanish, and addressing nursing interventions aimed at adults (≥ 18 years) with ischaemic stroke undergoing thrombolysis in intensive care units or emergency departments. Grey literature documents were also considered, namely theses, dissertations, technical reports, and official standards relevant to the topic under analysis. Studies conducted in non-critical contexts, with pediatric populations, that did not include nursing care, or that did not directly address the research question were excluded. Publications prior to 2019, non-peer-reviewed studies, case studies, and documents that did not present the minimum structural elements (abstract, objectives, methodology, results, and keywords) or whose translation was not available in one of the eligible languages were also excluded.

According to the previously defined eligibility criteria, the initial search resulted in the identification of 110 articles. After removing 38 duplicates, 72 articles were selected for content evaluation. In a subsequent phase, the search was refined by entering the terms “stroke,” “ischaemic stroke,” “thrombolytic therapy,” “nursing care,” “hospital emergency services,” and “intensive care unit” in the “Subject” field, with the aim of increasing the specificity of the search and ensuring the relevance of the studies to the objective of the review. The selection of studies was conducted

based on the PRISMA model guidelines, ensuring transparency, reproducibility, and methodological rigor. The screening and assessment of the relevance of the studies were performed by two independent reviewers, with disagreements resolved by consensus. In the data extraction and analysis process, the nursing interventions identified were grouped into three main areas: screening and initial assessment; thrombolysis administration; and post-thrombolysis care. This categorization allowed us to synthesize the most frequent intervention patterns and existing gaps in clinical practice.

The flow diagram of the process of identification, screening, eligibility, and inclusion of studies is represented in the Flow Diagram in Figure 1 (adapted from PRISMA Statement)⁽¹²⁾.

Results

After applying the inclusion criteria and analyzing the selected studies, each article included was coded with the letter “S” (for Study), followed by sequential numbering (S1, S2, S3, etc.), to facilitate organization and reference throughout the work. To respond to the objective of the review, the nursing interventions identified in the included studies were grouped into broad thematic areas in order to synthesize the main patterns and recurring practices, highlighting the most relevant interventions for people with ischaemic stroke undergoing thrombolysis. Overall, the nursing interventions most frequently described in the literature relate to systematic neurological monitoring (with emphasis on the application of the National Institutes of Health Stroke Scale [NIHSS]), strict control of vital signs, assessment of swallowing, active prevention of complications (hemorrhages, infections), and implementation of specific rapid response protocols. These areas emerge as central to the safety and efficacy of thrombolytic treatment in an acute setting.

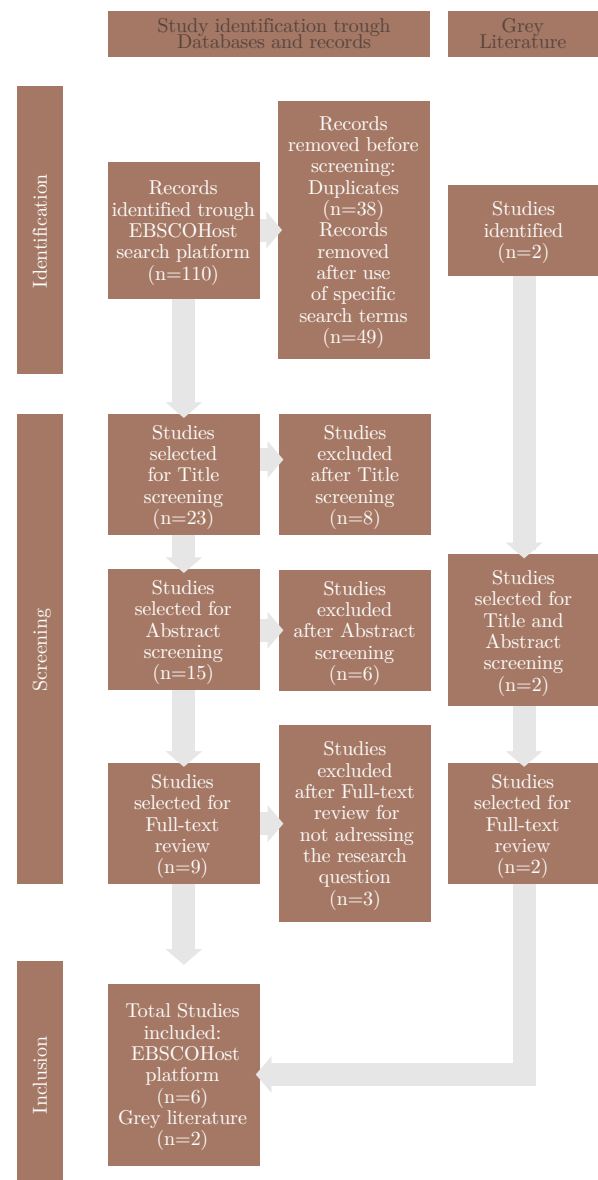


Figure 1: Flow Chart (adapted from PRISMA Statement)⁽¹²⁾.

The nursing interventions identified were grouped into thematic areas and summarized in Table 2 to highlight the main patterns of action throughout the course of the ischaemic stroke patient undergoing thrombolysis.

Table 3 shows the main methodological characteristics and results of each study included.

Table 2: Thematic Areas and Nursing Interventions Identified in Patients with Ischaemic Stroke Undergoing Thrombolysis.

Thematic Area	Main Nursing Interventions
Screening and early identification	– Application of rapid scales (FAST*, CPSS**); – Monitoring of vital signs; – Activation of protocols or “stroke code”.
Initial assessment and ABCDE approach	– Stabilization of airway, breathing, circulation, neurological status; – Venous access and collection of tests; – Rapid preparation for imaging tests.
Assessment of stroke severity	– Application of the NIHSS scale; – Assessment of level of consciousness and deficits; – Identification of eligibility for thrombolysis.
Administration of thrombolytic therapy	– Administration according to protocol; – Close monitoring of vital signs and NIHSS; – Suspension of therapy in case of complications.
Prevention of post-thrombolysis complications	– Continuous neurological assessment; – Correct positioning; – Swallowing assessment; – Monitoring for bleeding/infection; – Blood glucose and temperature control.
Transfer of care	– Safe preparation and transfer; – Structured communication between teams.

* FAST — Face, Arm, Speech, Time; ** CPSS (Cincinnati Prehospital Stroke Scale).

Table 3: Methodological characteristics and relevant results of each study.

Study	Title, Authors, Year, Country	Type of Study	Objective	Results/Nursing Interventions	Conclusions
S1	<i>Bringing Down the Door-to-needle Time</i> Verma & Jaiswal, 2023, India.	Case study.	Describe rapid thrombolysis protocol with door-to-needle time of 6 minutes.	Interventions: immediate screening of symptoms, activation of the “stroke code,” simultaneous medical evaluation with CT/MRI, rapid obtaining of informed consent, initiation of thrombolysis in the CT room, continuous monitoring, evaluation of eligibility for thrombectomy, transfer to the ICU/stroke unit.	Structured intervention reduces door-to-needle time and mortality.
S2	<i>Care of the Patient with Acute Ischemic Stroke</i> Rodgers <i>et al</i> , 2021, USA.	Review of AHA guidelines.	Update nursing care recommendations in acute stroke.	Nursing interventions before thrombolysis: collection of medical history, BP control (defined limits), neurological assessment (NIHSS), Mallampati Scale, monitoring of vital signs. During reperfusion: ABCDE support, continuous monitoring, assessment of complications. After thrombolysis: neurological and hemodynamic surveillance, glycemic control (140–180 mg/dL), temperature (< 37.5° C), swallowing assessment, prevention of ulcers and respiratory complications.	Nurses are essential in all phases of stroke patient care.
S3	<i>Effect of Initial Stroke Care Bundle</i> Mohamed <i>et al</i> , 2023, Egypt.	Quasi-experimental.	Assess impact of structured interventions.	Interventions included in the bundle: neurological assessment within 24 hours; zero diet until swallowing assessment; thrombolytic therapy if eligible; neurological monitoring every 4 hours; early safe mobilization; prevention of bronchoaspiration and DVT; systematic recording.	Bundles increase the quality of care and reduce mortality.
S4	<i>Factors Affecting Length of Stay</i> Dikbaş & Aslan, 2024, Turkey.	Retrospective study.	Identify factors affecting length of stay after thrombolysis.	Key interventions: continuous monitoring of SV and neurological status; invasive device care; frequent swallowing assessment; early rehabilitation and mobilization; prevention of respiratory and urinary infections; self-care support; early discharge plan.	Rigorous care reduces complications and length of hospital stay.
S5	<i>Nursing Care for Stroke Patients</i> Babkair <i>et al</i> , 2023, Saudi Arabia.	Descriptive, cross-sectional study.	To analyze current practices and gaps in stroke care.	Pre-thrombolysis interventions: ABCDE assessment; urgent CT scan; use of the NIHSS scale; stabilization of BP and blood glucose; 12-lead ECG; maintenance of SpO ₂ > 94%; effective IV access. Post-thrombolysis: continuous monitoring (neurological, hemodynamic, and respiratory); prevention of complications; functional and swallowing assessment; standardized recording and referral to stroke unit/ICU.	Specialized training improves interventions and clinical outcomes.
S6	<i>Time is Brain</i> Burns <i>et al</i> , 2023, USA.	Literature review.	Discuss strategies for early response to stroke.	Interventions: rapid clinical assessment (ABCDE); prioritization of CT/MRI for thrombolysis/thrombectomy eligibility; blood collection and monitoring of BP, blood glucose, and SpO ₂ without delaying imaging; rapid administration of rt-PA/thrombectomy; temperature control and infection prevention; early mobilization; use of target times (e.g., rt-PA within ≤ 60 minutes).	Coordinated and standardized care improves stroke prognosis.
S7	<i>Norma N.º 015/2017: Via Verde do Acidente Vascular Cerebral no Adulto</i> DGS 2017, Portugal.	Clinical Guideline.	Define technical guidelines and standardized procedures for the rapid diagnosis and treatment of stroke in adults, ensuring an integrated and effective response.	Interventions: initial stabilization (rapid ABCDE assessment), neurological assessment (GCS and NIHSS scales, pupil assessment), hospital admission (immediate care, validation of clinical condition, and diagnostic tests), and continuous monitoring (vital signs, neurological, thermal).	The implementation of standardized protocols ensures a rapid, coordinated, and safe response in the care of people with suspected stroke.
S8	<i>Guia de Enfermagem do Acidente Vascular Cerebral</i> Portugal Angels Nurse Task Force, 2025, Portugal.	Practical care guide.	Provide guidance and good nursing practices for the provision of care in the acute phase of stroke, promoting standardization and quality of care.	Interventions: in the various stages of stroke patient care (pre-hospital care, acute phase care, and post-acute care). All stages address continuous assessment, using standardized instruments (e.g., NIHSS, Barthel, GUSS scales), quality protocols, and targeted team training.	Standardization of care in the different stages of care and the need for continuous training of nurses.

Discussion

The various studies analyzed highlight nursing interventions for critically ill patients with acute stroke. From the analysis of these studies, it can be inferred that the management of stroke patients is complex and requires a structured approach in three distinct phases: prehospital, acute care, and rehabilitation⁽¹³⁾. In the hospital setting, and in accordance with the objective of this review, the nursing interventions identified in the studies were grouped into thematic areas, summarized in Table 2. Cross-cutting patterns include systematic neurological monitoring, rigorous control of vital signs, assessment of swallowing, active prevention of complications, and implementation of specific rapid response protocols.

Early identification of stroke patients depends on the ability of healthcare professionals to quickly recognize signs and symptoms, especially in the initial phase of treatment⁽¹⁴⁾. In this process, triage nurses play a central role, using rapid assessment tools such as FAST (Face, Arm, Speech, Time) and CPSS (Cincinnati Prehospital Stroke Scale)⁽⁷⁾. The implementation of specific protocols in hospitals and continuous training of teams make it possible to speed up diagnosis and reduce the time to treatment initiation, contributing to better clinical outcomes⁽¹⁵⁾.

After initial identification and appropriate transport of the patient, the hospital phase plays a crucial role in definitive diagnosis and rapid implementation of reperfusion therapies. The transition from pre-hospital to hospital admission must be swift and supported by well-established protocols, ensuring continuity in the approach to stroke. It is essential to focus the analysis on the approach to the acute phase. At this stage, the focus of care is to ensure rapid diagnosis and timely implementation of treatment in order to stabilize the patient and prevent early complications⁽¹³⁾. A rapid and coordinated response from the healthcare team, especially nurses, is crucial to optimizing clinical outcomes. Early recognition of the patient's needs allows for the timely implementation of evidence-based interventions, reducing the risk of complications and improving the effectiveness of treatment⁽¹⁶⁾. Nurses play a decisive role in monitoring peo-

ple with acute stroke, anticipating needs and recognizing possible complications, ensuring patient safety⁽¹⁶⁾.

The expression “time is brain” is related to the fact that the brain is extremely sensitive to ischemia, making time a crucial factor in the effectiveness of thrombolytic treatment⁽¹⁴⁾. According to the same authors, early recognition of stroke signs and symptoms is essential to provide the necessary care and rapid and timely treatment, which is based on the time factor, i.e., the time when the stroke signs and symptoms began⁽¹⁴⁾. The first few hours after the onset of signs and symptoms are therefore essential for the effectiveness of treatment and, consequently, for the survival of the stroke victim. According to current guidelines, the following is recommended: initial assessment of the patient within the first 10 minutes; performance of computed tomography (CT) within 20 minutes of arrival at the hospital; administration of thrombolytic therapy preferably within the first 60 minutes after admission to the hospital (window of opportunity up to 4.5 hours after the onset of symptoms); mechanical thrombectomy within 6 hours after the onset of symptoms⁽¹⁷⁾.

The distinction between ischaemic and hemorrhagic stroke is an essential step in therapeutic decision-making. Early imaging allows the most appropriate approach to be defined, ensuring that thrombolysis is administered only to eligible patients. In the first CT scan, there is often no established lesion, but this test is essential for screening for hemorrhagic stroke, as the symptoms may be indistinguishable⁽¹⁵⁾. As ischaemic stroke is more prevalent than hemorrhagic stroke, professionals should be prepared to treat an ischaemic stroke until proven otherwise⁽¹⁷⁾.

The pharmacological options currently available for the treatment of ischaemic stroke include alteplase and tenecteplase (TNK). Alteplase, considered the standard drug for several years, is administered by continuous infusion over 60 minutes, after an initial bolus⁽¹⁴⁾. Despite its proven efficacy in cerebral reperfusion, its mode of administration is more complex and prone to error. TNK is an alternative with simpler administration, in a single bolus, although monitoring precautions remain due to the risk of hemorrhage^(13,18). The practical implications of the available therapies

should be considered according to the evidence present in each context.

Continuous neurological monitoring using the NIHSS enables early detection of neurological deterioration. This scale is considered the gold standard for determining the severity of a stroke^(13,17,19). Its standardized use allows the severity of the stroke to be quantified and is considered in the patient's eligibility for thrombolysis or endovascular therapy. In addition, it enables objective measurement of changes in clinical status and identifies patients at higher risk of complications, such as intracerebral hemorrhage⁽⁷⁾.

Several factors influence the outcome after a stroke, the most important being the type and severity of the subsequent neurological damage. The prognosis is influenced by the patient's age, the etiology of the stroke, and any concomitant medical conditions, as well as the management approaches used in the treatment plan⁽¹⁹⁾. Thus, a specialized approach to the person with ischaemic stroke is crucial in identifying signs and symptoms, in the thrombolysis process, and after administration of fibrinolytic treatment in the prevention and management of complications. Swift and effective action in monitoring and identifying possible complications based on the best and most recent scientific evidence is essential. Specialized nursing intervention enables early recognition and prevention of complications with the aim of improving the neurological outcome of stroke patients. Stroke victims require care that demands continuous and careful observation in order to detect possible complications early on, which is why precise, concrete, and efficient intervention is crucial⁽¹⁹⁾.

It is therefore essential, before any hospital intervention, to quickly identify signs and symptoms in the pre-hospital phase, and triage is a fundamental step in this process. The strategies adopted at this stage allow patients to be directed to specialized care in the shortest possible time, increasing the likelihood of a positive clinical outcome:

Screening and early identification of stroke patients

- Rapid assessment of the presence of stroke signs and symptoms^(13,14).

- Application of rapid screening scales (e.g., FAST or CPSS) and correct referral of patients^(7,13,15).
- Activation of specific protocols, such as “stroke code,” to speed up assessment and initiation of treatment⁽¹⁴⁾.

Once a person with suspected stroke has been identified, the focus is on systematic assessment (ABCDE), which ensures initial stabilization of vital signs. These actions aim not only to recognize but also to intervene early in any complications, ensuring that the person remains hemodynamically stable until the diagnosis is confirmed:

Initial assessment and ABCDE approach

- Verification of airway patency, ventilation, circulation, and neurological status^(13,17,20).
- Immediate monitoring of vital signs, including blood pressure, respiratory rate, heart rate, temperature, and capillary blood glucose^(16,17).
- Use of the Glasgow Coma Scale (GCS) to assess level of consciousness⁽¹⁹⁾.
- Placement of two peripheral venous accesses (one exclusively for thrombolytic therapy perfusion and the other for necessary perfusions) and collection of clinical analyses, without ever delaying the administration of thrombolysis^(15,17).
- Assessment of the need for invasive procedures prior to the initiation of thrombolysis⁽¹⁹⁾.
- Rapid preparation for imaging tests (e.g., CT-CE), without delaying the administration of thrombolysis⁽¹³⁾.
- Assessment for eligibility for fibrinolytic therapy^(14,17).

After initial stabilization, it is essential to assess the severity of the stroke using standardized scales, allowing for adequate stratification of needs and the definition of an individualized intervention plan:

Assessment of Stroke Severity

- Use of the NIHSS scale, which assesses 11 items, namely Level of Consciousness, Best Conjugate Gaze, Visual Fields, Facial Paresis, Upper Limbs, Lower Limbs, Limb Ataxia, Sensitivity, Best Language, Dysarthria, Extinction, and Inattention^(13,15,16).

Once eligibility for reperfusion has been confirmed, the administration of thrombolytics requires constant monitoring by nurses. Rigour at this stage is not limited to the administration technique: monitoring for possible signs of neurological deterioration and hemorrhagic complications is equally crucial to the success of the treatment:

Administration of Thrombolytic Therapy

- Administration of thrombolytic therapy available in the service according to the established protocol⁽¹⁵⁾.
- Monitoring for signs of clinical deterioration during thrombolysis administration^(15,17).
- Neurological assessment with NIHSS application every 15 minutes and in SOS⁽¹⁶⁾.
- Suspension of treatment in the event of symptoms of intracranial hemorrhage (severe and persistent headache, renewed change in consciousness, nausea and vomiting, major bleeding, and/or seizures)⁽¹⁵⁻¹⁷⁾.

Once the acute phase of thrombolysis is complete, care remains focused on preventing complications such as hemorrhage, infection, and sudden neurological changes. Here, continuous observation/monitoring and the implementation of targeted measures, such as swallowing assessment and strict blood pressure control, are key interventions for improving prognosis:

Prevention of complications in the post-thrombolysis period (24 hours)

- Continuous neurological assessment (every 2 hours after the end of thrombolysis, every 3 hours between 6 and 24 hours, and once per shift during hospitalization until clinical discharge)⁽²⁰⁾.

- Continuous monitoring and recording of vital signs⁽¹³⁾.
- Maintain target blood pressure necessary for specific stroke patients⁽¹³⁾.
- Maintaining correct patient positioning (supine with head in midline, elevated between 15 and 30°, during the first 24 hours)⁽¹⁵⁾.
- Monitoring of blood loss^(13,15).
- Prohibition of oral feeding until swallowing assessment^(16,20).
- Monitoring of capillary blood glucose levels (target values: $140 < \text{BMT} < 180$)^(16,17).
- Monitoring of signs and symptoms of infection⁽¹⁷⁾.

Once the person is stable or eligible for complementary therapies, rapid and safe transfer to specialized services (e.g., intensive care units or interventional neuroradiology) is crucial, ensuring continuity of integrated care and speed in performing any additional procedures:

Transfer of care

- Preparation, coordination, and transfer of the patient for mechanical thrombectomy or to a specialized service⁽¹³⁾.

In short, patients with ischaemic stroke undergoing thrombolysis require care provided by a specialized, high-quality multidisciplinary team. To ensure the quality and safety of the care provided, it is essential to clearly define nursing care and create intervention protocols⁽¹⁴⁾. The nursing team plays an essential role in the administration of thrombolysis and is primarily responsible for this task. The more skilled and experienced the team is, the more effective their intervention will be⁽¹⁹⁾.

The results obtained in this review reinforce the importance of investing in the continuous training of nursing teams and the implementation of standardized, evidence-based protocols, with a view to standardizing and improving the care provided to people with ischaemic stroke undergoing thrombolysis. Continuing specialized education, the implementation of protocols

based on updated scientific guidelines, and the conduct of research studies should be priorities for nurses in general, especially those who provide care to stroke patients, in order to promote more effective and higher-quality practice. Certification and specialization of advanced nursing skills are increasingly essential, given the complexity of care provided to patients with acute stroke⁽¹³⁾.

It is important that future studies in this area involve nurses themselves, as active professionals who are always present in the care of patients with suspected acute stroke, as they play an essential role in decision-making, combining evidence-based knowledge with experience and clinical practice, making them fundamental to this process. Although there are reviews on nursing care in acute stroke, there are still few studies that systematize specific interventions in the context of thrombolysis. This fact highlights the relevance of this review and the need for further research focused on this subgroup of patients.

Although it provides a comprehensive overview of nursing interventions in the management of ischaemic stroke undergoing thrombolysis, this SR has some limitations. First, the inclusion of studies published only in Portuguese, English, and Spanish may have restricted the diversity of available evidence. The heterogeneity of the selected studies, in terms of methodologies used and clinical contexts analyzed, may hinder the generalization of results. The inclusion of gray literature, consisting of institutional standards and guidelines, broadened the scope of the review, although these sources are distinct in nature from traditional scientific publications. Finally, the constant evolution of clinical practices and guidelines may mean that new approaches and evidence emerge rapidly, making it essential to continue research and update recommendations for nursing practice.

Future studies should evaluate the effectiveness of specific nursing interventions in improving the clinical outcomes of these patients and analyze the impact of training and standardization of protocols in practice. The active involvement of nurses in developing recommendations based on the best evidence is also recommended.

Conclusion

The nursing interventions identified highlight the essential role of nurses in the management of patients with ischaemic stroke undergoing thrombolysis, from initial screening and stabilization to post-thrombolysis monitoring and prevention of complications.

Standardization of care, supported by up to date, evidence-based protocols, combined with ongoing training for nursing teams, is essential for improving clinical outcomes and ensuring the safety of patients in critical condition.

There are still gaps in the literature regarding the effectiveness of specific interventions and the practical implementation of care protocols. Future studies should evaluate the impact of these interventions on clinical outcomes and explore strategies to ensure uniformity in clinical practice, promoting excellence in nursing care for patients with ischaemic stroke undergoing thrombolysis.

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MC: Study design and coordination, data
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