

# RIASE

REVISTA IBERO-AMERICANA DE SAÚDE E ENVELHECIMENTO  
REVISTA IBERO-AMERICANA DE SALUD Y ENVEJECIMIENTO

## **EARLY CARE IN FUNCTIONALITY REHABILITATION IN STROKE PATIENTS**

## **CUIDADOS PRECOSES NA REABILITAÇÃO DA FUNCIONALIDADE EM DOENTES COM ACIDENTE VASCULAR CEREBRAL**

## **ATENCIÓN TEMPRANA DE REHABILITACIÓN EN LA FUNCIONALIDAD CON ACCIDENTE CEREBROVASCULAR**

Maria Inês Guerreiro - Professional Training Service of the Local Health Unit of the Litoral Alentejano - Health Center of Alcácer do Sal, Portugal.

ORCID: <https://orcid.org/0000-0002-8112-7753>

Maria José Abrantes Bule - Department of Nursing, University of Évora, Évora, Portugal.

ORCID: <https://orcid.org/0000-0002-0511-2920>

Gorete Mendonça dos Reis - Department of Nursing, University of Évora; Comprehensive Health Research Center (CHRC), Évora, Portugal.

ORCID: <https://orcid.org/0000-0003-1001-4142>

Corresponding Author/Autor Correspondente:

Maria Inês Guerreiro - Local Health Unit of the Litoral Alentejano, Alcácer do Sal, Portugal. [minesguerreiro19@gmail.com](mailto:minesguerreiro19@gmail.com)

Received/Recebido: 2020-02-21 Accepted/Aceite: 2020-03-31 Published/Publicado: 2020-12-31

DOI: [http://dx.doi.org/10.24902/r.riase.2020.6\(2\).410.171-183](http://dx.doi.org/10.24902/r.riase.2020.6(2).410.171-183)

©Author(s) (or their employer(s)) and RIASE 2020. Re-use permitted under CC BY-NC. No commercial re-use.

©Autor(es) (ou seu(s) empregador(es)) e RIASE 2020. Reutilização permitida de acordo com CC BY-NC. Nenhuma reutilização comercial.

## ABSTRACT

---

**Objective:** Analyze the results of the early therapeutic intervention of the rehabilitation nurse in functionality in stroke patients.

**Methods:** Multiple case studies according to CAse REport (CARE) guidelines. Four patients participated, mean age 71.8 years (SD=9.9 years). Study approved by the Ethics Committee for Health.

**Results:** Self-care and balance training led three patients to the modified dependency score (with assistance up to 25% of activity), one participant maintained the modified dependency level (with assistance up to 50% of activity). The average evolution in self-care ranged from 0.75 to 1.75 points, more favorable evolution in food, hygiene, dressing the upper half and use of the toilet. The mean evolution in balance was 12.75 points, three patients remained in the Acceptable category and one evolved to Good.

**Conclusion:** There were gains in functionality, sensitive to rehabilitation nursing care.

**Keywords:** Exercise therapy; Rehabilitation Nursing; Self-Care.

## RESUMO

---

**Objetivo:** Analisar resultados da intervenção terapêutica precoce do enfermeiro de reabilitação, na funcionalidade, em doentes com Acidente Vascular Cerebral.

**Métodos:** Estudos de caso múltiplos segundo as *guidelines* da CAse REport (CARE). Participaram quatro doentes, idade média de 71,8 anos (DP=9,9 anos). Estudo aprovado em Comissão de Ética para a Saúde.

**Resultados:** O treino de autocuidados e do equilíbrio conduziu três doentes ao *score* de dependência modificada (com assistência até 25% da atividade), um participante manteve o nível de dependência modificada (assistência até 50% da atividade). A média de evolução nos autocuidados variou entre 0,75 e 1,75 pontos, evolução mais favorável na alimentação, higiene, vestir a metade superior e uso do sanitário. A evolução média no equilíbrio foi de 12,75 pontos, três doentes mantiveram-se na categoria Aceitável e um evoluiu para Bom.

**Conclusão:** Verificaram-se ganhos na funcionalidade, sensíveis aos cuidados de enfermagem de reabilitação.

**Palavras-chave:** Autocuidado; Enfermagem de Reabilitação; Exercício Terapêutico.

## RESUMEN

---

**Objetivo:** Analizar los resultados de la intervención terapéutica temprana de la enfermera de rehabilitación, en la funcionalidad, en pacientes con accidente cerebrovascular.

**Métodos:** Estudios de casos múltiples de acuerdo con las pautas de CAse REport (CARE). Participaron cuatro pacientes, edad media 71,8 años (DP=9,9 años). Estudio aprobado por el Comité de Ética para la Salud.

**Resultados:** El autocuidado y el entrenamiento del equilibrio llevaron a tres pacientes a la puntuación de dependencia modificada (con asistencia de hasta el 25% de la actividad), un participante mantuvo el nivel de dependencia modificada (asistencia de hasta el 50% de la actividad). La evolución promedio en el autocuidado varió entre 0,75 y 1,75 puntos, una evolución más favorable en alimentación, higiene, vestir la parte superior del cuerpo y usar el baño. La evolución promedio en equilibrio fue de 12,75 puntos, tres pacientes permanecieron en la categoría Aceptable y uno evolucionó a Bueno.

**Conclusión:** Se confirman mejoras en la funcionalidad, sensibles a los cuidados de rehabilitación enfermera.

**Descriptores:** Autocuidado; Ejercicio Terapéutico; Enfermería de Rehabilitación.

## INTRODUCTION

---

Patients who survive a stroke often experience changes in functionality and varying degrees of dependence. Stroke is one of the most common causes of long-term addiction<sup>(1-2)</sup>.

In the literature review carried out by Aries & Hunter<sup>(3)</sup>, concerning the rehabilitation intervention in people with stroke, 24 hours after the event, it was found that a multidisciplinary approach with rehabilitation strategies can promote the recovery of these people, such as: an enriched environment, with social interaction, opportunities for repetition and practice of movements and functional activities involving paretic limbs, sensory stimulation and early activity outside the bed. The authors concluded that the intervention in the person with stroke should be promoted 24 hours after the stroke, with emphasis on the intervention of the nursing team that is directly linked to care and has a privileged position to coordinate the approach and encourage the person with physical limitation, in order to optimize their recovery and, above all, also promote teamwork<sup>(3)</sup>.

The European Stroke Organization (ESO) reports with grade B evidence the early mobilization of moderate intensity in stroke patients and considers the progressive training of activities of daily living (Grade A)<sup>(4)</sup>. The intensity of early mobilization must be adapted to the clinical situation and monitored from the perspective of the patient's signs and symptoms (Grade C)<sup>(4)</sup>.

The reported cases refer to four stroke patients, who were not admitted to a differentiated unit, with changes in functionality resulting from hemiplegia and who were subjected to rehabilitation nursing care with daily life activities (DLA) and balance training initiated in the acute phase. The diagnostic evaluation was carried out with validated instruments, the intervention protocol was developed based on the evidence and the results were obtained by the difference between the initial evaluation and the final evaluation. Rehabilitation nursing care was effective in the transition from complete to modified dependence.

### *Objective*

To analyze the results from the rehabilitation nurse's early therapeutic intervention, in functionality, in people with stroke.

## METHOD

---

### *Study design*

Multiple case studies according to the CAse REport guidelines<sup>(5)</sup> in order to comply with the principles of precision and transparency of results and their contribution to rehabilitation nursing. The intervention protocol followed the methodology of the nursing process and the International Classification for Nursing practice (ICNP), in version 2.0<sup>(6)</sup> was used. The study was carried out from September 2018 to January 2019, based on the following research question "What is the health improvement obtained through the early therapeutic intervention of the rehabilitation nurse, in functionality, in patients with stroke?"

### *Ethical principles*

This study was approved by the Ethics Committee for Health of the Local Health Unit. The principles of the Declaration of Helsinki were respected. The participants were asked to provide informed consent. The principle of free abandonment to participation was safeguarded. In all phases of collection, analysis and dissemination of results, the anonymity of the participants was maintained.

### *Participants*

Patients hospitalized for stroke in the acute phase, excluding cases that due to changes in the level of consciousness, they did not present manifestations of conscious interaction with professionals and the environment. Four patients participated, who are hereinafter referred to as A1 to A4. The type of sampling was for convenience.

### *Intervention Protocol*

The intervention protocol was created based on the literature review e structured in stages of nursing process:

**Assessment** – The data were collected through a form, composed of biophysical parameters. To assess functionality, the Functional Independence Measure (FIM) was applied, consisting of 18 items distributed in six domains: Self-care; Control of Sphincters, Mobility and Transfers, Locomotion, Communication and Awareness of the Outside World. The maximum score is 126 points, which corresponds to complete independence and the minimum 18 points that represents complete dependence<sup>(7)</sup>. Four cutoff points can also be identified: 18 points (complete dependence); 19 – 60 points (modified dependency with assistance up to 50% of the task); 61 – 103 points (modified dependency, with assistance up to 25% of the task); 104 – 126 points (complete independence)<sup>(8)</sup>.

Balance was assessed using the Berg Scale (BSE), translated and adapted to the Portuguese language, considering the Brazilian version as a reliable instrument to be used in assessing balance<sup>(9)</sup>. It consists of 14 items which include specific functional activities in different support bases. Each item has an ordinal scale of 5 alternatives that receive a score from 0 to 4, for a total of 56 points. Final scores ranging from 0 to 20 represent a decrease in balance, between 21 and 40 represent acceptable balance, and between 41 and 56 represent a good balance<sup>(8)</sup>.

The analysis of the evaluation data led to the formulation of the rehabilitation nursing diagnoses: Self-care dressing up committed; self-care use of the toilet committed, self-care eating and drinking committed; body balance committed and walking or walking with aid committed<sup>(8)</sup>.

**Intervention plan** – The rehabilitation nursing care was planned according to the nursing diagnoses (Table 1).

Table 1 - Intervention plan of rehabilitation nursing.

Nursing diagnosis	Intervention
Self-care dressing up committed.	To instruct self-care.
	To demonstrate washing, drying, dressing and undressing.
	To train washing, drying, dressing, undressing.
	To train the use of devices to support self-care.
Self-care use of the toilet committed.	Training of habits elimination.
	Training the use of devices for disposal.
Self-care eating and drinking committed.	Instructing about self-care.
	Training self-care.
	Re-educating dominant upper limb.
	Training the use of support devices for self-care.
Body balance committed.	Functional, dynamic and static balance training.
Committed walking/walking with aid committed.	Transfer training on the affected side.
	Walking aid training.

The interventions were performed on alternate days, in the morning, adjusting the training to the schedule of usual activities in the inpatient unit. The care protocol was carried out by the same professional, without recourse to other team members. Each session totaled an average of 90 minutes distributed at different times: Self-care of hygiene, dressing and undressing and use of the toilet; therapeutic exercises and a third moment for walking with aid training. The plan was appropriate to the patient's evolution, in order to increase his ability to perform the tasks and was completed at the time of discharge.

**Results assessments** – The results sensitive to the rehabilitation nursing intervention were extracted from the differences obtained in the initial evaluation, in comparison with those of the final evaluation.

## RESULTS

The results are presented as defined in the CARE protocol<sup>(5)</sup>: Characterization of cases, clinical data, relevant data that occurred during the intervention (i.e. timeline), diagnostic evaluation, results and discussion. The four cases are presented separately and in the discussion of the results, the differences and similarities found are highlighted.

Biographical characterization data related to age and sex are presented and clinical data related to medical admission diagnosis, as well as active secondary diagnoses, were considered relevant (Table 2).

Table 2 - Characterization of cases.

	A1	A2	A3	A4
Sex	Male	Male	Female	Male
Years-old	69	82	57	79
Admission diagnosis	Hemorrhagic stroke of the right capsular nucleus with tetra-ventricular flood	Ischemic stroke of the capsular nucleus and right ventricular	Ischemic stroke of the left cerebellar hemisphere	Ischemic stroke (left middle cerebral artery)
Secondary diagnostics active	HTA Obesity Hemorrhagic stroke Disorientation space/time	HTA Cerebrovascular disease	Status after total hip replacement.	

The initial deficits presented by the patients have changed and are relevant in the scope of the intervention project. They are presented according to a chronological line, designated as provided for in the CARE protocol and they report motor deficits. Case A1 showed a decrease in muscle strength in both lower limbs, which is associated with the reason for hospitalization, but also with active secondary diagnoses. Case A3 showed no change in strength, coinciding with the location of the lesion. Right hemiparesis was seen in ca-

ses A2 and A4. The evolution of muscle strength was observed in all cases in which changes were recorded. The initial and final assessment of muscle tone using the Modified Ashworth Scale documents the absence of changes (Table 3).

Table 3 - Relevant data chronogram.

Time	A1		A2		A3		A4	
	Start	End	Start	End	Start	End	Start	End
	<b>Muscle strength - Medical Research Council Muscle Scale</b>							
Right upper limb	5/5	5/5	3/5	4/5	5/5	5/5	4/5	5/5
Left upper limb	5/5	5/5	5/5	5/5	5/5	5/5	5/5	5/5
Right lower limb	3/5	4/5	4/5	5/5	5/5	5/5	4/5	5/5
Left lower limb	3/5	4/5	5/5	5/5	5/5	5/5	5/5	5/5
	<b>Muscle tone - Modified Ashworth Scale</b>							
Right upper limb	0		0		0		0	
Right upper limb	0		0		0		0	
Left upper limb	0		0		0		0	
Right lower limb	0		0		0		0	

Functionality and balance were the parameters used in the diagnostic and results assessment. All participants decreased their level of initial dependence, with an increase in the MIF score that varied between 13 to 20 points (mean M=17; standard deviation SD=3.08). According to the MIF cutoff points, most participants achieved a modified dependency classification score, with assistance up to 25% of the activity. Only the participant A1 maintained the modified dependency level, with assistance up to 50% of the activity (Table 4).

Tabela 4 - Assessment of functionality before and after rehabilitation nursing intervention.

MIF	A1		A2		A3		A4	
	Start	End	Start	End	Start	End	Start	End
	<b>Self-care</b>							
Food	4	5	4	6	5	7	5	7
Higiyene	2	3	2	4	4	7	3	4
Shower	2	3	2	3	4	4	3	4
Dressing the upper half of body	3	4	3	4	5	7	3	4
Dressing the lower half of body	2	3	2	3	4	5	3	4
Use of toilet	2	3	3	4	4	5	2	4
	<b>Sphincter Control</b>							
Bladder	2	3	3	5	5	7	5	5
Intestine	2	3	3	5	5	7	5	5
	<b>Mobility and Transfers</b>							
Bed, chair, wheelchair	2	3	3	5	3	5	3	4
Toilet	2	3	3	4	3	4	3	4
Bathtub, shower	2	3	3	4	3	4	3	4
	<b>Locomotion</b>							
Crutch, wheelchair	2	3	2	4	2	4	3	4
Stairs	2	2	2	3	2	3	2	3
	<b>Communication</b>							
Understanding	3	4	4	5	5	5	4	5
Expression	4	4	4	5	7	7	4	5
	<b>Awareness of the outside world</b>							
Social interaction	4	4	5	5	7	7	5	5
Problem resolution	2	2	3	3	5	5	4	4
Memory	3	3	3	3	7	7	4	4
Total	41	58	57	77	80	100	64	79
Results	+17		+20		+20		+15	

The results presented demonstrate a high functional dependence after the stroke. The structured intervention aimed at training self-care, balance training and motor functional re-education, contributed to the reduction of functional dependence, enabling participants to perform at levels between minimum and moderate help according to the MIF.

In self-care: food was the one with the lowest levels of dependence in all cases and also one of the ones with the most favorable evolution. After the intervention, two participants became independent, one with modified independence and another participant with modified dependence. In hygiene, after the intervention, one participant reached complete independence; two remained with modified dependence with minimal help; and one participant with moderate help. In clothing, the parameter “dressing the lower half of body” showed higher levels of dependence, compared to the gains obtained in training to “dressing the upper half of body”, however all participants managed to evolve favorably in the activity.

After using the toilet, two participants had modified dependence and minimal help, one participant with supervision and another participant with moderate help. In mobility and transfers, the training of transfers between surfaces, the reeducation of the postural reflex, and all the other exercises presented in the intervention protocol made it possible to perform with the least possible help in all cases.

The average evolution in balance was 12.75 points, three patients remained in the Acceptable category and one evolved to Good (Fig. 1).

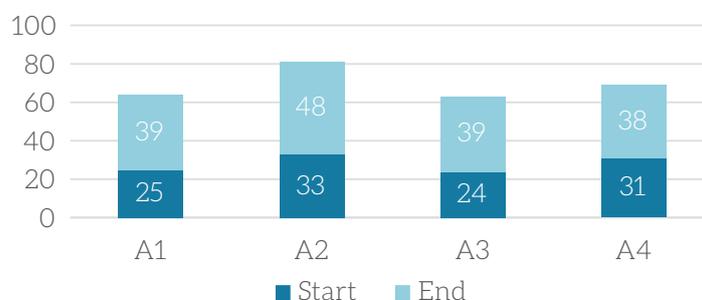


Figure 1 - Balance assessment before and after rehabilitation nursing intervention.

## DISCUSSION

---

Acquired brain injury, such as stroke, is one of the most common causes of long-term addiction<sup>(1)</sup>. It is a common neurological disorder, when considered in isolation from other cerebrovascular diseases; it is the fourth leading cause of death worldwide and the main reason for disability in community contexts<sup>(2)</sup>.

The study participants were mostly elderly people, aged between 69 and 82 years-old. One participant was 57-years-old. The results for elderly people diagnosed with stroke have been described in several studies, where the age group was above 65 years-old. Increasing age is associated with higher mortality and greater severity resulting from stroke, associated with worse functional results<sup>(10)</sup>.

A study on autonomy/independence in self-care found that self-care hygiene showed higher levels of dependence in the final assessment. This idea can be corroborated by the fact that the participants are elderly people with a higher dependency index who already have difficulties in performing certain tasks of their DLAs, such as being able to wash/dry the body, among others<sup>(11)</sup>. The results can be explained taking into account the characteristics of the people.

The training of patients for self-care is effective in increasing functionality<sup>(12)</sup> as seen in the cases studied. The teaching and training of self-care according to a structured protocol proved to be effective, with functional gains assessed by the MIF.

The study by Aries et al. refers that activities outside the bed, such as sitting and standing, walking to the toilet, making transfers in the toilet, are potentiators of an active participation of the person in their rehabilitation<sup>(3)</sup> process and increase their well-being<sup>(3)</sup>.

The activities of transference and movement in the bed combine strategies of strength, coordination of movements and balance and the results demonstrate the favorable evolution obtained by all patients not only in the performance of self-care but also in the gains in balance. A literature review found the importance that the practice and repetition of movements be incorporated into functional activities and/or DLAs<sup>(3)</sup>. Walking assessment, walking training with short training sessions several times during the shift and the re-acquisition of the lost automatic pattern, taking into account energy expenditure, are interventions that benefit the person. An adequate intervention and approach called "early mobilization" significantly reduces complications associated with the time spent in bed<sup>(3)</sup>. The positive evolution at this level was a facilitating factor in the ability to perform self-care. The process of recovery and adaptation to a disability allows the per-

son to adjust to a new life and an altered body<sup>(13)</sup>, through an individualized and structured plan, people with special needs and functionality limitations are trained.

## CONCLUSION

---

All participants obtained an increase in their functionality, maximizing their motor and cardiorespiratory performance according to the specificity of each person, their tolerance to effort and their physical capacity, factors taken into account in the intensity of activities. The results obtained confirm the importance of the rehabilitation nursing intervention, reaffirm the skills in the specialty area and indicate the importance of models of rehabilitation care starting in the acute phase. The limitations to the study resulted from the time of contact with each participant and the lack of homogeneity in the cases studied.

Declaration of Interests/Declaração de Interesses: Study carried out within the final stage of the Master's Degree in Nursing in the area of specialization in rehabilitation nursing.

### Ethical Disclosures

Conflicts of interest: The authors have no conflicts of interest to declare.

Financing Support: This work has not received any contribution, grant or scholarship.

Confidentiality of Data: The authors declare that they have followed the protocols of their work center on the publication of data from patients.

Protection of Human and Animal Subjects: The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

Provenance and Peer Review: Not commissioned; externally peer reviewed.

### Responsabilidades Éticas

Conflitos de Interesse: Os autores declaram a inexistência de conflitos de interesse na realização do presente trabalho.

Fontes de Financiamento: Não existiram fontes externas de financiamento para a realização deste artigo.

Confidencialidade dos Dados: Os autores declaram ter seguido os protocolos da sua instituição acerca da publicação dos dados de doentes.

Proteção de Pessoas e Animais: Os autores declaram que os procedimentos seguidos estavam de acordo com os regulamentos estabelecidos pelos responsáveis da Comissão de Investigação Clínica e Ética e de acordo com a Declaração de Helsínquia da Associação Médica Mundial.

Proveniência e Revisão por Pares: Não comissionado; revisão externa por pares.

## REFERENCES

---

1. Bender A, Adrion C, Fischer L, Huber M, Jawny K, Straube A, et al. Long-term rehabilitation in patients with acquired brain injury: A randomized controlled trial of an intensive, participation-focused outpatient treatment program. *Dtsch Arztebl Int.* 2016;113:634.
2. Klinke ME, Hafsteinsdottir TB, Hjaltason H, Jonsdottir H. Ward-based interventions for patients with hemispatial neglect in stroke rehabilitation: a systematic literature review. *Int J Nurs Stud.* 2015;52:1375-403.
3. Aries A, Hunter SM. Optimising rehabilitation potential after stroke: a 24-hour interdisciplinary approach. *Br J Neurosci Nurs.* 2014;10:268-73.
4. Ahmed N, Audebert H, Turc G, Cordonnier C, Christensen H, Sacco S, et al. Consensus statements and recommendations from the ESO-Karolinska Stroke Update Conference, Stockholm 11-13 November 2018. *Eur Stroke J.* 2020;4:307-17.
5. Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D, et al. The CARE Guidelines: Consensus-based Clinical Case Reporting Guideline Development. *Glob Adv Health Med.* 2013;2:38-43. doi:10.7453/gahmj.2013.008
6. Ordem dos Enfermeiros. CIPE, Versão 2015 - Classificação Internacional para a Prática de Enfermagem. Loures : Lusodidacta, 2016.
7. Direção Geral da Saúde. Acidente Vascular Cerebral: Prescrição de medicina física e de reabilitação - Norma n.º 054/2011 de 27/12/2011. Lisboa: DGS; 2011.
8. Mesa do Colégio da Especialidade de Enfermagem de Reabilitação. Instrumentos de recolha de dados para a documentação dos Cuidados Especializados em Enfermagem de Reabilitação. Lisboa: Ordem dos Enfermeiros; 2016.
9. Silva Ad, Almeida GJ, Cassilhas RC, Cohen M, Peccin MS, Tufik S, et al. Equilíbrio, coordenação e agilidade de idosos submetidos à prática de exercícios físicos resistidos. *Rev Bras Edu Fís Esp.* 2008;14:88-93.
10. O'Brien SR, Xue Y. Inpatient rehabilitation outcomes in patients with stroke aged 85 years or older. *Phys Ther.* 2016;96:1381-8.
11. Couto G. Autonomia/Independência no Autocuidado Sensibilidade aos Cuidados de Enfermagem de Reabilitação [Dissertação de Mestrado]. Porto: Escola Superior de Saúde do Porto; 2012.

12. Reis G, Bule MJ. Capacitação e Atividade de Vida. In: Marques-Vieira C, Sousa L, editores. Cuidados de Enfermagem de Reabilitação ao longo da Vida. Loures: Lusodidacta; 2017. p.57-66

13. Menoita E. Reabilitar a Pessoa Idosa com AVC: Contributos para um envelhecer resiliente. Loures: Lusociência; 2014.