



**FACULDADE DE MEDICINA DA UNIVERSIDADE DE COIMBRA**

**MESTRADO INTEGRADO EM MEDICINA – TRABALHO FINAL**

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***ACCIDENTAL FALL IN HEMIPARETIC PATIENTS: FUNCTIONAL  
RISK ASSESSMENT AND PREVENTION***

ARTIGO CIENTÍFICO ORIGINAL

ÁREA CIENTÍFICA DE MEDICINA FÍSICA E DE REABILITAÇÃO

Trabalho realizado sob a orientação de:

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JANEIRO/2017



**ACCIDENTAL FALL IN HEMIPARETIC PATIENTS:  
FUNCTIONAL RISK ASSESSMENT AND  
PREVENTION**

Dissertation presented to the Faculty of Medicine of the University of Coimbra for the fulfillment of the requirements for a Master Degree in Medicine, elaborated under the scientific supervision of Prof. Doctor João Páscoa Pinheiro and Doctor Carla Pina Amaral.

Joana Rita Lopes, 2017

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## **ABBREVIATIONS**

10MWT - 10 Meter Walk Test

ADL – Activities of Daily Living

CHUC – Coimbra Hospital and University Center

FES - Fall Efficacy Scale

FIM<sup>®</sup> - Functional Independence Measure

FMUC – Faculty of Medicine of the University of Coimbra

m – meter (s)

PRM-CHUC – Physical and Rehabilitation Medicine in the Coimbra Hospital and University  
Center

SPSS – Statistical Package for the Social Sciences

WS - Walking Speed

## RESUMO

**Introdução:** A queda acidental é um fenómeno comum na população acometida por acidente vascular cerebral, sendo causa frequente de medo de queda, hospitalização e agravamento do prognóstico. A avaliação do medo de queda é um método já comprovado de prevenção de futura morbidade, contudo, os estudos realizados em populações hemiparéticas funcionais são ainda escassos, nomeadamente em Portugal.

**Objetivos:** Avaliar a utilização da Fall Efficacy Scale (FES), na versão portuguesa, como preditor do risco de queda numa população hemiparética funcional. Pretende-se ainda comparar o risco de queda nesta população com outra sem défices motores e funcionais.

**Materiais e Métodos:** Este estudo explorativo não randomizado foi realizado no Serviço de Medicina Física do Centro Hospitalar Universitário de Coimbra (PRM-CHUC), com uma amostra experimental de 33 doentes hemiparéticos de 45-80 anos, com evento vascular cerebral ocorrido há mais de 12 meses, capazes de efectuar marcha autónoma e com Medida de Independência Funcional (FIM<sup>®</sup>) superior a 110. Foram submetidos a um questionário que incluía parâmetros sociodemográficos, antropométricos, caracterização das quedas, execução de uma marcha de 10 metros cronometrada e a FES. Recorreu-se também a um grupo de controlo de 33 adultos, de 65-75 anos, com FIMs<sup>®</sup> equivalentes e sem défices motores. Foram utilizados os testes t-student para amostras independentes, coeficiente de correlação e qui-quadrado de *Pearson*, na versão 22 do *SPSS Statistics*<sup>®</sup>.

**Resultados:** Do grupo experimental com 7 mulheres e 26 homens, com idade média de  $61.09 \pm 7.34$  anos, 51.5% (17 pacientes) tiveram pelo menos uma ocorrência de queda, com uma média de  $2.59 \pm 1.58$ . Os 17 que caíram obtiveram um score médio na FES de  $72.41 \pm 22.62$  enquanto os 16 que não caíram obtiveram  $85.75 \pm 6.55$ . A FES revelou uma relação significativa com a ocorrência de queda ( $p=0.031$ ) e correlação significativa com o número de quedas ( $p=0.032$  e coeficiente correlativo de *Pearson* = -0.520). Do grupo controlo

de 33 adultos, 9 homens e 24 mulheres, com uma idade média de  $68.61 \pm 2.78$ , 57.6% (19 pacientes) tiveram pelo menos uma ocorrência de queda, com uma média de  $2.42 \pm 2.27$ . Não se demonstrou diferença significativa entre o número de quedas do grupo experimental e do grupo controlo ( $p=0.579$  e qui-quadrado de *Pearson*= 0.308).

**Conclusão:** A FES pode ser utilizada como um instrumento preditor da ocorrência de quedas em populações hemiparéticas funcionais. Este tipo de população, após um programa de reabilitação, é equiparável, em termos de morbilidade relativa a quedas acidentais, a uma população de adultos saudáveis. Este facto acentua a importância da reabilitação para a manutenção da funcionalidade individual.

**Palavras-Chave:** queda, risco, acidente vascular cerebral, hemiparésia, função

## ABSTRACT

**Introduction:** Accidental fall is a common event in stroke patients, leading to fear of falling, frequent hospitalization and worsening prognosis. The fear of falling assessment is an important and proven method for preventing future disability but is yet to be fully tested in functional hemiparetic populations, particularly in Portugal.

**Objectives:** To evaluate the use of the Fall Efficacy Scale (FES), in its Portuguese validated version, as a predictor of fall risk in a functional hemiparetic population. This population's falls were also compared to a control population, with no motor or functional deficits.

**Materials and Methods:** This exploratory non-randomized study was conducted in the Physical and Rehabilitation Medicine department in the Coimbra Hospital and University Center (PRM-CHUC) with an experimental group of 33 hemiparetic patients aged between 45 and 80 years, with a minimum of 12 months since stroke and hemiparesis. Autonomous mobility was also required, with or without mobility aids, and a Functional Independence Measure<sup>®</sup> (FIM<sup>®</sup>) superior to 110. They were submitted to a questionnaire which included sociodemographic and anthropometric parameters, fall history and characterization, a timed 10 meter walk test and the FES. A control group of 33 patients ranging from 65 to 75 years was also used, with identical FIMs<sup>®</sup> and no motor deficits. The t-Test for independent samples, Pearson Correlation Coefficient and Pearson Chi-Squared test were used for the statistical analysis, in the SPSS Statistics<sup>®</sup> version 22.

**Results:** In the experimental group, with 7 women and 26 men, mean age of  $61.09 \pm 7.34$  years, 51.5% (17 patients) experienced at least one fall, with an average of  $2.59 \pm 1.58$  falls. The fallers scored a mean of  $72.41 \pm 22.62$  on the FES while the 16 non-fallers scored  $85.75 \pm 6.55$ . The FES revealed a significant relation with fall occurrence (p-value=0.031) and a significant correlation with number of falls (p-value=0.032 and Pearson correlation coefficient= -0.520). In the control group, with 9 men and 24 women, mean age of



68.61±2.78 years, 57.6% (19 patients) experienced at least one fall, with a mean of 2.42±2.27 falls. No significant relation was found between the number of falls of the experimental group and the control group (p-value=0.579 and Pearson Chi-Squared Test=0.308).

**Conclusions:** The FES can be used to predict fall occurrence in functional hemiparetic populations. After a rehabilitation program, a functional hemiparetic population's fall related mobility is similar to that of a healthy population. This fact enhances the importance of rehabilitation in the maintenance of individual function.

**Keywords:** fall, risk, stroke, hemiparesis, function

## INTRODUCTION

Acute stroke is the second leading cause of long term disability and mortality worldwide above the age of 60 and the fifth among people aged 15 to 59.<sup>1</sup> On a national basis, the death toll in Portugal reached 11.2% in 2014, representing one of the main causes of mortality.<sup>2</sup> Stroke occurrence leads to the impairment of psychological and physiological body functions, with consequences such as hemiparesis, and creates severe limitation in activities of daily living and social reintegration, which greatly impacts an individual's quality of life.<sup>3,4</sup> Consequently these patients reveal an elevated risk of fall occurrence with subsequent hospitalization and increase in morbidity.<sup>5,6,7</sup>

The patient's perception of the high possibility of falling when attempting to execute any action that requires movement creates a fear of falling and consequently a psychological restriction of several activities, which, associated to their already undermined self-confidence and heightened perception of loss of function and independence, also affects their overall rehabilitation and has a considerably negative social impact.<sup>4,8,9</sup>

With these consequences in mind, the application of functional evaluation scales in rehabilitation is of great importance for fall prevention. It has already been proven as a useful predictor of fall occurrence with the assessment of balance confidence and fear of falling avoidance behavior being among the ones with greater significance.<sup>9,10,11</sup> However, regarding highly functional hemiparetic populations in rehabilitation, little research has been done concerning fall predictive measures and comparison with healthy populations, with similar functional independence measures.

This study focuses on evaluating the use of the recently adapted and validated Portuguese version of the Falls Efficacy Scale<sup>12,13</sup> as a fall predictor in a functional hemiparetic population. Fall risk is also compared to a healthy and functional population.

## **MATERIALS AND METHODS**

### **Subjects and Selection Criteria**

This study was conducted from April to September 2016 in the PRM-CHUC, in the Center Region of Portugal. It consisted of a non-randomized exploratory study with an experimental group of 33 patients with ages ranging from 45 to 80, minimum of 12 months since stroke and hemiparesis, selected from external consultations and several rehabilitation sectors within the department. Autonomous mobility was also required, with or without mobility aids, as well as a Functional Independence Measure® (FIM®) superior to 110, in order to maintain a sufficiently independent population. After being explained of the aims of this study all participants gave written informed consent (see Annex I), prior to the interview. Regarding the control group, it consisted of 33 healthy and functional adults aged 65 to 75, with no history of motor or functional deficits, and equivalents FIMs®. Patients with hampered mobility and in need of constant wheel-chair use, severe balance and gait impediment, and with history of psychiatric pathology were excluded.

### **Assessment measures**

A questionnaire was applied containing queries regarding sociodemographic and anthropometric parameters, as well as fall history and characterization and FIM® measurement (see Annex III). The experimental sample was also questioned regarding stroke description, mobility aids and medication (see Annex II). The Portuguese version of the Fall Efficacy Scale (see Annex IV) and a timed 10 meter walk test (10MWT) were also applied on the experimental sample. This fall efficacy assessment tool is an adaptation of the original Fall Efficacy Scale by Tinetti et al.<sup>13</sup> and was modified in 2011 to be used on the portuguese population<sup>12</sup>.

This scale includes 10 common daily activities, each classifiable from 1 (No confidence) to 10 (Very confident) in terms of the degree of confidence each patient has in completing each of the listed activities. The scale results can then range from 10 (no confidence in any of the listed activities) to 100 (full confidence in every activity)<sup>12</sup>. The 10 meter walk test (10MWT) is a simple tool of mobility assessment, frequently used in mobility based studies in various population types ranging from healthy elderly to the neurologically and orthopedically impaired.<sup>14,15</sup> The 10 MWT with walking speed (WS) calculation was made through a 20 m straight path divided in 3 portions: the first 5 m for acceleration, the 10 central meters for walking in steady speed and timing, and 5 m for deceleration.<sup>16</sup>

FIM<sup>®</sup> is a widely known and used tool in function assessment and measure in in-patient rehabilitation.<sup>17</sup> It was adapted to the portuguese language by Laíns in 1990<sup>18</sup>. The scale consists of a motor and cognitive assessment divided in 6 parameters: self-care and sphincter control, transfers and locomotion, communication and social cognition. It contains 18 items, with 13 corresponding to motor and 5 to cognitive tasks. These tasks, based in activities of daily living (ADL), are ranked on a 7-point ordinal scale ranging from 1 (Total assistance) to 7 (Complete independence) resulting in a total score ranging from 18 to 126 points.<sup>18</sup>

This study was approved by the Coimbra University Hospital Center's (CHUC) Ethics Committee and the Faculty of Medicine of the University of Coimbra's (FMUC) Ethics Committee (see Annexes V and VI).

### **Statistical Analysis**

The SPSS Statistics<sup>®</sup> version 22 was used to analyze all collected data. Besides the descriptive analysis of the data, several statistical tests were used, which included t-Test for Independent Samples, Pearson Coefficient Correlation and Pearson's Chi-Squared Test. The variables were considered significant if  $p < 0.05$ . The screened variables were history and

number of falls, FES and WS from the 10MWT. The experimental group and the control group were also compared regarding history of falls.

## RESULTS

### Patient Characteristics

Study participants included an experimental group of 33 patients, 7 women and 26 men, with a mean age of  $61.09 \pm 7.34$  years and a mean FIM<sup>®</sup> of  $121.88 \pm 3.81$ . Seventeen patients had at least one fall occurrence in the last year with a mean of  $2.59 \pm 1.58$  falls. The control group included 33 patients, 24 women and 9 men, with a mean age of  $68.61 \pm 2.78$  years and a mean FIM<sup>®</sup> of  $124.55 \pm 2.55$ . Nineteen had at least one fall occurrence in the last year, with a mean of  $2.42 \pm 2.27$  falls (see Table 1).

**Table 1:** Descriptive analysis of the experimental group (n=33) and control group (n=33).

	Experimental Group		Control Group	
	Percentage (%)	Mean $\pm$ Standard Deviation	Percentage (%)	Mean $\pm$ Standard Deviation
Age	-	$61.09 \pm 7.34$	-	$68.61 \pm 2.78$
Gender				
Female	21.2	-	72.7	-
Male	78.8	-	27.3	-
FIM <sup>®</sup>	-	$121.88 \pm 3.81$	-	$124.55 \pm 2.55$
Type of Stroke				
Ischemic	84.8	-	-	-
Hemorrhagic	15.2	-	-	-
Months since Stroke	-	$66.39 \pm 63.02$	-	-
Hemiparetic Side				
Right	45.4	-	-	-
Left	54.5	-	-	-

Other Deficits				
Altered Sensibility	24.3	-	-	-
Slight Motor Aphasia	6.1	-	-	-
Left Tremor	3	-	-	-
Vision	6.1	-	-	-
Ataxia	3	-	-	-
Mobility Aid Users	36.4	-	-	-
Fall History				
Fallers	51.5 (n=17)	-	57.6 (n=19)	-
Non-Fallers	48.5 (n=16)	-	43.4 (n=14)	-
Number of Falls	-	2.59±1.58	-	2.42±2.27
Consequences of Fall				
Hospitalization	0	-	21.1	-
Major Lesion	11.8	-	15.8	-
Minor Lesion	29.4	-	21.1	-
Chronic Medication Users	100	-	-	-
10MWT (Walking Speed)				
Fallers	-	0.72±0.30	-	-
Non-Fallers	-	0.79±0.31	-	-
FES				
Fallers	-	72.41±22.62	-	-
Non-Fallers	-	85.75±6.55	-	-

### Fall Efficacy Scale

A t-Test for Independent Samples and a Pearson Correlation Coefficient were conducted to identify the association between the FES and the occurrence and number of falls in the last year, respectively. Sixteen patients that had no fall occurrences in the last year had a mean score of 85.75±6.55, while the 17 fallers had a mean score of 72.41±22.62. The comparative and correlational analysis revealed a significant relation between FES and fall occurrence in

the last year, and between FES and number of falls, with a  $p= 0.031$  (see Table 2) and a  $p=0.032$  and Pearson Correlation Coefficient of  $-0.520$  (see Table 3), respectively.

**Table 2:** Comparative analysis between FES and Fall History using the t-Test for Independent Samples.

		Fall History		
		p-value	CI 95%	n
FES		0.031	[1.35; 25.32]	17

CI: Confidence Interval

**Table 3:** Correlational analysis between FES and Number of Falls using the Pearson Correlative Coefficient.

		Number of Falls		
		Pearson Correlative Coefficient	p-value	Mean $\pm$ SD (number of falls)
FES		-0.520	0.0320	2.59 $\pm$ 1.58

SD: Standard Deviation

### 10 Meter Walk Test and Walking Speed

No significant relation was found between the WS and fall history ( $p\text{-value}=0.519$ ), with faller and non-faller groups showing  $0.72\pm 0.30$  and  $0.79\pm 0.31$  m/s of speed, respectively (see Table 4).

**Table 4:** Comparative analysis between WS calculated from the 10MWT and Fall History using the t-Test for Independent Samples.

		p-value	CI 95%
Walking Speed		0.519	[-0.15; 0.29]

SD: Standard Deviation

CI: Confidence Interval

### Experimental vs Control Group

No significant difference was found between both groups regarding fall occurrence ( $p=0.579$  and Pearson's chi-square=0.308) (See Tables 5).

**Table 5:** Comparative analysis between fall history in the experimental (n=17) and control group (n=19) using the Pearson chi-squared test.

	Pearson Chi-Square	p-value
Fall History (Experimental Group)	0.308 <sup>b</sup>	0.579

<sup>b</sup>0 cells have expected count less than 5. The minimum expected count is 6.79.

### DISCUSSION

Little research has been done concerning fall predictive measures in highly functional hemiparetic populations in rehabilitation and their comparison with healthy populations, with similar functional independence measures. This gap is particularly present in the Portuguese literature, where the application of the portuguese adaptation of the original Fall Efficacy Scale<sup>12,13</sup> is yet to be verified in functional chronic stroke survivors as it was in this study. Nonetheless, the FES in its original form or international adaptation is a widely used scale in fall avoidance behavior studies in acute and chronic stroke patients.<sup>9-11,14,19</sup> This exploratory non randomized study revealed a significant association between the FES and fall occurrence in the past 12 months, with a p-value of 0.031. The falling group, which represented 51.5% of the experimental group, scored a mean of  $72.41 \pm 22.62$  while the non-fallers scored  $85.75 \pm 6.55$  showing that patients with history of falling had a lower self-efficacy than non-fallers. Albeit highly functional, this population had a relatively large fall rate (51.5% of fallers) in comparison to other studies using chronic stroke community dwelling patients which had 40%<sup>9</sup>, 48%<sup>20</sup> and 50%<sup>21</sup> fall rate. This large fall rate could have been due to 42.4% of the patients having other deficits besides hemiparesis like altered sensitivity. Fear of falling



has already been linked in literature to fall occurrence as a risk factor and also as a result of previous falls, resulting in patients with fall history having lower levels of fall related self-efficacy and more likelihood to be afraid of falling in the future than non-fallers.<sup>22</sup> Fall history has also been thoroughly described as an accurate predictor of fall prevalence and risk factor<sup>23,24</sup> and as being associated to fear of falling and decreased self-efficacy in chronic stroke patients<sup>9</sup>. Regarding number of falls, which showed a mean of  $2.59 \pm 1.58$ , a significant correlation was established with the FES, with a p-value of 0.032 and a Pearson correlation coefficient of -0.520. This specific value indicates that the number of falls and FES association had a moderate negative correlation, meaning that, in patients with increasing numbers of falls, self-efficacy values tend to decrease.

The Fall Efficacy Scale<sup>13</sup> has been proven to be a successful predictor of falling in older adults, among other falling avoidance behavior scales, in a recent prospective study<sup>10</sup>. Regardless, this prospective study, in opposition to literature,<sup>23,24</sup> didn't find fall history to be related to increased fall risk, probably due to the study's inherent limitations. Although no causal associations can be established, this research suggests that the FES, in its Portuguese version, can be used as a useful predictive instrument in fall risk assessment in chronic functional stroke patients. Future prospective studies in this type of functional populations are needed to further establish predictive associations between the FES and future falls.

Unlike what was expected, no significant relation was found between the WS and fall history, with faller and non-faller groups showing very similar speeds,  $0.71 \pm 0.30$  and  $0.79 \pm 0.31$  m/s respectively. The experimental and control groups were compared over fall history in a 12 month period and revealed no significant difference. Unlike previous studies that compared long term community dwelling stroke patients to control groups and concluded that chronic stroke survivors had more frequent fall occurrences<sup>25</sup>, both the experimental and

control groups revealed a similar fall frequency, showing  $2.59\pm 1.58$  and  $2.42\pm 2.27$ , respectively.

These results enhance the importance of thorough rehabilitation programs in the achievement and maintenance of renewed individual function.

The main limitations showcased by this study were the small sized sample and consequential lack of sample randomization, the possible under-reporting of number of falls due to recall bias on retrospective studies<sup>26</sup> and the non-prospective study design.

## CONCLUSIONS

The Fall Efficacy Scale in its portuguese version<sup>12,13</sup> was found to be significantly related and correlated to fall history and number of falls, respectively, in a highly functional hemiparetic community dwelling population of post stroke patients. According to these findings, the FES can be used as a useful predictor of future fall occurrence in functional chronic stroke patients. Seeing as a significant percentage of the experimental group had fall history, further assessment of these findings through future prospective studies is needed to further prove this association and lead to successful fall risk interventions.

After going through a rehabilitation program at PRM-CHUC, this once dependent population reached functional FIM<sup>®</sup> levels comparable to our control group. This resulted in similar fall histories with similar number of falls in a 12 month period. This finding enhances the importance of rehabilitation in the recovery and maintenance of individual function and normalization of ADL in a population prone to difficult social reintegration and decreased quality of life<sup>3,4</sup>.

## **ACKNOWLEDGEMENTS**

I thank Prof. Doctor João Páscoa Pinheiro for the orientating this study and master thesis.

I thank Doctor Carla Pina Amaral for the co-orientation and support throughout this study.

I thank Doctor Pedro Aroso for the collaboration.

I thank my colleague Gonçalo Engenheiro for mutually aiding me throughout this process.

I thank Prof. Dr. Susana Ramos for cooperating in the statistical analysis.

I thank the Physical and Rehabilitation Medicine department of CHUC for the constant cooperation, with special regard to Doctor Maria Joaquim Tão.

For the patience and support throughout this journey I'd like to thank my family, friends and Bruno Ramoa.

Disclosure of interest: I declare that I have no conflicts of interest concerning this article.

Financing sources: There was no external financing source for the development of this article.

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## ANNEX I – INFORMED CONSENT

Por favor, leia com atenção a seguinte informação. Se achar que algo está incorreto ou que não está claro, não hesite em solicitar mais informações. Se concorda com a proposta que lhe foi feita, queira assinar este documento.

Título: QUEDA ACIDENTAL NO DOENTE HEMIPARÉTICO: AVALIAÇÃO FUNCIONAL DE RISCO E PREVENÇÃO

Serviço de Medicina Física e Reabilitação – CHUC

Orientador: Professor Doutor João Páscoa Pinheiro

Co-orientador: Dr. Carla Pina Amaral

Aluno: Joana Rita Ferreira Lopes

No âmbito do trabalho final de 6º ano com vista à obtenção do grau de Mestre do Ciclo de Estudos do Mestrado Integrado em Medicina, venho por este meio solicitar a sua colaboração para participar neste projeto, através do preenchimento de questionários de caracterização individual, da “Medida da Independência Funcional<sup>®</sup> (FIM<sup>®</sup>)” e da “Falls Efficacy Scale (FES) – versão portuguesa” e da realização do Teste dos 10 Metros de Marcha (10MWT). Este estudo tem como objetivo definir estratégias de prevenção clínica e terapêutica de queda accidental em doentes hemiparéticos.

Não existem respostas certas nem erradas, importa sim registar a sua opinião, assinalando a resposta que melhor representa a sua situação.

É garantido que a sua participação não acarreta quaisquer gastos ou custos e que os dados recolhidos serão tratados e mantidos com total confidencialidade.

A sua participação é voluntária, e desde já agradecemos as suas respostas, pois sem elas não seria possível concluir este estudo.

Obrigada pelo tempo dispensado e por colaborar na realização de estudo.

.....

*Declaro ter lido e compreendido este documento, bem como as informações verbais que me foram fornecidas pela/s pessoa/s que acima assina/m. Foi-me garantida a possibilidade de, em qualquer altura, recusar participar neste estudo sem qualquer tipo de consequências. Desta forma, aceito participar neste estudo e permito a utilização dos dados, que de forma voluntária forneço, confiando em que apenas serão utilizados para esta investigação e nas garantias de confidencialidade e anonimato que me são dadas pelo/a investigador/a.*

Nome: \_\_\_\_\_

Assinatura. \_\_\_\_\_

Data: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

## ANNEX II – QUESTIONNAIRE OF INDIVIDUAL ASSESSMENT

### Parte I – Caracterização do doente

1. Idade: \_\_\_\_\_ anos
2. Género: Feminino <sub>1</sub> Masculino <sub>2</sub>
3. Antropometria:

Altura		m
Peso		Kg
IMC		Kg/m <sup>2</sup>

### Parte II – Caracterização da doença

4. AVC: Isquémico <sub>1</sub> Hemorrágico <sub>2</sub>
5. Território Vascular: Direita <sub>1</sub>  
Esquerda <sub>2</sub>
6. Data do AVC: DD /MM / AAAA
7. Hemiparésia (lateralização): Não <sub>1</sub> Sim <sub>2</sub>
8. Se respondeu sim à questão 7:  
Direita <sub>1</sub> Esquerda <sub>2</sub>
9. Outros défices Não <sub>0</sub> Sim <sub>5</sub>  
(ter em atenção existência de inatenção, alterações sensoriais, défice cognitivo, ataxia)  
Qual: \_\_\_\_\_
10. Auxiliar de marcha: Não <sub>0</sub> Sim <sub>5</sub>  
Qual: \_\_\_\_\_

### Parte III – Ocorrência de quedas (último ano)

11. No último ano teve alguma ocorrência de queda? Não <sub>0</sub> Sim <sub>1</sub>
12. Se respondeu Sim à questão 11, qual o número de quedas? \_\_\_\_\_
13. Consequências da Queda:  
Hospitalização? 0 <sub>0</sub> 1 <sub>1</sub> 2 ou + <sub>2</sub>  
Fratura? 0 <sub>0</sub> 1 <sub>1</sub> 2 ou + <sub>2</sub>  
Contusão? 0 <sub>0</sub> 1 <sub>1</sub> 2 ou + <sub>2</sub>

### Parte IV – Medicação crónica

14. Faz medicação habitualmente? Sim <sub>0</sub> Não <sub>1</sub>
15. Listagem de medicamentos (DCI):

Medicamentos	
11.1	11.8
11.2	11.9
11.3	11.10
11.4	11.11
11.5	11.12
11.6	11.13
11.7	11.14

### Parte V – Avaliação funcional

16. FES : \_\_\_\_\_ pontos
17. 10MWT : \_\_\_\_\_ segundos

#### Crítérios de inclusão no estudo:

- AVC com hemiparesia ≥ 1 ano.
- Marcha autónoma
- Idade 45 – 80 anos
- MIF >110

*Agradecemos a colaboração e o tempo dispendido na resposta ao Questionário!*



**ANNEX III – FUNCTIONAL INDEPENDENCE MEASURE® (FIM®)**

7 Independência completa (em segurança, em tempo normal)	<b>Sem ajuda</b>
6 Independência modificada (ajuda técnica)	
<b>Dependência modificada</b>	<b>Ajuda</b>
5 Supervisão	
4 Ajuda mínima (indivíduo ≥ 75%)	
3 Ajuda moderada (indivíduo 50-74%)	
<b>Dependência completa</b>	
2 Ajuda máxima (indivíduo 25-49%)	
1 Ajuda total (indivíduo 0-24%)	

Data: \_\_\_\_\_

**Auto-cuidados**

- A Alimentação
- B Higiene pessoal
- C Banho (lavar o corpo)
- D Vestir metade superior
- E Vestir metade inferior
- F Utilização da sanita

**Locomoção**

- L Marcha, cadeira de rodas
- M Escadas

**Comunicação**

- N Compreensão
- O Expressão

**Controlo dos esfíncteres**

- G Bexiga
- H Intestino

**Cognição Social**

- P Interação social
- Q Resolução de problemas
- R Memória

**Mobilidade**

**Transferências**

- I Leito, cadeira, cadeira rodas
- J Sanita
- K Banheira, duche

**Total (de 18 a 126 pontos):**

©Laíns, J. Sistema Uniformizado de Dados para Reabilitação Médica (SUDRM). *SMFR/HUC and Research Foundation - State University of New York at Buffalo* 0–52 (1990).

**ANNEX IV – FALL EFFICACY SCALE, PORTUGUESE VERSION**


ABAIXO ESTÃO INDICADAS VÁRIAS TAREFAS.  
 À FRENTE DELAS ENCONTRA-SE UMA LINHA QUE MEDE O GRAU DE CONFIANÇA, OU SEJA, O MEDO QUE TEM DE CAIR NA SUA EXECUÇÃO.  
 MARQUE NA LINHA COM UMA CRUZ O QUE SENTE AO EXECUTAR A TAREFA.

	Sem nenhuma Confiança	Minimamente Confiante	Muito Confiante
1. Vestir e despir-se	----- ----- ----- ----- ----- ----- ----- ----- ----- -----  1    2    3    4    5    6    7    8    9    10		
2. Preparar uma refeição ligeira	----- ----- ----- ----- ----- ----- ----- ----- ----- -----  1    2    3    4    5    6    7    8    9    10		
3. Tomar um banho ou duche	----- ----- ----- ----- ----- ----- ----- ----- ----- -----  1    2    3    4    5    6    7    8    9    10		
4. Sentar / Levantar da cadeira	----- ----- ----- ----- ----- ----- ----- ----- ----- -----  1    2    3    4    5    6    7    8    9    10		
5. Deitar / Levantar da cama	----- ----- ----- ----- ----- ----- ----- ----- ----- -----  1    2    3    4    5    6    7    8    9    10		
6. Atender a porta ou o telefone	----- ----- ----- ----- ----- ----- ----- ----- ----- -----  1    2    3    4    5    6    7    8    9    10		
7. Andar dentro de casa	----- ----- ----- ----- ----- ----- ----- ----- ----- -----  1    2    3    4    5    6    7    8    9    10		
8. Chegar aos armários	----- ----- ----- ----- ----- ----- ----- ----- ----- -----  1    2    3    4    5    6    7    8    9    10		
9. Trabalho doméstico ligeiro (limpar o pó, fazer a cama, lavar a louça)	----- ----- ----- ----- ----- ----- ----- ----- ----- -----  1    2    3    4    5    6    7    8    9    10		
10. Pequenas compras	----- ----- ----- ----- ----- ----- ----- ----- ----- -----  1    2    3    4    5    6    7    8    9    10		

©Cristina Argel de Melo. ADAPTAÇÃO CULTURAL E VALIDAÇÃO DA ESCALA ‘FALLS EFFICACY SCALE’ DE TINETTI. *ifisionline* **1**, 33–43 (2011).

©Tinetti, M. E., Richman, D. & Powell, L. Falls efficacy as a measure of fear of falling. *J. Gerontol.* **45**, P239-43 (1990).

**ANNEX V – APPROVAL BY THE ETHICS COMMITTEE OF CHUC**

<b>COMISSÃO DE ÉTICA PARA A SAÚDE</b>		 <b>CHUC</b> CENTRO HOSPITALAR E UNIVERSITÁRIO DE COIMBRA	
		<i>Prof. Doutor José Pedro Figueiredo</i> Director C.H.U.C. - EPE 21.9.16	
		Exmo. Senhor Prof. Doutor José Pedro Figueiredo Digmº Diretor Clínico do CHUC	
S/Refº	S/Comunicação	N/Ref. – Ofício n.º CES/0167	Data 12.09.2016
<p>Assunto: <b>[CHUC-079-16]</b> – <i>Estudo Observacional "Queda Acidental no Doente Hemiplégico: Avaliação Funcional do Risco e Prevenção"</i> - Prof. Doutor João Páscoa Pinheiro – Director do Serviço de Medicina Física e Reabilitação do CHUC. (Entrada do processo na CES a 14/07/2016)</p>			
<p>Cumprir informar Vossa Ex.ª, de que a Comissão de Ética para a Saúde do Centro Hospitalar e Universitário de Coimbra, reunida em 09 de Setembro de 2016, com a presença da maioria dos seus membros, após análise do projeto mencionado em epígrafe e ouvido o relator, emitiu parecer favorável à sua realização. Parecer aprovado por unanimidade.</p>			
<p>Mais se informa que a CES do CHUC deve ser semestralmente actualizada em relação ao desenvolvimento dos estudos favoravelmente analisados e informada da data da conclusão dos mesmos, que deverá ser acompanhada de relatório final.</p>			
<p>Com os melhores cumprimentos.</p>			
<p>A COMISSÃO DE ÉTICA PARA A SAÚDE H. DO CHUC Comissão de Ética para a Saúde <i>[Signature]</i> Prof. Doutor José Joaquim Sousa Barros Presidente da CES do CHUC</p>			
<p><i>A CES do CHUC: Prof. Doutor José Joaquim Sousa Barros; Prof.ª Doutora Maria Fátima Pinto Saraiva Martins; Dr. Mário Rui Almeida Branco; Enf.ª Adélio Tinoco Mendes; Prof. Doutor Carlos Alberto Fontes Ribeiro; Padre José António Afonso Pais; Dr. José António Feio; Dr. José Alves Gnlo Gonçalves; Enf.º Fernando Mateus; Dr. José António Pinheiro; Dra. Cláudia Santos; Dr. Paulo Figueiredo.</i></p>			
<p>CHUC - Centro Hospitalar e Universitário de Coimbra Praceta Prof. Mota Pinto, 3000 075 Coimbra - Portugal Telefone: +351 239 400 400</p>		<p>Contacto: Telefone: 239 400 408 Telefax: 239 405 646 E-mail: <a href="mailto:secetica@huc.min-saude.pt">secetica@huc.min-saude.pt</a></p>	

**ANNEX VI – APPROVAL BY THE ETHICS COMMITTEE OF FMUC**



FMUC FACULDADE DE MEDICINA  
UNIVERSIDADE DE COIMBRA

**COMISSÃO DE ÉTICA DA FMUC**

Of. Ref<sup>o</sup> **023-CE-2016**

Data 29/3/2016

C/C aos Exmos. Senhores  
Investigadores e co-investigadores

Exmo Senhor  
Prof. Doutor Duarte Nuno Vieira  
Director da Faculdade de Medicina de  
Universidade de Coimbra

**Assunto: Pedido de parecer à Comissão de Ética - Projecto de Investigação autónomo (ref<sup>o</sup> CE-024/2016).**

**Investigador(a) Principal:** João José Carreiro Páscoa Pinheiro

**Co-Investigador(es):** Joana Rita Ferreira Lopes e Carla Manuel Tavares de Pina Amaral

**Título do Projecto: "Queda accidental no hemiplégico: avaliação funcional de risco e prevenção".**

A Comissão de Ética da Faculdade de Medicina, após análise do projecto de investigação supra identificado, decidiu emitir o parecer que a seguir se transcreve:

**"Parecer favorável não se excluindo, no entanto, a necessidade de submissão à Comissão de Ética do CHUC, Instituição onde será realizado o Projecto".**

Queira aceitar os meus melhores cumprimentos.

O Presidente,

Prof. Doutor João Manuel Pedroso de Lima

HC

SERVIÇOS TÉCNICOS DE APOIO À GESTÃO - STAG • COMISSÃO DE ÉTICA

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