THE REHABILITATION OF STROKE PATIENTS AT COMMUNITY HEALTH CENTRES IN THE WESTERN CAPE

STUDENT:

Anthea Rhoda

Student Number: 8321322

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy (Physiotherapy) in the Department of Physiotherapy, University of the Western Cape

Supervisors:

Prof RM Mpofu

(University of the Western Cape)

Prof W. DeWeerdt

(Katholieke Universiteit Leuven)

May 2010

ABSTRACT

Background

The rehabilitation of stroke patients can occur at different settings. These include in-patient settings, such as stroke units or general rehabilitation wards and out-patient settings, such as out-patient departments attached to hospitals, day hospital departments and the patients' home. In South-Africa, day hospitals have been upgraded and are now referred to as Community Health Centres which provide comprehensive health services to the population. In the Western Cape these centres are faced with the rehabilitation of stroke patients who have been discharged early from hospital during the acute stage or who have never been admitted to hospitals. To date there is a lack of best practice guidelines and formal evaluations in terms of efficacy and effectiveness of rehabilitation at these centres. The aim of the study was therefore to investigate the rehabilitation of stroke patients at Community Health Centres in the Metropole Region of the Western Cape. The structure, process and outcomes (SPO) model was used as a conceptual framework in this study.

Methodology

The study was conceptualised as having three district parts that incorporate different research designs namely, survey research, as well as longitudinal and cross-sectional observational studies. Part one reported on survey techniques that addressed the research questions relating to the structure of rehabilitation. For this part of the study the sample consisted of all therapists employed at the Community Health Centres to collect data relating to structure which comprised the staff and equipment available for rehabilitation

of stroke patients at the centres. A self-administered questionnaire was developed by the researcher to gather information for this part of the study. Part two incorporated a longitudinal observational study to collect data relating to the participants' outcomes. The outcomes investigated related to participant impairments, activity limitations and participation restrictions and was collected at baseline, 2 and 6 months post stroke. A number of standardized outcome measures were used to collect this data. These measures included the Rivermead Motor Assessment Scale, the Barthel Index, the Nottingham Extended Activities of Daily Living Scale and the Modified Rankin Scale. Part three reports primarily on the cross-sectional, observational study which addressed the research questions relating to the process of rehabilitation. The study sample used to collect the data related to services received, the number of therapy sessions and the intensity of physiotherapy was the same sample used in the part 2 of this thesis. To collect data relating to the content of physiotherapy a purposive sample (n=13) was selected from this sample. Process information was gathered by viewing the therapists' records, a questionnaire completed by the participants and video-recordings.

The data was captured and analysed using Microsoft excel, SPSS version 15 and 16 and SAS. Descriptive statistics were used to determine, frequencies, means, standard deviations, medians and inter-quartile ranges. A mixed effects regression model was used to determine the difference between the score of Rivermead Motor Assessment Scale as well as the scores of the Barthel Index at the different assessment periods. Multiple linear regression analysis was used to determine the factors, which predicts impairments and activity limitations at 6 months.

The necessary ethical considerations were adhered to during the implementation of the study. Permission to conduct the study was requested and granted; written informed consent was requested from the participants or a caregiver.

Results

At Community Health Centres in the Metrolpole Region of the Western Cape therapy services available for rehabilitation are lacking especially occupational and speech therapy. Only 20 of the 39 centres in this region, offered rehabilitation services. More importantly the services that are available are not coordinated optimally. To determine outcomes of rehabilitation 100 first ever stroke patients were recruited. There was a 24% drop out rate in the study. The study sample of stroke consisted of equal numbers of male and females who had a mean age of 61 years. The majority of the participants' diagnosis of stroke was made on a clinical basis and the intake assessment was performed at a median of 21 days post-stroke. A statistically significant improvement was noted in both motor impairments (as measured by the Rivermead Motor Assessment Scale) and activity limitations (as measured by the Barthel Index) between baseline and 2 months but not between 2 and 6 months post-stroke. Transport was the extended activity that the majority of the participants could not perform independently even at 6 months post-stroke. The participants had major participation restrictions with regards to work, social and leisure activities and caring for their families. Only a few of the participants were able to return to these roles post-stroke. The motor impairment and functional activity scores at intake significantly ($p<0.05$) predicted these outcomes at 6 months. The number of hours of therapy also

significantly predicted the impairment in gross motor function at 6 months ($p<0.05$) while gender and age significantly predicted functional limitations at 6 months ($p<0.05$). With regards to content of physiotherapy the most frequently occurring categories were relearning selective movements (median 10.21 minutes), mobilizations (median 6.67 minutes) and standing and standing balance (median 6 minutes). Almost half (49%) of the participants received between 1 and 4 hours of physiotherapy over a 6 month period.

Conclusion

The stroke patients receiving rehabilitation had mild strokes but had moderate to severe activity limitations. They had participation restrictions and could not return to previous roles. The initial scores of the Rivermead Motor Assessment Gross Function and number of hours of physiotherapy predicted gross motor impairment at six months post stroke. The initial scores of the Rivermead Motor Assessment Leg and Trunk Function predicted leg and trunk impairment at 6 months, while the initial scores of the Rivermead Motor Assessment Arm Function was the best predictor of upper limb impairment at six months post stroke. The initial scores of the Barthel Index were the best predictors of activity (functional) limitations at 6 months. There is a lack of therapy services to provide rehabilitation at the Community Health Centres in the Western Cape. However, services that are currently available are not coordinated which negatively impacts effective rehabilitation. Findings about the process of rehabilitation indicated that physiotherapy services were of a low intensity. The number of therapists working at Community Health Centres should be increased which could result in an increase in the intensity of therapy. The therapist should use a standardized outcome measure to screen

patients who could benefit from more intensive rehabilitation. The therapist should focus their interventions to address the activity limitations and participation restrictions of stroke patients accessing Community Health Centres for rehabilitation. The information obtained in the study could be used to improve the rehabilitation of stroke patients at Community Health Centres in the Metropole region of the Western Cape.

DECLARATION

I declare that **"The Rehabilitation of Stroke patients at Community Health Centers in the Metropole Region of the Western Cape"** is my own work, that it has not been submitted for any degree or examination in any other university, and that all sources I have used or quoted have been indicated and acknowledge by means of complete references.

AJ Rhoda

Signature……. May 2010

Supervisor:

…….
Professor RM Mpofu

DEDICATION

I dedicate this thesis to my husband, Llewellyn for his support and encouragement through the good and challenging times of my study, and to my two sons Matthew and Andrew for the sacrifices they were prepared to make to allow me to complete my thesis. May God Bless you.

ACKNOWLEDGEMENTS

Firstly I would like to thank God for blessing me with physical and mental strength to enable me to complete my study. A special word of thanks goes to my supervisors Professor Mpofu and Professor De Weerdt for their guidance, support and commitment during the past five years. The prompt responses to questions and timely feedback made it easier for me to conduct the study. A word of thanks goes to Dr Liesbet De Wit and Dr Koen Putman who shared their knowledge and experience gained from the CERISE study. Thank you also to Sonja Swanevelder who assisted with statistical analysis and to Dr Mario Smith who assisted with the final editing of this document. I am also highly indebted to the therapists working at the Community Health Centres and especially to Caroline De Wet who was always willing to provide much needed information about the centres. To all the stroke patients who so willingly allowed me to enter their homes to collect data, I want to provide a special word of thanks I greatly appreciated it. I extend my sincere thanks to my research assistants Wasielah Davids and Esmerelda Presens for their commitment and dedication to getting the tasks done. To my colleagues' thanks for all the motivation and encouragement provided especially through the challenging times. Finally, to my family, thank you for all the sacrifices you made during my PhD journey.

TABLE OF CONTENTS

LIST OF APPENDICES

Appendix 26 Patient information sheet English version

Appendix 27 Patient information sheet Afrikaans version

Appendix 28 Patient information sheet Xhosa version

Appendix 29 Patient Consent form English version

Appendix 30 Patient Consent form Afrikaans version

Appendix 31 Patient Consent form Xhosa version

LIST OF FIGURES

LIST OF TABLES

DEFINITION OF TERMS

Activity: "The execution of a task or action by an individual" (WHO, 2001)

Activity limitations: "Difficulties an individual might have in executing activities" (WHO,2001)

Impairments: "Problems in body functions or structure as a significant deviation or loss" (WHO,2001)

Instrumental activities of daily living: Activities needed to maintain the household and function in the community

Outcomes: A patient characteristic that occurs after a stroke that is expected to change after an intervention

Participation: "Involvement in a life situation" (WHO,2001)

Participation restrictions: "Problems an individual may experience in life situations" (WHO,2001)

Rehabilitation: "All measures aimed at reducing the impact of disability for an individual enabling him or her to achieve independence, social integration, a better quality of life and self-actualization" (Helander, 1999)

Rehabilitation process: The type, content and intensity of rehabilitation

Rehabilitation outcomes: Changes noted in the impairments, activity limitations and participation restrictions following rehabilitation

Rehabilitation structure: Resources in terms of staff and equipment available for rehabilitation

Stroke: “Rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than vascular origin” (WHO,1989)

LIST OF ABBREVIATIONS

ADL: Activities of daily living

AIDS: Acquired immune deficiency syndrome

BI: Barthel Index

CHCs: Community Health Centres

CSP: Comprehensive Service Plan

CERISE Project: Collaborative Evaluation of Rehabilitation in Stroke across Europe

CT Scan: Computed Tomographic Scan

CVA: Cerebrovascular Accident

ESD: Early-supported discharge

EQ-5D: Measure for health related quality of life

HIV: Human Immunodeficiency Virus

HRQoL: Health related quality of life

ICF: International Classification of Functioning, Disability and Health

NIHSS: National institute of Health stroke Scale

RMA: Rivermead Motor Assessment

RMA-G: Rivermead Motor Assessment Gross Motor Function

RMA-LT: Rivermead Motor Assessment Leg and trunk function

RMA-A: Rivermead Motor Assessment Arm Function

MRS: Modified Rankin Scale

NEADL: Nottingham Extended Activities of Daily Living

MRI: Magnetic Resonance Imaging

QoL: Quality of life

SPO: Structure, Process, Outcome

TSOA: Time since stroke onset

VAS: Visual Analogue Scale

WCRC: Western Cape Rehabilitation Centre

WHO: World Health Organisation

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Stroke is a devastating, disabling condition that affects individuals worldwide. There is evidence to suggest that patients in the acute stage who are treated in stroke units have better outcomes (Stroke Unit Trialists' Collaboration, 1997). This is not always possible in developing countries like South Africa due to a lack of resources (Kengne and Anderson, 2006). For example, in developing countries, stroke patients are often referred for rehabilitation to primary level outpatient facilities that might not always be the most appropriate settings.

The aim of this doctoral study is to investigate outpatient rehabilitation services available to stroke patients in the Metropole Region of the Western Cape in post-apartheid South Africa[1]. The impetus for the study was provided by direct clinical observation of the primary researcher that stroke patients with varying levels of severity and varying intervals post-stroke were presenting at primary level Community Health Centres (CHCs – outpatient treatment facilities). This observation is in sharp contrast to international trends in the treatment of stroke where similar patients would be admitted to Stroke Rehabilitation Units. After 1994 a national health care policy was promulgated and adopted in support of primary health care with implications for the nature of treatments offered and where they are located. Thus, it

[1] The Metropole Region became the Cape Metro District after the implementation of this study. The region will be referred to as the Metropole Region in this thesis as it is part of the registered title of the thesis.

became important to research the nature of stroke rehabilitation at primary level in South Africa. To introduce this topic more fully, the rest of the chapter provides a brief overview of the burden of stroke as a chronic disease, the background to stroke rehabilitation in South Africa and the problem statement. The chapter concludes with a summary of the organisation of the thesis.

1.2 BACKGROUND

1.2.1 Burden of stroke

Bradshaw *et al*, (2004) assert that the illnesses that place the highest burden on South African society include, but are not limited to, cardiovascular diseases (including stroke), HIV/AIDS, cancer and diabetes. Stroke was further identified as the fourth most common cause of death in South Africa and the second most common cause of death in the Western Cape (Bradshaw *et al*., 2004). Stroke has been declared a catastrophic illness in South Africa by the World Stroke Foundation, based on 11 disability-adjusted number of life years lost per 1000 of the population (Culebras, 2006). Researchers concur that stroke is an undisputed major cause of disability (Agency for Health Care Research, 1995; Bonita, Broad and Beaglehole, 1997; SASPI Project Team, 2004). South African statistics indicate that 60% of stroke survivors are disabled and need assistance with the activities of daily living (SASPI Project Team, 2004). This places a major burden on families and communities in South Africa. Patients with stroke may well experience a range of impairments that could impact on physical and psychological functioning, detract from the person's ability to participate in work and leisure activities, as well as decreasing the quality of life (World Health Organisation, 2001). Thus, it becomes evident that stroke in South Africa is a chronic

disease that more often than not results in mortality or disability. This necessitates clear definitions and operationalisation of stroke-related disability. Disability post-stroke can be conceptualised using the International Classification of Functioning, Disability and Health (ICF) as described by the World Health Organisation (World Health Organisation, 2001). In the ICF framework the impairments, loss of ability to perform functional activities (activity limitations) and the inability to resume life roles (participation restrictions) can be identified. The specific environment where all of these losses occur can also be categorised. The ICF is presented in greater detail in Chapter 2 of this thesis. The chronic nature of stroke requires well-conceptualised interventions for prevention and rehabilitation.

1.2.2 Stroke rehabilitation

Gresham, (1997) define stroke rehabilitation as an active process beginning during acute hospitalisation, progressing for those with residual impairments to a systematic programme of rehabilitation services, and continuing after the individual returns to the community.

In the Stroke Therapy Guideline it has been proposed that all stroke patients should be admitted to hospital and receive multi-disciplinary rehabilitation at an appropriate level (South African Medical Association-Neurological Association Working Group, 2000). The guideline advocates for a structured approach to the management of stroke patients in which acute management takes place at a hospital and sub-acute management is located at specialised rehabilitation centres, secondary inpatient facilities or Community Health Centres. However, this plan is not supported by the provision of adequate resources for stroke rehabilitation.

The 2010 Western Cape public health services strategic plan, operationalised as the Comprehensive Service Plan (CSP), differentiates between high and low intensity rehabilitation facilities. It is important to note that CHCs have been designated as low intensity facilities in which rehabilitation should be offered by at least one rehabilitation professional or auxiliary rehabilitation worker. The rehabilitation interventions should be provided for 1–2 hours per day but not necessarily on a daily basis. The rehabilitation services provided should range from the retraining of functional skills to advocacy for persons with disabilities, the training of caregivers and workplace visits (Provincial Government of the Western Cape, 2007). However, this document fails to identify clearly which factors patients are triaged into high or low intensity facilities (Provincial Government of the Western Cape, 2007.

Hoenig, Horner, Duncan, Clipp and Hamilton (1999) note that the provision of rehabilitation is as diverse as the interventions provided, the method in which rehabilitation is provided, as well as the service providers. Similarly, in South Africa rehabilitation interventions vary greatly due to a number of factors that result in unequal access to health care. For example, patients from a higher socio-economic status generally have medical aid and can access private hospital care during the acute phase and private rehabilitation during the sub-acute phase. Poorer patients who do not have medical aid are dependent on state facilities such as hospitals and CHCs for hospital care and rehabilitation. One of the challenges is that not all stroke patients are hospitalised and those who are admitted are routinely discharged while in the acute phase. Hale and Wallner (1996) assert that patients are discharged even though community

rehabilitation services have been found to be inadequate for the management of acute and sub-acute patients. Thus, low intensity CHCs are tasked with providing rehabilitation services to acute stroke patients. Hence, the reality of stroke rehabilitation in the South African context is not consistent with international trends or with local policy guidelines on stroke rehabilitation. Therefore, it became important to investigate closely the quality of rehabilitation services provided at CHCs within the South African context.

The current reality is that stroke rehabilitation at CHCs is not well formulated or organised according to best practice guidelines. For example, the objectives of stroke rehabilitation in the context of acute presentations at primary health care facilities have not been formally stipulated. Thus, any investigation into stroke rehabilitation has to start with a formal process of documenting what the rehabilitation presently entails. Subsequently, investigations can examine stroke rehabilitation within a clearly defined theoretical or research framework. The study adopted the standard health services research framework of Structure, Process and Outcome (SPO) to examine the rehabilitation of stroke patients accessing CHCs.

The SPO framework was initially developed to assess the quality of health care and has recently been used to examine outcomes related to differences in structure and process of rehabilitation and the relationship between structure and the process of rehabilitation (Hoenig *et al*., 1999). In the study the researcher aims to provide a comprehensive overview of stroke rehabilitation at CHCs by focusing on the structure, process and outcomes. When examining the structure of care, the study attempts to describe the

facilities available for rehabilitation and the rehabilitation professionals required to provide treatment. The type, content and intensity of rehabilitative therapy comprises the process of care, while changes noted in terms of impairment, activity and participation following rehabilitation constitute the patient outcomes.

1.3 PROBLEM STATEMENT

Stroke is one of the most common chronic lifestyle diseases in the Western Cape. This disease places a high burden on patients, their families, the communities in which they live, as well as the health care system and the state. The extant body of literature on stroke rehabilitation, as presented in Chapter 2, recommends hospitalisation during the acute stage and subsequent rehabilitation at appropriate levels in the sub-acute stage. Local legislative guidelines and policies concur with the sentiments expressed in the literature reviewed. Contrary to what is recommended in the literature and local policy documents, there are many variations in service provision for stroke rehabilitation in the Western Cape, South Africa. Furthermore, there is a shortage of rehabilitation services to which patients have differential access – ostensibly due to socio-economic status, other demographics and the sequelae of the political history of South Africa. As mentioned before, low intensity facilities such as CHCs are faced with the rehabilitation of stroke patients who have been discharged from hospital early during the acute stage or who have never been admitted to hospital. The challenge of stroke rehabilitation at CHCs is further complicated by a general lack of best practice guidelines and formal evaluation in terms of efficacy and effectiveness. In fact, the structure, process and outcomes of stroke rehabilitation at these facilities

are poorly documented. Similarly, there is a lack of published research on the outcomes of individuals who have suffered a stroke in South Africa. Published literature has focused on inpatient rehabilitation services and neglected outpatient and community-based rehabilitation services. Therefore, in this thesis the researcher aims to determine the outcomes of rehabilitation of stroke patients at Community Health Centres in the Metropole Region of the Western Cape, South Africa.

1.4 RESEARCH QUESTIONS

1 What structure is available for the rehabilitation of stroke patients at CHCs in the Western Cape?

2 What is the process of rehabilitation of stroke patients at CHCs in the Western Cape?

3 What are the outcomes of patients receiving rehabilitation at CHCs in the Western Cape?

1.5 AIMS OF THE STUDY

The study had three overarching aims: Firstly, the structure of rehabilitation of stroke patients accessing CHCs in one health region in the Western Cape, South Africa is documented and described. Secondly, the outcomes of stroke patients receiving rehabilitation at these centres at various intervals post-stroke are measured with specific reference to impairments, activity limitations and participation restrictions. In addition, the factors that significantly predicted outcomes at six months post-stroke are identified. Thirdly, the process of rehabilitation at CHCs is examined.

1.6 STUDY OBJECTIVES

The following specific objectives were developed to address the aims of the study:

1 To describe the structure of stroke rehabilitation at Community Health Centres in the Metropole Region of the Western Cape.

1.1 To determine the staff complement at CHCs where stroke rehabilitation was provided.

1.2 To document the therapy equipment available at CHCs where stroke rehabilitation was provided.

2 To describe the outcome of the participants in relation to their impairments, activity limitations, participation restrictions and quality of life.

2.1 To determine the socio-demographic and risk profiles of stroke patients receiving rehabilitation.

2.2 To assess the patient outcomes obtained at various points post-stroke:

2.2.1 At baseline (baseline assessment),

2.2.2 At two months post-stroke follow-up,

2.2.3 At six months post-stroke follow-up, and

2.2.4 Factors that could predict motor impairment and activity limitations at six months post-stroke.

3 To determine the processes of rehabilitation.

3.1 To determine the interventions received.

3.2 To determine the frequency of therapy.

3.3 To determine the intensity and content of physiotherapy received.

1.7 OUTLINE OF THE THESIS

The thesis is organised into six chapters. Chapter 1 presents the rationale and significance of the study and thereby reports the burden of stroke in South Africa and more specifically the Western Cape. In addition, the fact that acute stroke patients are referred to CHCs with varying levels of stroke severity is highlighted. Hence, the need to examine stroke rehabilitation at this level is presented and the use of the Structure, Process and Outcome model (SPO model) as a way of doing this is introduced. Chapter 1 also presents the research questions, as well as the aims and objectives of the study. The chapter concludes with an outline of the thesis.

In Chapter 2 the researcher summarises a review of relevant literature in order to give an understanding of the need for the implementation of the study. The literature reviewed includes the epidemiology of stroke globally with an emphasis on the rehabilitation of stroke. With regards to rehabilitation the SPO model is presented as a conceptual framework for the study. Therefore, the literature review includes rehabilitation structural issues that are best described in relation to settings and rehabilitation process issues, which include the interventions, content and intensity of physiotherapy. The rehabilitation outcomes are presented within the framework of the International Classification of Functioning, Disability and Health (ICF). A review of stroke rehabilitation in South Africa is included in Chapter 2.

Chapter 3 describes the methodology employed in the study. The researcher provides a description of the quantitative methodologies of data collection and analysis employed in the study. The study was conceptualised as having

three distinct parts that incorporate different research designs, namely, survey, longitudinal observational and cross-sectional studies. In part one the researcher reports on survey techniques that address the research questions relating to the structure of rehabilitation. The longitudinal observational study which addresses the research questions relating to the outcome of rehabilitation is described in part two. In part three the researcher reports primarily on the cross-sectional observational study which addresses the research questions relating to the process of rehabilitation. In each part the sample, the instruments used to collect data, and the procedure and methods used to analyse the data are described. It is important to note that the research setting (3.2) and ethical considerations (3.6) are the same for all three parts of the study and hence these are described for the overall study.

Chapter 4 contains the results of the statistical analysis of the quantitative data. The chapter is organised into three sections in which the results that answer the respective research questions are categorised. Section A contains the results pertaining to the research questions about the structure of care which relates to the staff and equipment available for rehabilitation. Section B contains the reflections about the outcomes of the rehabilitation of stroke patients at CHCs. The outcomes are presented in terms of the impairments, activities and participation of the participants. Factors predicting motor impairment and activity limitation at six months are also presented. Included in this section is a presentation of the demographic and health status profiles of the participants. Section C describes the findings relating to the process of stroke rehabilitation, including results about the services received by study

participants, the frequency of occupational, speech and physiotherapy and the intensity and content of physiotherapy.

Chapter 5 discusses the results and compares them with the findings of published literature. The chapter highlights the implication of these results both for local and international audiences. Key findings that are discussed relate to the socio-demographic status of the participants (stroke patients), the staff and facilities available for rehabilitation at CHCs, the type of rehabilitation received, and the intensity, duration and content of physiotherapy. The outcomes of the participants are another key finding that is broadly discussed.

Chapter 6 concludes the thesis. The researcher gives an overall summary of the thesis, makes recommendations that arise from the results of the study and highlights the limitations of the study. Recommendations are made both for the therapists employed at the CHCs, the employers of these therapists and for future research.

1.8 SUMMARY OF CHAPTER

In the first chapter of this thesis, stroke as a devastating condition in South Africa and the Western Cape has been highlighted. Although many stroke patients access CHCs for rehabilitation, service providers working at CHCs in the Western Cape are challenged when it comes to providing services to stroke patients that most likely could be managed more effectively at another level of care. However, there is no formal documentation regarding the rehabilitation of stroke patients at the CHCs in the Metropole Region of the Western Cape. In order to achieve this aim the main objectives, as highlighted

in Chapter 1, are to determine the structure process and outcomes of rehabilitation. Chapter 1 presented this information in the form of the background to the study, the problem statement, as well as the aims and objectives of the study. Chapter 2 reviews the literature relating to stroke and rehabilitation in an attempt to further justify the rationale for the study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter the researcher provides a comprehensive review of the existing literature on stroke in an attempt to formulate the rationale for the study. The literature review is organised into four major sections, namely, definition of stroke, epidemiology of stroke, stroke risk factors and stroke rehabilitation. The main focus of the review relates to stroke rehabilitation. The rehabilitation of stroke includes the structure, process and outcomes of rehabilitation (SPO). The studies that focus on the structure of rehabilitation include those that discuss the different rehabilitation settings and the staff component of these settings. Studies that explore the content, intensity and type of rehabilitation are reviewed to determine the rehabilitation process. The different outcomes post-stroke are presented in the framework of the International Classification of Functioning, Disability and Health (ICF).

2.2 DEFINITION OF STROKE

Stroke is defined by the World Health Organisation (WHO) as “an acute neurological dysfunction of vascular origin with sudden (within seconds) or at least rapid (within hours) occurrence of symptoms and signs corresponding to the involvement of focal areas in the brain” (World Health Organisation, 1989:1412). Episodes that are excluded from the above definition are transient ischaemic attacks (TIAs), subdural haematoma, and haemorrhage or infarction caused by infection or tumour. It is important to note that a TIA

differs from stroke in that it is a brief episode, with a fast and complete clinical recovery. The recognition and identification of the TIA is however crucial in the secondary prevention of a subsequent stroke (World Health Organisation, 1989).

A stroke can be classified into two main types (World Health Organisation, 1989), with a number of subtypes (Bamford, 1991). The two main types are either an ischaemic stroke or a haemorrhagic stroke. These classifications are based on the underlying cause. An ischaemic stroke is caused by an embolus or thrombus blocking a cerebral artery, while a haemorrhagic stroke occurs as the result of a ruptured cerebral artery (Mower, 1997). An ischaemic stroke can be classified as large vessel, small vessel, atherothrombotic, cardioembolic, other cause or unknown cause. While a haemorrhagic stroke can be classified as a primary intracerebral haemorrhage or a sub-arachnoid haemorrhage (Bamford, 1991).

As presented in the studies below, the majority of strokes occur as the result of a cerebral infarction (Terent, 1993). In the United Kingdom cerebral infarction causes 76% of first strokes, while 8% occur as a result of primary intracerebral haemorrhage, 5% as a result of sub-arachnoid haemorrhage and 11% being unspecified (Terent, 1993). Similarly, in Australia cerebral infarction caused 61% of stroke while intracerebral haemorrhage accounted for 10% of strokes, with 4% as a result of sub-arachnoid haemorrhage and 25% being unspecified (Terent, 1993).

Data from a hospital-based stroke register in Cape Town of 1000 patients with first-ever stroke, captured between the years 2000 and 2006 revealed that ischaemic infarction resulted in 81% of all strokes in patients older than 45 years, while primary cerebral haemorrhage accounted for 11% of strokes, leaving 8% unidentified (Bryer, Tipping and De Villiers, 2006).

According to Connor (2006), an accurate diagnosis of type of stroke can only be done conclusively following a Computerised Tomography (CT) scan or Magnetic Resonance Imaging (MRI). However, the timing of the scan is deemed important to distinguish small cerebral haemorrhages from small infarcts as the haemorrhages can resolve within a few hours. It is advised that all patients should have a scan at least within the first two weeks post-stroke (Connor and Bryer, 2006). Connor (2006a) also reports that due to costs CT scans and MRIs are not freely available in developing countries and even less so in rural areas (Kengne and Anderson, 2006). In sub-Saharan Africa CT scans are performed in only about half the cases and then mainly for those patients who can afford them. Therefore, it is apparent that in the low and middle income group of the population CT scans are not done to confirm the diagnosis of stroke (Connor, 2006). In studies involving populations in sub-Saharan Africa where CT scans were used to determine the type of stroke it would appear that the picture differs from what is found in developed countries. For example, there seems to be a higher incidence of haemorrhagic strokes in blacks than what is normally reported (Kengne and Anderson, 2006).

Although CT scans and MRIs are needed to make a conclusive diagnosis regarding the type of stroke, various clinical scoring systems have also been developed to classify stroke subtypes. The clinical scoring systems include the Guy's Hospital and the Siriraj Stroke Scoring System (Hawkins, Bonita, Broad and Anderson, 1995). When using these scales, the presenting clinical signs and symptoms of the stroke patient are scored. Classification either as a haemorrhagic or an ischaemic stroke depends on the score. However, these scoring systems are not as accurate as CT scans. Both the Guy's Hospital and the Siriraj Stroke Scoring System are not valid (Hawkins *et al*., 1995) and reliable (Weir, Murray, Adams, Muir, Gosset and Lees, 1994) enough to be used to classify stroke types.

2.3 BURDEN OF STROKE

Knowledge about the burden of a disease assists with the development of appropriate services to manage the disease. The burden of stroke of a population includes incidence, prevalence and mortality (Warlow, 1998).

2.3.1 Stroke incidence

The incidence of a disease refers to the number of new cases presented over a given period (Orencia and Ballard, 1993; Terent, 1993). The documented incidence of stroke varies according to age, gender, ethnicity and geographical location (Stansbury, Jia, Williams, Vogel and Duncan, 2005). The average annual incidence of stroke per capita increases with age. The incidence increases from 30 per 100 000 people for those aged 30–40 years to almost 3000 per 100 000 in the 80–90 age groups (Fieschi, Falcou, Sacchetti and Toni, 1998). Similar rates were reported in a systematic review

which included 15 population-based studies conducted by Feign, Lawes, Bennet and Anderson (2003) aimed at determining the prevalence, mortality case-fatality of stroke in the late twentieth century. This study which included population-based studies reported that stroke incidence increases with age. People over 45 years of age have a stroke incidence rate of between 10–30 per 100 000, while for people between 75 and 85 years of age the rates increased and ranged from 1200 to 2000 per 100 000.

Gender differences also exist with regard to stroke incidence. It has been found that one in ten men and one in 15 women are at risk of suffering a stroke between the ages of 45 and 75 years. The World Health Organisation Monica Project, conducted in 16 European and two Asian populations, revealed incidence rates of 101–285 for men and 47–198 for females per 100 000 of the population (Thorsveld, Asplund, Kuulasmaa, Rajakangas and Schroll, 1995). The differences in incidence of stroke are however age-related. Petrea, Beiser, Seshadri, Kelly-Hayes, Kase and Wolf (2009) reported results from the Framington Heart Study which found that at a younger age women experience their first-ever stroke on average about five years later than men. Women also demonstrated having a greater long-term risk of stroke because they have a greater life expectancy (Petrea *et al.*, 2009).

The stroke incidence rate varies in different parts of the world. For example, results from the International Collaboration (Sudlow and Warlow, 1997) which compared data from Europe, Russia, Australasia and the United States showed that in the age groups 45–84 years the incidence rates recorded in these countries were mostly similar: between 300/100 000 and 500/100 000.

However, the rates were significantly lower in Dijon, France at 238/100 000 and higher in Novosibirsk, Russia at 627/100 000. To date however no population-based stroke incidence studies have been conducted in sub-Saharan Africa (Kengne and Anderson, 2006).

2.3.2 Prevalence

The prevalence of a disease is the proportion of the population affected by a specific disease at a given time (point prevalence), or at a certain period (Orencia and Ballard, 1993). Prevalence data provide information regarding the scale of the disease in the given population. This information is used to plan health services. Incidence and survival post-stroke are the determinants of the prevalence of stroke (Orencia and Ballard, 1993).

With regard to prevalence rates, the systematic review conducted by Feign *et al*. (2003), which included nine population-based studies, revealed that prevalence rates of stroke in people aged 65 or older were 4610–7330 per 100 000 of the population. The study also found that the prevalence was higher in males than females, ranging from 5880–9260 per 100 000 for men and 3220–6120 for women aged 65 years and older.

Studies conducted in sub-Saharan Africa recorded much lower rates: between 200–300 per 100 000 (Kengne and Anderson, 2006). The SASPI Project Team (2004) conducted the first stroke prevalence study in South Africa and recorded a crude prevalence rate of 300 per 100 000 of the population, with a 95% (250–357) Confidence Interval (CI). In the study a higher prevalence rate was recorded for females (348 per 100 000) than for males (246 per 100 000).

The lower prevalence recorded for South Africa when compared with other high income countries could be the result of lower incidence or high case fatality. As no studies have reliable data on either stroke incidence or case fatality in South Africa and no conclusion could be made about the lower prevalence rate recorded (SASPI Project Team, 2004).

2.3.3 Mortality

Internationally stroke causes 10–12% of all deaths and is reported to be the third leading cause of death, after heart disease and cancer in industrialised countries (Bonita and Beaglehole, 1993). In the age group 40–69 years, the age-standardised mortality rates vary in certain countries, with Bulgaria recording rates as high as 240 and 144 per 100 000 for men and women respectively. Switzerland recorded lower rates of 29 and 18 per 100 000 for men and women respectively (Fieschi *et al*., 1998). Rates recorded at this same time period in the United States (US) were 42 per 100 000 of the population for men and 33 for women, while the rates in Australia were 45 for men and 34 for women (Bonita and Beaglehole, 1993). A greater mortality was found in blacks than other racial groups in the US (Stansbury *et al*., 2005).

With regard to stroke mortality in South Africa, stroke was recorded as the fourth most common cause of death in South Africa in 2000 resulting in 6% of all deaths. More than 18 184 females and 13 930 males died of stroke in 2000. The mortality rate was 124.9 per 100 000 of the population (Bradshaw, Groenewald, Laubscher, Nannan, Nojilana and Norman, 2003). A study conducted by Bradshaw *et al.* (2004) revealed that stroke is the second

leading cause of death in the Western Cape, following ischaemic heart disease. Stroke is responsible for 8.8% deaths in this province.

2.4 STROKE RISK FACTORS

The risk factors for stroke are divided into modifiable and non-modifiable risk factors (Salter, Teasall, Foley, Bhogal and Speechley, 2007).

Modifiable risk factors include high blood pressure, diabetes, hyperlipidemia, physical inactivity, smoking, heavy alcohol use, arterial fibrillation; coronary heart diseases and congestive heart failure (Salter *et al*., 2007). These risk factors often occur as a result of the individual's lifestyle and could be addressed. With regard to modifiable risk factors, Redfern, Mckevitt, Dundas and Rudd (2000) found that in the United Kingdom (UK) 87.5% of first-time stroke patients had at least one modifiable lifestyle risk factor for stroke. A similar finding was reported by Wilson, Taylor, Phillips, Stewart, Dickson and Ramsden (2001) for about 75% of the Canadian population.

Hypertension has been found to be the most significant risk factor for stroke (Salter *et al*., 2007). Strong evidence exists to indicate that the control of high blood pressure is associated with a reduced risk of stroke, particularly in patients with a history of intracerebral haemorrhage (Salter *et al*., 2007). Correct management of hypertension leads to the reduction in mortality post-stroke (Garraway, Whisnant, Kurland and O'Fallon, 1979). The risk of stroke is said to increase proportionately with the increase in systolic and diastolic blood pressure. In individuals with a systolic pressure of ≥ 140 mmHg and diastolic pressure of ≥ 90 mmHg, the lifetime risk of stroke is significantly

increased when compared with individuals who have normal blood pressure (Seshadri, Beiser, Kelly-Hayes, Kase, Rhoda and Kannel, 2006).

A number of researchers have demonstrated that diabetes is an independent risk factor for stroke (Barret-Conner and Khaw, 1988; Sacco, Benjamin, Broderick, Dyken, Easton and Feinberg, 1997). A two to sixfold risk for stroke exists in patients who are diabetic (Flemming and Brown, 2004). It has been shown that aggressive treatment of both types I and II diabetes in patients who are hypertensive reduces the risk of stroke (Flemming and Brown, 2004).

The role of hyperlipidemia has still to be clarified. While this is the case, Salter *et al*. (2007) suggest that it is quite likely that high concentrations of total serum cholesterol are associated with increasing the risk of non-haemorrhagic stroke.

Although there is no clear association between physical activity and stroke, Lee, Folsom and Blair (2003) found that high and moderate levels of activity are beneficial in preventing both ischaemic and haemorrhagic stroke. It appears though that there is a relationship between moderate intensity exercise like walking and stroke risk (Salter *et al*., 2007).

Smoking has been found to be a direct risk factor for stroke. People who smoke 20 or more cigarettes per day have a two to four times increased risk of stroke than non-smokers (Flemming and Brown, 2004; Robbins, Manson Lee, Satterfield and Hennekens, 1994 –; Kawachi, Colditz, Stamfer, Willet, Manson and Rosner, 1993). Smoking is also associated with death and

dependency and increased functional limitation post-stroke (Ovbiagele, Weir, Saver, Muir and Lees, 2006). It is also said to be a dose-dependent risk for stroke. This means that heavy smokers have a greater risk for stroke (Robbins *et al*., 1994). Salter *et al*. (2007) deduced that the risk for suffering a stroke is reduced in those who stop smoking.

Alcohol consumption can either reduce or increase the risk for stroke depending on the amount of alcohol consumed. Reynolds, Lewis, Nolen, Kinney, Sathya and He (2003) assert that people who drink one to two glasses of alcohol per day had the least risk for ischaemic stroke. Individuals who drink more than five glasses of alcohol per day have an increased risk of stroke compared to people who do not consume alcohol at all.

Cardiac diseases as risk factors for stroke include arterial fibrillation, cardiac failure and coronary heart disease. In the Framingham study conducted by Wolf, Abbott and Kannel (1991), the incidence of stroke more than doubled in patients who had coronary artery disease. There was also a fourfold excess of stroke in individuals with cardiac failure and a fivefold excess in those who had arterial fibrillation.

Age, gender, race and the occurrence of a previous stroke are non-modifiable risk factors (Salter *et al*., 2007). The risk of stroke increases with an increase in age (Bonita, 1992). The average age of stroke patients is 70 years for men and 75 years for females (Feign *et al*., 2003). The mean age in sub-Saharan African countries is however known to be much lower at < 60 years (Kengne and Anderson, 2006). In a study conducted to compare gender differences in

both incidence and post-stroke disability authors found that women were significantly older at the time they suffered their first stroke with and increased incidence in the age group over 85 years than compared to men (Petrea, Beiser, Seshadri, Kelly-Hayes, Kase, & Wolf, 2009). The lifetime risk of experiencing a stroke is slightly higher in females than males due to the longer life expectancy of females (Seshadri *et al*., 2006). In the study conducted by Petrea *et al*. (2009) no statistically significant differences were found between males and females with regard to type of stroke, stroke severity and case fatality. With regard to disability in acute and sub-acute periods post-stroke, women had a higher level of disability (Petrea *et al*., 2009).

Varied incidence and mortality rates are found among different racial groups (Tegos, Kalodiki, Daskalopoulou and Nicolaides, 2000). The incidence rate also appears to be higher in blacks than in whites. Rosmand, Folsom, Chambless, Wang, McGovern and Howard (1999) found that blacks in the Unites States were at a 38% greater risk of experiencing a stroke than whites. Similarly Bonita *et al*. (1997) found that the Maori and Pacific people had higher incidence rates of stroke than the rest of the citizens of Auckland, who were mainly European. Studies conducted in different developing countries have revealed that the incidence and mortality of stroke is higher in blacks than in whites (Ayala, Greenlund, Croft, Keenan, Donehoo and Giles, 2001; Stansbury *et al*., 2005; Stewart, Dundas, Howard, Rudd and Wolfe, 1999).

In addition to the abovementioned risk factors, a previous stroke has also been identified as a significant risk factor for recurrent stroke and more so

during the first year post-stroke. The results of the Oxford Community Stroke Project revealed that the risk for stroke was 15 times greater for stroke survivors than for the population in general (Burn, Dennis, Bamford, Sandercock, Wade and Warlow, 1994). History of a previous transient ischaemic attack (TIA) has also been found to be a significant long-term predictor of recurrent stroke (Hankey, 2003). In a long-term study conducted by Van Wijk, van Gijn, Franke, Vermeulen, Gorter and Algra (2005) it was found that the cumulative risk for stroke post-TIA increased after the first three years post-stroke.

2.5 STROKE REHABILITATION

The concept of rehabilitation includes all measures aimed at reducing the impact of disability for an individual, enabling him or her to achieve independence, social integration, a better quality of life and self-actualisation (Helander, 1999). Included in the concept of rehabilitation is the social integration of the person with a disability (Office of Deputy President, 1997; Helander, 1999:8). Stroke rehabilitation could be viewed within the field of rehabilitation medicine. According to Stucki, Ewert and Cieza (2000) rehabilitation medicine may be defined as the multi- and interdisciplinary management of a person's functioning and health. The goals of rehabilitation would be to reduce the impact of the disability on the individual resulting from, for example, a stroke. Although the goals are clear and similar, rehabilitation interventions, service providers, context and patient characteristics could differ (Hoenig *et al*., 1999). This makes the implementation of rehabilitation research complex.

2.5.1 Structure, Process and Outcomes Framework

The Structure, Process and Outcomes (SPO) framework has been suggested as a method to help reduce the complexity of rehabilitation research. The SPO framework, initially developed to assess the quality of health care, has more recently been used in rehabilitation services research (Hoenig *et al*., 1999). In this framework, the structure of care includes the facilities available for rehabilitation and the rehabilitation professionals required to provide treatment. When determining the structure of care, information relating to the qualifications of the health professionals providing the service are included. Rehabilitation is often provided by teams of professionals. The health professionals involved in stroke rehabilitation include physiotherapists, occupational therapists, speech therapists, dieticians and nurses. Therapy assistants also assist in the rehabilitation process. The qualifications of these professionals could differ and while their roles may differ they could also overlap (Hoenig *et al*., 1999). The setting in which rehabilitation occurs is also included in the description of the structure of care. The different rehabilitation settings are discussed in section 2.5.1.1 below.

The process of care is defined as the content of care, the referral process to and through the system, as well as the services that the patient receives. Components that are included in the process of care are provision of assistive devices and prostheses, the use of physical agents such as ultrasound, the type of exercises given, and the frequency and duration of rehabilitation (Hoenig *et al*., 1999). The process of care can be evaluated in terms of direct patient care as well as the policies and procedures that the care provided. Direct patient care can be summarised as the content of care and the intensity

of care, while when determining the policies and procedures governing the care, the amount of co-ordination of care by the health professionals is investigated. Other policies that are explored relate to local and international policies that must be adhered to when providing the care.

Outcomes can be described as patient characteristics that change as a result of care (Hoenig *et al*., 1999). When conducting rehabilitation research it is useful to classify the patient outcomes according to the disablement process. The patient outcomes could therefore be classified according to impairments, activity limitations and participation restrictions as conceptualised by the International Classification of Functioning Disability and Health (World Health Organisation, 2001). This classification will be discussed in section 2.5.1.3 below.

2.5.1.1 Rehabilitation structure

In this section of the literature review the structure of rehabilitation is reviewed according to the setting. Rehabilitation can be provided in a number of different settings. Patients can receive rehabilitation on an inpatient basis, at outpatient clinics or in their own homes.

Inpatient rehabilitation settings

Inpatient rehabilitation settings include stroke units in acute care hospitals, generic wards at acute care hospitals, rehabilitation centres and nursing homes (Stroke Unit Trialists' Collaboration, 1997).

Systematic reviews spanning 1997 to 2007 provide strong evidence for the management of patients with stroke in stroke units (Stroke Unit Trialists' Collaboration, 2007). The initial review relating to the effects of stroke units was originally published in 1997 by Stroke Unit Trialists' Collaboration and had as a main objective to assess the effects of stroke unit care when compared with other forms of care provided to patients with stroke.

The latest update of the review, reported in the Cochrane Library, consisted of 31 randomised controlled trials including a total of 6936 patients (Stroke Unit Trialists' Collaboration, 2007). Only studies where the allocation of patients to a treatment group was done in a random or quasi-random manner were included. In this systematic review, stroke unit care was seen as a unit where co-ordinated multi-disciplinary rehabilitation was provided by staff who had expertise in the management of patients with stroke. It was further characterised as rehabilitation settings that routinely included caregivers in the rehabilitation process and provided regular education and training programmes (Stroke Unit Trialists' Collaboration, 2007).

The meta findings reported by the Stroke Unit Trialists' Collaboration (2007) revealed that stroke patients who are managed in an organised manner by a multi-disciplinary team in a stroke unit have better outcomes related to death, independence and the need for admission to an institution. In the sub-group analysis, conducted as part of the review, it was found that the improved outcomes were not related to gender, age or stroke severity, but were noted in all sub-groups of patients. The benefits of stroke unit care were greater for those patients who were managed in a separate ward. The above reviews

included well-designed randomised trials with high internal validity and they provide level 1 evidence, as defined by Sackett, Richardson, Rosenberg and Haynes (1997), for the management of stroke patients in stroke units. Despite the level 1 evidence, further randomised controlled trials assessing the effects of stroke units to evaluate the effects on outcomes such as quality of life have been recommended by the Stroke Unit Trialists' Collaboration (2007).

Although the national Department of Health in South Africa recommends that each province should have a stroke unit, according to the knowledge of the researcher there are only two state subsidised hospitals in South Africa that have designated stroke units Both these hospitals are situated in Cape Town. In a follow-up study conducted by one of these hospitals it was found that there was a significant difference in inpatient mortality for those patients managed in the stroke unit (De Villiers, Kalula and Burch, 2009). In this study the length of hospital stay increased significantly in the patients managed in the stroke unit which could have resulted in increased costs. Further research is needed regarding the management of stroke patients in stroke units in South Africa.

Outpatient rehabilitation settings

In developed countries stroke patients are often referred to outpatient facilities when discharged from inpatient facilities. The outpatient rehabilitation approaches that have been reported in the literature include: a) Early Supported Discharge care (ESD), b) institution-based care, and c) home-based therapy.

a) Early Supported Discharge (ESD)

The idea that patients would prefer to return home after experiencing a stroke and the fact that the home environment is the best place for the patient with stroke to obtain the skills to function within that environment has led to the development of a rehabilitation approach named Early Supported Discharge (ESD) (Teasall, Foley, Bhogal and Speechley, 2008). Early Supported Discharge is defined as "interdisciplinary rehabilitation, which is provided at home or in the community during a period of time when the patient would normally be in an inpatient stroke rehabilitation unit" (Teasall *et al.*, 2008:3)

The effects of ESD have been widely researched. Studies conducted include both randomised controlled trials and systematic reviews (Teasall *et al.*, 2008). In the literature review conducted as part of this thesis the researcher would like to highlight a few trials that were conducted in Australia (Anderson, Rubennach, Mhurchu, Clarke, Spensor and Winsor, 2000), Norway (Indredavik, Fjaertoft, Ekeberg, Loge and Morch, 2000) and Bautz-Holter, Rygh, Rodgers and Wyller,2002), Canada (Mayo, Wood-Dauphine, Cote, Gayton, Carlton and Buttery, 2000) and the United Kingdom (Donnelly, Power, Russell and Fullerton, 2004) – all with similar results. Table 2.1 summarises these trials with regard to the participants included, the main outcomes measured, the interventions provided and the results.

Table 2.1 Summary of randomised controlled trials investigating ESD

Authors	Inclusion criteria of participants	Main outcomes	Intervention	Results
Indredavik *et al*., 2000 Compared extended stroke unit service with ordinary stroke unit service	Admitted to stroke unit, included within seven days post-stroke onset	Basic activities of daily living (Barthel Index) and global disability (modified Rankin Scale score) at 26 weeks Secondary: LOS	A mobile team supported the patient, thereby allowing the patient to live at home as soon as possible after stroke	Patients who were managed by the team had improved functional outcomes and a decreased LOS
Mayo *et al*., 2000 Home rehabilitation compared with usual care	Patient admitted for acute stroke, exact date prior to admission not specified	Health-related quality of life (ESD-36) Secondary: Impairment, stroke severity, disability handicap (RNL) Assessment done at one and three months post-baseline	On discharge patients received follow-up services from multi-disciplinary team for four weeks in their homes Interventions were individualised according to patients' needs	No difference between groups at one and three months with regard to disability but a significant improvement with regard to instrumental activities of daily living and re-integration Intervention group had significantly higher SF-36 scores at three months Decreased LOS
Anderson *et al*., 2000 Community rehabilitation team providing treatment in the homes compared with conventional care	All patients admitted to specific hospitals with clinical diagnosis of stroke Acute treatment not specified Patients could be included if consultant agreed they were medically stable to be discharged	Outcomes: ADL (Barthel Index) cognition (mini-mental), general health status (GHQ-28), pre-morbid level of functioning (AAP), family dynamics (MFAD) LOS All assessments conducted at one, three, six and 12 months after randomisation	Adaptations to home so that patient could be discharged Individually tailored therapy session conducted in the patient's home	No significant difference between groups at six months, besides carers of intervention group, demonstrated lower mental health LOS significantly reduced in experimental group

Bautz-Holter., *et al*., 2002 – not in references, not described in intro paragraph Support offered by multi-disciplinary team and follow-up community services compared with conventional care	Stroke patients admitted to acute stroke unit with stroke onset < six days prior to admission	Main outcome: Instrumental activities of daily living (Nottingham) at six months Secondary outcomes: General health status (GHQ), Depression (Montgomery Aasberg Depression Rating Scale), mortality, placement and patient and carer satisfaction, LOS	Managed by multi-disciplinary team that supported the patient whenever needed, treatment provided by community-based services	No significant difference between groups with regard to primary outcome Significant difference with regard to general health questionnaire in favour of intervention group at three months not maintained to six months. Mean LOS decreased in intervention group
Donnelly *et al*., 2004 Compared community-based rehabilitation stroke team with hospital-based rehabilitation	Stroke within four weeks prior to admission Patients admitted to stroke unit	Basic ADL (Barthel Index), IADL (Nottingham), Quality of life (SF36), caregiver strain (CSI), patient and carer satisfaction, costs Assessments were conducted at baseline and 12 months later	Patients received treatment at their homes, for a three month period and follow-up team meetings	Only significant difference was that patients in intervention group were more satisfied with services received Mean LOS decreased in intervention group

Key: LOS = Length of Stay, IADL = Instrumental Activities of Daily Living, ADL = Activities of Daily Living, GHQ = General Health Questionnaire, RNL = Re-integration to Normal Living, SF-36 = Medical Outcomes Study Short Form-36, CSI = Caregiver Strain Index, AAP= Adelaide Activities Profile, MFAD = McMaster Family Assessment Device.

Outcomes measured by these studies included, death, dependency or need for institutionalisation, level of independence, length of hospital stay (LOS), subjective health status, satisfaction with services, number of readmissions and health-related quality of life. The results of the studies concluded that there is no difference between patients who are discharged from hospital earlier and who are supported by a team in the community when compared

with those who spend a longer period of time in hospital and receive the usual care including outpatient therapy or further inpatient rehabilitation.

Although the trials had similar results the researcher would like to highlight a number of concepts that differed between the studies and which could make the implementation of the rehabilitation approach difficult. These concepts related to the description of the acute treatment received by the patients, the difference in time from stroke onset and the difference in the interventions provided to the experimental group. In addition to the above differences the outcomes measured in the different studies varied. Therefore, it is not clear if this approach works only for patients who are discharged from an acute stroke unit, or if it is more appropriate for acute or chronic stroke patients. As the interventions and outcomes measured were different, it is not clear what the interventions were that would need to be implemented to achieve the acquired outcomes and which specific outcome the approach would improve.

The randomised controlled trials do however provide some evidence that if supported by a co-ordinated team in the community certain stroke patients can be discharged from hospital earlier. Two systematic reviews (Early Supported Discharged Trialists, 2005; Teasall et al., 2008), which included the studies presented in Table 2.1 supported the findings of these studies. The review conducted by Teasall et al, (2008), concluded that there is strong evidence to suggest that patients who have had mild to moderate strokes can be discharged earlier.

A major limitation to the usefulness of these reviews is that the interventions that would support ESD have not been made explicit. Similarly, knowledge of the exact composition of the teams is lacking and no clear recommendations are made as to what disciplines would be integral to an effective team providing rehabilitation for ESD. In poorly-resourced countries like South Africa a team-based approach to managing stroke patients is recommended. However, the composition of the team, as well as preferred interventions and by extension required equipment should be identified in order to ensure that rehabilitation is optimally provided. In essence the ESD approach is premised on hospitalisation during the acute phase. However, in South Africa not all stroke patients are admitted to hospital in the acute stages. Essentially hospitalisation is reserved for patients who present as more acute and for patients who have access medical aid. More acutely ill patients are not likely to be candidates for ESD whereas those with medical aid are likely to be discharged once stabilised. Thus ESD becomes the default position for patients with medical aid, who are less acute and who have been admitted to hospital. What was also surprising from the studies was the measurement of LOS as an outcome variable. As the “community support” was implemented to enable patients to be discharged earlier it would have been expected that the LOS in the experimental groups would be shorter.

b) Institution-based care

Institution-based outpatient rehabilitation includes the outpatient settings attached to hospitals and day hospitals or geriatric day care centres. The majority of stroke patients referred to these centres would have received inpatient rehabilitation at a hospital. Outpatient services are therefore seen as

a method to continue care. These patients therefore often live at home, are able to walk independently and receive some assistance from caregivers (Hershkovitz, Beloosesky, Brill and Gottlieb, 2004).

Researchers investigating the outcomes of rehabilitation of stroke patients at day hospitals have found that they are effective in improving health-related quality of life (Olsson and Sunnerhagen, 2006), as well as in reducing handicap due to stroke (Hershkovitz *et al*., 2004).

Olsson and Sunnerhagen (2006) conducted a longitudinal study on a single sample of stroke patients to determine the effects of a day hospital rehabilitation programme on the health-related quality of life in the patients. The study investigated the effects of a 6–8 week rehabilitation programme on self-rated health and health-related quality of life of patients with first-ever stroke aged between 18 and 65. The intervention consisted of management by a multi-disciplinary team who met on a weekly basis to discuss and further plan the rehabilitation programme. The results of the study revealed that a 6–8 week day hospital rehabilitation programme resulted in a significant improvement in physical and cognitive functions as measured by the Functional Independence Measure (FIM), as well as in self-rated and health-related quality of life as measured by the Medical Outcomes Study 36-item short form and the EQ-5D respectively. The results also indicated that these outcomes were not significantly associated with each other. Improvements noted were greatest in patients who had a higher level of impairments in the outcomes measured.

Although the researchers used validated outcome measures, the researcher would like to highlight a few flaws that make acceptance of the results questionable. The authors did not motivate the sample size which only consisted of 52 patients. In addition, they excluded patients who did not complete at least six weeks, thereby not applying an intention to treat analysis. The intervention provided was not clearly stated and so it is not clear what the content of care was that caused the improvements in the outcomes. The intensity of treatment also differed among the participants as some only received one treatment per week whereas others could have received four sessions – the authors did not consider or comment on this. The authors stated that the study conducted was a prospective study, yet they often referred to data collected on admission so it was not clear whether this data was collected on admission to inpatient or outpatient rehabilitation. Therefore, the study presented does not make it clear what the day hospital rehabilitation programme should consist of to make a difference.

Similarly, Hershkovitz *et al*. (2004) conducted a before and after study investigating the effects of a multi-disciplinary day hospital rehabilitation programme on handicap (participation). In addition to this they wanted to determine if there was a relationship between handicap and level of functioning, as well as see if demographic factors such as age, gender, marital status and level of education influenced handicap. The study included participants who were 4–12 weeks post-stroke onset who were either from acute settings or community settings. The rehabilitation programme was intense and included half hour sessions of physiotherapy, occupational therapy and aerobic activity three times a week. A multi-disciplinary team was

available who met on a weekly basis to discuss the management of the patients.

The results of the study indicated that day hospital attendance reduced the level of handicap. Hershkovitz *et al*. (2004) concluded from this study that a day hospital programme affected participation and extended activities of daily living more than basic activities of daily living. When compared with the study conducted by Olsson and Sunnerhagen (2006) the study by Hershkovitz *et al*. (2004) presents a clearer picture of the interventions.

Although the studies by Hershkovitz *et al*. (2004) and Olsson and Sunnerhagen (2006) indicate some positive effect of day hospital rehabilitation for stroke patients, the results have to be verified by further randomised controlled trials. In an earlier systematic review conducted by Dekker *et al*. (1998) no evidence was found to support the view that day hospital rehabilitation for stroke patients was effective. This review included 15 randomised controlled trials. The definition and composition of what day hospital rehabilitation entails, the differences in control groups, as well as the intensity of treatment and the instruments used to assess the outcomes were all factors that made the comparison of the studies included in the review difficult (Dekker *et al*.,1998). It becomes apparent that more co-ordination is required to develop an internationally accepted research protocol so that findings from different studies can be compared more easily. Clear recommendations about operational definitions of core constructs and outcomes would greatly improve future meta evaluations of stroke rehabilitation findings in day hospital settings. However, systemic differences

in health care across different countries and within provinces place limitations on the extent to which comparisons can be made or control groups matched.

c) Home-based rehabilitation

The home environment is recognised as a setting for continued rehabilitation of patients discharged from hospitals. Studies investigating the effects of home-based care compared to hospital or day hospital care were conducted and seemingly conflicting results are reported.

The Bradford Community Trial, a randomised controlled trial conducted by Young and Forster (1992) in the United Kingdom (UK), aimed at determining whether home-based physiotherapy or day hospital rehabilitation was better for stroke patients older than 60. The patients were assessed at discharge from inpatient rehabilitation, at eight weeks post-discharge and at six months post-discharge. Outcomes that were assessed included social activities, perceived health status, emotional distress of the caregivers, activities of daily living and motor function. The results of the study revealed that although the home therapy group received much less therapy than the day hospital group they demonstrated a significantly better improvement in outcomes related to activity. The patients in both groups had low levels of participation and no significant difference was found between the groups with regard to perceived health status or carer stress. Overall Young and Forster (1992) suggest that if a patient could chose between therapy at home versus travelling to the day hospital, the day hospital should be the preferred place for therapy as it is slightly more effective.

Similarly Gladman *et al*. (1993) conducted a stratified randomised controlled trial, namely, the Domino Trial, to determine whether patients treated at home by an occupational therapist and a physiotherapist had better outcomes when compared with patients who received routine follow-up services that consisted mainly of outpatient but no home-based services. The outcomes measured at three and six months included extended activities of daily living. Additional outcomes measured at six months included basic activities of daily living and perceived health of the patients as well as the level of social engagement and life satisfaction of the carers. The results of the study revealed that the patients in both groups received similar intensity of therapy. In the study conducted by Gladman *et al*. (1993) patients who were treated in stroke units during the acute stage and then received therapy at home had better outcomes relating to household and leisure activities. The finding of this study however revealed that older frail patients could have benefited by attending day hospitals for treatment.

To try and address the discrepancies found in the Bradford and Domino trials Gladman, Forster and Young (1995) reviewed the methodologies of the two studies and analysed a combination of the results. In the review they compared common outcomes in two strata of patients receiving different treatment approaches. Firstly, the authors included frail patients from both studies and compared day hospital therapy with home-based therapy. Secondly, they included patients who were not classified as being frail and compared hospital-based therapy with home therapy. The findings of the study by Gladman *et al*. (1995) reported that differences in results of the Bradford and Domino trials were mainly due to dissimilarity in therapy

intensity. The results of their study revealed that home-based therapy had a small advantage as it reduced disability between discharge from hospital and six months post-stroke. The home-based therapy should however be provided for a minimum of 15–20 sessions. In contrast to what was found by the authors previously, the level of frailty of the patients did not influence the results. Gladman *et al*. (1995) recommended home-based therapy as the most appropriate follow-up service for stroke patients living in urban settings in the United Kingdom. The results cannot be generalised to other settings that include rural areas where levels of support provided to clients at home differ. Therefore, further research needs to be conducted in different settings to determine whether home care is superior to day hospital care. In South Africa home rehabilitation might not be the recommended choice of follow-up rehabilitation due to limited staff resources and issues of safety (Hale and Wallner, 1996).

To answer the question of whether home-based rehabilitation was more expensive than day hospital-based therapy, (Roderick, Low, Day, Peasgood, Mullee and Turnbull, 2001) conducted a randomised controlled trial. Their study included first-ever patients with stroke who were referred from hospital or community settings. The main outcome measured in the study by Roderick *et al*. (2001) was activity as measured by the Barthel Index. Secondary outcomes were mobility, social activity, mental state and quality of life. The main outcome was measured when the patients entered into the study and at six months follow-up. The costs that were evaluated included service costs, transport costs and overheads such as stationery and telephone. In their study Roderick *et al*. (2001) found no significant differences between home

and day hospital groups with regard to costs or other outcomes. In short, more research is indicated with greater attention to methodological considerations that will enhance generalisation to greater populations and varied contexts. In particular, patient groups need to be clearly defined and stratified to assess whether there are any significant interactions between levels of stroke and treatment setting.

The studies described above all investigated a stroke population that was initially admitted to hospital. Some positive findings have been noted by studies involving stroke patients not admitted to hospital. In a randomised controlled trial Walker, Gladman, Lincoln, Siemonsma and Whiteley (1999) measured outcomes that included basic activities of daily living, extended activities of daily living, motor function, mood, carer's strain and services received since time of stroke. These outcomes were measured at one month post-stroke and six months post-randomisation. In the study the patients in the intervention group received occupational therapy. The findings indicated that provision of occupational therapy that focused on improving functioning in the basic and instrumental activities of daily living resulted in better outcomes of the basic and instrumental activities of daily living. It is important to note that the patients who were included in this trial were those who were not severely affected, as evidenced by the (mean) Barthel Index Scores of 18/20 in both groups on admission. In other words, non-admission to hospital means a lower level of impairment. In developing countries, such as South Africa, patients are not admitted to hospital for a number of reasons and cannot be assumed to have a lower level of impairment. In fact, they could have a

greater level of disability and might therefore not benefit merely from being treated at home by occupational therapists.

Wolfe, Tilling and Rudd (2000) conducted a pilot randomised study to determine the effectiveness of rehabilitation for stroke patients not admitted to hospital. Their aim was to evaluate whether patients with stroke who remain at home would have better outcomes if they received home therapy or the usual community-based therapy. The results of the pilot trial, which consisted of 43 patients in total, revealed that providing services by community-based teams made up of a physiotherapist, occupational therapist and speech and language therapist was feasible. However, the effectiveness of such an approach would have to be validated using a larger sample size of at least 300 participants.

2.5.1.2 Process of rehabilitation

To appraise the process of stroke rehabilitation it is important to reflect on the optimal starting point, the intensity and the frequency of therapy and the content of rehabilitation which might be very different between settings (Hoenig *et al.*, 1999).

Starting time of rehabilitation

A positive association has been found between early rehabilitation and improved functional outcomes. This seems to be related to the fact that in the acute phase the brain is primed for recovery, thus creating an ideal opportunity for therapeutic input (Teasall *et al.*, 2005a). To determine the effects of onset to admission interval on functional outcome, Paolucci,

Antonucci, Grasso, Morelli, Troisi and Coiro (2000) investigated a cohort of patients admitted for rehabilitation in Italy. The aim of the study was to investigate the effects of onset to admission interval on rehabilitation outcomes. This study investigated 135 patients who were divided into three age and disability-matched groups. The results of the study revealed that patients who started their rehabilitation within the first 20 days post-stroke responded more positively to treatment than those who started later. Another study which investigated the effects of onset to admission interval was a retrospective study where the records of 553 patients admitted to a hospital in Canada were reviewed. The study found that patients who were admitted within the first 30 days after their first-ever unilateral stroke experienced greater functional improvement as measured by the Functional Independence Measure (FIM) and a shorter hospital stay than those who were admitted after 30≤ days post-stroke onset (Salter *et al*., 2006). A limitation of the study conducted by Salter *et al*., (2006) was that as it was a retrospective study which used information recorded in patient records, where the researchers depended on previously recorded data that could have been incorrectly captured. As highlighted by Salter *et al*. (2006) the application of a randomised controlled trial which included a control group could have made the results more valid. However, this is not possible as it would mean withholding rehabilitation from certain individuals which would be unethical as provision of rehabilitation in the early stages post-stroke has been shown to influence recovery positively The results however support the findings of an earlier critical review conducted by Cifu and Stewart (1999) in which studies conducted between 1966 to 1998 that assessed functional outcome at discharge and follow-up was included. The overall findings of the review

concluded that rehabilitation started within 3–30 days post-stroke resulted in improved functional outcomes. Hence, it is recommended that stroke patients who can tolerate intensive rehabilitation should be admitted to inpatient rehabilitation facilities and start rehabilitation as soon as possible.

Intensity and frequency of treatment

There is strong evidence to suggest that greater intensity of physiotherapy and occupational therapy can result in improved functional outcomes in stroke patients (Teasall, Foley, Salter, Zettler and Kruger, 2005b). The results of a meta-analysis conducted by Kwakkel *et al*. (2004a) which included 31 studies showed that when intensive exercise therapy is provided, that is, at least 16 hours more than what is provided on average within the first six months, a small but favourable effect on the activities of daily living and walking speed would result. These results were however mainly related to studies that investigated extra time spent on treatment of the leg and ADL in general. The meta-analysis conducted by Kwakkel *et al*. (2004a) also showed improvements in instrumental activities of daily living although only supported by nine out of 31 studies (Kwakkel *et al*., 2004a). The results of the meta-analysis suggest that increased intensity of exercise therapy benefits patients clinically.

The existing evidence regarding intensity of therapy indicates that greater intensity of therapy resulted in improved short-term functional outcomes, yet rehabilitation staff do not provide the intensity and frequency of therapy needed to obtain the improved outcomes (Teasall and Kalra, 2005). Studies have shown that although patients are admitted for intensive therapy they

spend limited time in direct contact with therapists. In a centre-based observational study conducted by De Wit, Putman, Dejaeger, Baert, Berman and Bogaerts (2005) findings showed that patients spent from one to three hours per day in therapy in four centres across Europe. These researchers found that when patients are admitted 75% of the time spent there is taken up by non-therapeutic activities.

Berhardt, Dewey, Thrift and Donnan (2004) found similar results in their observational study of 64 stroke patients admitted to a stroke unit in Heidelberg, Victoria, Australia. The researchers found that patients were involved in therapeutic activities for only 12.8% of the time and 53% of their time was spent resting (Berhardt *et al*., 2004). Although the literature indicates that increased practice improves functional recovery, the actual amount of time that patients spend in active rehabilitation is not ideal (Kwakkel, Kollen and Twisk, 2004). Information relating to intensity of therapy is not specific about what the ideal intensity should be. Once the ideal intensity is known the challenge would be to ensure that patients admitted to inpatient rehabilitation centres spend the time receiving treatment and not just resting.

Content of rehabilitation

Physiotherapy and occupational therapy are important components of the rehabilitation of stroke patients. It is therefore important to know the content of these two therapies, as well as their effect on outcome. Physiotherapy can be defined as providing services to individuals and populations to develop, maintain and restore maximum movement (World Confederation for Physical Therapy, 2007). The primary goal of occupational therapy is to enable people

to participate in the activities of everyday life (World Confederation of Occupational Therapists, 2007).

Physiotherapy treatment of stroke patients commonly include activities to re-educate upper and lower limb function, sensory function, normalise tone, re-educate functional activities such as rolling, re-education of balance in sitting and standing, walking, stair climbing; electrotherapy techniques, management of pain and oedema, activities to improve aerobic function, neuromuscular stimulation, patient and carer education and provision of orthotics and assistive devices (Ballinger, Ashburn, Low and Roderick, 1999; Van Peppen, Kwakkel, Wood-Dauhinee, Hendriks, van der Wees and Dekker, 2004).

In a systematic review conducted by Van Peppen *et al*. (2004) to investigate physical therapy interventions which result in improved outcomes, strong evidence was found for task-orientated exercise training to regain balance and gait, as well as for strengthening of the lower limbs. No evidence was found for the traditional neurological treatment approaches, upper limb exercises, biofeedback, functional and neuromuscular electrical stimulation to improve dexterity or gait, use of orthotics and assistive devices, to improve functional outcome as well as physical therapy interventions for reducing hemiplegic shoulder pain and oedema. As indicated by Van Peppen *et al*. (2004) none of the physiotherapeutic approaches is superior to the other when it comes to patient outcomes. Pollock, Baer, Langhorne and Pomeray (2007) confirmed these findings in a recent Cochrane review conducted to determine the effects of physiotherapy treatment approaches on the recovery of postural control and lower limb function after stroke. The results of the

review found insufficient evidence indicating that any one specific treatment approach is superior for promoting the recovery of disability in patients post-stroke (Pollock *et al*., 2007). The treatment approaches evaluated in the review included Neurodevelopmental Treatment Approaches (Bobath), Proprioceptive Neuromuscular Facilitation and the Motor Learning Programme (Pollock *et al*., 2007).

Occupational therapy interventions employed in the rehabilitation of stroke patients include re-education of physical functioning, personal activities of daily living, domestic activities of daily living, physical function, perception cognition and mood, home visits, social activities, social and leisure activities, education of patient and carer and provision of wheelchairs, assistive devices and equipment (Ballinger *et al*., 1999; De Wit, Putman, Lincoln, Baert, Berman, Beyens*,* 2006).

A systematic review conducted by Steultjens, Dekker, Bouter, van de Nes and Cup (2003) revealed that comprehensive occupational therapy services had a small but significant effect on activities of daily living, extended activities of daily living and social participation. Comprehensive occupational therapy as investigated by Steultjens *et al*. (2003) included training of sensory-motor functions, cognitive function, activities of daily living and domestic activities, instruction and advice on use of assistive devices, provision of splints and slings and patient and carer education. When the researchers investigated the effect of individual activities on the main outcomes, no significant difference was found between these outcomes and training of cognitive function, perception training and retraining of wheelchair propulsion. However, Walker

et al. (1999) demonstrated that community occupational therapy significantly increases the ability of patients to perform activities of daily living as already noted in section 2.5.1.

2.5.1.3 Rehabilitation outcomes

Kaplan (2007:16) defines health care outcomes as "meaningful results following an episode of intervention". These can relate to the patient, the service provider, the processes or health care systems. In patient outcomes the "meaningful results" could be improved function post-rehabilitation which is regarded as the "episode of intervention".

Stroke patients' outcomes can be conceptualised using the International Classification of Functioning, Disability and Health (ICF). This model is the revised version of the International Classification of Impairments, Disabilities and Handicaps (ICIDH), developed by the World Health Organisation in 1980. The ICIDH was developed to classify the consequences of disease, injury and disorder. The ICIDH provided a framework for the consequences of disease. Criticisms, mainly by the disabled community, about the negative connotation of the ICIDH with its focus on impairment, disability and handicap led to its revision and the subsequent development of the ICF.

The ICF is seen as a comprehensive framework and classification which provides a common language that can be understood by all stakeholders including policymakers and persons who have become disabled (Geyh, Cieza, Schouten, Dickson, Frommelt and Omar, 2004). The ICF is therefore useful for analysing the patient's problems post-stroke as well as assisting in

enabling a systematic analysis of rehabilitation interventions (Wade and de Jong, 2000). The ICF defines health and health domains as a bidirectional relationship between the components. When compared to the ICIDH the ICF has expanded on the personal, social and physical context of disability, placing the emphasis contextual factors, which include personal and environmental factors (World Health Organisation, 2001). The domains of the ICF are described from a perspective of the body, the individual and society. The different components of the ICF include body functions, body structures, impairments, activity limitations, participation restrictions and environmental factors. The ICF describes impairments as problems in body function or structure such as a significant deviation or loss. Activity limitations are difficulties an individual may have in executing activities. Participation restrictions are problems an individual may experience in the physical, social and attitudinal environment, in which people live and conduct their lives. Environmental factors are a significant part of the revised classification. In this model disability is seen as an umbrella term for impairment, activity limitation and participation restrictions. The present literature review has considered post-stroke outcomes at impairment level, activity (functional) level as well as at participation (handicap) level. Environmental factors have not been considered as they are not included in the research questions.

A stroke can affect individuals at the levels of impairment, activity and participation. The following sub-sections of the literature review discuss the impairments, activity limitations and participation restrictions of stroke patients, as well as factors affecting these outcomes. It is important to note that as the aim of rehabilitation is to facilitate functional independence and the

re-integration of the individual into the community, the measurement of rehabilitation outcomes should focus on the level of activity limitations and participation restrictions. The measurement of impairment is, however, important when determining the severity and prognosis of the disease and it also assists with the evaluation of the effect of impairment specific treatment (Wade, 1992). While the quality of life of the individual is crucial, this is not explicitly considered in ICF (Wade and de Jong, 2000).

Impairments

Impairments post-stroke refer to the body functions and structures that are affected as a result of the incident. In stroke, the main body structure that is affected is the brain, which results in abnormal functioning of the neurological system.

In a study conducted by Lawrence, Coshall, Dundas, Stewart, Rudd and Howard (2001) the following common impairments were identified: impaired motor function, sensory deficits, abnormal muscle tone, perceptual and cognitive limitations, speech impairments, depression, urinary incontinence and dysphagia. Patients with stroke had physical as well as psychological problems. The inability to communicate effectively is a symptom present in many stroke patients. Although the study conducted by Lawrence *et al*. (2001) included a large sample size of first-ever stroke patients, some of the assessments of certain impairments were subjective measures and not clearly explained. These included the assessment of dysphagia and ataxia. However, motor impairment was the most common impairment identified in the patients

assessed by Lawrence *et al*. (2001), with the upper limb more affected than the lower limb.

Impairment post-stroke seems to have an impact on other outcomes post-stroke. Desrosiers, Malouin, Bourbonnais, Richards, Rochette and Bravo (2003) conducted a follow-up study of patients with stroke admitted to an intensive rehabilitation programme in Canada. The aim of this study was to determine whether there was a relationship between impairment and disability measured at the end of rehabilitation and handicap measured at six months post-rehabilitation. Desrosiers *et al*. (2003) also aimed to determine if impairment or disability were more closely related to handicap at six months. In their study valid and reliable outcome measures were used to measure the different outcomes. The results of the study revealed that impairment and disability measures of the leg were more strongly associated with handicap than impairment and disability of the arm. The results also revealed that impairments were more strongly associated with handicap than disability. To assess whether impairments influenced disability the previously mentioned study conducted by Lawrence *et al*. (2001) found that urinary incontinence, dysphagia, cognitive impairment and gaze paresis independently predicted poor outcomes relating to death and severe disability at three months.

Activity limitations

The activity limitations that patients experience post-stroke are mainly the basic activities of daily living which include bathing, eating, dressing, toileting, bladder and bowel control, mobility, transfers and the ability to climb stairs (Mayo, Wood-Dauhinee, Ahmed, Gordon, Higgins and McEwen, 1999;

Duncan, 1994). The incidence of dependence in activities of daily living is highest immediately post-stroke and decreases significantly thereafter (Duncan, 1994). A major problem post-stroke is the inability to walk, although most survivors regain independent ambulation (Duncan, 1994). Mayo *et al*. (1999) conducted a study relating to disablement post-stroke during the first year after an acute episode of stroke. In their hospital-based study the researchers found that at three months post-stroke impairment in gait speed was present in 85% of persons, while 78% had not reached age-specific norms for upper limb function. In a population-based study conducted in New Zealand, Bonita *et al*. (1997) found that one third of the population required assistance with at least one activity of daily living with a gender differential. Women were more dependent on others for self-care (27%) than men (16%). In studies conducted in sub-Saharan Africa stroke patients appeared to be more dependent on others for self-care (SASPI Project Team, 2004; Walker *et al*., 2000b). Walker *et al*. (2000b) reported that in Tanzania the number of people needing assistance with at least one activity of daily living was 60%. In a South African study it was 66% of stroke survivors who needed assistance (SASPI Project Team, 2004).

These aforementioned activities of daily living are mainly used to function within the home. A number of activities have been identified that are needed to assist people to function within their communities as well as to run their households. These activities are referred to as instrumental activities of daily living. Activities such as using public transport and crossing the road, going shopping, washing clothes and cleaning the house are examples of instrumental activities of daily living (Nouri and Lincoln, 1987). Although these

activities could be specific for different environments, similar problems were experienced by patients in Israel (Hartman-Maier, Soroker, Ring, Avni and Katz, 2007) and South Africa (Rouillard, 2006). The most common instrumental activities that patients with stroke are not able to perform post-incident include washing clothes, shopping and house work (Hartman-Maier *et al*., 2007; Rouillard, 2006) as well as travelling by public transport (Rouillard, 2006)

Participation restrictions post-stroke

Participation refers to the ability of the person to manage the role they were previously fulfilling (World Health Organisation, 2001). Domains of participation that are mainly affected post-stroke are leisure activities, employment and education (Desrosiers, Rochette, Noreau, Boubonnais, Bravo and Bourget, 2006).

Sturm, Dewey, Donnan, Macdonell, McNeil and Thrift (2002) conducted a community-based study in Melbourne to determine handicap patterns, the relationship between handicap (participation) and disability; and between handicap and patient perception of recovery. Patients were assessed at three and 12 months post-stroke. The results of this study showed that handicap was increased post-stroke both at three and 12 months. The domains of physical independence and occupation, as measured by the London Handicap Scale, were the most severely affected domains. About 30% of the participants in this study reported that they had made an incomplete recovery although they were fully independent with regard to the activities of daily living as illustrated by their Barthel Index Scores. Therefore, it is apparent that

patients' perception of recovery was not only determined by the ability to perform the basic activities of daily living but also related to participation factors.

Clarke, Black, Badley, Lawrence and Williams (1999) conducted a study to determine the effect of stroke on handicap. The study, which was conducted in Canada, included all stroke patients admitted to a specific hospital for a three year period. Clarke *et al*. (1999) assessed impairment, disability and handicap at three and 12 months post-stroke onset using standardise outcome measures. The relationship between the outcomes were compared at three months and provided information regarding the outcomes of patients who were in the sub-acute stage post-stroke; and again at 12 months to determine the relationship between the variables in patients who were more chronic. The results of the study indicated that individuals with physical disability and post-stroke depressive symptoms reported greater handicap at both the three and 12 month follow-up period. The results also indicated that cognitive disability as measured by the Functional Independence Measure (FIM) influenced handicap at 12 months follow-up. Additionally those who had suffered a previous stroke reported a significantly higher level of handicap at one year than those who were first-time stroke patients.

Patel, Tilling, Lawrence, Rudd, Wolfe and Mckett (2006) aimed at estimating long-term disability, handicap and quality of life three years post-stroke. Their study was community-based and included first-ever stroke patients. The results of the study by Patel *et al*. (2006) indicated that at both one and three years post-stroke, 26% of the participants were moderately to severely

disabled. In addition, at one year the majority of the participants were handicapped with 51% remaining handicapped at the three year period. The participants' perceptions of physical health were poor and that of mental health satisfactory at both one and three years. No significant changes were noted between the different domains except for a slight improvement in Role Emotion as measured by the SF-26 (Patel *et al*., 2006). It is therefore clear that the effects of stroke are long-term and that up to half of the people who have suffered a stroke are not able to resume their previous roles and are therefore classified as having participation restrictions or handicapped as previously stated.

Health-related quality of life of stroke patients

Quality of life has been defined as the perception of an individual regarding their position in the society in which they live, in relation to their own goals, expectations, standards and concerns. (World Health Organisation, 1995). This is a broad concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships and their relationship to salient features of the environment. The concept of health is encompassed within the broad definition of quality of health. Quality of life is seen as the broad multi-dimensional construct that refers to the specific disease or the health of the individual (Salter, Moses, Foley and Teasall, 2008).

The measurement of health-related quality of life in stroke patients needs to include four domains or dimensions, namely: the physical, functional, psychological and social health domain (De Haan, Aaronson, Limburg, Hewer

and van Crevel, 1993). Impairments related to the stroke could be included in the physical health domain. Self-care, mobility and the ability to perform previous roles forms part of the functional health domain. Conditions such as dementia or post-stroke depression could be part of the psychological domain. Social and family contact is included in the social domain (De Haan *et al*., 1993).

The majority of stroke patients report a decline in health-related quality of life post-stroke (Hackett, Duncan, Anderson, Broad and Bonita, 2000; King, 1996). A number of factors have been identified which determine the health-related quality of life of people who have experienced a stroke. King (1996) records depression, perceived social support and functional status as factors that predicted quality of life in stroke survivors. Similarly functional status and depression were identified by Carod-Artal, Egido, González and de Seijas (2000) as predictors of quality of life in these patients. The effects of aphasia on quality of life post-stroke have not been sufficiently investigated (Krančiukaitė and Rastenytė, 2006). Patients with language deficits are often excluded from quality of life studies due to the nature of the data collection instruments (King, 1996). As some patients are not able to provide information regarding their quality of life, the use of proxies has been investigated. However, it was found that patients rate their quality of life higher than proxies and therefore proxy reports are not necessarily an accurate estimate of a patient's perceptions. A concept that could be investigated in patients who are not able to verbalise their quality of life is the role of non-verbal cues in quantifying quality of life.

In a South African study conducted by Jelsma, Mkoka and Amosun (2008), people living in low socio-economic under-resourced areas reported that the most important domain for quality of life was the environmental domain. This domain included access to medical services, owning a brick home with water, electricity and sanitation and having sufficient food.

2.5.1.3.1 Measurement of outcomes

A number of standardised outcome measures have been developed (Finch, Brooks, Stratford and Mayo, 2002) specifically to address the outcomes experienced by patients who have suffered a stroke (Salter, Jutai, Teasall, Foley and Bitensky, 2005). These measurement instruments could be used to determine the outcomes at the different levels of the ICF. As these were mainly designed before the finalisation of the ICF some of them do not measure a specific level but across two levels of the ICF. As most studies measure the effects of certain interventions on outcomes, or the relationship between outcomes, or even still the recovery or long-term level of outcomes, researchers would usually include the use of a number of outcome measures which assess specific outcomes. In addition, specific criteria have been developed to appraise specific measures.

Certain specific requirements are available to indicate whether an outcome measure is appropriate or not. These include psychometric properties such as validity, reliability and responsiveness. Valid instruments would measure what they intended to measure in a specific population. Reliability refers to ability of the measure to produce similar results irrespective of who is completing the measure; the instrument should also provide consistent results over time. The

measure should be responsive in that it is able to detect changes over time (Greenhalgh, Long, Brettle and Grant,1998).

Other factors that are important to note when selecting an outcome for use in research or clinical practice includes the user-friendliness of the instrument and if it is acceptable to the clients to whom it is administered. This means that the administration of a tool must not be viewed as a burden either by the health care provider or the client. The implementation of the measure by self-report or therapists is also a factor that affects the result obtained. Many measures are measures of self-report and therefore tend to be subjective. The reporting of individuals about their conditions could be challenging when the patient has cognitive deficits. The use of proxies in these cases are also not always appropriate as proxies often report differently when it comes to level of functioning and quality of life of patients (Hackett *et al*., 2000). The outcome measures are often administered to patients or people who are able to communicate in English. These measures therefore need to be translated into the different languages. In these cases it is important to be aware of the translation procedures recommended by the authors of the instrument as they may have specific criteria in mind. Mkoka, Jelsma and Vaughan (2003) cautioned against the use of correct words as certain words directly translated could have a different meaning in a specific culture.

It is also important to consider the recovery period when selecting the time of administration of the outcome assessment (Duncan, Lai and Keighly, 2000). Neurological recovery occurs at a different rate to functional recovery, the recovery of patients with different levels of severity also differs. Therefore, it is

better to measure outcomes at six months post-stroke (Duncan *et al*., 2000). Outcome measures could also be used to determine good or bad outcomes which relate to the scoring of the participants at a specific point. There are many discrepancies in the literature regarding what constitutes a good or poor outcome (Duncan *et al*., 2000).

Impairment measures

Instruments that measure impairments include those who measure a variety of impairments and those, which only measure motor or impairments, balance problems or depression. The National Institute for Health Stroke Scale (NIHSS) measures a number of neurological deficits. The NIHSS encompasses 15 items which include cognitive impairment, gaze deviation, hemianopia, facial palsy, weakness of lower and upper limbs, ataxia of lower and upper limbs, sensory loss, dysarthria, aphasia and inattention. For each individual item the scores could range from 0 = no impairment to 4 = complete impairment (Weimar *et al*., 2002). The scale is scored from 0–42, with a higher score indicating a higher level of neurological impairment or stroke severity. The NIHSS is a good predictor of outcome at three months post-stroke (Weimar *et al*., 2002). The NIHSS scale was developed to determine the severity of the stroke at baseline (Brott, Adams, Olinger, Marsan, Barsan and Biller, 1989). The scale ranges from 0–42 with higher scores indicating more severe stroke. It comprises 15 items which relate to cognitive, visual, sensory, motor, communicative and perceptual impairments. Therefore, it allows the researcher to assess severity of stroke based on the effect of the stroke on body structures and functions, assessing primarily impairments. The scale is completed by direct observation as opposed to self-report. The scale

was found to be valid and shows concurrent validity with the Barthel Index. An adequate interrater reliability with an Intraclass Correlation (ICC) of 0.69 has been reported (Brott *et al*., 1989). Law (2002) proposed the following guideline to rate reliability coefficients: Excellent (r >0.80), Adequate (r between 0.60 and 0.79) and Poor (r< 0.60).

The Rivermead Motor Assessment (RMA) is a measure of motor performance that provides an indication of impairment in motor function. This instrument was developed when there was no short, reliable and valid system to assess movement (Finch *et al*., 2002). It consists of three sub-scales that measure gross motor function, leg and trunk impairment, as well as arm impairment. It consists of items that could measure impairment and activity. The scale is completed by direct observation by the physiotherapist. The observed activity is scored either as the patient's ability to do the activity with a score = 1, or the patient's inability to perform the activity score = 0. The higher the final score for each sub-section, the higher the level of functioning. Lincoln and Leadbitter (1979) reported that the RMA is a reliable and valid tool based on good to excellent psychometric properties, for example, excellent scalability coefficients reporting coefficients of scalability (CS), values of gross motor section (r=0.91), leg and trunk section (r=0.81), and arm section (r=0.96). A positive or negative difference of three points of the total on the scale indicates a clinically significant difference (Finch *et al*., 2002).

The Rivermead Motor Assessment Scale has been applied in a number of studies including randomised controlled trials to determine effects of specific interventions (Bagley, Forster, Smith and Young, 2005) as well as in follow-up

studies to determine the relationship between motor impairment and activity post-stroke and to determine the effects of certain variables on impairment and disability (Soyuer and Soyuer, 2005). The tool was used both in the Collaborative Evaluation of Rehabilitation in Stroke across Europe (CERISE) study (De Wit *et al*., 2006) and the Western Cape Rehabilitation Centre (WCRC) study (Rouilard, 2006), to determine recovery post-stroke.

Another widely-used valid and reliable outcome measure, which determines impairment post-stroke, is the Fugl-Meyer Assessment of Sensorimotor Recovery after Stroke (FM). The FM is a performance-based measure, which measures impairment of voluntary movement of the lower and upper limb, balance and sensation. The motor section of this scale includes assessment of movement, reflexes, co-ordination and speed. The observed activities are scored on an ordinal scale which ranges from 0 = no function to 2 = full function. The items included in this scale are based on the stages of post-stroke recovery as identified by Brunnstrom (Finch et al., 2002), which state that motor recovery occurs along a predicted path with certain aspects occurring before others. Aspects such as pain, sensation and range of motion were identified as influencing recovery and were therefore included in the measure. The complete tool consists of 155 items. As is the case of the Rivermead Motor Assessment Scale, the FM was used in a number of stroke rehabilitation research studies. These included studies which investigated the effects of specific interventions on stroke outcome (Hseih, Wang and Lee, 2007), as well as studies that assessed whether motor impairment could predict physical disability post-stroke (Chae, Johnston, Hekung, Zorowitz and

Richard, 1995), and to determine functional recovery post-stroke (Ferucci, Bandinelli, Guralnik, Lamponi, Bertini, Falchini and Baroni, 1993).

Activity measures

Measures of activity could be divided into those that measure basic activities of daily living and those that measure instrumental or extended activities of daily living. The Barthel Index and the Functional Independence Measures are the two instruments most often used to determine basic activities of daily living.

The aim of the Barthel Index is to determine the level of independence in the basic activities of daily living (Mahoney and Barthel, 1965). The Barthel Index is very easy to use as the tool consists of ten items, including basic mobility, self-care activities and an assessment of bladder and bowel continence. The items are measured on a graded scale from independence to dependence, and are scored via an arbitrary weighting system. The scores range from 0–100 with each item being assigned a score of 0, 5, 10 or 15 (Finch *et al.*, 2002). The Barthel Index can be completed by self-report or by direct observation. An excellent test-retest reliability coefficient r= 0.98 has been found for this tool (Wolf *et al.*, 1991). Shah, Cooper and Maas (1992) reported high correlations between the Barthel Index and the Kenny self-care evaluation (r=0.73). The Barthel Index has been found to be insensitive to small changes in functional status and has a ceiling effect. It has however been used as a gold standard in the validation of a number of other measures (Finch *et al.*, 2002). One of the advantages of the Barthel Index is that the

information required could be obtained from the most reliable source which could be the health care worker or the carer (Finch, 2002).

The Barthel Index has been widely used in a number of studies relating to rehabilitation research which includes studies that evaluated the input provided by stroke teams (Lincoln, Walker, Dixon and Knights, 2004), those that addressed recovery (De Wit *et al*., 2006), as well as the investigation of rehabilitation of patients with stroke in different settings (Young and Forster, 1992).

Another measure that is widely used to measure activities of daily living is the Functional Independence Measure (FIM). This measure has 18 items made up of 13 motor items and five items relating to cognition. The total scores range from 18–126, with the higher score indicating a higher level of independence. Inter-observer reliability of 0.95 and test-retest reliability of 0.95 were determined (Ottenbacher, Hsu, Granger and Fiedler, 1996). Concurrent validity showed a strong association with the Barthel Index (r=0.74 admission; r=0.92 discharge) (Hsueh, Lin, Jeng and Hsieh, 2002). However, the FIM can only be administered by someone who has received certified training in its administration. It has many more items than the Barthel Index and takes about 30 minutes to administer and score (Finch *et al*., 2002).

A number of limitations have been noted in terms of determining outcomes relating to changes in outcomes in different groups of patients with stroke. It is therefore recommended that when investigating, recovery activity should be considered beyond activities of daily living (Duncan, Jorgensen and Wade, 2000). Therefore, it is recommended that extended or instrumental activities

of daily living be included. The Nottingham Extended Activities of Daily Living Scale (NEADL) measures independence in instrumental activities of daily living (Nouri and Lincoln, 1987). These activities encompass interaction with the environment and include the household and community. They are broader than the basic activities of daily living. The NEADL is a self-report questionnaire based on the level of activity actually performed. It is scored on a continuum ranging from inability to perform, to the ability to perform independently using a 4 or 2-point scale. The scoring is hierarchical where 0 = unable to perform the activity, 1 = able to perform the activity with assistance, 2 = able to perform the activity on own with difficulty and 3 = able to perform the activity on own easily. This 4-point scale could be collapsed into two when doing the analysis. The score ranges between 0–22, with higher scores indicating a greater level of independence. For this study the NEADL was administered at the two and six month assessment periods and scored using the 2-point scale. Lincoln and Gladman (1992) have validated the tool in stroke patients discharged from hospital and have recommended its use. The NEADL was used in randomised control trials to determine the effects of different types of rehabilitation services on extended activities of daily living (Gladman et al., 1993). It has also been used in a randomised controlled trial to determine the effects of constraint-induced therapy (Lin, Wu and Liu, 2008) and to predict recovery and outcome (Frank, Schlote, Hasenbein, Wallesch, 2006).

Participation Measures

The domains of activity and participation have been combined in the ICF classification (World Health Organisation, 2001). Measures that are classified as those used to measure participation is therefore either classified as part of activity measures or quality of life measures (Salter *et al*., 2005). Therefore, the scales that contain items which address participation are the Modified Rankin Scale (MRS) and the Stroke Impact Scale (SIS).

The Modified Rankin Scale (MRS) measures global disability post-stroke (Van Swieten, Koudstaal, Visser, Schouten and van Gijn, 1988). The MRS is scored on a scale from 0–5, where 0 indicates no disability and 5 indicates severe disability. When scoring the MRS a subjective score is assigned based on the individual's level of independence as compared with the person's ability to perform these activities prior to the stroke. The total scores of the MRS could be dichotomised into a favourable outcome (MRS <2) and a non-favourable outcome (MRS ≥2) (Hacke *et al*.,2008). This process of classifying patients into these groups creates problems and have been criticized (Sulter, Steen and de Keyser, (1999). Excellent intrarater reliability has been reported for both MRS (k=0.8) and (MRS) (k_w= ≥ 94) (Wilson, Hareendran, Dendry, Potter, Bone and Muir, 2005). The MRS has good concurrent validity with the Barthel Index (r=-0.81) (Cup, Reimer, Thijssen, and van Kuyk-Minis, 2003). A structured interview with five sections that range from being totally dependent to only having impairment was developed for the MRS (Wilson *et al*., 2005). This interview includes specific questions relating to participation in work activities, family life and leisure activities. These questions were specifically used in the study to determine participation. The tool has been widely used in

acute stroke trials (Sulter,et al., 1999). It has also been identified as a prognostic measure (Huybrechts and Caro, 2007).

The Stroke Impact Scale (SIS) is another scale that includes items to assess participation. This scale measures impact of stroke in a number of domains including social participation. It consists of 59 items and uses an algorithm to determine scores. With regard to validity, the ICCs for the majority of the domains range between 0.7 to 0.92 with only the emotion domain having a score of 0.57. The disability domain of the Stroke Impact Scale (SIS) demonstrated excellent correlations with other validated measures but the participation domain only showed moderate correlation with the social function domain of the SF-36 (Duncan, Wallace, Lai, Johnson, Embretson and Laster, 1999). The scale adheres to a specific rigorous translation process and translated versions need to be obtained (Finch *et al*., 2002). There are no Afrikaans or Xhosa versions of this instrument available (Finch *et al*., 2002).

Quality of life measures

The EQ-5D and the Medical Outcomes Study 36-Item Short-Form Health Survey SF-36 are common instruments used to assess quality of life in patients with stroke.

The EQ5-D is a generic index instrument that focuses on a set of health-related quality of life items to provide a broad assessment. It is a self-administered tool made up of two parts: The first part is designed to obtain an indication of the level of difficulty experienced in mobility, self-care and usual

activities. The instrument also assess for the presence and severity of pain and discomfort; as well as anxiety and depression.

The EQ5-D measures the individual's perception of their current health status using a Visual Analogue Scale (VAS) where 0 indicates worst imaginable health state and 100 best possible health state. Dorman, Slattery, Farrell, Dennis and Sandercock (1998) reported excellent test-retest reliability coefficients for the utility items (ICC= 0.83) and for the VAS (ICC=0.86). The EQ-5D has been found to be a valid measure to assess health-related quality of life in stroke patients. Dorman, Dennis and Sandercock (1999) found that the mobility (r=0.57), self-care (r=0.65) and usual activities (r=0.63) of the EQ-5D correlated most strongly with SF-36 physical functioning domain. Dorman *et al*. (1999) reported 'good' correlations between the VAS EQ-5D and the general health domain of the SF-36 (r=0.66). The scale has been used to determine the quality of life of patients in a number of studies (Huybrechts and Caro, 2007), including a number of studies that were conducted in South Africa to determine quality of life in patients living with HIV/AIDS (Hughes, Jelsma, Mac,ean, Darder and Tinise, 2004), as well as in a local Cape Town community with diverse inhabitants (Jelsma *et al*., 2004a).

The SF-36 consists of 36-items that are aimed at determining perceived health status. As the EQ-5D the SF-36 is a generic instrument and can be used with people with a variety of diagnosis, it is widely used in stroke rehabilitation research (Patel *et al*., 2006; Mant *et al*., 2000). The scale consists of a mental and a physical component made up of different sections

that measure physical functioning and role limitations (Finch *et al*., 2002). The items are scored on a Likert-type scale and summary mental and physical scores can be obtained using algorithms. The scale is valid and reliable but a special licence must be purchased needed before the scale can be used.

2.6 Recovery post-stroke

2.6.1 Definition of recovery

Recovery post-stroke could either be neurological recovery, motor recovery or functional recovery (Teasall, Bayone and Bitensky, 2005) Neurological recovery, also known as spontaneous recovery, which demonstrates itself in the improvement in impairments, occurs as a result of neural plasticity. This type of recovery can be classified as either early recovery which occurs as a result of "decreasing local oedema, reperfusion of the ischaemic penumbra and resolution of diaschisis …" (Kwakkel *et al*., 2004b) or later recovery which occurs as a result of the reorganisation processes that occur in the brain (Teasall, Bayone and Bitensky, 2005). The neurological recovery that occurs in the early stages post-stroke is mainly the result of spontaneous recovery while the changes that occur later could be influenced by rehabilitation (Teasall, Bayone and Bitensky, 2004). Functional recovery, also known as adaptive recovery, refers to the changes that occur in mobility and activities of daily living. Functional recovery which is definitely influenced by therapeutic interventions often occurs independently of neurological recovery.

2.6.2 Time course of recovery

2.6.2.1 Neurological recovery

Studies have shown that most of the neurological recovery occurs within the first three months post-stroke (Teasall *et al*., 2005b). Recovery could however occur after this up to approximately six months or even one year but the pace would be slower. The amount of recovery is largely influenced by the initial stroke severity with more severe strokes having a greater level of impairment (Teasall *et al*., 2005b)

To assess recovery post-stroke, Jørgensen *et al.* (1995) conducted a follow-up study of 1197 acute patients with stroke to determine the recovery post-stroke. Ninety-three percent of the patients in the study were assessed within the first week post-stroke and then on a weekly basis. The final assessments were conducted at six months post-stroke. The assessments included the severity of stroke as measured by the Scandinavian Neurological Stroke Scale and the activities of daily living which were measured using the Barthel Index. The rate of neurological recovery was determined by the initial stroke severity. Of the patients who were assessed as part of the Copenhagen stroke study, 95% reached the greatest neurological level when they were 11 weeks post-stroke. In patients who were classified as having a mild stroke, best neurological level was noted within six weeks, those with moderate stroke at ten weeks and those with severe reached the neurological level within 15 weeks; similarly those with most severe stroke reached their level within 13 weeks.

2.6.2.2 Motor recovery

Impairments of movement are common in individuals who have suffered a stroke. It is important to distinguish between motor and functional recovery as the improvement in motor function does not always translate into functional recovery. In contrast to this, improvements in the ability to carry out activities of daily living can occur without motor deficits being present.

Duncan *et al*. (1992) conducted a prospective study of 104 new stroke patients to describe the motor recovery which occurred during the first six months post-stroke. The main outcome was the motor score on the Fugl-Meyer assessments and the ability of the participants to perform activities of daily living as measured by the Barthel Index – both measured at six months post-stroke. In this study the outcomes were measured at baseline, five days, 30, 90 and 180 days post-stroke. The study results indicate that most of the recovery occurs early after stroke. The Fugl-Meyer motor scores at baseline explained 53% of the variance of the six month motor function; while the five day motor scores explained 74% of the variance; and the 30 day motor score explained 84% of the variance of motor function at six months. The results of the study revealed that the greatest amount of recovery occurred during the first three months post-stroke irrespective of stroke severity at baseline.

2.6.2.3 Functional recovery

Functional recovery may be impeded by other impairments which include sensory deficits, cognitive impairments and communication problems. Functional recovery could however also occur with no neurological recovery and could also occur after neurological recovery has stopped. Duncan *et al*.

(1992) reported that the greatest recovery of ADL as measured by the Barthel index occurred within the first 30 days. A strong correlation was found between the Fugl-Meyer score and Barthel Index scores at the follow-up assessment periods. This highlighted the fact that motor function is important in order to obtain independence in ADL. Although this is the case, the study results also revealed that patients could be fully independent in ADL even while still having some motor impairment. These results support the findings suggesting that independence in functional activities – specifically ADL – is influenced by other factors and not only the availability of motor function.

Results of the Copenhagen stroke study (Jørgensen *et al*., 1995a) indicated that 95% of the patients reached their highest functional level within 13 weeks post-stroke, with 80% of these reaching their best level already at six weeks. As in the case of neurological recovery, the speed of functional recovery was dependent on the initial stroke severity. For patients with mild stroke, recovery occurred within two months and these patients reached their highest level within three weeks post-stroke.

The findings reported above were all derived from follow-up or longitudinal studies that appear to be the appropriate methodology for the aims specified. However, the authors of the literature reviewed failed to comment more comprehensively on the technical aspects of accommodating for attrition in their respective analyses.

2.7 Factors affecting outcomes and recovery post-stroke

One of the most frequently asked questions posed by stroke patients or their families is: “When will I be able to walk again?” Knowledge of the factors that predict a favourable or unfavourable outcome post-stroke is therefore important in order to answer such questions. It is also important for service providers to ensure provision of appropriate and effective services.

A number of factors have been identified that predict stroke outcome and/ or recovery. These factors include demographics such as age, (Kwakkel, Kollen and Twisk,1996 ; Weir *et al*., 2003), the level of education and equivalent income (Putman *et al*., 2007). Also included are factors relating to body structure and function such as level of motor impairment and activity at baseline (Kwakkel *et al*., 2006), as well as rehabilitation process factors such as time since stroke onset and date of admission and intensity of rehabilitation (Cifu and Stewart, 1999).

Hendricks *et al*. (2002) systematically reviewed articles with the aim of determining prognostic factors for motor recovery post-stroke. Studies that were included were those published from as early as 1966 to 2001. A total of 14 studies were included in the review. The review by Hendricks *et al*. (2002) reported that the level of paresis at baseline is the strongest predictor of motor recovery post-stroke. This means that patients with a higher level of motor function had a better chance of recovery.

Kwakkel *et al*. (1996) also conducted a critical review of the literature aimed at identifying factors which predicted disability in patients with stroke. Their

findings were supported by the inclusion of eight cohort studies. The review found that disability assessed within two weeks post-stroke onset, urinary incontinence, level of initial motor impairment, old age, loss of consciousness within the first 48 hours post-stroke, disorientation to time and place, poor sitting balance and status after recurrent stroke could predict functional recovery in patients with stroke. The review also found that if patients perceived that they were getting lots of social support they would recover faster and better. The sample size used in the study which indicated this result could however not eliminate the effects of other confounding factors. The review by Kwakkel *et al*. (1996) reported that ethnicity, gender and side of stroke were not significant predictors of outcome post-stroke.

In another review that was conducted after the one by Kwakkel *et al*. (1996), Meijer, Ihnenfeldt, de Groot, van Liebeek, Vermeulen and de Haan (2003) aimed to determine factors which could predict activities of daily living and ambulation six months to one year post-stroke. A total of 26 articles which yielded a total of 7850 patients with stroke were included in the review. The results of this review indicated that “urinary incontinence, low initial Barthel Index score, older age, severe paresis or paralysis, swallowing problems, ideomotor apraxia, ideational apraxia, visuospatial-construction problems and complications from ischaemic stroke” (Meijer *et al*., 2003) assessed within the first two weeks post-stroke are all predictors of ambulation and activities of daily living at six months to one year post-stroke.

The results of a prospective observational study conducted by Maseiro, Avesani, Armani, Verena and Ermani (2007) revealed that age, as well as

motor and functional impairment as measured by the Motricity Index, the Trunk Control Test and the Functional Independence Measure (FIM) respectively were predictors of ambulatory recovery that was measured using the Functional Ambulation Classification. This study also found that gender and side of paralysis did not correlate with recovery of ambulation.

As indicated above a strong association has been found between age and functional outcome post-stroke, with older people having a poorer functional outcome (Sturm, Donnan, Dewey, Macdonell, Gilligan and Thrift, 2004; Kwakkel, Wagenaar, Kollen and Lankhorst, 1996). Although gender has not been found to be a predictor of motor or functional outcome post-stroke, women have been reported to have a lower level of functioning post-stroke than men (Sturm *et al*., 2004). A prospective cohort, hospital-based study conducted by Lai, Duncan, Dew and Keighly, (2005) found that at six months post-stroke women were less likely to be independent in executing basic, as well as instrumental activities of daily living at six months post-stroke. With regard to socio-economic factors, results from the CERISE study as described in section 2.9 of this thesis (Putman, *et al*., 2007) revealed that socio-economic factors such as level of education and equivalent income affected recovery during different stages of rehabilitation. The authors found that level of education affected motor and functional recovery during acute inpatient rehabilitation while equivalent income affected motor recovery after discharge from inpatient rehabilitation centres.

The effects of rehabilitation process issues on the patients' outcomes have been discussed in section 2.5.1 and 2.5.2 above. As previously mentioned,

the time between stroke onset and rehabilitation as well as the intensity of rehabilitation will affect the outcome. Early admission to rehabilitation is associated with improved functional outcomes (Teasall *et al*., 2005b). Strong evidence exists that a greater intensity of physiotherapy and occupational therapy results in enhanced functional outcomes (Teasall *et al*., 2005b).

The above information from systematic reviews as well as observational cohort studies have identified that factors which predict or influence recovery and outcome at various stages post-stroke include impairment and activity level factors. From the above reviews it is evident that demographic factors such as age, rehabilitation factors such as intensity of therapy and time since stroke onset, and impairment factors such as swallowing problems, dysarthria, urinary incontinence and baseline level of motor impairment as well as baseline level of activity are factors that would predict outcome post-stroke. These prognostic factors were therefore included in the analysis of the study as factors influencing motor and functional outcome at six months post-stroke. As is the case in many studies predicting outcome or recovery gender was included as a factor to predict outcome (De Wit *et al*., 2006). In addition to this, to see whether level of education influenced the outcome, as found in the CERISE study, this variable were also included.

2.8 Rehabilitation of stroke patients in South Africa

In South Africa state funded acute care and rehabilitation facilities for stroke patients are limited (Fritz, 2006a). There is only one stroke unit at a tertiary, academic hospital in the whole of South Africa (Connor, 2006). The Western Cape Rehabilitation Centre, an inpatient facility provides rehabilitation

services to patients with various diagnoses living in the Western Cape and surrounding provinces (Provincial government of the Western Cape, 2007). Rhoda (2002) found that the majority of patients referred to a community-based centre received mainly outpatient services in the acute stage.

Hale and Eales (2001) conducted a survey to determine the best perceived physiotherapy approaches for stroke rehabilitation in South Africa. The respondents in this study advocated for the use of stroke units, although some of them acknowledged home-based rehabilitation as an appropriate setting for stroke patients. However, they highlighted financial and time constraints as some of the challenges that could be faced when attempting to rehabilitate stroke patients in their homes (Hale and Eales, 2001). Financial constraints were also identified as a reason for patients not attending outpatient appointments (Whitlaw, Meyer, Bawa and Jennings, 1994). Lack of transport and an inability of family members to provide escorts were other factors limiting attendance of outpatient therapy services. The authors recommended the development of community-based services as an alternative to high-cost hospital-based services. A few other challenges to the provision of physiotherapy services for stroke patients were indicated by Hale and Wallner (1996). Challenges include high levels of crime that hinder accessibility of health professionals to certain communities where these services are required. From the above it is clear that there is a need to improve and increase the acute care and rehabilitation facilities for stroke patients in South Africa especially in the public sector (Connor, 2006b).

2.9 Links with other studies

During the implementation of this study the researcher liaised with other researchers who were in the process of conducting stroke rehabilitation outcome studies. One of the studies was the Collaborative Evaluation of Rehabilitation in Stroke across Europe (CERISE). The overall aim of the CERISE study was to compare the rehabilitation process and patient outcomes. In doing so the study aimed to define the components of stroke rehabilitation practices that are important for the recovery of patients (De Wit, 2006). A number of objectives were developed to address the aim of the study. These objectives were (De Wit, 2006: 10):

- "Use of time of stroke patients during their stay in the rehabilitation centres";
- "the content of individual physiotherapy and occupational therapy sessions for stroke patients";
- "the prevalence of depression and anxiety, their time course and predictive factors"; and
- "the motor and functional recovery patterns until six months after stroke incident".

A number of studies were conducted to achieve the objectives of the CERISE study. To determine 'use of time', 60 stroke patients were randomly selected from each centre and observed at 10 minute intervals using behavioural mapping. The content of physiotherapy and occupational therapy was determined by the video recordings of physiotherapy and occupational therapy sessions of 15 stroke patients per centre. The content of the therapy was recorded using a validated and reliable scoring list. To assess motor and functional recovery of the patients, and anxiety and depression experienced

by the patients a total of 532 consecutively selected stroke patients were recruited. One hundred and thirty-five first-ever stroke patients were recruited from three of the centres that were situated in the United Kingdom, Germany and Switzerland and 127 patients were recruited from a fourth centre that was situated in Belgium. The inclusion criteria applied in the CERISE study were:

1) A first-ever stroke as defined by the World Health Organisation,
2) Ages 40–85 years,
3) A score on the Rivermead Motor Assessment – gross function ≤ 11, and/ or score on leg and trunk function ≤ 8, and/ or score on arm function ≤ 12 on admission to the centre.

Patients were excluded from the CERISE study if:

1) They had other neurological impairments with permanent damage.
2) They presented with stroke-like symptoms due to subdural haematoma, tumour, encephalitis or trauma.
3) They had a pre-stroke Barthel Index < 50.
4) They were admitted to the centre more than six weeks post-stroke, and
5) There was no informed consent.

In this part of the CERISE study a number of standardised outcome measures were administered at admission to the centre, discharge, from the centre, as well as at two, four and six months post-stroke. The outcome measures that were included and administered at different assessment periods included the National Institute of Health Stroke Scale, the Barthel Index, the Rivermead Motor Assessment Scale, the Nottingham Extended Activities of Daily Living Scale, the Hospital Anxiety and Depression Scale, the EQ-5D, the Caregiver

Strain Index and the Sickness Impact Scale. In addition demographic and baseline clinical data were collected on admission.

The researcher liaised with a researcher who conducted an outcomes study at the Western Cape Rehabilitation Centre (WCRC). The aim of this study was "to describe the pattern of recovery and outcome at six months post-stroke in first-ever stroke patients accessing the Western Cape Rehabilitation Centre. A secondary aim that was explored in this study was the effect of certain selected factors of interest on outcome …" (Rouillard: 2006:5). Both the study conducted by the researcher and the WCRC study used similar outcome measures, as well as the inclusion and exclusion criteria applied in the CERISE study. With regard to inclusion criteria only the age ranges were different because people in South Africa tend to suffer stroke at a younger age; hence the ages to be included were between 18–85 years. The outcomes were also measured at similar time periods post-stroke. To address the main outcomes relating to motor and functional recovery as well as quality of life the same outcome measures were used.

By using the same outcome measures and measurement instruments, the researcher would be able to compare the results of the study with studies conducted in developed countries. Although the CERISE study was conducted at an inpatient setting, it was difficult to compare or base the study on an outpatient study conducted in a developed country as outpatient services in these countries differ greatly from those in South Africa, and specifically in the Western Cape. By liaising with the researchers from the CERISE study the researchers were able to receive training in the use of some of the measures, and more specifically the use of the scoring list that

was used to score the video recordings. The use of similar instruments and assessment periods as those used in the WCRC study would allow for a comparison of results between patients accessing inpatient settings and those accessing outpatient settings in the same research setting. Specific patient characteristics would be considered, that is, a case mix analysis, before any comparisons and conclusions from these would be done.

2.10 SUMMARY OF LITERATURE FINDINGS

In Chapter 2 the researcher summarises a review of relevant literature in order to gain an understanding for the need to implement the study. The literature reviewed includes the burden of stroke globally with an emphasis on the rehabilitation of stroke. The incidence and prevalence of stroke presented in this review indicated that stroke could differ in different parts of the world and that more stroke epidemiological studies are needed in sub-Saharan African countries.

With regard to rehabilitation, the SPO model is presented as a conceptual framework for the study. Therefore, the literature review includes rehabilitation structural issues that are described in relation to settings, as well as rehabilitation process issues, that include the interventions, content and intensity of physiotherapy. With regard to the structure of rehabilitation, it is recommended that all stroke patients be managed in a stroke unit immediately post-stroke. Patients with mild to moderate strokes could be discharged from hospital earlier if an organised multi-disciplinary stroke team were available to provide continued rehabilitation in the patient's community. With regard to day hospital rehabilitation, some positive effects have been

found but these were not supported by randomised controlled trials. However, there is some supportive evidence for rehabilitation that occurs in the patients home.

The rehabilitation process issues relate to the starting time of rehabilitation, the intensity and the content of therapy. Studies indicated that an increased intensity of therapy would result in improved functional outcomes, but no specific physiotherapeutic approach was been found to be superior to the other. It is also recommended that rehabilitation should proceed as soon as possible post-stroke.

The rehabilitation outcomes are presented within the framework of the International Classification of Functioning, Disability and Health (ICF). There was a high degree of consensus in the body of literature relating to the impairments, activity limitations and participation restrictions that occur post-stroke. A number of factors that influence these outcomes have however been identified in the literature. These include level of impairment and activity at stroke onset and urinary incontinence. Information regarding the factors influencing outcome assist in provision of appropriate care.

Making a comparison of the results of stroke outcome studies remain a challenge due to variances in the socio-economic status, geographical location and access to health care of the study subjects. Factors that also render a comparison of data problematic is the heterogeneity of the study population, times of assessment and follow-up, the assessment tools used and the methods used to analyse the data. A number of authors have

highlighted the need to standardise some of these variables in order to improve the available evidence for stroke rehabilitation.

From the review of the literature, it becomes evident that there are four major concerns or gaps in the stroke rehabilitation literature. Firstly, despite the similarities in the aetiology of stroke, research into rehabilitation has been uncoordinated with a lack of consensus on the core constructs, an operational definition of variables and outcomes and most suitable methodologies that could be implemented across contextual variations. In short, this makes comparison and generalisation of findings difficult.

Secondly, randomised clinical trials have not been sufficiently conceptualised to identify the components of the interventions and the curative factors integral to favourable outcomes in the examined settings of the respective studies. Thus the significant findings are of a summative nature with reduced external validity.

A third area of concern in the literature was the contextual inappropriateness of findings and recommendations for South Africa where resources are limited, lower indices of patient advocacy persist, the complexity of co-morbid clinical presentations, as well as great variation in access to medical services due to economic and socio-political factors.

Fourthly, there is incompatibility or inconsistency between baseline practices regarding stroke rehabilitation in South Africa and internationally, for example, differences in hospitalisation during the acute phase and varying lengths of

stay. Furthermore, in South Africa decisions about hospitalisation are informed by multiple factors including, but not limited to the level of disability and acuity of stroke. In short, larger percentages of stroke patients access outpatient rehabilitation as exclusive or continued treatment in South Africa than in First World countries. Outpatient rehabilitation services in South Africa are not necessarily dedicated to stroke patients, but serve a larger and more diverse clinical population. Given this context, the outcomes of outpatient rehabilitation of stroke patients in particular are not well documented and researched. Consequently, the need for more contextualised research on outpatient stroke rehabilitation services becomes more evident. The study attempts to address this need by evaluating the structure, process and outcome of stroke rehabilitation in a South African outpatient setting.

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

In this chapter, the researcher describes the quantitative methodologies of data collection and analysis employed in the study. The study was conceptualised as having three distinct parts that incorporate different research designs, namely, survey research, longitudinal observational and cross-sectional studies. Part One reports on survey techniques that address the research questions relating to the structure of rehabilitation. The longitudinal observational study that addresses the research questions relating to the outcome of rehabilitation is described in Part Two. Part Three outlines the cross-sectional, observational study that addresses the research questions relating to the process of rehabilitation. In each part the sample, instruments used to collect data, procedure and methods used to analyse the data are described. It is important to note that the research setting (3.2) and ethical considerations (3.6) are the same for all three parts of the study and hence these are described for the overall study.

3.2 RESEARCH SETTING

The study was conducted at Community Health Centres (CHCs) in the Metropole Region of the Western Cape. The Metropole Region of the Western Cape is divided into eight health districts in which there are 39 CHCs. Stroke rehabilitation services are offered at 20 of these CHCs. Therefore, the rehabilitation setting comprises these 20 centres. Community Health Centres (CHCs) are seen as the foundation of the National Health System in South

Africa (ANC, 1994). The multi-disciplinary staff at CHCs may include physiotherapists, occupational therapists, doctors, nurses, social workers, radiographers, pharmacists and dieticians. Comprehensive services including health promotion, preventive care, curative care and rehabilitative care are offered at CHCs. Services provided may also include, but are not limited to, mother and child care, immunisation, family planning, counselling for sexually transmitted diseases (STDs), treatment for minor trauma and locally prevalent diseases, oral health care, the follow-up treatment and rehabilitation of people with chronic disorders or disabilities, counselling and mental health services, as well as primary welfare care. CHCs are the first point of entry into the health care system and are also referral centres for patients treated at secondary and tertiary institutions.

Patients with neurological impairments are the second largest group treated by physiotherapists at CHCs (Personal communication C De Wet Chief Physiotherapists, 2005). Of these, stroke patients form the largest group. There are no specific criteria for admission to these centres and stroke patients are therefore at varying levels of functioning and severity post-stroke. Rhoda and Hendry (2003) found that the majority of stroke patients referred to these centres are in the acute or sub-acute stage post-stroke. At these centres the patients may receive rehabilitation involving more than one type of service. However, professionals providing these services are not necessarily functioning as a co-ordinated team with a common goal of treatment (Rhoda, 2002).

3.3 PART ONE: STRUCTURE OF REHABILITATION

Part One presents the methodology used in an attempt to answer the research questions related to the structure of rehabilitation at Community Health Centres in the Western Cape. As mentioned in the literature review, the structure of stroke rehabilitation is defined as resources (staff and equipment) available for stroke rehabilitation.

3.3.1 Design

A cross-sectional survey of all therapists employed at the 20 CHCs offering rehabilitation care in the Metropole Region of the Western Cape was used to collect data relating to the structure of stroke rehabilitation at these centres. When conducting the survey research, the researcher assumes that meaningful information could be obtained from the identified research sample (Domholdt, 2000). Therefore, in this type of research the researcher relies on self-report information from participants as opposed to observations or measurements taken by researchers (Domholdt, 2000). Self-administered or interview questionnaires are often used to collect data in surveys. The cross-sectional survey design was deemed to be appropriate for the study. The therapists could provide the most meaningful information about the structure of rehabilitation for stroke patients at CHCs by completing a self-administered questionnaire.

3.3.2 Sample

The sampling frame for this part of the study comprised of all therapists deployed at CHCs providing stroke rehabilitation in the Metropole Region of

the Western Cape. A non-probability sample, specifically a convenience sample, was used because therapists were selected on availability. The small number of therapists made it possible to select the entire sampling frame for inclusion in this survey.

3.3.3 Instrumentation

A self-constructed questionnaire was used to collect data relating to the structure of rehabilitation (Appendix 3). This questionnaire was developed by the researcher based on a taxonomy developed by Hoenig *et al*. (2000) to assess structure and the process of rehabilitation. The questionnaire consisted of two sections: Section A requested information relating to the demographic status of therapists (e.g. gender, centre, highest qualification, year of qualification); and Section B requested information regarding the services and equipment available at the centres, as well as the co-ordination of care. The co-ordination of care included the occurrence of team meetings, the use of standardised evaluation and documentation forms, the use of standard guidelines and the most common techniques used. Three reviewers with extensive experience in the field of neurological rehabilitation provided feedback about the content validity of the questionnaire. The basis for their collective expertise included, but was not limited to, clinical practice, research and publication, teaching, as well as community-based intervention in neurological rehabilitation. The reviewers concurred that the questionnaire appeared to be valid in terms of its content and made minor editorial changes. In addition, the questionnaire was sent to five therapists who did not form part of the sampling frame for completion and commentary on ease of administration, logical flow, clarity of items and face validity. Their feedback

was that the questionnaire appeared to deal with the proposed aims and objectives of the survey and was easy to complete as a self-report measure.

3.3.4 Procedure

Once permission was obtained from the Senate Research Grants and Study Leave Committee of the University of the Western Cape and the medical superintendent of the Community Health Services Organisation (Appendix 1), the researcher attended one of the monthly meetings of Community Health Centre therapists to present the study proposal and highlight the aims, objectives and significance of the study. Given the small sample size and the familiarity of the researcher to the study participants, it was possible for the researcher to identify the respondents from the responses to items on the questionnaire. The researcher thus negotiated with would-be participants that anonymity would be ensured in the communication of the results. The benign and non-personal nature of the items further encouraged participation and consent, despite possible identification.

The therapists' questionnaires were either hand-delivered or posted to the different centres together with a consent form (Appendix 2) and an information sheet, as well as a self-addressed stamped envelope for the return of the questionnaire. The researcher followed up non-respondents telephonically after three weeks to encourage participation with a view to increasing the overall response rate to the survey.

3.3.5 Data analysis

The data were captured and analysed using Microsoft Excel. Data relating to the structure of rehabilitation was summarised using descriptive statistics and presented as frequencies and percentages.

3.4 PART TWO: OUTCOME OF REHABILITATION

This part presents the methodology used to answer the research questions related to the outcome of rehabilitation at Community Health Centres in the Western Cape. To address the objectives stated in Chapter 1, the participant outcomes relating to their impairments, activity limitations, participation restrictions and quality of life were assessed at baseline, two months post-stroke and six months post-stroke.

3.4.1 Design

A longitudinal observational study was used to collect the data relating to the outcomes of stroke rehabilitation at CHCs in the second part of the study. The study was also longitudinal in nature because it obtained follow-up data over a period with outcomes observed at three time points and at one specific point as is the case in cross-sectional studies. In the study the outcome data was collected at baseline, two months and six months post-stroke. In addition to it being longitudinal, the study was also observational and non-experimental. Smith and Smith (2003) assert that observational studies allow the investigator to describe, analyse and interpret the situation as it exists without any attempts being made to influence it in any way. Such a study design is appropriate for this part of the study, as the researcher describes and

analyses rehabilitation outcomes following an existing rehabilitation programme provided by therapists at CHCs.

A brief exposition of the advantages and challenges in longitudinal observations follows. Threats to internal validity are commonly minimised and even controlled by adding a control group, using randomisation and establishing baselines, as well as multiple or longitudinal observations. In this part of the study, control groups and randomisation were not feasible given the nature of the topic. However, the documentation of stroke outcomes following rehabilitation can be tracked meaningfully over time while using baseline data and follow-up observations to partial out rival hypotheses such as spontaneous recovery. Longitudinal observational studies have also been found to be useful in identifying predictors of outcome. In the study, this design afforded an opportunity to predict the outcome of stroke at two and six months post-stroke.

One of the major disadvantages of longitudinal studies is the loss of participants to follow-up as a result of attrition or mortality. If the subjects who drop out of the study are significantly different to those who remain in the study, sources of systematic error or bias could potentially be introduced (Howell, 2008). Munro (2001) argues that the impact of attrition on significance testing can be addressed by employing a mixed effects regression model to analyse the data. A more detailed discussion of this model is presented in the analysis section (3.4.6).

3.4.2 Sample

This section of the study incorporated a conveniently selected, non-probability sample. In non-probability sampling the participants are not randomly selected, meaning that not every stroke patient had an equal chance of being included in the sample (Domholdt, 2000). A non-probability sampling method is commonly used in physiotherapy research due to the small numbers of patients available in specified settings. The researcher aimed to recruit stroke patients attending CHCs for rehabilitation who met very specific criteria. Therefore, a convenience sample of stroke patients who met the inclusion criteria was consecutively recruited into the study. The inclusion and exclusion criteria used to select the participants were as follows:

3.4.2.1 Inclusion criteria

Patients were included in the study if:

1 They had suffered a first-ever stroke as defined by the World Health Organisation (WHO, 1989); patients who had suffered a previous stroke would be excluded as they could have impairments as a result of the previous stroke.

2. They had Rivermead Motor Assessment (RMA) scores as follows: Rivermead Motor Assessment – Gross function (RMA-G) ≤ 11; and/or Leg and trunk function (RMA-LT) ≤ 8; and/or Arm function (RMA-A) ≤ 12 on admission to the CHC. This meant that the participants still had some degree of motor impairment (Lincoln and Leadbitter, 1979).

3.4.2.2 Exclusion criteria

Patients were excluded from the study if:

1 They were < 35 and > 85 years of age.

2 They had other neurological impairments with permanent damage, such as a previous head injury or spinal cord injuries. These patients would be excluded as the impairments assessed need to be specifically as a result of a stroke and not as a result of a stroke combined with another condition.

3 They had stroke-like symptoms due to sub-dural haematoma, brain tumour, encephalitis or trauma, since the aim of the study is to investigate patients with stroke and not those with other cerebral conditions.

4 A period of more than six weeks had lapsed since the occurrence of the stroke. In patients with mild stroke, recovery could occur as early as six weeks post-stroke (Jorgensen, 1995a).

5 They had a pre-stroke Barthel Index Score of < 50. Patients with a pre-stroke Barthel Index score would be dependent on others for certain activities of daily living (Shah *et al.*, 1992).

6 The patient or family did not provide informed consent.

A non-probability sampling method was used whereby not all stroke patients had an equal opportunity to be included in the study as already mentioned in section 3.4.1. Hence, the sample size is not based on population size but on other factors. Consequently, the use of regression analysis guided the

determination of sample size. When conducting regression analysis the literature recommends that for every one dependent variable at least ten independent variables are needed (Munro, 2001). The researcher identified eight specific variables from the literature (Kwakkel *et al*., 2006, Tilling *et al*., 2001; Meijer *et al*., 2003) that predicted motor and functional outcome post-stroke. Thus, a total of 80 participants would be sufficient as the proposed data analysis included parametric statistics that are more robust when the sample includes at least 50 participants. The study was longitudinal and recruitment spanned a two year, five month period from June 2005 to November 2007 due to the rate of presentation of stroke patients at CHCs as previously mentioned. The researcher had to plan for dealing with attrition due to drop-out and therefore decided to recruit 100 participants which would be sufficient for the statistical analysis anticipated and to address drop-out effect.

3.4.3 Instrumentation

Two questionnaires and six standardised outcome measures were used to collect data for this part of the study. One of the questionnaires collected information relating to socio-economic status and the other was used to collect bio-demographic data. The six standardised outcome measures were used to collect data relating to the impairments, activity limitations and participation restrictions experienced by the participants as discussed below.

3.4.3.1 Questionnaires

3.4.3.1.1 Socio-economic status (Appendix 4)

A self-constructed questionnaire adapted from Putman *et al*. (2007) was used to collect data relating to the socio-economic status of participants. This included a number of variables, such as highest educational level achieved, employment status, number of members in the family and total family income. This questionnaire was essentially a self-report and no formal proof or documentation was requested to support the self-report. When scoring the educational level of the participants Sub A[2] to Std 5 was regarded as the primary level of education; Std 6 to Std 10 as secondary education; and Std 8 with a diploma or certificate to tertiary education with a doctorate was classified as tertiary level of education. The income levels of the participants were also classified into high and low income levels with participants with an income of ≤ R1000 being in the low income group and those with an income of > R1000 being in the high income group.

3.4.3.1.2 Bio-demographics (Appendix 5)

The researcher developed a bio-demographic instrument based on studies by other researchers (Mayo *et al*., 1999; Kalache and Aboderin, 1995; Bonita, 1992; Hayn, 1997). The questionnaire collected data relating to the demographic characteristics (age and gender) of the participants, information relating to the stroke (date and side of brain where stroke occurred, side of impairment, how the diagnosis was made), as well as data relating to the risk factors or associated illnesses. The instrument allowed for the capturing of

[2]Pre-1998 school years

data relating to the referral process, how the patients accessed the CHCs and who primarily cared for the participant at home.

3.4.3.2 Standardised outcome measures

Six standardised outcome measures were used to assess the following dimensions: 1) Impairment, 2) Activity, 3) Participation and 4) Quality of life.

The tools that were used in the study are mentioned below. The researcher provided some motivation for the use of the specific tools. The descriptions, as well as information about the validity and reliability of the tools are presented in section 2.5.6.

3.4.3.2.1 Impairment measures

The National Institute for Stroke Health Scale (NIHSS) (Appendix 6) was used to determine the impairments of the participants. This scale determines the severity of stroke, a factor which could provide information relating to the severity of patients with stroke accessing CHCs. The NIHSS also provides information about a variety of impairments including cognitive, language, movement and sensory impairments. In addition to the NIHSS, the Rivermead Motor Assessment (RMA) (Appendix 7) was used to collect data relating to impairments. The RMA is a tool that specifically measures motor performance and could be seen to expand on the information relating to motor performance identified in the NIHSS.

3.4.3.4.2 Activity measures

The Barthel Index (Appendix 8,9,10) and the Nottingham Extended Activities of Daily Living Index (Appendices 11, 12, 13) were used to measure activity limitations of the participants. The Barthel Index is widely used in stroke rehabilitation and its use could assist with comparing outcomes of stroke patients with similar inclusion criteria (Rouillard, 2006). The Barthel Index only takes 5–10 minutes to complete and the information could be obtained through self-report from a reliable source that does not necessarily have to be the patient. To expand on the activities measured by the Barthel Index the Nottingham Extended Activities of Daily Living Scale was used to measure the instrumental activities of daily living. These instrumental activities assist the participants to function in the environment outside of their homes and to conduct household activities. Hence, the activities included in the tool should be culturally acceptable and include activities that are appropriate to the setting. After viewing the tool the researcher found that the majority of the items included were appropriate to the research setting.

3.4.3.4.3 Participation measure: The Modified Rankin Scale (Appendices 14, 15, 16)

In the study the Modified Rankin Scale (MRS) was used to measure participation. Although the Modified Rankin Scale is a measure of global disability and not specifically participation, the motivation for the use of this tool by the researcher related to the participation domains such as work, family responsibilities and leisure and social activity that were included in the structured interview of the MRS. In this section these domains are expanded

and the individual's involvement in these roles prior to stroke, the ability to continue with these roles as before or to a lesser degree is investigated. This information was relevant as it goes beyond just being or not being involved in the roles.

3.4.3.4.4 Quality of life measures

The EQ-5D (17,18,19) was used to determine the quality of life of the participants. Constructs used to determine quality of life could be quite specific to the setting. It is also important that these documents are translated correctly to capture the constructs correctly. The EQ-5D had gone through a rigorous translation process and had been implemented successfully in different communities in the Western Cape. Therefore, the researcher was convinced that it could be used successfully to determine the quality of life of patients with stroke in the Western Cape.

The tools mentioned above were used in both the Collaborative Evaluation of Rehabilitation in Stroke across Europe (CERISE), as well as the Western Cape Rehabilitation Centre (WCRC) studies and this further motivated the use of these tools in the study. The use of the same measuring instruments would facilitate a comparison of the results.

3.4.3.3 Translation of the questionnaires

The measures of self-report which included the Extended Activities of Daily Living, Barthel Index and the Modified Rankin Scale were translated from English to Afrikaans by the staff of the Writing Centre at the University of the

Western Cape (UWC). Translation from Afrikaans back into English was done by two social sciences graduates who both have experience in translations. Neither of the translators had prior knowledge of the tools or a background in the medical profession. A consensus meeting was then held between the researcher and the researcher involved in the WCRC study. Certain terminology seemed inappropriate for the specific population and alternative words were suggested. The words suggested by the researchers were referred back to the two translators. Consensus was reached before they were included in the questionnaire. The translations from Xhosa into English were done by a lecturer in the Xhosa Department at UWC. The translation from Xhosa back into English was done by another lecturer of the same department. These translators also did not have prior knowledge of the tools or a background in the medical profession. The Xhosa-speaking research assistants ensured the correct Xhosa terminology, which was tested during the pilot study. A Xhosa (Jelsma, Mkoka, Amosun & Nieuwveldt 2004a) and Afrikaans (Jelsma &Ferguson, 2004b) version of the EQ-5D was already available; hence, the translation of these tools was not necessary.

3.4.4 Pilot study

Two separate pilot studies were conducted. The first study piloted the NIHSS and the RMA which were the observer-scored standardised outcome measures. The second study piloted the two questionnaires and the self-report standardised outcome measures.

3.4.4.1 Piloting of NIHSS and RMA

These measures involved an observer scoring an observed task. A sample of 15 stroke patients admitted at the WCRC was used for this pilot study. For English and Afrikaans-speaking patients the researcher conducted the test, while for the Xhosa-speaking patients the Xhosa-speaking research assistant gave instructions to the patients while the researcher scored the subjects' performance. The pilot study was done to familiarise the researcher with using the tools within a South African situation and to acquaint the Xhosa- speaking assistant to provide instructions when needed.

3.4.4.2 Piloting the questionnaires and measures of self-report

Three Afrikaans-speaking and three Xhosa-speaking stroke patients per questionnaire were interviewed during this part of the pilot study. The names and contact details of patients who could be included in the pilot study were obtained from the therapists at the CHCs. The aim of the pilot study was explained to the patients and those who consented to participate were interviewed at their homes. The aim was to familiarise the researchers with the use of these tools and to see whether any additional changes needed to be made to the content of the translated questionnaires. The researcher administered the English and Afrikaans questionnaires and standardised measures while a Xhosa-speaking research assistant administered the Xhosa questionnaires. This process also assisted in determining how long it would take to complete the questionnaires. No changes were needed to the questionnaires following this section of the pilot study.

3.4.5 Procedure

Permission to conduct the study was obtained from the medical superintendent of the Community Health Services Organisation and ethical clearance was obtained from the Senate Research Grants and Study Leave Committee at the University of the Western Cape. To inform the therapists working at the CHCs about the study, the researcher attended one of the monthly meetings of the CHC therapists. At this meeting the researcher presented the study proposal and highlighted the aims, objectives, significance of the study, as well as the ethical considerations that would be adhered to during the implementation of the study. The therapists were informed that they would be contacted on a weekly basis to enquire about new patients with stroke who had suffered a first-ever stroke and who had suffered their stroke not more than six weeks ago.

Before recruiting participants to be included in the study, the researcher spent a week receiving training in the application of the measurement tools from researchers who were linked to the CERISE. This training occurred at the Department of Rehabilitation Sciences, Katolieke Universiteit Leuven in Belgium. Professor DeWeerdt and Dr Liesbet De Wit, co-ordinators of the CERISE project, observed data collection techniques applied in the study during a visit to South Africa in October 2005. This assisted with ensuring standardisation of data collection techniques needed when results are being compared.

The pilot study was conducted once the instruments were translated and the researcher had been trained. Following this the researcher, contacted the CHCs for the names of patients who had suffered a first-ever stroke and were newly admitted to the centres. Once the names and contact details of eligible patients were obtained they were contacted and an appointment was set up. In cases where telephone numbers were not available, the researcher or research assistants went to the patient's home. The aim of the study was explained to the patient and in some cases the patient's family or caregiver. The patients were invited to participate in the study and were asked to give written informed consent. In cases where the patient was not able to give written informed consent, a family member was approached. Where written informed consent was obtained, the patients were assessed to see whether they met the inclusion criteria. If the patient was eligible to be included in the study, the necessary baseline questionnaires were completed (see table 3.1) by the researcher or the research assistant. The bio-demographic questionnaire was completed first, followed by the NIHSS and then the RMA. Once these observer-rated tools were completed, the researcher continued to complete the other self-report questionnaires. Once the researcher had finished collecting the baseline data, the participants were informed that they would be contacted for an appointment for the two and six month follow-up assessments.

The two and six monthly follow-up assessments were done by the same researcher or assistant who had conducted the baseline assessments within a window period of seven working days either before or after the actual two month or six month post-stroke date.

Table 3.1 summarises the schedule for the administration of the different questionnaires and standardised outcome measures at the assessment periods in this part of the study.

Table 3.1 Administration schedule

	Timeline		
Instrument	**Baseline**	**Two months**	**Six months**
Socio-economic questionnaire		X	
Bio-demographic questionnaire	X		
NIHSS	X		
RMA	X	X	X
BI	X	X	X
NEADL		X	X
EQ-5D		X	X
MRS	X		X

NIHSS = National Institute of Health Stroke Scale, RMA = Rivermead Motor Assessment Scale; BI = Barthel Index; NEADL = Nottingham Extended Activities of Daily Living; EQ-5D = Euroqol; MRS = Modified Rankin Scale

3.4.6 Data analysis

The data were captured and analysed using the Statistical Package for Social Science (SPSS) and Statistical Analysis System (SAS). To ensure correct capturing, the data were entered twice and compared using the COMPARE procedure in SAS. The Shapiro Wilk W test was used to assess normality of the data. Both descriptive and inferential statistics were used to analyse the data.

3.4.6.1 Descriptive statistics

Frequencies of the different socio-demographic and rehabilitation outcome variables were determined. These frequencies related to data collected at baseline, two months and six months post-stroke. These frequencies were presented in the form of means and standard deviations or medians and inter-quartile ranges depending on the distribution of the data.

3.4.6.2 Inferential statistics

A mixed effects regression model was used to determine the difference between the scores of the Rivermead Motor Assessment Scale, as well as the scores of the Barthel Index at the different assessment periods. This model allows for the inclusion of all cases in the analysis irrespective of the loss to follow-up. Hence, an intention-to-treat analysis was adopted. A p-value of 0.05 was considered for tests of significance.

To determine the factors influencing motor (impairment) and functional (activity) outcomes at six months, the three estimates of the Rivermead Motor Assessment were used as outcome measures or dependent variables for impairment, that is, RMA-G, RMA-LT and RMA-A and the Barthel Index was used as an estimation of activity. From the reviewed literature (Putman *et al.*,2007; Teasall *et al.*, 2007; Kwakkel *et al.*, 2006; eight independent variables were identified as critical predictors: 1) age, 2) gender, 3) urinary incontinence, 4) swallowing problems, 5) number of hours in therapy, 6) level of education, 7) initial value of the outcome parameter, and 8) dysarthria. These predictor variables were included in a multiple regression where they could compete with each other to determine what the unique semi-partial contributions of the respective predictors would be. To ensure that the proposed analysis had sufficient power or was robust, a closer examination of drop-out cases was conducted. The participants who died of cardiovascular causes were retained in the sample for analysis and an imputed score of zero (0) was assigned for the outcome measurements at six months. Participants lost due to drop-out were considered for retention on the basis of mean

comparison tests to determine whether this group differed significantly from the non drop-out group in terms of age, NIHSS (stroke severity) and gender.

3.5 PART THREE: PROCESS OF REHABILITATION

The process issues that were addressed were the type of services received, the number of speech, occupational and physiotherapy sessions received and the content and intensity of physiotherapy.

3.5.1 Design

An observational cross-sectional study design was used to collect data for this part of the study. A description of observational and cross-sectional studies is provided in sections 3.3 and 3.4 of this chapter.

3.5.2 Sample

The study sample used to collect the data relating to the services received, the number of therapy sessions and the intensity of physiotherapy was the same sample used in the Part Two of this thesis. In order to collect data relating to the content of physiotherapy a purposive sample was selected from these 100 participants. The inclusion criteria used to select the participants to determine the content of physiotherapy was based on the RMA-G scores. The aim was to select patients who presented with a motor deficit that could be classified as mild, moderate or severe according to the RMA-G score. Hulley and Cummings (1988) recommend that 10% of the original sample would suffice for selecting a representative sample.

3.5.3 Instrumentation

In this part of the study three methods of data collection were used. These were questionnaires, archived records and video recordings.

3.5.3.1 Use of Care Questionnaire

A structured interview questionnaire, named the Use of Care Questionnaire was completed at two and six months post-stroke, was used to collect information relating to the services received by the participants. The Use of Care Questionnaire was adapted from a questionnaire developed by Putman, (2006) for use in the CERISE study. This questionnaire was used to determine the services the participants received between baseline and two months, as well as between two months and six months post-stroke respectively (Appendices 20, 21 22 and 23, 24, 25).

In the study the two month questionnaire consisted of four sections and the six month questionnaire consisted of five sections. Sections 1–4 were the same in both questionnaires completed at two and six months post-stroke. Section 1 of the questionnaire determined the participant's general status and interaction with family and social contacts. Section 2 included questions relating to the use of medical services. Section 3 investigated the participant's mobility in and outside the home. Section 4 focused on the home environment. Section 5 of the six month questionnaire included questions relating to return to work and productivity.

3.5.3.2 Archived records (data extraction sheet)

The patient registers and physiotherapy notes were used to extract data relating to the intensity and duration of therapy. Data that were extracted from the therapists' documents and participants' records were: the participant's name, research identification number, date of admission to centre, date of discharge or date last seen and the number of physiotherapy, occupational therapy and speech therapy sessions, as well as the duration of physiotherapy treatment sessions.

3.5.3.3 Video recordings

The researcher made video recordings of actual live physiotherapy sessions conducted by the physiotherapist treating the patient.

To define the content of physiotherapy, the video recordings were analysed using a scoring list developed by De Wit *et al*., (2006) for use in the CERISE study. The scoring list consisted of 12 categories with 46 mutually exclusive sub-categories. The categories were: 1) mobilisation, 2) selective movements, 3) lying and lying balance, 4) sitting and sitting balance, 5) standing and standing balance, 6) sensory and visual perception, 7) transfers, 8) ambulatory activities, 9) personal activities of daily living, 10) domestic activities of daily living, 11) leisure and work related activities, and 12) miscellaneous.

De Wit *et al*., (2006) tested the inter-rater reliability of the scoring list. To do this four researchers who were part of the CERISE study, individually scored five physiotherapy and five occupational therapy sessions. The reliability

study was set up in four different rehabilitation centres: one in Great Britain, one in Belgium, one in Switzerland and one in Germany. A fifth researcher, who was independent to any of the rehabilitation centres that formed part of the CERISE study, scored all 40 tapes and her scores were compared with the scores of the other four researchers. The inter-rater reliability of the scoring list was then computed by the main researcher of the project and was found to be excellent for all categories ICC : 0.96–0.99).

3.5.4 Procedure

Data relating to the services received were extracted from the Use of Care Questionnaires completed at two and six months assessment periods. To collect data relating to the frequency of physiotherapy, occupational and speech therapy and the number of hours of physiotherapy, the researcher made an appointment with the therapists at a time that was convenient for the therapists and viewed the participants' records and the therapists' documents. In cases where the admission and discharge dates for physiotherapy and occupational therapy differed, the earliest and latest dates were recorded. The information relating to the frequency of therapy and the number of hours of physiotherapy was collected for each participant after the six month assessments had been conducted.

Participants who met the criteria and provided consent to be video recorded were requested to be recorded at one of their follow-up treatment sessions with the therapists at the CHCs.

3.5.5 Data analysis

The data were captured and analysed using Microsoft Excel. Data relating to the process of care were summarised using descriptive statistics and presented as frequencies and percentages.

3.6 ETHICAL CONSIDERATIONS

Ethical approval to conduct the study was granted by the Senate Research Grants and Study Leave Committee at the University of the Western Cape. Permission to conduct the study was also obtained from the medical superintendent of the Community Health Services Organisation. The aim of the study was explained to the participants and/or their families. The participants were provided with an information sheet Appendices 26, 27, 28). Written informed consent (Appendices 29, 30, 31) was obtained from all participants or their families where the participants could not provide consent due to communication problems or cognitive decline. The patients were assured of confidentiality and anonymity and they had the right to withdraw from the study at any stage. There was no obvious risk involved in participating in the study. Patients were referred to the appropriate medical professional at the CHC via the referring therapist if they needed any medical interventions. All interested parties will have access to the findings of the study.

3.7 SUMMARY OF CHAPTER

In this chapter, the researcher summarised the methodologies employed in this three-part data collection approach: Part One reported on a cross-sectional survey of therapists including physiotherapists and occupational

therapists. The researcher reported on the collection and analyses of data regarding the structure of rehabilitation. In Part Two the researcher reported on a longitudinal observational study on the outcome of rehabilitation using standardised outcome measures. Included are the sampling methods used and the statistical tests employed. Part Three described the process of rehabilitation using a cross-sectional observational study. In Part Three the use of records and video recordings to collect data were presented.

CHAPTER 4

RESULTS

4.1 INTRODUCTION

The chapter is organized into three sections in which the results answering the respective research questions (see 1.4) are presented. Where necessary, brief references are made to the statistical analyses employed. In Section A the researcher presents the results relating to the research questions about the structure of care. While in section B the findings about the outcomes of the rehabilitation of stroke patients at CHCs are presented. The researcher presents the findings relating to the process of stroke rehabilitation in section C.

4.2 SECTION A: STRUCTURE OF REHABILITATION

Results about the structure of rehabilitation included information regarding the infrastructure (staff and equipment) available at the CHCs that provided rehabilitation. Information included in this section also relates to team meetings to discuss the management of stroke patients and the use of guidelines when rehabilitating stroke patients. Tables summarizing data in this section refer to the CHCs as the unit of analysis (n=20), however, Table 4.1 below summarizes the demographic status of the therapists who provided the information (n=22). For two of the centres information was provided by both the physiotherapist and the occupational therapist working at the centre.

Table 4.1 Demographic status of therapists (n=22)

Variable	
Gender: number(%)	
male	4(18.2)
female	18(81.8)
Age: mean(SD)	32.5(8.28)
Number of years qualified median: (q1-q3)	6(3-13.2)
Qualification: number(%)	
diploma	1(4.4)
bachelor	19(86.5)
masters	2(9.1)

The majority of the therapists were females who had obtained a bachelors degree. The therapists had been qualified for a median of 6 years. Table 4.2 presents the distribution of physiotherapy and occupational therapy services and staff at Community Health Centres per district in the Western Cape Metropole.

Table 4.2 Distribution of therapy services per district

	Northern	Southern	Western	Tygerberg	Khayelitsha	Mitchell's	Klipfontein	Eastern	Total
Number of thousand of population per district	300	500	360	500	360	450	400	400	3270
Number of CHCs	4	5	5	7	4	4	5	5	39
Number of physiotherapists	1	2	2	2	2	1	4	2	16
Number of centres with physiotherapy services	1	3	2	3	3	1	4	3	20
Number of occupational therapists	1	1	0	2	0	0	1	1	6
Number of centres with occupational therapy services	4	3	0	4	0	0	3	2	16

From the table above it becomes evident that three districts did not have occupational therapists deployed and therefore did not offer occupational therapy services. It also illustrates that the occupational therapists and physiotherapists are providing services to more than one centre in the same district.

4.2.1 Number and percentage of staff and equipment available at the centres

The number and percentage of staff and equipment available at the centres as reported by the therapist when completing the questionnaires are presented in Table 4.3 and table 4.4 respectively.

Table 4.3 Services available at the 20 Community Health Centres in the Metropole Region of the Western Cape (n=20).

Services	Centres with services	
	n	(%)
Physiotherapists	20	(100)
Medical officer	20	(100)
Nurse	20	(100)
*Orthopaedic nurse	20	(100)
Physiotherapy assistants	1	(5)
Occupational therapists	10	(50)
Occupational therapy assistants	5	(25)
Rehabilitation workers	1	(5)
Home-based carers	14	(70)
Students (physiotherapy (occupational therapy, speech therapy)	10	(50)
Speech therapists	2	(10)
Psychologists	8	(40)
Dietician	16	(80)
Social workers	15	(75)
Other: (Health promoter and nutritional advisors)	10	(50)

* = Orthopaedic nurse = nurses who have been trained to follow-up persons with disabilities needs, e.g. wheelchair repairs

All the centres had physiotherapy (n=20), medical services (n=20) and orthopaedic nursing services (n=20) available. With regards to auxiliary rehabilitation services more occupational therapy (n=10) than physiotherapy assistants (n=1) were employed at this level with only 1 of the centres having the services of a rehabilitation worker. Fourteen centres offered home-based care.

Table 4.4 Equipment available for the 20 Community Health Centres in the Metropole Region of the Western Cape (n=20).

Equipment	Centres with equipment	
	n	%
Hot packs	20	100
Treatment couch	19	95
Mobility Assistive devices	19	95
Ultrasound	19	95
Wheelchairs	19	95
Ice	17	85
Weights	17	85
Gymballs	16	80
Treatment mats	16	80
Parallel bars	15	75
Mirrors	15	75
Interferential therapy	13	65
Stairs	9	45
Tens	9	45
Suspension therapy	8	40
Wall bars	6	30
Nebuliser	6	30
Suction machine	5	25
Short Wave diathermy	5	25
Wax	4	20
Orthoses	3	15
Functional electrical stimulation	2	10
Others	1	0.5
Rollers	0	0.0
Wedges	0	0.0
Hand splints	0	0.0
Materials to produce splints	0	0.0
Small balls	0	0.0
Springs	0	0.0
Pulley system	0	0.0

The majority of the centres (95%) had a Bobath plinth and assistive devices which included walking aids such as walking sticks, crutches and quadrupods. Gymballs and therapy mats were not available at 20% of the centres, while parallel bars and mirrors were not available at 25% of the centres. Only 2 (9.1%) of the therapists indicated having team meetings to discuss the rehabilitation of stroke patients, while 13 (59%) indicated making use of one

or other guideline when rehabilitating stroke patients. In short, equipment was not available in an equal manner at all the CHCs.

4.3 SECTION B: OUTCOME OF REHABILITATION

This section reports on the description of the sample of stroke patients and their impairments, activity limitations, participation restrictions and quality of life. The temporal changes in motor outcomes (impairments) and functional outcomes (activity limitations) are also reported. In addition, the results of regression analyses identifying significant predictors of motor outcomes and functional outcomes at 6 months are presented.

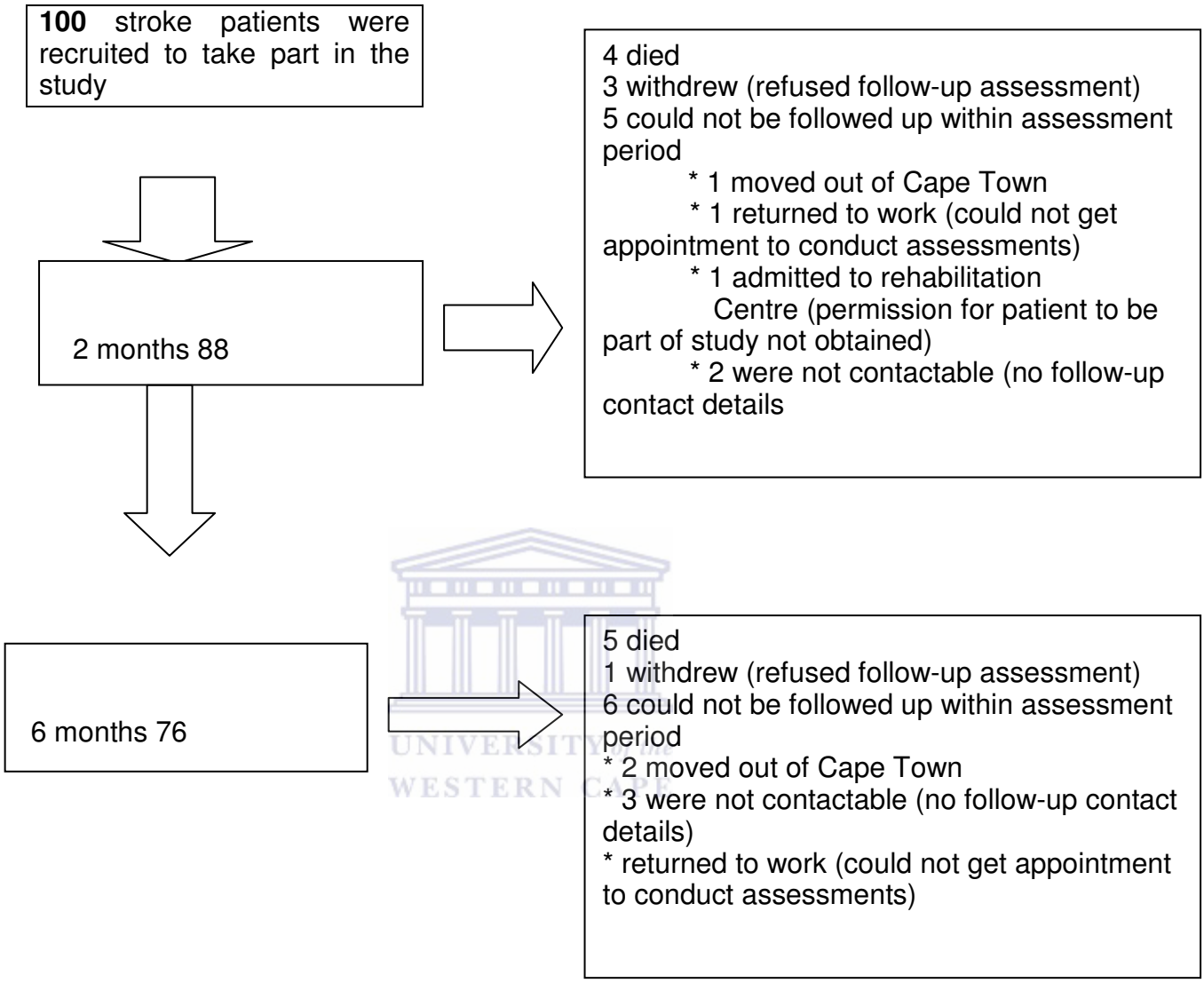
4.3.1: DESCRIPTION OF THE STUDY SAMPLE

The description of the participants includes recruitment, demographic and socio-economic status, the clinical picture, and risk factor profile. Premorbid levels of global disability (as estimated by the Modified Rankin Scale) and activity limitations (as estimated by the Barthel Index) are also presented.

4.3.1.1 Participant recruitment.

Figure 4.1 presents the results of participants recruited into the study over 29 months as well as those who dropped out at the 2 and 6 month assessment time points.

Figure 4.1 Results of participant recruitment



4.3.1.2 Socio-demographic and health profile of the participants

The results presented below include the age, gender, socio-economic and health status of the participants.

4.3.1.2a Age and gender of the participants

The study sample consisted of an equal number of males 50(50%) and females 50 (50%). The mean age of the population was 61.0 with a standard deviation of 10.55 and ages ranged from 36 years to 85 years.

4.3.1.2b Socio-economic Status of the participants

The socio-economics status of the participants assessed at the 2 month post stroke assessment period is only available for 88 of the participants. The following variables: level of education; employment status; non-employment status and monthly household income are stipulated in Table 4.5.

Table 4.5 Socio-economic status of the participants (n=88)

Socio-economic Status	number (%)
Level of education	
No formal education	9 (10.2)
Primary	44 (50.0)
Secondary	35 (39.8)
Tertiary	0 (0.0)
Current Employment Status	
Employed	31 (35.2)
Unemployed	57 (64.8)
Current Non-employment Status	
Pensioner	36 (40.9)
Unable to work due to disability/illness (Receiving grant / private insurance)	6 (6.8)
Unemployed preferred not to work	4 (4.5)
Unemployed looking for work	4 (4.5)
Unable to work due to disability / illness (No grant)	3 (3.4)
Other, specify	2 (2.3)
Looking after the home, no income	2 (2.3)
Monthly Household Income in South African Rand	
No Income	5 (5.7)
1 – 200	8 (9.1)
201 – 500	23 (26.1)
501 – 1000	35 (39.8)
10001 – 1500	10 (11.4)
1501 – 2500	6 (6.8)
2501 – 4500	1(1.1)
> 4501	0 (0.0)

A total of 10.2% of the participants had no formal education, while 50% of the participants had a low level of education and none of them had tertiary level of education (Stats SA, 2006). Of those who were unemployed 40.9% were receiving an old age or private pension. The results also revealed that 80.7% of the participants would be classified in the lower income bracket as they have a monthly family income of ≤ R 1000 (approximately US$ 90) (Stats SA, 2006).

4.3.1.3 Clinical picture of the participants at baseline

The clinical picture of the participants which includes the side of impairment post-stroke, the method of diagnosis, the type of stroke and the number of days post stroke at the time of assessment is illustrated in Table 4.6.

Table 4.6: Clinical Picture of participants (n=100)

Clinical Picture	Result
Side of impairment n(%)	
Left	56 (56.0)
Right	44 (44.0
Both	0 (0.0)
Diagnosis n (%)	
CT-scan	19 (19.0)
Clinical	81 (81.0)
Type of stroke n (%)	
Haemorrhagic	1 (1.0)
Ischemic	18 (18.0)
Indeterminate	81 (81.0)
Days post stroke	
Median (q1 – q3)	21 (15 -31)

The majority of the participants' diagnosis of their condition was made on a clinical basis. Of the 19 patients who were diagnosed following a CT scan, 18 had been diagnosed as having suffered an ischemic stroke. The baseline assessments of the participants were done within a median of 21 days post stroke with assessment days ranging from 4 to 42 days post stroke.

4.3.1.4 Risk factor profile of the participants at baseline

The presence of risk factors was obtained via self-report and in the case of hypertension confirmed by the use of anti-hypertensive medication. Although

the participants were using medication for their hypertension and diabetes it was beyond the scope of this study to ascertain whether these illnesses were controlled. Table 4.7 summarises the reported risk factors of all participants.

Table 4.7: Reported Risk factors of the participants (n=100)

Risk Factor	n%
Hypertension	90 (90.0)
Smoking (current)	54 (54.0)
Diabetes	46 (46.0)
Heart condition	22 (22.0)
Hyperliperdemia	8 (8.0)
Alcohol abuse	5 (5.0)
Previous Transient Ischaemic Attack	3 (3.0)
Oral Contraception	1 (1.0)
Peripheral vascular disease	1 (1.0)

The majority of the participants had hypertension (90.0%). More than half of the participants were smoking at the time of their stroke with almost half (46%) of them being diabetic.

4.3.1.5 Pre-morbid level of disability

The functional level and level of global disability of the participants prior to their stroke was determined using the Barthel Index and the Modified Rankin Scale (MRS) respectively. These results are presented in Table 4.8 and 4.9 showing the scores, frequency, percentage and the cumulative percentage.

Table 4.8: Pre-stroke Barthel Index Scores (n=100)

Barthel Score	Frequency	Percentage	Cumulative Percent
80	1	1.0	1.0
90	12	12.0	13.0
95	5	5.0	18.0
100	82	82.0	100.0

As indicated in 3.4.2 stroke patients with a pre-stroke Barthel Index score of < 50 were excluded from the study. Although the majority of the participants (82.0%) were independent before their stroke (Barthel Score =100), 18.3% needed assistance with at least 1 activity of daily living (Barthel Score< 100).

Table 4.9: Pre-Stroke Modified Rankin Scale Scores (n=100)

MRS Scores	Frequency	Percent	Cumulative Percent
0	40	40.0	40.0
1	47	47.0	87.0
2	1	1.0	88.0
3	12	12.0	100.0

Forty-seven percent of the participants were still able to carry out all usual duties and activities before suffering a stroke despite having stroke-like symptoms (MRS=1) e.g. visual problems. One participant reported having problems carrying out his/(her) usual activities (MRS=2) such as, caring for the family, working and taking part in social and leisure activities.

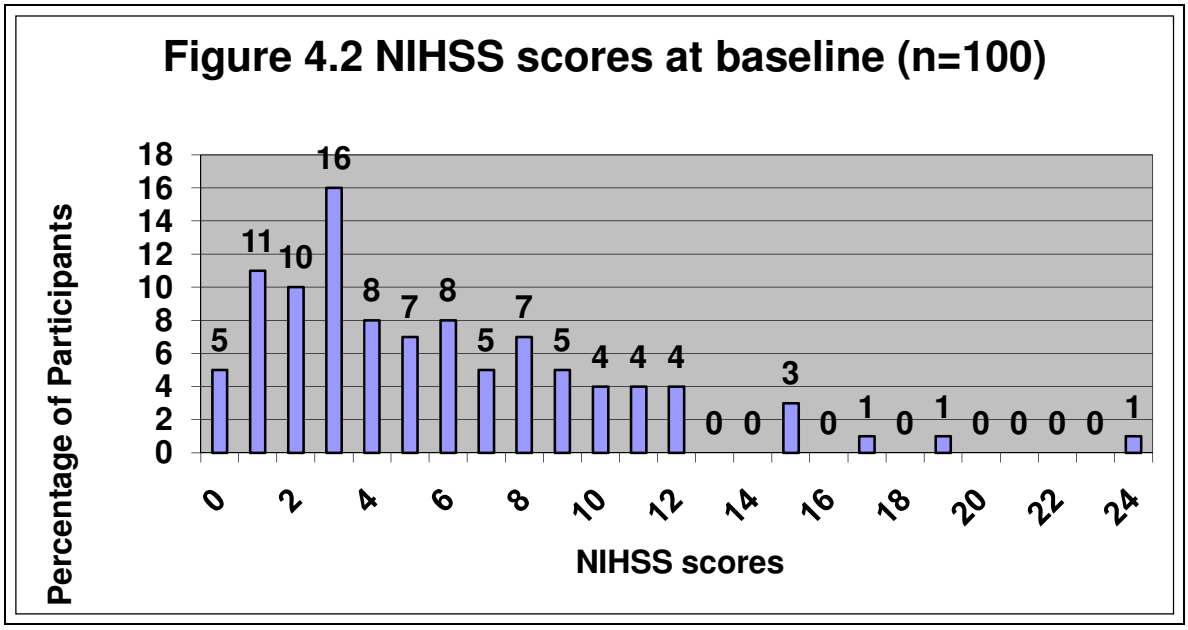
Twelve percent could walk independently, but required assistance to look after their own affairs (MRS=3).

4.3.2 PARTICIPANT IMPAIRMENTS

For the purpose of this study the impairments of the participants' were determined using the National Institute for Health Stroke Scale (NIHSS) and the Rivermead Motor Assessment Scale (RMA). In determining the level of impairment post-stroke the NIHSS provides information about the severity of the stroke.

4.3.2.1a NIHSS scores on admission

This scale measures a wide range of impairments on a scale of 0-42, the higher the score the greater the severity of the stroke. Figure 4.2 illustrates the percentage of participants with different NIHSS.



From Figure 4.2 above it becomes evident that the frequency distribution of NIHSS scores was negatively skewed (skewness 1.307 and kurtosis .487). The median NIHSS score was 4.5 (q1-q3; 2-8) for this sample. The NIHSS scores of the participants ranged from 0-24. The majority (70%) of the participants were mildly affected (NIHSS scores <8), with 27% being mildly affected (NIHSS scores 8-16), and 3% being severely affected (NIHSS scores >17) (Briggs et al., 2001).

4.3.2.1b Impairments experienced according to the NIHSS measurements at baseline.

The common impairments experienced by the participants at baseline are also presented in table 4.10.

Table 4.10: Participant impairments at baseline (n=100)

Individual impairments	Number	%
Lower limb impairment	65	65.0
Sensory impairment	63	63.0
Upper limb impairment	54	54.0
Facial paralysis	47	47.0
Cognitive impairment	39	39.0
Dysarthria	36	36.0
Extinction	32	32.0
Aphasia	22	22.0
Visual impairment	14	14.0
Impaired gaze	7	7.0

Motor (lower limb; 65% and upper limb; 54%) and sensory impairments (63%) were experienced by the majority of the participants. In addition 58%of the patients had speech impairments with 22% being aphasic and 36% having dysarthria. The impairments that were experienced by less than 50 % of the participants were facial paralysis, extinction, ataxia, visual impairments and impaired gaze.

4.3.2.2 Impairments as measured by the Rivermead Motor Assessment Scale.

The motor impairment of the participants was determined using the Rivermead Motor Assessment Scale. The Rivermead Motor Assessment Scale has three categories namely the gross function (RMA-G), leg and trunk function (RMA-LT) and arm function (RMA-A). The minimum scores for each category of the scale are 0 with maximum scores for RMA-G being 13, the RMA-LT being 10 and the (RMA-A) being 15. This scale was administered at all three assessment periods.

4.2.2.2a Rivermead Motor Assessment mean scores at different assessment periods.

Table 4.11 Presents the mean and standard deviation of the RMA scores for the different assessment periods

Table 4.11: Rivermead Motor Assessment Mean Scores at different assessment periods

Score range	baseline (n = 100)	2 month (n = 88)	6 month (n=76)
	mean (SD)	**mean (SD)**	**mean (SD)**
RMA- G (0 – 13)	7.3(3.83)	8.70(3.36)	9.09(3.3)
RMA- LT (0-10)	5.03(2.84)	6.06(2.68)	6.66(2.60)
RMA- A (0 – 15)	5.10(4.12)	6.93(4.91)	7.53(4.91)

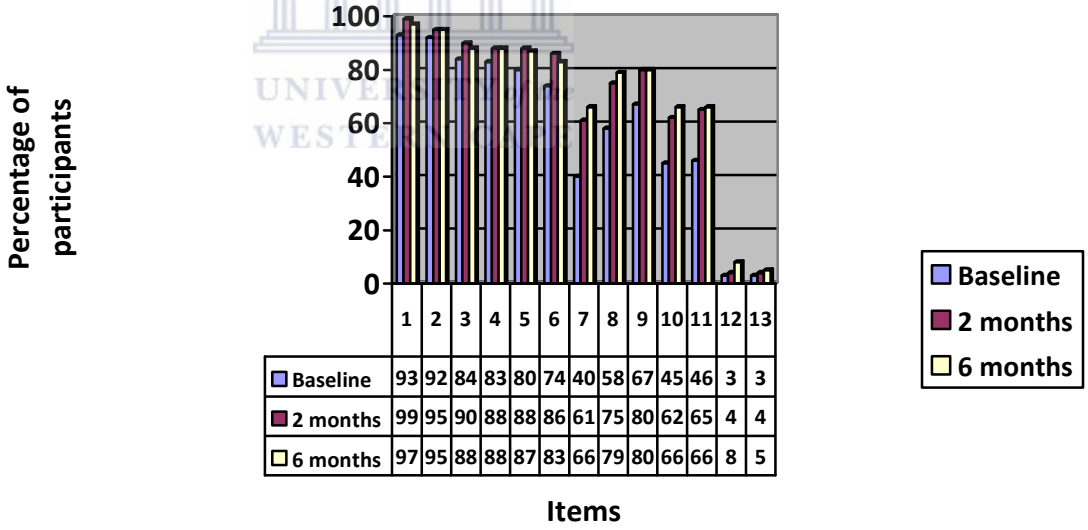
From the above table a change is noted in the mean scores all the RMA-G, RMA-LT and RMA-A between baseline, 2 months and 6 months assessment

periods. It should however be highlighted that a number of participants were lost to follow-up between baseline and 2 months (12 participants) and between 2 and 6 months (12 participants).

4.3.2.2b Individual Items on the RMA.

The following 3 figures illustrate the individual items of the three sub-scales of the RMA scale.

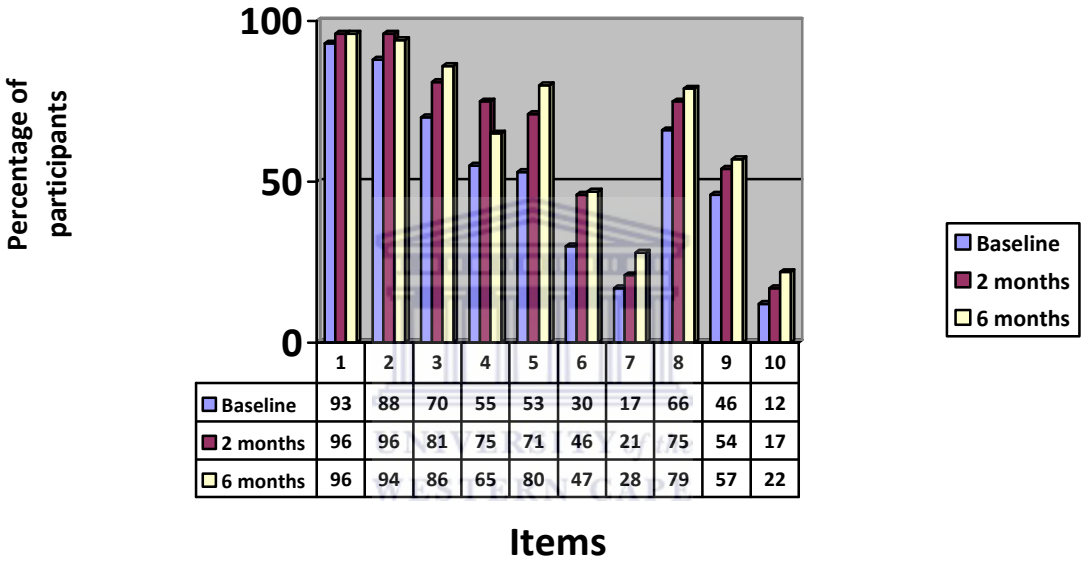
Figure 4.3 Percentage of participants independent on the 13 sub items of the RMA-G at baseline (n=100), two (n=88) and six months (n=76) post stroke onset



Key for items: figure 4.3
1. Unsupported sit
2. Lying to sitting
3. Sitting to standing
4. Transfer to wheelchair towards unaffected side
5. Transfer to wheelchair towards affected side
6. Walk 10m indoors with an aid
7. Climb stairs independently
8. Walk 10m indoors without aid
9. Pick up bean bag from floor
10. Walk outside 40m
11. Walk up and down 4 steps
12. Run 10m
13. Hop on affected leg 5 times

As noted in figure 4.4, unsupported sitting (1) was the activity that the majority of the participants were able to perform independently. This is in sharp contrast to running (12) and hopping (13).These were activities that the majority of the participants could not perform at baseline and at two and six months post onset stroke. An increase in the number of participants who were able to perform various other activities occurred mainly between baseline and two months post onset stroke. There was a slight decrease in the number of participants who were able to perform; unsupported sitting (2% decrease), sitting to standing (3% decrease), transfer to wheelchair towards affected side (1% decrease) and walk 10m inside with an aid (3% decrease) independently.

Figure 4.5 Percentage of participants independent on the 10 sub items of the RMA-LT at baseline(n=100), two (n=88) and six months (n=76) post stroke onset



	1	2	3	4	5	6	7	8	9	10
Baseline	93	88	70	55	53	30	17	66	46	12
2 months	96	96	81	75	71	46	21	75	54	17
6 months	96	94	86	65	80	47	28	79	57	22

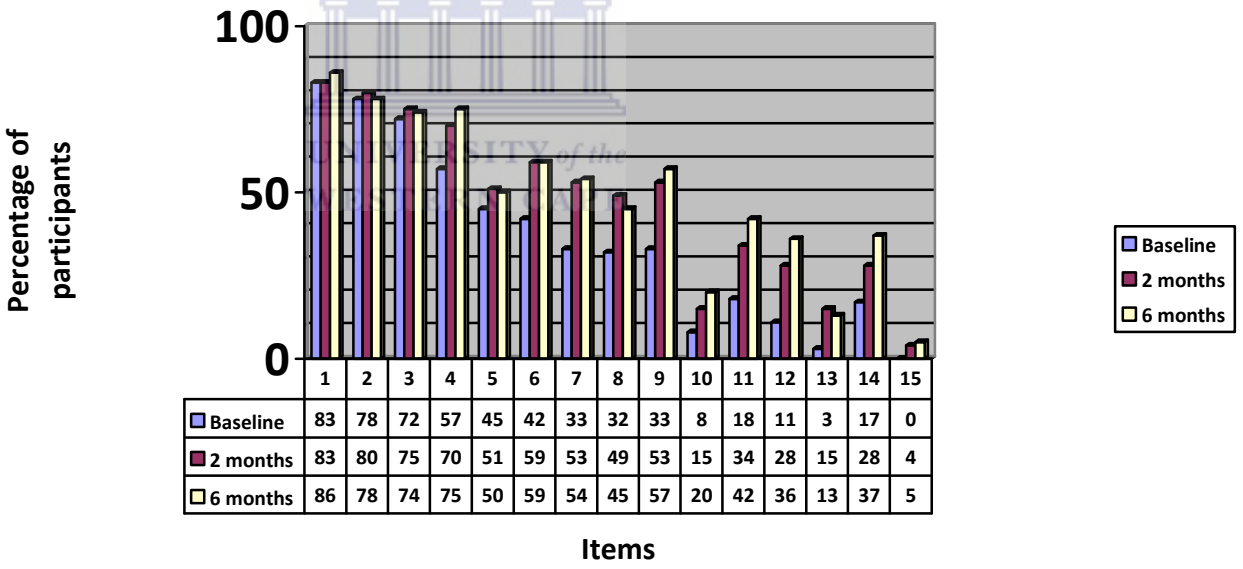
Key for items: figure 4.4
1: Roll to affected side
2: Roll to unaffected side
3: Half-bridging
4: Sitting to standing
5: Lift affected leg over side of bed
6: Step unaffected leg on and off block in standing
7: Tap ground lightly 5 times with affected leg in standing
8: Dorsiflexion of affected ankle in lying with knee flexion
9: Dorsiflexion of affected ankle in lying knee extension
10: Place affected leg in neutral position, with knee flexion

The majority of the participants were able to perform rolling at all three assessment periods. The activity that most participants could not perform at

all three assessment periods was standing and flexing the affected knee to 90 degrees while keeping the hip in extension (10) and tapping the ground with the affected leg (7). Although there was a change in the number of participants who could perform most of the activities

between baseline and 2 months, the number of participants who could roll to the affected side (1) remained unchanged between 2 and 6 months..

Figure 4.5:percentage of participants independent on the 15 sub items of the RMA-A at baseline (n=100), two (n=88) and six (n=76) months post stroke onset



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Baseline	83	78	72	57	45	42	33	32	33	8	18	11	3	17	0
2 months	83	80	75	70	51	59	53	49	53	15	34	28	15	28	4
6 months	86	78	74	75	50	59	54	45	57	20	42	36	13	37	5

Key of Items for figure 4.5

1: Lying protract the shoulder girdle with arm in elevation
2: Lying, hold extended arm in elevation
3: Flexion and extension of the elbow
4: Pronation and supination of the elbow
5: Pick up large ball with both arms extended
6: Pick up tennis ball with affected hand, repeat 5 times
7: Pick up pencil with affected hand, repeat 5 times
8: Pick up piece of paper, repeat 5 times
9: Cut putty with knife and fork
10: Bounce ball with affected hand in standing
11: Opposition of thumb and fingers
12: Supination and pronation of hand
13: Turn body towards wall while holding affected palm flat against wall with arm at 90 degrees.
14: Tie bow at back of head
15: Pat-a-cake

The majority of the participants were able to protract their scapula (activity 1) at all three assessment periods. None of the participants were able to perform the “pat-a-cake” activity (activity 15) independently at baseline and only 3.9% and 5.3% of the participants were able to perform this activity independently at the 2 and 6 month assessment periods respectively. Although the number of participants who were able to perform the activities increased between baseline and 2 months and between 2 months and 6 months, there was a decrease in the number of participants who could “hold the extended arm in elevation while in lying” (2% decrease), or perform “flexion and extension of the elbow” (1% decrease), or “pick up large ball with both arms extended” (1% decrease), or “pick up piece of paper” (4% decrease) or “turn body towards wall while holding affected palm flat against wall with arm at 90 degrees (2% decrease).

4.3.2.2c Change of RMA scores across time points

Table 4.12 summarizes the results of the Mixed Effects Regression model. This model was tested at an alpha level of .05 and confidence intervals were obtained and tested to see whether their respective upper and lower limits differed significantly from zero.

Table 4.12 Time effects: Changes in motor impairments as measured by the RMA-G, RMA-LT, RMA-A for different assessment periods

Assessment period	RMA-G LS mean (CI)	RMA-LT LS mean(CI)	RMA-A LS mean(CI)
Baseline - 2 months	1.23(0.89;1.58*)	0.96(0.66;1.25*)	1.78(1.23;2.21*)
2 – 6 months	0.17(-0.25;0.6)	0.26(-0.26;-0.596)	0.47(-0.145;1.09)
Baseline – 6 months	1.40(0.92;1.88*)	1.22(0.85;1.58*)	2.23(1.54;3.00*)

- P < .05

From Table 4.12 it becomes evident that the mean changes or difference scores observed at between baseline and two months, as well as baseline and six months were found to be significant at an alpha level of .05 for all three Rivermead Motor Assessment Scores. Thus we can conclude with 95% confidence that the changes observed in mean scores for the Rivermead subscales were significantly different from zero, i.e. the difference is not due to chance. The above table also illustrates that the mean changes or difference scores observed between two and six months for all three Rivermead Motor Assessment scores did not approach significance. Thus we can conclude with 95% confidence that the changes observed in mean scores for the Rivermead subscales between two and six months were not significantly different from zero, i.e. the difference is likely to be due to chance.

As this statistically significant change did not occur between two and six months and only between baseline and two months, it is evident that most of the changes occurred between baseline and two months but were maintained to six months.

4.3.3 Activity Limitations of the participants

The Barthel Index and the Nottingham Activities of Daily Living Scale was used to assess the activity limitations of the participants. Included in this section of the results are the Barthel Index scores according to level of severity. The percentage of participants who were independent on the 10 individual items of the Barthel Index as well as the mean and standard deviations for the three assessment periods and the change of scores across time are documented. The frequency of participants who were independent on individual items of the NEADL scale is also presented and the significance of the change over time.

4.3.3.1a Barthel Index Scores according to level of severity

The participants' ability to perform functional activities of daily living was measured using the Barthel Index. The scores for the Barthel Index range from 0 to 100, a higher score indicating a higher level of functioning. The participants were grouped according to level of severity on the basis of the Barthel Scores. The number and percentage of participants at the three assessment periods are presented in Table 4.13 according to level of dependence.

Table 4.13: Barthel Index Score according to participants' severity for each assessment point

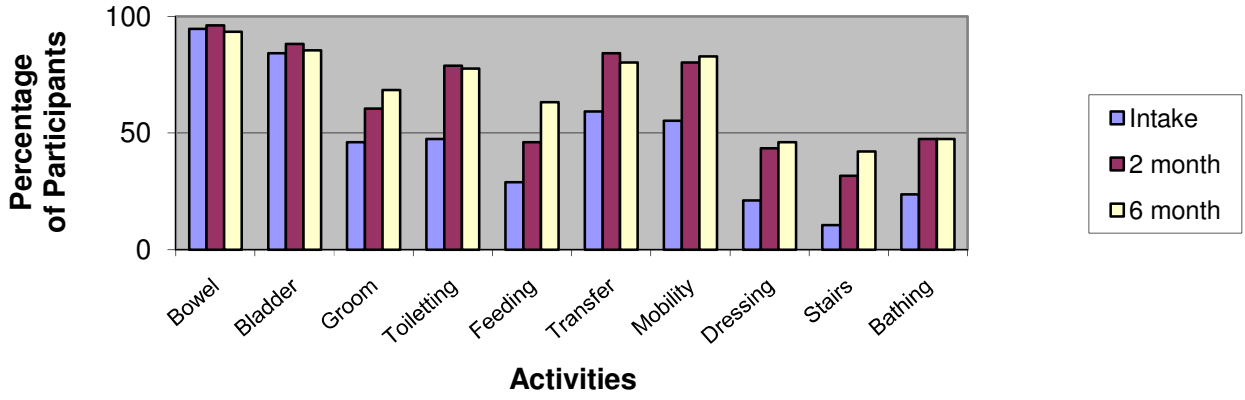
Category	Number (%) of participants		
	Baseline n=100	2 months n=88	6 months n=76
Dependent (0 -55)	41 (41.0)	17 (19.3)	13 (17.1)
Moderate Assistance (60 -80)	36 (36.0)	27 (30.7)	17 (22.4)
Minimal Assistance (85 -95)	21 (21.0)	33 (37.5)	31 (40.8)
Independent (100)	2 (2.0)	11 (12.5)	15 (19.7)

The above results indicate that at the 6 month assessment period only 19.7% of the participants were fully independent with the majority (80.3%) still needing assistance with at least one activity of daily living.

4.3.3.1b Participants independent in executing of Barthel Index activities.

Figure 4.7 illustrates the individual items of the Barthel Index for the different assessment periods. Percentages are presented as the number of participants at the different time points differed as a result of participant dropout.

Figure: 4.6 Percentage of participants who were independent on the 10 sub-items of the Barthel Index at baseline(n=100), two(n=88) and six months(n=76) post stroke onset.



At the first assessment period the majority of the participants needed assistance with all activities except bowel, bladder, transfers and mobility. At the two month follow-up period this however changed with less than half of the participants' still needing assistance with feeding, dressing, stair climbing and bathing. At six month the majority still needed assistance with dressing, stair climbing and bathing.

4.3.3.1c Change of Barthel Index scores across time points

Table 4.14 presents the mean and standard deviation of the Barthel Index scores for the different time periods.

Table 4.14: Barthel Index means scores and standard deviation at the different assessment periods

Score range	baseline (n = 100)	. 2 month (n = 88)	6 month (n=76)
	mean (SD)	**mean (SD)**	**mean (SD)**
Barthel Index	62.7(22.6)	74.9(22.9)	78.6(23.7)

The above table illustrates that there was an improvement in the mean Barthel Index scores between the three assessment periods. The results of the Mixed Effects Regression Model used to determine if the improvement noted was statistically significant are summarized in table 4.14.

Table 4.15: Time effects: Changes in activity limitations as measured by the Barthel Index from baseline to 6 months.

Barthel Index	LS Means	CI
baseline -2 months	12.5	(9.24; 15.8)*
2 months-6 months	0.451	(-3.19; 4.09)
baseline-6 months	13.0	(8.74; 17.2)*

In table 4.15 it becomes evident that the mean changes or difference scores observed between baseline and two months, as well as baseline and six months, were significant at an alpha level of .05. Thus the researcher can conclude with 95% confidence that the changes observed in mean scores for the Barthel Index scores were significantly different from zero, i.e. the difference is not due to chance. The above table also illustrates that the mean changes or difference scores observed between two and six months did not approach significance. Thus one can conclude with 95% confidence that the changes observed in mean scores for the Barthel Index between two and six months were not significantly different from zero, i.e. the difference is likely to be due to chance

4.3.3.2 Nottingham Extended Activities of Daily Living (NEADL)

4.3.3.2a Individual items of the NEADL

Table 4.16 presents the number and percentage of participants who were independent in the individual activities at the two assessment periods.

Table 4.16: Number (%) of participants' independent in items of the NEADL at two months and six months post stroke onset.

Variable	Participants n(%)	
	2 months	6 months`
	n=88	n=76
Mobility		
Walk outside	66 (75.0)	59 (77.6)
Climb stairs	32 (36.4)	34 (44.7)
Get in and out of car	55 (62.5)	49 (64.5)
Walk over uneven ground	47 (53.4)	50 (65.8)
Cross roads	46 (52.3)	48 (63.2)
Travel on public transport	16 (18.2)	25 (32.9)
Kitchen Activities		
Feed yourself	83 (94.3)	73 (96.1)
Make yourself a hot drink	47 (53.4)	49 (64.5)
Take hot drinks from one room to another	48 (54.5)	50 (65.8)
Do the washing up	32 (36.4)	32 (42.1)
Make yourself a hot snack	33 (37.5)	39 (51.3)
Domestic Tasks		
Manage your own money when out	47 (53.4.)	46 (60.5)
Wash small items of clothing	30 (34.1)	34 (44.7)
Do your own housework	23 (26.1)	26 (34.2)
Do your own shopping	17 (19.3)	23 (30.3)
Do a full clothes wash	8 (9.1)	12 (15.8)
Leisure activities		
Read newspaper and books	54 (61.4)	48 (63.2)
Use the telephone	44 (50.0)	48 (63.2)
Write letters	4 (4.5)	6 (7.9)
Go out socially	19 (21.6)	23 (30.3)
Manage your own garden	11 (12.5)	17 (22.4)
Drive a car	6 (6.8)	3 (3.9)

Of those participants who improved in their ability to perform the majority of activities independently between the two and six months assessment periods, most of them could not write letters independently (92.1%) or drive a car (96.1%) at six months post stroke. At six months the majority of the participants were also not able to perform climbing stairs, travelling on public

transport, washing the dishes, doing the washing, household and shopping, going out socially, managing the garden.

4.3.3.2b Change in NEADL scores across time points

Table 4.17 presents the mean and standard deviation of the NEADL Scores at two and six months. Table 4.17 also summarizes the results of the Mixed effects Regression model used to address the lost-to follow-up across the assessment periods. The model was tested at an alpha level of .05 and confidence intervals were obtained and tested to see whether their respective upper and lower limits differed significantly from zero.

Table 4.17: Time effects: Changes in instrumental activities of daily living as measured by the NEADL from 2 to 6 months

Variable	Mean (SD) 2 month n = 88	Mean (SD) 6 month n = 76	LS mean(CI) 2-6months	
NEADL	8.72(5.45)	10.36(5.80)	1.33	(0.577; 2.076) *

- $p < 0.05$

Key: NEADL Nottingham extended activities of daily living scale.

Table 4.17 illustrates that there was an improvement in the mean NEADL scores between the two assessment periods. From Table 4.19 it also becomes evident that the mean changes or difference scores observed between two months and six months, for the NEADL scores were found to be significant at an alpha level of .05. Thus we can conclude with 95% confidence that the changes observed in mean scores for the NEADL scores were significantly different from zero, i.e. the difference is not due to chance.

4.3.4 Participation restrictions of the participants

4.3.4.1 Roles at baseline

Table 4.18 illustrates the participants' involvement in conducting the above roles prior to their stroke and the change of these roles post stroke.

Table 4.18: Participation in roles prior to stroke and changes of these roles due to stroke as measured at baseline (n=100)

Roles	Previous role	Did not sustain previous role	Reduced ability	Unable
	n(%)	n(%)	n(%)	n(%)
Work	31(31)	30(96.8)	4(13.3)	26(86.7)
Family responsibility	45(45)	35(77.8)	7(20.0)	28(80.0)
Leisure and social	88(88)	75(85.2)	33(44.0)	42(56.0)

A total of 31% of the participants was working at the time they had a stroke, 45% was looking after the family and 88% had regular social and leisure time activities. Of the participants who could not resume their specific roles as before 86.7% could not return to work. Forty four percent of the participants who were involved in regular leisure and social activities prior to their stroke indicated that they could return to doing so but at a lower intensity.

4.3.4.2 Return to previous roles at six months

Table 4.19 summarises the number and percentages of participants who could return to their previous roles according to the MRS.

Table 4.19: Participants roles at 6 months (n=100)

Roles	Previous Role n %	Returned to previous role n(%)	Unable to return to previous role n(%)	Dropout status unknown n(%)
Work	31(31)	3(9.7)	23(74.2)	5(16.1)
Family responsibility	45(45)	16(35.6)	25(55.6)	4(8.8)
Leisure and social	88(88)	17(19.3)	55(62.5)	16(18.2)

When the MRS was assessed at 6 months, 9.7% of the participants who were working before their stroke could return to work, 35.6 % of those who took up responsibility for their family resumed their role as caregivers of their families and 19.3% who were involved in leisure and social activities were able to participate as before.

4.3.5 Health-related quality of life of the participants

The health-related quality of life of the participants was determined using the EQ-5D. With activities are scored according to a range from participants having no problem with the activity to them having a severe problem with performing the activity. Onlt the participants who were able to verbally provide responses were included. The EQ-5D scores are presented in Table 4.20. O

Table 4.20: Number and percentage of participants EQ- 5D scores at 2 and 6 months

EQ- 5D Profile	n (%) of participants	
	2 month (n=85)	6 month (n=73)
Mobility		
no problem	46(54.1)	47(64.4)
some problem	31(36.5)	23(31.5)
confined to bed	8(9.4)	3(4.1)
Self-care		
no problem	42(49.4)	47(64.4)
some problem	32(37.6)	20(27.4)
unable	22(12.9)	6(8.2)
Usual activities		
no problem	16(18.8)	15(20.5)
some problem	20(23.5)	27(37.0)
unable	49(57.6)	31(42.5)
Pain - discomfort		
none	47(55.3)	37(50.7)
moderate	33(38.8)	25(34.2)
extreme	5(5.9)	11(15.1)
Anxiety - depression		
none	52(61.2)	45(61.6)
moderate	26(30.6)	25(34.2)
extreme	7(8.2)	3(4.1)
EQ-5D VAS		
median	70	65
(q1-q2)	50-90	50-90

According to the results presented in table 4.20, the activity that was the most severely affected was the ability to perform usual activities. Nearly 58 % of the participants were unable to perform their usual activities at 2 months post stroke. This number decreased slightly at 6 months where only 42% reported not being able to perform their usual activities. An important number of the participants reported experiencing pain (44.7%) or anxiety-depression (38.8) at two months. Extreme pain was experienced by more patients at 6 months (15.1%) in comparison with 2 months (5.9%). The Shapiro Wilk W test

indicated that the VAS scores were not normally distributed therefore the non parametric Wilcoxon Paired Test was used to determine if a statistically significant difference occurred between the scores at 2 and 6 months. There was no statistically significant difference between the sores (p=0.81).

4.3.6 Factors predicting impairment (motor) and activity (function) at six months

The final sample (n=95) analysed to determine which independent variables were significant predictors of impairment and activity at 6 months post stroke consisted of 76 complete cases at follow-up and 19 cases from the drop-out group. The drop-out group consisted of 24 participants who were lost to follow-up. Five participants were ineligible for inclusion in the analysis on the basis of mortality due to non-vascular causes. Three participants died as a result of cardiovascular causes and were retained in the sample for analysis and an imputed score of zero (0) was assigned for the outcome measurements at 6 months. The remaining 16 participants could be considered for inclusion if they did not differ significantly from the non-drop out on any of the following variables: age, gender, and severity of stroke as the primary parameters. Table 4.21 presents the results of the mean comparison tests performed to determine whether the drop-out group differed significantly from the non drop-out group using either parametric or non-parametric tests where applicable.

Table 4.21: Mean Comparison tests between drop out (n=16) and non-drop out (n=76) groups.

Variable	Test	*p*
Age	t-test:	0.26
Gender	Chi-square	0.61
NIHSS score	Mann-Whitney U-test	0.69

Key: NIHSS= National Institute for health stroke scale.

From the above table, it becomes evident that the drop-out group did not differ significantly from the non drop-out group on any of the parameters tested, as evidenced by p-values that exceeded 0.05 alpha level. The missing values for the drop-out group were imputed based on the principle of regression imputation. So, the final analysis was conducted on 95 participants. The independent variables identified for the proposed regression analysis were correlated with the four dependent variables to examine whether there were significant correlations. Included in the independent variables was the initial value of the parameter, i.e. the initial scores on the Rivermead and the Barthel Index.

Results from correlation matrices between potential predictor variables and the outcome parameters were as follows: The RMA-G was significantly correlated with Gender (-.26) and number of hours of therapy (-.22) at .05 alpha level, as well as with Age (-.30), dysarthria (-.29), urinary incontinence (-.24) and initial RMA-G (.81) at .01 alpha level.

The RMA-LT was significantly correlated with Age (-.23), Dysarthria (-.28) and initial RMA-LT (.83) at a.01 alpha level. The RMA-A was significantly

correlated with Age (-.28), dysarthria (-.38), number of hours of therapy (-.28) and initial RMA-A (.81) at .01 alpha level. The Barthel index was significantly correlated with Gender (-.26), Age (-.35), dysarthria (-.38), urinary incontinence (-.30) and initial Barthel score (.78) at .01 alpha level. These variables were subsequently entered as predictors into four linear regression models predicting impairment and activity. Three regression analyses were conducted with RMA-G, RMA-LT and RMA-A as the outcome variables for the respective models predicting Impairment. The fourth regression model tested predictors of Activity as estimated by the Barthel Index.

The decision to perform linear regression analyses was based on the residuals showing a normal distribution for all four outcome variables. The entry criterion was set at 0.15 and the retention criterion was set at 0.05 for predictor variables. The results of each of these regression models have been summarized into four tables and will be presented below.

The initial RMA-G score and the number of hours in therapy were the only variables that met the criteria for retention in the stepwise regression model predicting RMA-G at 6 months and the results of that analysis is reflected in Table 4.22 below.

Table 4.22: Stepwise linear regression model predicting impairment in gross motor function at 6 months post stroke

Predictor variable	Beta (SE)	Partial R^2	p-value
Initial RMA-G	**0.84 (0.06)**	**0.65**	**<0.0001**
No of hours of therapy	**0.13 (0.06)**	**0.02**	**0.03**

Key: RMA-G= Rivermead Motor Assessment Scale gross

As reflected in the above table the initial RMA-G was the strongest predictor of Impairment in Gross Motor Functioning as evidenced by the partial explained variance (0.65). Impairment in gross motor function at baseline was a significant predictor of impairment in gross motor function at six months post-stroke (p-value < 0.0001). In other words, impairment in gross motor function at 6 months post stroke can be considered to be a function of impairment in gross motor function at baseline. The number of hours in therapy also significantly predicted (partial coefficient = .02) impairment in gross motor function at six months post stroke as evidenced by the p-value < .05. Thus 2 % of the variance in impairment in gross motor function is a function of the number of hours spent in therapy.

The initial RMA-LT score was the only variable that met criteria for retention in the stepwise regression model predicting RMA-LT at 6 months and the results of that analysis is reflected in Table 4.23 below.

Table 4.23: Stepwise linear regression model predicting impairment in leg and trunk motor function at 6 months post stroke.

Predictor variable	Beta (SE)	Partial R^2	p-value
Initial RMA-LT	**0.88 (0.07)**	**0.66**	**<0.0001**

Key: RMA-LT= Rivermead Motor Assessment Leg and Trunk Function

The above table reflects that the initial RMA-LT score was the only significant predictor (p-value < 0.0001) of impairment in Leg and trunk Motor Functioning as evidenced by the partial regression coefficient (0.66). In other words, 66% of the impairment in leg and trunk motor function at 6 months can be considered to be a function of impairment in leg and trunk motor function at baseline.

The initial RMA-A score was the only variable that met criteria for retention in the stepwise regression model predicting RMA-A at 6 months. The findings of the stepwise linear regression predicting Impairment in motor functioning of the arm at 6 months post-stroke are summarized in Table 4.24 below.

Table 4.24: Stepwise linear regression model predicting impairment in motor function of the arm at 6 months post stroke.

Predictor variable	Beta (SE)	Partial R^2	p-value
Initial RMA-A	**0.95 (0.08)**	**0.61**	**<0.0001**

Key: RMA-A=Rivermead Motor Assessment Arm function

From the table above, the initial RMA-A score significantly predicted impairment in Motor Functioning of the arm, as evidenced by the partial regression coefficient (0.61). Impairment in motor function of the arm at baseline significantly predicts impairment in motor function of the arm at 6 months post-stroke (p-value < 0.0001). In other words, 61% of the impairment in motor function of the arm at 6 months post stroke can be considered to be a function of impairment in motor function of the arm at baseline.

The initial BI score, age and gender were the only variables that met criteria for retention in the stepwise regression model predicting Activity limitations (BI) at 6 months post stroke. The findings of the stepwise linear regression predicting Activity limitations, as measured by the Barthel index, at six months post-stroke are summarized in Table 4.25 below.

Table 4.25: Stepwise linear regression model predicting activity limitations, as measured by the Barthel index, at 6 months post stroke.

Predictor variable	Beta	(SE)	Partial R^2	p-value
Initial BI	**0.81**	**(0.10)**	**0.47**	**<0.0001**
Age	**-0.50**	**(0.20)**	**0.03**	**0.02**
Gender	**-8.58**	**(4.08)**	**0.03**	**0.04**

Key: BI=Barthel Index

From the table above, it becomes evident that all three independent variables were found to be significant predictors of activity limitation at 6 months post stroke. The initial BI score was the strongest predictor of Activity, controlling for age and gender, as evidenced by the partial regression coefficient (partial $R^2 = .47$) and was significant at an alpha level < 0.0001. Thus the estimated limitation in activity at baseline or baseline accounts for 47% of the limitation in activity at six months post stroke.

Age (p = .02) and gender (p = .04) were both found to be significant predictors of limitation in activity at six months post stroke. Both variables respectively accounted for 3% of the variance of the limitation in activity at 6 months post stroke controlling for the other variables in the model. In other words, for every increment of one year in age, there would be a reduction of 0.5 in the Barthel score obtained at six months post stroke. This suggests that older stroke survivors, controlling for gender and initial limitation in activity, will report increased limitation in activity or decreased activity at 6 months post

stroke. Similarly, women appear to score lower on the Bartel index at 6 month post stroke as evidenced by the negative signage of the beta value (-8.58). In other words, a less favourable outcome at 6 months post stroke is predicted for women with regards to limitations in activity.

In all four stepwise regression analyses, the initial score of the parameter emerged as the strongest (in some cases only) predictor of the outcome variable. In an attempt to test the limits of this analysis, a multiple linear regression was computed without the initial parameter scores. The findings are reflected in Table 4.26 below.

Table 4.26: Multiple linear regression models predicting impairment activity limitations at 6 months post stroke when the initial outcome parameter was removed from the multiple regression equation.

Model	Outcome Variable	Significant predictors	Partial R^2	p
1	RMA-G	Dysarthria	0.08	0.01
2	RMA-LT	Dysarthria	0.09	0.01
3	RMA-A	Dysarthria	0.12	0.001
4	BI	Dysarthria	0.12	0.001
		Age	0.07	0.01
		Gender	0.06	0.01

Key: RMA-G=Rivermead Motor Assessment Gross function, RMA-LT= Rivermead Motor Assessment Leg and Trunk function, RMA-A =Rivermead Motor Assessment Scale Arm function, BI=Barthel Index.

From the Table 4.26 it becomes apparent that dysarthria emerges as a significant predictor of all four outcome variables at an alpa level of 0.01. The

respective effect sizes for dysarthria ranged between 0.08 and 0.12 on the four regression equations or models. It appears that dysarthria accounts for 8% of the variance in gross motor functioning; 9% of the variance in motor functioning of the leg and trunk; 12% of the variance in functioning of the arm, as well as activity limitation when controlling for gender and age. What emerges from this analysis is that dysarthria loses all power as a predictor when initial scores of the parameter are reintroduced, i.e. the initial outcome parameters totally dominate dysarthria as a predictor variable

4.4 SECTION C: PROCESS OF REHABILITATION

Process information that was collected included the type of rehabilitation therapy services offered, the number of physiotherapy, occupational therapy and speech therapy sessions that the participants received. Information relating to the content and number of hours of physiotherapy was also described as part of the process of rehabilitation of the participants.

4.4.1 Services Delivered

At the 2 and 6 month assessment time points, the participants provided information regarding the services they received during the 2 and 4 months prior to the assessment period. This information is provided in Table 4.27.

Table 4.27: Services received by the participants

Services Received	Number (%) of Participants	
	2 month n=88 (%)	6 month n=76 (%)
Physiotherapy	87 (98.8)	44(57.9)
Medical care	55(62.5)	63(82.9)
Occupational therapy	22(25.0)	16(21.1)
Speech therapy	8(9.1)	6(7.9)
Home-based care	4(4.5)	1(1.3)
Nursing care	4(4.5)	3(3.9)
Other	3(3.4)	6(7.9)
Social worker	2(2.3)	7(9.2)
Intervention by dietician	2(2.3)	2(2.6)
Rehabilitation worker	1(1.1)	1(1.3)
Specialist services	1(1.1)	2(2.6)

The table shows that the majority of the participants were treated by physiotherapists at both the two and six month assessment periods.

There was a decrease in the percentage receiving most of the services between 2 and 6 month assessment periods.

Twenty percent more participants were receiving medical services and seven percent more social work services in the four months prior to the six months follow-up than during the first two months post stroke onset. The majority of the participants received physiotherapy or occupational on an individual basis as only 4 reported having attended group therapy.

4.4.2 Number of therapy treatment sessions

The number of therapy sessions the participants received was captured from the use of care questionnaire. Table 4.28 summarises the number and percentage of speech, occupational and physiotherapy sessions the participants received.

Table 4.28: Total number of speech, occupational and physiotherapy sessions received by the participants (n=100)

Number of therapy sessions	n (%) of participants		
	PT	OT	Speech
0	3(3.0)	65(65.0)	92(92.0)
1-5	68(68.0)	22(22.0)	8(8.0)
6-10	15(15.0)	5(5.0)	0(0)
11-15	6(6.0)	4(4.0)	0(0)
16-36	8(8.0)	4(4.0)	0(0)

Key: PT= Physiotherapy, OT=Occupational Therapy, Speech = Speech Therapy.

Table 4.34 illustrates that of those who received any physiotherapy, occupational therapy or speech therapy the vast majority received between 1 and 5 therapy sessions. Sixty eight percent of the participants received between 1 and 5 physiotherapy sessions, while 22% percent of the same participants received between one and five occupational therapy sessions. Only 8% of the patients received speech therapy.

4.4.3 Content of physiotherapy

The content of physiotherapy was determined via observations according to video recordings. As mentioned in section 3.5 of this thesis the content of therapy was limited to the content of physiotherapy as the individual

occupational therapy treatment sessions were limited and it was therefore not possible to obtain a large enough sample for video-recordings. Information relating to the participants who were video recorded is presented in this section.

4.4.3.1 Characteristics of participants who were video-recorded.

An entire physiotherapy treatment session of a conveniently selected sample of 13 participants was video recorded to determine the content of physiotherapy. A scoring list consisting of therapeutic activities used in the CERISE study, developed by De Wit *et al*. (2006) was used to collect this information (see 3.5.3) Characteristics of the participants who were video-recorded in comparison to the total study population are presented in Table 4.29.

Table 4.29: Characteristics of Participants video-taped (n=13) and the study sample (n=87)

Variable	Participants		
	Video-taped	Remaining sample	p-value
Age (years)			
mean	65.5	61.1	0.80
SD	6.5	10.52	
Gender (number) (%)			
male	7(53.8)	44(50.6)	0.76
female	6(46.2)	43(49.4)	
Side of impairment (number) (%)			0.34
left	7(53.8)	52(59.8)	
right	6(46.2)	34(39.1)	
both	0(0.00)	1(1.1)	
RMA-GF median	4	8	0.28
q1-q2	3-10	4-11	

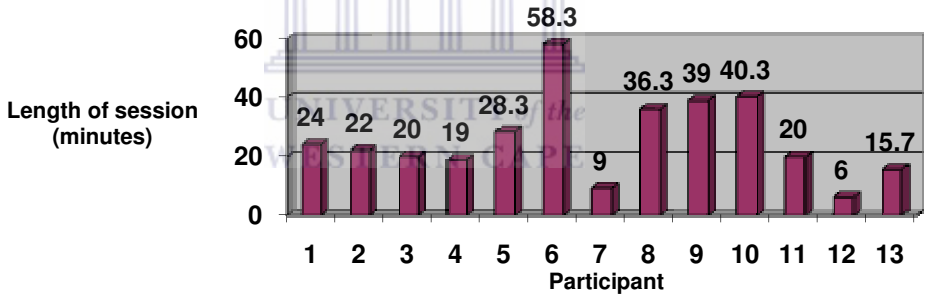
RMA-G: Rivermead motor assessment gross function:

There was no statistically significant difference (p>0.5) found for age, gender, side of impairment and RMA-G between the study sample and the sample of participants who were video-taped.

4.4.3.2 Length of video-recorded treatment sessions

The length of the video-recorded treatment sessions were calculated by adding the frequency with which the category occurred and multiplying it by 20 seconds. To convert the time to minutes the length of time was divided by 60. The length of the individual sessions is presented in Figure 4.8.

Figure 4.7 Length of video-recorded treatment sessions



The length of treatment sessions ranged from 6 minutes to 58.3 minutes. The median treatment time was 22 minutes. Two of the participants were treated for less than 10 minutes.

4.4.3.3 Occurrence of categories.

The data from all the video-taped treatment sessions were pooled to determine the most frequently occurring categories. The percentage of time spent per category per treatment session was calculated and expressed in minutes per one hour treatment sessions. The median occurrence of each category is presented in Table 4.30.

Table 4.30: Median occurrence of categories and rank correlation with the level of motor impairment (RMA-G)

Category	Time spent median (q1-q3)	Spearman rank correlation
1. Mobilisation, manual joint mobilisation, stretching, palpation (including pain assessment) passive relaxation and massage	6.67 (2.10-14.70)	(r:-.1.6)
2. Relearning selective movements	10.21 (7.10-22.05)	(r: .01)
3. Lying and lying balance	4.94 (1.75-6.06)	(r: -.62*)
4. Sitting and sitting balance	5.14 (3.04-20.79)	(r:-.09)
5. Standing and standing balance	6.00 (1.00-19.13)	(r:-.01)
6. Sensory and visual perceptual training and cognition	0.00 (0.00-0.00)	N/A
7. Transfers	3.30 (1.63-8.95)	(r:-.70**)
8. Ambulatory exercises	0.91 (0.00-6.88)	(r:.72**)
9. Personal activities of daily living	0.00 (0.00-3.56)	(r:.18)
10. Domestic activities of daily living	0.00 (0.00-0.00)	N/A
11. Leisure and work related activities	0.00 (0.00-0.00)	N/A
12. Miscellaneous techniques	0.00 (0.00-0.00)	N/A

RMA-G: Rivermead motor assessment gross function:
N/A: (not applicable)
P<.05:*, P<.01**

,

The most frequently occurring categories were relearning selective movements (median 10.2 minutes), mobilisations (median 6.7 minutes) and standing and standing balance (median 6 minutes). The least frequently occurring categories were ambulatory exercise (median 0.91 minutes) and personal activities of daily living (median 0 minutes). The activities of sensory and visual perceptual training and cognition, domestic activities of daily living, leisure and work related activities and miscellaneous techniques were not observed during the physiotherapy treatments sessions that were video-taped.

4.4.3.4 Relationship between content of physiotherapy and level of motor impairment

After pooling the 13 treatment sessions, correlations were computed between the level of functioning or impairment as measured by the RMA-G and the occurrence of a specific content category. Eight content categories that were observed in this sample were correlated with functional impairment. The findings of the Spearman correlation coefficients are presented in table 4.36.

A strong, inverse correlation was reported between functional activity or impairment and transfers (r: -.70**) while a strong positive correlation was found between ambulatory activities and functional ability or impairment. This correlation was tested for significance and found to be significantly different from zero at a .01 alpha level. In other words, the more functional a patient was, the less likely it was that transfers would be part of the physiotherapy programme and the more likely ambulatory activities would occur.

A moderate, inverse correlation was reported between functional impairment and lying and lying balance (r: -.62*). This correlation was tested for significance and found to be significantly different from zero at a .05 alpha level. In other words, the more functional a stroke patient was, the less likely lying and lying balance would occur as part of the content of physiotherapy.

4.4.4 Intensity of physiotherapy treatment

The intensity of physiotherapy is the total treatment time the patients received. Physiotherapists record the treatment session in units of 5 minutes. The total treatment time received by each participant was calculated by adding the number of units and multiplying by 5. This figure was then divided by 60 to convert the time to hours. The total treatment time received by the participants is presented in table 4.31.

Table 4.31: Physiotherapy treatment time (n=100)

Time (hours)	n	%
0	3	3.0
<1	24	24.0
1-2	25	25.0
>2-4	24	24.0
>4-7	10	10.0
>7-10	8	8.0
>10	6	6.0

Forty-nine percent the participants received between 1-4 hours of physiotherapy. The numbers of hours of physiotherapy received by the participants ranged from 0-19 hours.

4.5 SUMMARY OF CHAPTER.

At CHCs in the Metropole Region of the Western Cape therapy services available for rehabilitation are lacking especially occupational and speech therapy. Only 20 Of the 39 centres in this region, offered rehabilitation services. There was a 24% drop out rate in the study. The study sample consisted of equal numbers of male and females who had a mean age of 61 years. The majority of the participants' diagnosis of stroke was made on a clinical basis and the baseline assessment was performed at a median of 21 days post-stroke. The majority of the participants only suffered a mild stroke with lower limb impairments being the most prevalent. A significant improvement was noted in both motor impairments as measured by the Rivermead Motor Assessment Scale and activity limitations as measured by the Barthel Index between baseline and 2 (6) months but not between 2 and 6 months. Travelling on public transport and driving a car were the extended activities that the majority of the participants could not perform independently even at 6 months post-stroke. The participants had major participation restrictions with regards to work, social and leisure activities and caring for their families. Only a minority of the participants were able to return to these roles post-stroke. With regards to content of physiotherapy the most frequently occurring categories were relearning selective movements (median 10.21 minutes), mobilisations (median 6.67 minutes) and standing and standing balance (median 6 minutes). Almost half (49%) of the participants received between 1 and 4 hours of physiotherapy over a 6 month period. A discussion of the results will follow in chapter 5.

CHAPTER 5

DISCUSSION

5.1 INTRODUCTION

The aim of this study is to determine the structure, process and outcome of the rehabilitation of stroke patients at Community Heath Centres in the Metropole Region of the Western Cape. The findings of the study are discussed below and have been organised along three themes: Structure of stroke rehabilitation, Outcomes of stroke rehabilitation including the demographic profile of the sample, and Process of stroke rehabilitation. Each section will contextualise the findings against the extant body of literature on stroke rehabilitation. The researcher also attempts to highlight the implications of the results of the study for further improvement in stroke rehabilitation services at CHCs.

5.2 STRUCTURE OF REHABILITATION

The findings on the structure of stroke rehabilitation at Community Health Centres are discussed with reference to the resources, for example, the staff and equipment available at the CHC and the related literature.

5.2.1 Staff complement

From the study it became clear that there is a lack of therapy staff specifically, occupational and speech therapists, employed at Community Health Centres in the Metropole Region of the Western Cape.

According to the Comprehensive Service Plan (CSP), (Department of Health, 2007), there should be an equal number of occupational and physiotherapists employed in the various districts that form part of the Metropole Region. The CSP also states that there should be approximately half the number of speech therapists when compared to physiotherapists or occupational therapists. The researcher found that there were 16 physiotherapists, six occupational therapists and no speech therapists employed at the CHCs in all districts of the Metropole Region. The limited availability of services meant that a large percentage of the population residing in this geographical area did not have access to rehabilitation services, specifically occupational and speech therapy services, as recommended by the National Rehabilitation Policy (NRP) of South Africa (Department of Health, 2000). According the NRP all people with disabilities should have access to rehabilitation services (Department of Health, 2000). The non-availability of occupational therapy services could result in patients with stroke not receiving therapy that would assist them with the re-education of activities related to participation restrictions and instrumental activities of daily living, activities that are practised by occupational therapists (De Wit *et al*., 2006). The lack of services is also a challenge to therapists who need to refer patients from other levels of care, for example, tertiary and secondary level for further rehabilitation to facilitate community re-integration. Patients could therefore receive intensive inpatient rehabilitation and not be followed-up in the community which would facilitate re-integration into homes and communities. Therapists working at CHCs often conduct home visits to assess the functioning of patients within their homes (Rhoda, 2002).

Where rehabilitation services were available at the CHCs, these services were not provided in a co-ordinated manner. Only two of the therapists in the study reported that they had regular meetings to discuss the progress of stroke patients. It is important to note that there is empirical evidence suggesting that it is the co-ordination of services, such as physiotherapy, occupational therapy, speech therapy, nursing and medical services, that results in improved outcome, and not only the availability of services (Langhorne and Pollock, 2002). Similarly, Young and Forster (2007) reported that co-ordinated stroke care has been reported to be beneficial for stroke patients irrespective of the level of severity, age or gender of the patients. Thus it becomes evident that the therapeutic value of rehabilitation is curtailed by the lack of optimal co-ordination at CHCs in the Western Cape.

The lack of regular meetings to plan services and set goals implies that a less effective multi-disciplinary approach is being used. In this approach the goals set for the patient are not decided by the whole team, but each member sets individual goals. It has been reported that an inter-disciplinary approach which involves setting and working towards common goals is more effective in improving outcomes (Cifu and Stewart, 1999). One of the challenges to provide optimally co-ordinated services at the CHCs in the Metropole Region of the Western Cape is the fact that stroke is but one of the many conditions treated by rehabilitation professionals (Personal Communication, C De Wet, July 2007). In other words, service delivery across clinical presentations, for example, stroke, low back pain, etc. is prioritised above co-ordination of multi-disciplinary services per diagnosis. However, one could argue that in a setting where resources are limited it would be beneficial for professionals to interact

with each other regarding the patient's goals and to develop an inter-disciplinary or collaborative approach that is more beneficial for the patient.

5.2.2 Equipment

Based on a study that included various Veteran Hospitals Hoenig *et al*. (2000) suggested that the availability of the following items be determined when assessing rehabilitation facilities providing stroke rehabilitation: Exercise equipment, parallel bars, mats, as well as equipment such as biofeedback equipment and Functional Electrical Stimulation (FES) instruments, adaptive kitchen, bathroom and toilet, simulated home environments and the use of pre-fabricated ankle foot orthosis. Most of the therapists working at the CHCs reported that the exercise equipment as recommended by Hoenig *et al*. (2000) was available at the centres. However, equipment such as simulated settings and FES was not available at the majority of the centres. It should be noted that the setting for the study was community-based and the therapists could practice the ability to use the bathroom and perform activities in kitchen in the patients' homes as the therapists had access to the patients' homes (Rhoda, 2002). It has also been highlighted by Holmqvist, von Koch, Kostulas, Holm, Widsell and Tegler (1998) that the home environment is best suited to re-educate these activities as the patient would be practising the tasks in a familiar setting. The fact that only two centres reported having Functional Electrical Stimulation (FES) should not be seen as a problem since the evidence for use of FES for improving dexterity, muscle strength and walking performance in patients with stroke is limited (Van Peppen *et al*., 2004).

Inclusive in the goals of the South African Rehabilitation Policy is the provision of assistive devices aimed at addressing impairments and reducing the effects of disability on an individual (Department of Health, 2000). The fact that the majority of the centres could provide assistive devices is in line with the recommendation of the policy. Mobility assistive devices are useful as they assist with balance during walking and decrease exertion when walking. The availability of wheelchairs for patients who have had severe motor impairments is beneficial as it assists with the mobility of these patients (Duncan *et al*., 2005).

5.3 REHABILITATION OUTCOMES

The findings relating to the demographic profile of the participants, their impairments, activity limitations and the participation restrictions, as outlined in the second objective, are discussed in the sections that follow.

5.3.1 Profile of the participants

5.3.1.1 Socio-demographic profile

The results of this study support the literature in stating that stroke occurs in a younger population in sub-Saharan Africa (Kengne and Anderson, 2006). The mean age of the participants in the study was 61 years which is similar to the mean age of stroke patients recorded in a study conducted in Tanzania (Walker, 2000b). The mean age of stroke patients in sub-Saharan Africa has been reported to be approximately 5–10 years younger than that found in developing countries. For example, in the CERISE study (De Wit *et al*., 2006), the patients were considerably older than those in the study, for example, the

mean age of the patients admitted to rehabilitation centres in the United Kingdom was 72.0 years and in Switzerland 71.7 years.

The occurrence of stroke in younger patients has a number of implications. It has financial implications for the state as a disability grant needs to be provided to a portion of the population who would be seen as being economically active. In the study 44% of the participants in the study were younger than 60 years. These are participants who could be classified as being potentially active economically and who would not normally receive a social grant from the state. Stroke therefore places an increased financial burden on the state as the health costs involved in managing the disease are high (Fritz, 2006b). In addition the state needs to provide financial support for those who have become disabled as a result of the disease. It should be remembered that the South African government not only provides social assistance grants to older people as an old age pension, it also provides a disability grant to persons with disabilities, as well as support for children, for example, the child support grant and/ or a foster care grant (Woolard, 2003). The financial burden of providing grants or support to stroke survivors increases exponentially when the survivors are younger than 60 years, that is, the statutory pensionable age.

Stroke in a younger population also affects the person and the family as younger stroke patients have specific needs that are not always highlighted in the older stroke population. These include high levels of anxiety that occurs as a result of the inability to return to employment and care for their families as before (Teasall, McRae and Finestone, 2000). Approximately 32% of the

participants in the CHC study who were employed at the time of their stroke could have experienced this anxiety.

It is not clear from the literature why the mean age of stroke survivors is so much lower in sub-Saharan African countries than in other countries. Kengne and Anderson (2006) have highlighted the fact that the life expectancy of populations in sub-Saharan African countries have dropped tremendously due to the HIV/AIDS pandemic. For example, the life expectancy is reported to be as low as 33 years in some of these countries. This might influence the results obtained when researching age-related conditions such as stroke (Kengne and Anderson, 2006). One could question whether the mean is the most accurate measure of central tendency to use when reflecting population parameters in countries where life expectancy is low and whether one could compare this mean result with the results obtained in countries where life expectancy is higher.

From the findings of the study it would appear that stroke patients receiving outpatient rehabilitation at CHCs were older than those admitted to inpatient facilities in the Western Cape. For example, Rouillard (2006) reported a mean age of 51.3 years for stroke patients admitted for rehabilitation at the Western Cape Rehabilitation Centre (WCRC). Similarly, De Villiers, Kalula, Bryer and Ferreira (2006) reported a mean age of 59.6 years for patients admitted to an acute stroke unit in the Western Cape. From these findings it becomes apparent that inpatient facilities are admitting patients with stroke who are younger, while older patients have to access outpatient facilities for rehabilitation. The lack of resources that limits admission of patients with

stroke to inpatient rehabilitation facilities in the Western Cape could be the reason why the patients admitted are younger than those admitted to CHCs. Younger patients are known to have better outcomes than older ones (Sturm *et al*., 2004). The fact that patients who are older are being referred to CHCs could have an impact on the caregiving provided to these patients. The caregivers could be also be older and be in poor health themselves which could result in caregiver strain (Bugge, Alexander and Hagen,1999).

The participants who were part of the study may well have been experiencing social challenges prior to their stroke given that the majority of the participants in this study had no or only a primary level of education and a household income < R1000 a month. It often happens that spouses or children take on the role of caregivers thus necessitating their resignation from work (Whitlaw *et al*., 1994) and thereby placing an even greater financial burden on the family. This would inevitably result in the person and family having to adapt their lifestyle which could lead to family conflict, especially between spouses (Teasall *et al*., 2000). Although the impact of stroke on the family was not investigated in the study, results from the WCRC study which included participants from a similar socio-economic background, noted that the majority of carers reported financial strain and the need to make work adjustments (Rouillard, 2006). It can therefore be concluded that having a family member who has experienced a stroke would impact on the families of participants in the study.

Levels of education and income also affect rehabilitation outcomes of patients with stroke. In the investigation of socio-economic factors on recovery as

evaluated in the CERISE study (Putman *et al*., 2007), it was found that a higher level of education was associated with improved motor and functional recovery during inpatient rehabilitation. Putman *et al*., (2007) conclude that therapists tend to communicate differently with patients who have a higher level of education and this could result in improved outcomes because patients with a higher level of education were given more information which could affect recovery (Putman *et al*., 2007). In contrast to what was reported by Putman *et al*. (2007), the level of education was not a predictor of functional or motor outcome in the CHC study. The setting was an outpatient setting and the influence of level of education was only noted by Putman *et al*. (2007) during inpatient rehabilitation. However, Putman *et al.* (2007) found that level of income affected motor recovery of patients once discharged from inpatient settings. The author highlights that this difference could be the result of differences in follow-up services which result in differences in intensity of therapy for those who could still benefit from interventions. Although the level of income was not included as a prognostic factor in the study, one could conclude, as highlighted by Putman *et al.* (2007), that differences in level of income could affect attendance of follow-up therapy sessions. The reasons why patients would not attend follow-up sessions could be due to a lack of money to pay for services or transport to access services. The lack of transport has often been cited (Whitelaw *et al*.,1994) as a major obstacle to access treatment even when treatment was offered free of charge or as a state-subsidised service, for example, at CHCs. Accessibility to rehabilitation services was however not investigated in the study.

It is important to note that the CHC study sample might seem biased with regard to socio-economic status since the majority of the participants form part of the lower socio-economic segment of South Africa's population. As stated earlier, it must be noted that South African citizens in the higher income groups and those with medical insurance are managed in the private sector and not at Community Health Centres. The outcomes of these patients could be different to what is presented in this study.

5.3.1.2 Medical status

Connor (2006) notes that imaging using CT scans or MRIs are necessary to determine the type of stroke. Resources such as CT scans and MRIs are not freely available in the public health sector in South Africa due to high costs. As only 19% of the participants in the study had their stroke confirmed by a CT scan, it can be assumed that an accurate diagnosis of the type of stroke could not be determined in the majority of the study participants. The acute management of different types of stroke differs and therefore the correct diagnosis is imperative (American Heart Association, 2007). The increased availability of CT scans could assist with the correct diagnosis of stroke, as well as the type of stroke suffered in this population and inform the appropriate emergency management.

Hypertension (90%) followed by smoking (54%) and then diabetes (46%) were the most prevalent risk factors in the study sample. Similar results were found by two previous studies conducted in the Western Cape (Rhoda and Hendry, 2003; Rouillard, 2006). In their study, Rhoda and Hendry (2003) found that 73% of the participants had hypertension, 29% smoked and 27%

had diabetes. In the study conducted by Rouillard (2006), 74% of the participants had hypertension, 52% smoked and 23.5% were diabetic. These findings concur on the rank order of the three most prevalent co-morbid risk factors in stroke patients in the Western Cape. However, the percentages reported in this study sample were considerable higher for hypertension and diabetes when compared with the study results of the previous studies conducted in the Western Cape. The difference might be attributed to two reasons: Firstly, the sample in Rouillard (2006) was reportedly younger as evidenced by a lower mean age. The expectation is that the incidence of co-morbid diseases of lifestyle would be positively correlated to age. As the mean age of samples increase, co-morbid diseases such as hypertension would also increase (Anderson, 1999). Secondly, Rhoda and Hendry (2003) recorded the incidence of co-morbid lifestyle diseases from records. One of the major disadvantages of using records is that there is often data missing, and therefore the lower incidence reported might be attributable to a limitation in the methodology (Banks, 1998). In contrast, the findings in the study were gathered via patient report and confirmed by the use of medication in an attempt to increase the accuracy of reporting. This might account for the higher incidence reported in the study.

Although a large number of South Africans are at risk of suffering a stroke, Bogoshi, Stewart, Hale and Fritz (2003) found that the knowledge of stroke in at risk groups in the South African population was inadequate. This means that although people have hypertension they are not aware that they could experience a stroke if they do not take their medication. It would be important to determine how many patients had been diagnosed with hypertension and

had not been taking their medication diligently and therefore had a stroke, or whether they were taking their medication and still got a stroke. The investigation relating to control of hypertension was however not included in the study.

5.3.2 Disability outcomes

The outcomes relating to disability can be described in terms of the impairments, activity limitations and participation restrictions of the participants. In this section the outcomes are discussed in terms of the levels of each outcome at baseline and six months post-stroke. The outcomes are compared with the results in the literature and the implications for the population.

5.3.2.1 Impairments of the participants

The baseline Rivermead Motor Assessment Scores indicated that the participants in the study had greater motor impairments of the upper limb ($mean_{RMA\text{-}A}$ = 5.10) than the lower limb ($mean_{RMA\text{-}LT}$ = 5.03). Participants who were part of the CERISE and WCRC studies also had greater impairments of the upper limb when compared with the lower limb. Rouillard (2006) reported a greater degree of impairment for stroke patients admitted to the WCRC as evidenced by lower mean scores on the Rivermead sub-scales ($mean_{RMA\text{-}LT}$=2, $mean_{RMA\text{-}LT}$ =0). Similarly, De Wit, Putman, Schuback, Komrek, Angst and Baert (2007) reported a greater degree of impairment for stroke patients admitted to rehabilitation centres in the United Kingdom ($mean_{RMA\text{-}LT}$ =4, $mean_{RMA\text{-}LT}$ = 3) and Belgium ($mean_{RMA\text{-}LT}$ =4, $mean_{RMA\text{-}LT}$ =2). When comparing the results of the study with the study conducted at WCRC in the

Western Cape it becomes apparent that stroke patients admitted to the inpatient rehabilitation facility have greater levels of baseline impairment than those managed at CHCs.

Although the participants in the study were less impaired than those admitted to inpatient facilities, there were certain activities that they could not perform at baseline which could affect their level of functioning. When assessing the individual lower limb items that the participants in the study were not able to perform, it was found that activities which involved weight-bearing on the affected leg and individual movements such as dorsi-flexion and active selected lower limb movements were the activities the participants could not perform. The inability to perform these movements could affect both the stance phase and swing phase of gait (Shumway-Cook and Woollacott, 2001). The results of the baseline RMA-G, however, indicated that the participants were able to walk independently for 10 meters with or without an aid but were not able to walk for 40 meters outside the house, climb stairs and run or hop. This meant that although the patients could be mobile inside their homes they were not mobile outside their homes.

The items on the RMA-A scale that the majority of the participants were not able to perform at baseline were activities that mainly involved doing a task which involved both upper limbs or fine motor tasks of the affected limb. The impairment in upper limb function could affect the ability to perform activities of daily living and instrumental activities of daily living. Motor impairments post-stroke have been found to influence both activity and participation (Rochette, Desrosiers, Bravo, St-Cyr/Tribble and Bourget, 2007). The loss of

the ability to perform activities of daily living and instrumental activities of daily living is discussed in section 5.3.3.

At six months post-stroke, the participants' ability to perform gross motor functions improved with more than 50% of them being able to walk outside their homes. When compared with the motor function of the lower limb, the majority were still not able to perform activities that involved weight-bearing on the affected limb although more participants had active dorsi-flexion. The ability to perform functional activities without motor function occurs as a result of compensation (Kwakkel, Kollen and Lindeman, 2004). Patients are known to re-learn functional activities in the presence of motor impairments.

A statistically significant improvement was noted in the mean RMA scores between baseline and two months but not between two months and six months. This finding could be explained by the rate of neurological and motor recovery post-stroke. A number of studies have indicated that neurological recovery occurs early after stroke (Duncan *et al*., 2000; Jørgensen *et al*., 1995). Jørgensen *et al*. (1995) reported that in patients who were part of the Copenhagen study those who had severe strokes reached their best recovery within 15 weeks. For the participants classified as having a mild stroke in the Copenhagen study, neurological recovery was reached within six weeks post-stroke onset. The majority of the patients in the CHC study were classified as having a mild stroke as measured by the NIHSS. When compared to the participants in the Copenhagen study one could conclude that the lack of significant recovery between two and six months could be related to the fact that the participants reached their best measurable level of recovery. Duncan

et al. (2000) also reported that the most evident recovery of neurological impairments occurs within the first month, although some neurological recovery could still be observed for up to six months in patients with severe stroke. When comparing the results of the study with that of the Copenhagen study by Jørgensen *et al.* (1995) it should be noted that the severity of stroke was determined using different scales and results should be compared with caution. However, the finding that neurological and motor recovery occur earlier in the post-stroke period appears to be robust based on its consistency despite the different scales being used. Similarly, the interaction between the severity of stroke impairment and rate of recovery has been consistently noted. Therapists working at CHCs should therefore be aware of the level of neurological and motor impairments of the stroke patients and should subsequently provide interventions that are appropriate and would optimally facilitate recovery. For example, depending on the severity of the stroke experienced, the aim of rehabilitation for patients who are past three to six months post-stroke should not be to improve neurological or motor impairments but to address factors such as improving activity and participation.

5.3..2.2 Activity limitations of the participants

Limitations in activities is a major challenge to patients who have experienced a stroke (Mayo *et al*.,1999). Patients with stroke, therefore, often need assistance from caregivers to perform basic activities of daily living. In the p study the majority of the participants needed moderate assistance with daily activities, Barthel Index Score 60/100 to 80/100 at baseline. Although the majority of the participants only needed moderate assistance, the individual

activities they could not perform at baseline included toileting, feeding, dressing and bathing. This meant that at the time of stroke onset they probably needed someone to care for them on a full-time basis. The implication of this is that they were dependent on a carer which often leads to feelings of helplessness and frustration (Dowswell, Lawler, Dowswell, Young, Forster and Hearn, 2000).

At six months post-stroke the majority of the participants in the study only needed minimal assistance, Barthel index score of 85/100 to 95/100 (Granger, Dewis, Sherwood and Barrett, 1979). The activities that the majority could still not perform independently were dressing, stair climbing and bathing as measured by the Barthel Index (see figure 4.8). The ability to perform activities such as toileting and feeding independently meant that the participants might not have required full-time assistance. Participants in a follow-up study conducted one year post-stroke by Hartman-Maier *et al*. (2007) in Israel and those who were part of the WCRC study were also less dependent in dressing, stair climbing and bathing. The inability of the patient with stroke to perform activities such as bathing and stair climbing could also be as a result of environmental barriers such as bathrooms that are inaccessible or homes that are not accessible due to steps at front doors. This means that in patients where improvement in functional activity is no longer expected, the rehabilitation interventions should therefore be focused on intervention in the environment of the person with the disability (Helander, 1999). The building of ramps would be needed to assist where patients are not able to climb stairs and the provisions of assistive devices to assist with bathing.

When investigating instrumental activities of daily living it was found that more than 50% of the participants still needed assistance with climbing stairs, travelling using public transport, doing housework or managing the garden at six months. The inability to independently perform activities such as washing clothes, shopping and housework were also found in a cohort of stroke patients in Israel assessed one year post-stroke (Hartman-Maier *et al*., 2007). In the WCRC study conducted by Rouillard (2006) it was found that the abovementioned activities, including travelling by public transport were ones that were difficult for stroke patients to perform independently at six months post-stroke. What is evident from the results is that patients with stroke are experiencing the same difficulties with certain activities irrespective of the intensity of rehabilitation received, age or the ability to perform basic activities of daily living. The participants in the WCRC study received a greater intensity of rehabilitation, were younger and had a higher level of ability to perform the activities of daily living when compared to those in the study. There is therefore a need to investigate what the problems are with the tasks that the patients are not able to perform. As previously mentioned the environment in which these tasks need to be performed could be the limiting factor. The inability to perform certain tasks that they could do previously such as household tasks and shopping meant that these tasks had to be performed by others thus resulting in a role change as is discussed in section 5.3.4.

The inability of participants in the study to use public transport was a major concern. Only one out of three participants in the study was able to use public transport. The socio-economic status of the study population with 80.7% on

an income below R1000 a month implies that only a small number of the participants owned a car. The ability to use public transport is therefore important. It is imperative to distinguish whether the inability to use public transport is intrinsic to the patient, meaning as a result of motor or other impairments or whether it is a result of extrinsic factors such as accessibility of the transport system. At present there is only one train station in the research setting area that is accessible to people who cannot use stairs. Persons with disabilities have indicated that the public transport system which includes trains, buses and minibus taxis are not suitable for their use (Office of the Premier, Western Cape, 2002: 47). "Inaccessibility of stations and platforms, steps too high to climb, problems hailing down busses and taxis and overcrowding" were some of the reasons given by people with disabilities in the Western Cape for unsuitable public transport modes (Office of the Premier, Western Cape, 2002: 47). The inability to use public transport resulted in participants having to pay out large sums of money to neighbours or other members of the community to transport them.

A lack of access to transport could impact on other domains of the individual's life. The patients' involvement in recreational activities could decrease. Their visits outside of the house sometimes become limited to follow-up medical appointments with the doctor (Rochette *et al*., 2007). In South Africa a state subsidised transport system, namely, Dial-a-Ride, is available to people with disabilities, but it is not always convenient as one has to be a registered user and book way in advance to be picked up. A number of users had indicated frustration as they cannot use Dial-a-Ride at the spur of the moment and even

if they had booked they often still had to wait very long before being picked up.

As was the case with motor impairment, a significant improvement was noted in basic activities of daily living between baseline and two months but not between two and six months. The baseline Barthel scores of participants (mean = 62.7) could be classified as having moderate disability (Jørgensen *et al*., 1995). Jørgensen *et al*. (1995) found that patients with moderate disability attained their best levels of functioning within seven weeks. The lack of recovery between two and six months could possibly be attributed to optimal recovery being attained by two months post-stroke already. It should however be noted that the mean (SD) Barthel score of the participants at six months was only 78.6 (23.7) – still indicating mild disability, with only 15% being totally independent with a Barthel score equalling 100. In contrast Jørgensen *et al*. (1995) reported total independence in 46% of the participants in the Copenhagen study. As the participants were all treated in a stroke unit from acute admission to end of rehabilitation, the lack of a statistically significant improvement between two and six months noted in the study could also be due to decreased intensity of treatment received by the participants.

When investigating factors predicting activity limitation at six months, the results from the regression analysis revealed that the level of impairment and activity limitations at intake are the strongest predictors of impairment and activity limitation respectively at six months. This information supports previous literature which states that levels of motor and functional impairments are the best predictors of disability post-stroke (Kwakkel *et al*.,

2006; Meijer *et al*., 2003). Information regarding factors that determine outcome post-stroke could be used to plan services for stroke patients. In the setting the rehabilitation professionals can use the Barthel Index which is an easy to use tool to assist with the appropriate management of patients who have low Barthel scores in the acute stage. It should be noted that the availability of nursing homes for patients who have an unfavourable outcome six months post-stroke is limited in the Western Cape. The majority of these patients are managed at home by their families. One could make a good case for greater input by home-based carers whose services were available at most of the centres as reported by the therapists. The implication of these findings is that therapists could use initial levels of impairments and activity as a gross screening of prognosis and plan interventions that are appropriate, particularly in a health care system where the availability of rehabilitation staff is limited.

5.3.2.3 Participation restrictions of the participants

Work, family responsibilities, leisure and social activities were the participation domains investigated in this study. Of the participants who remained in the study, 74% could not return to work, 54% were unable to resume the role of caring for their families and 48.9% were unable to take part in social and leisure activities as before. From these results it becomes evident that the stroke had impacted greatly on the ability of the individual to resume the roles s/he had performed prior to the stroke. This finding is confirmed by the results of the EQ-5D which indicated that participants had the most difficulties with conducting usual activities. These usual activities were the ones that included

work, caring for families and leisure activities (Dorman, Dennis and Sandercock, 1999).

In studies that used the EQ-5D as an outcome measure similar results were reported. The domains of employment/education and family responsibility and leisure were similarly affected in participants of the study by Desrosiers *et al*. (2003). In a study conducted in Sweden the authors investigated the effects of day hospital rehabilitation in a group of younger stroke patients. The outcome of the study in Sweden revealed that usual activity was the category that was the most affected as measured by the EQ-5D (Olsson and Sunnerhagen, 2006). In the study conducted at WCRC the majority (61) of the stroke patients also experienced problems conducting their usual activities (Rouillard (2006).

Many patients with stroke and their carers have highlighted the importance of being involved in income generating activities post-disability (Khondowe, Rhoda and Mpofu, 2007). Return to work or activities that would result in the generation of income should therefore be a common goal in the rehabilitation of persons with disabilities. Although most of the participants in the study were unemployed even before the stroke, only three (9.7%) of the participants who were employed at the time of their stroke could return to their jobs.

The inability to return to work has a number of implications for the person who has suffered a stroke and the family. The patient now becomes dependent on the family for financial support and the family is left with one less income while having additional expenses related to transport to attend medical

appointments, etc. The inability to care for the family and return to work has been highlighted as a factor that concerns young stroke patients (Teasall et al., 2000). The participants' inability to access public transport and the high unemployment rate in the research setting could be two challenges that participants would experience if wanting to return to work (Treger, Shames, Giaquinto and Ring, 2007). Although the results of the study have highlighted that the inability to use public transport was an instrumental activity that the majority of the participants could not perform post-stroke, it is not clear that this was the major reason why the participants could not return to work. Further research is needed to explore the reasons why the participants could not return to work so that the interventions provided by the therapists would be appropriate.

The inability to resume the role of caring for the family was a challenge for about 35% of the participants. These patients who were taking care of others experienced a change in roles as they often needed someone to take care of them. This could lead to feelings of vulnerability in the area of changing roles and responsibilities as expressed by participants who participated in a qualitative study conducted by Burton (2000). The inability to resume previous roles could also lead to a sense of losing control which would result anger and frustration (Dowswell, et al., 2000). This feeling of helplessness could in turn cause depressed mood, a symptom which often occurs in people with stroke. Results of a systematic review revealed that depressive symptoms occur in 33% of all stoke survivors (Hackett, Yapa, Parag, and Anderson, 2005). The change in roles could not only have affected the patient but the carers as well, since carers often express a sense of lack of time for themselves as a result

of having to care for someone who has experienced a stroke, while having to assume different roles (Dowswell, Lawler, Dowswell, Young, Forster and Hearn, 2000). The impact on carers was however not investigated in the study.

A decrease in participation in social and leisure activities as found in the study is a common phenomenon in people who have had a stroke (Burton, 2000; Dowswell *et al*., 2000). The inability of patients to return to their previous levels of leisure and social activities could either be as a result of the inability of the patient to access the facilities to take part in these activities or the patients' perception that their personality had changed as expressed by respondents in qualitative interviews (Dowswell *et al*. 2000). A fear of being treated differently was another reason for the lack of social interaction in patients with stroke (Rochette *et al*., 2007). The reasons why patients were not able to return to being involved in previous activities were not investigated in the study. It is however important to note that the re-integration of people with stroke with regard to leisure and social activities would need to include intervening in both the personal and environmental domains.

In summary, it is therefore clear that a number of factors which could either be environmental or personal could have resulted in the participation restrictions experienced by the participants in the study. The MRS structured interview was used as an outcome measure in the study to determine participation. The questions asked related to whether the patients could perform the activities and if they were able, could they perform the activities as before or at a reduced level or rate. What seems to be important are the barriers that could

be preventing participants from participating as before. Since these barriers could be context-specific they could differ for different individuals. Therefore, it becomes clear that barriers of facilitators that cause participation restrictions need to be investigated.

5.4 PROCESS OF REHABILITATION

5.4.1 Services received

As previously mentioned a wide range of services which include medical services, social work, dieticians, physiotherapy, and occupational therapy are provided to stroke patients at certain CHCs. Although this is the case, not many of the patients reported receiving the abovementioned services. Similar to what is found in the literature physiotherapy was the therapeutic service most frequently received by the participants (Jiménez, de Pedro-Cuesta, Almazan and Widen Holmqvist, 2000; Whitelaw *et al.*, 1993). A study conducted in Cape Town by De Villiers *et al.* (2006), which included patients discharged from a secondary hospital in the Western Cape, also reported that 27% of the patients received physiotherapy, 5% occupational therapy, and 6% speech therapy.

The use of services could either be linked to patient outcomes such as motor impairments or decreased ability to perform functional activities, or to the availability of staff. If provision of services are linked to the patient outcomes, the reasons why stroke patients often receive more physiotherapy than occupational therapy highlights the fact that rehabilitation in the acute stage is often still impairment-based. A greater emphasis is placed on motor and functional recovery and not on addressing the participation restrictions which

would normally be emphasised by occupational therapists (De Wit *et al*., 2006). It is more than likely that stroke patients who were part of the study received more physiotherapy than occupational therapy due to the lack of occupational therapists employed at the CHCs. Although a number of occupational therapy assistants were employed at the centres, their role mainly involves facilitating groups such as psychosocial groups and not the individual treatment of stroke patients.

5.4.2 Content of physiotherapy

An analysis of therapeutic interventions is important as it assists with the application of interventions that are appropriate. The recording of the content of therapy was a challenge in the study. A large number of the participants only visited the centres once for physiotherapy and therefore could not be video recorded. The recording of occupational therapy sessions was an even a greater challenge as only 35% of the total study population received occupational therapy and of these the majority only had one treatment session and therefore could not be video recorded. The researcher therefore only included an analysis of physiotherapy sessions in the study. The content of physiotherapy in the study consisted mainly of exercises in sitting and sitting balance, re-learning selective movements, mobilisations and exercises in standing. This was similar to the results found in the CERISE study conducted by De Wit *et al. (*2006). Selective movements, exercises and balance in sitting and standing and ambulatory exercises were also the activities more frequently practised by physiotherapists in the CERISE study. In the study although 74% of the participants were able to walk 10 meters with an aid at intake only 58% could do this without and aid, one would have

expected that walking could have been included more frequently as one of the main goals of rehabilitation for stroke patients as the ability to walk and walking without an aid is more functional given that it allows patients to be able to carry objects while walking.

Of the activities that were included the least frequently occurring categories were personal activities of daily living (median 0 minutes) and ambulatory exercises (median 0.33 minutes). The participants in the study had more severe problems with activity restrictions than with impairments. Activities such as leisure and social activities are re-educated more by occupational therapists than by physiotherapists (Booth and Hewison, 2002; Ballinger *et al*., 1999). The need to employ more occupational therapists at the CHCs is once again highlighted as there is a need to improve activities that are included more often by occupational therapists in treatment sessions. The fact that occupational therapy treatment sessions were not video recorded is a limitation of this study, as one does not know whether the occupational therapy interventions would have been aimed at addressing the activity limitation and participation restrictions experienced by the patients.

The CSP (Provincial Government of the Western Cape, 2007) recommends that the rehabilitation provided at low intensity centres such as CHCs should include re-education of functional activities, training of caregivers, visits to the clients' workplace as well as advocating for the rights of persons with disabilities. From the results of the study it is clear that many of the activities recommended by the CSP are not being provided and if the provincial government would like to see the plan being implemented it becomes

important that the provincial government should employ more therapists and that these therapists should be providing rehabilitation that is appropriate to patients with stroke and other patients with disabilities.

5.4.3 Intensity of rehabilitation

The intensity of rehabilitation determined in the study included the number of therapy sessions received by the participants and the physiotherapy treatment time. The participants in the study received much less physiotherapy compared to what is found in other inpatient or outpatient community-based settings in developed countries. In rehabilitation centres stroke patients are reported as receiving as much as one hour a day of therapy in the United Kingdom and nearly three hours a day in Switzerland (De Wit *et al.*, 2006). The number of treatment sessions in total was also less than what was provided in a study conducted in the United Kingdom (UK) (Young and Forster, 1992). Stroke patients treated in a day hospital in the Bradford Community Trial in the UK attended for a median of 31 times in a six month period (Young and Forster, 1992). In the study the majority of the participants only received one to five treatment sessions over a six month period. Sixty-eight percent (68%) of these participants had between one to five visits to the physiotherapist with a median of 1.83 hours of physiotherapy.

Although these participants received much less therapy compared to what was presented in the literature, a statistically significant improvement in motor and functional recovery was noted between baseline and two months post-stroke. It could be questioned at this stage whether the improvement noted with regard to motor and functional impairment in the participants between

baseline and two months was the result of therapy or merely a result of the natural recovery process which occurs post-stroke. It has been suggested by Kwakkel *et al*. (2006) that between 16–42% of the improvements noted within the first six to ten weeks is as a result of progression of time.

Furthermore, there was no significant improvement noted between two and six months and some of the participants even demonstrated deterioration on some of the items, namely, sitting to standing, walking independently with an aid and transfers between two and six months. The question that arises is: If a greater intensity and duration of therapy were provided to the participants would they have demonstrated a significant improvement in impairments and basic activities of daily living between two and six months? It has been suggested in section 5.3.3 that the decreased intensity of therapy could have resulted in poorer outcomes in the participants.

The effects of this decreased intensity of physiotherapy cannot be linked to the poor outcome on extended activities of daily living. Participation restriction as the physiotherapy input was not aimed at intervening in these domains and there is no evidence to suggest that improved impairment directly results in improved extended activities of daily living and participation restrictions.

The decreased number of therapy sessions could also be the result of patients not attending follow-up therapy sessions due to accessibility factors. The majority of the patients who have a stroke can only access the centres using transport. As the public transport system is not accessible to people with disabilities (Office of the Premier Western Cape, 2000) they would have to use private transport which is often unaffordable. Therefore, patients do not

attend follow-up treatment sessions. Accessibility of rehabilitation services in the community for this specific group of stroke patients therefore needs to be explored.

5.5 LIMITATIONS OF THE STUDY

The researcher would like to highlight the following limitations of the study. The diagnosis of stroke was made on a clinical basis in the majority (81%) of the participants and not confirmed by CT scan or MRI. This means that some participants in the study could have presented with clinical neurological symptoms as a result of another cerebral condition.

The study had a high drop-out rate of 24%. The concern in this scenario is always that there might be systematic reasons accounting for the attrition in which case inferences made should be interpreted with caution. The researcher attempted to address this by applying an intention-to-treat analysis, as well as ensuring that the sample size was large enough to avoid significant reductions in power, as well as ensuring that subject-to-variable ratios in the analyses conformed to the minimum requirements.

The fact that the therapist questionnaire developed by the researcher was not tested for reliability is a limitation as it could query the consistency of the information obtained from the instrument.

The sample in the study only includes people from a lower socio-economic background. Direct and parallel comparison of the results of this study with those conducted in other socio-economic strata and areas of the country or

other parts of the world should be done with caution due to environmental differences. Furthermore, sampling and methodological variations between the different studies will also limit comparisons, and results from other studies are also mainly attained from studies conducted with hospital-based samples.

5.6 SUMMARY OF CHAPTER

In this chapter, the researcher discussed the results of the study in relation to the research questions (see Chapter 1, section 1.4) and compared these results with global literature. Limited rehabilitation services are available for the rehabilitation of stroke patients at CHCs in the Western Cape. Where services were available they are not organised in a co-ordinated manner contrary to the recommendation in the literature. The age and gender distribution, as well as the socio-economic status of the stroke patients whose rehabilitation outcomes were investigated is representative of stroke patients in sub-Saharan Africa.

Although the participants in the study were less impaired than those admitted to inpatient settings locally and abroad, they experienced similar lacks with regard to the ability to perform certain instrumental activities of daily living and adopting roles which they held prior to the stroke.

The findings indicating that the initial level of motor impairment and functional activity were identified as the main predictors for these outcomes at six months post-stroke, are similar to what was found in previous studies. Although the content of physiotherapy was similar to what is implemented in certain other countries the intensity is much less.

The results of this study were similar in some aspects and different in other aspects to what has previously been documented in the literature. However, it is important to note that the study sample is unique in that it consisted of stroke patients who were still in the acute to sub-acute stage post-stroke receiving minimal rehabilitation when compared to other stroke populations. Further conclusions and recommendations from the study are presented in the following chapter.

CHAPTER 6

CONCLUSION, SIGNIFICANCE AND RECOMMENDATIONS

In this chapter of the thesis the researcher concludes the major findings of the study and makes recommendations about stroke rehabilitation at CHCs. The significance of the findings for stroke rehabilitation in this setting is also highlighted.

6.1 CONCLUSION

The researcher was motivated to conduct the study after she observed that in a certain region in the Western Cape, South Africa, many stroke patients with various levels of severity access Community Health Centres (CHCs) for rehabilitation. The services received by the stroke patients at these centres were not formalised or co-ordinated. In addition, limited information was available regarding the effectiveness of this service. To address the gaps in the knowledge related to the rehabilitation of stroke patients at CHCs in the Western Cape, the study aimed to determine the structure, process and outcome of rehabilitation of stroke patients at CHCs within the Structure Process and Outcomes framework (SPO).

The International Classification of Functioning, Disability and Health (ICF) was used as a framework to conceptualise the outcomes of the participants. A longitudinal observational study assessed the participants' outcomes at baseline, two and six months post-stroke. Although the participants had mild strokes and could function independently within their homes, their inability to be independent in certain activities of daily living limited their re-integration

into their communities. They also lacked the ability to return to the roles they had prior to the stroke.

The structure and process of rehabilitation at the centres which were determined by use of a cross-sectional survey of therapists working at the centres and by reviewing patient records revealed that the rehabilitation services received were curtailed by the lack of sufficient physio, occupational and speech therapists employed at CHCs. The lack of therapists in turn impacted the intensity of treatment which might in turn have affected the lack of significant improvement in functioning for patients between two and six months post-stroke. The content of physiotherapy services focused on impairment and retraining of functional activities. However, as previously mentioned, stroke patients accessing CHCs presented with greater limitations in instrumental activities of daily living and participation that are traditionally addressed by occupational therapists. Thus it would appear that rehabilitation of stroke patients at CHCs should be amended to include a greater emphasis on re-integration into work and community participation.

6.2 SIGNIFICANCE OF THE STUDY FINDINGS

Rehabilitation of stroke patients at low intensity rehabilitation facilities such as Community Health Centres is a common phenomenon in developing countries like South Africa. According to the researcher and as determined by the literature reviewed, this is the first study that has investigated the structure, process and outcomes of stroke patients attending this type of rehabilitation setting. The findings therefore provide information relating to the level of impairment, activity and participation of patients with stroke accessing

Community Health Centres. This information could be of interest to rehabilitation professionals and researchers interested in stroke rehabilitation.

The findings start to identify the gaps in the provision of rehabilitation services at primary level. This information could be used by the Department of Health in the Western Cape to assist with the implementation of services as indicated in the Comprehensive Service Plan (CSP). As mentioned in Chapter 5 of this thesis, the CSP recommends that “rehabilitation services provided should range from retraining of functional skills to advocacy for persons with disabilities, training of caregivers and workplace visits” (Provincial Government of the Western Cape, 2007: 68).

According to the findings of this study, when treating patients with stroke, the re-training of functional skills should involve activities such as bathing, stair climbing and dressing. With regards to advocacy the findings reveal that therapists should advocate for accessible transport and buildings for persons with stroke. The researcher would support workplace visits as the return to work rate for participants in the study was low.

Although the study was not a formal evaluation, the therapists working at the centres could use the information gained from the study as an indication of the effectiveness of their management of patients with stroke. They could use the information to ensure that the rehabilitation provided is appropriately aimed at improving outcomes which would result in a re-integration of patients into the community. In addition they could use the information to motivate for additional therapy posts at CHCs.

The findings of the study are also relevant to stroke patients receiving rehabilitation at CHCs. Sharing the findings of the study with the patients would enable them to gain knowledge of stroke rehabilitation services provided at the centres as well as the outcome of these services. The patients could be assisted to advocate for improved rehabilitation services at these centres and lobby other government departments for services like accessible transport, etc.

6.3 RECOMMENDATIONS

Taking into account the results of the study, the researcher would like to make the following recommendations for the improvement of rehabilitation services for stroke patients and for future research.

6.3.1 Recommendations for the provision of services

6.3.1.1 Recommendations for structure and process of rehabilitation

The researcher would like to recommend that more rehabilitation professionals such as occupational therapists and physiotherapists be employed at Community Health Centres in the Western Cape so that all the centres have at least physiotherapy and occupational therapy services. If it is not possible for all the centres to have permanent therapists, the therapists should be employed within districts in a manner whereby smaller centres would receive services from therapists working at larger centres. The researcher would like to recommend further that speech therapists be employed at primary level, specifically at Community Health Centres, in order to prevent the majority of patients needing speech therapy from having to

travel to tertiary institutions to receive these services. An increase in staff would allow therapists to increase the intensity of therapy and to work in a co-ordinated manner.

6.3.1.2 Recommendations to improve outcomes of rehabilitation

Therapists working at Community Health Centres should make use of a standardised outcome measuring tool that could be used to screen the patients' level of stroke severity and level of motor and functional impairments thus enabling more appropriate management of patients.

The interventions provided by therapists working at the centres should be focused on reducing activity limitations and participation restrictions to facilitate re-integration into communities and the resuming of previous roles of patients with stroke accessing Community Health Centres.

To implement the above the assessment of the stroke patients should include an assessment of their physical and social environment to ensure that if needed the rehabilitation interventions should include intervening in the physical environment of the patient, a goal that is encompassed in the definition of rehabilitation.

6.3.2 Recommendations for further research

A number of research questions arose from the study that could be addressed in future studies.

There is a need to investigate the reasons for significant improvement experienced by participants between baseline and two months even though they received very little rehabilitation. The results of these studies would start to answer some burning questions relating to what is the critical amount of therapy need is to obtain an optimal outcome.

Future studies could be conducted to investigate whether an increased rehabilitation input – specifically occupational therapy input – would decrease the activity limitations and participation restrictions experienced by stroke patients admitted to CHCs.

As already mentioned, the participants experienced participation restrictions and activity limitations. Studies could be conducted to investigate the reasons for these limitations or restrictions. These studies must include an investigation of the environmental factors that may well be the prime reasons for limitations. The researcher would like to suggest that these studies be of a quantitative and qualitative nature because qualitative studies would provide indepth information regarding the experiences of individuals which are difficult to determine using quantitative studies.

The researcher would like to recommend that the study be replicated in other provinces in South Africa to broaden the data available relating to structure, process and outcomes of stroke rehabilitation nationally. This information is largely lacking and could inform national policy.

REFERENCES

American Heart Association. (2007). Guidelines for the Early Management of Adults With Ischemic Stroke. *Stroke, 38*, 1655-1711

Agency for Health Care Research. (1995). *Post-stroke Rehabilitation*. Clinical Guideline Number 16 Publication No. 95-00062

Anderson, C., Rubenach, S., Mhurchu, C., Clarke, M., Spensor, C., & Winsor, A. (2000). Home or Hospital for Stroke Rehabilitation? Results of a Randomised Controlled Trial: 1: Health Outcomes at 6 Months. *Stroke, 31*, 1024-1031.

Anderson, G. (1999). Effect of Age on Hypertension: Analysis of Over 4,800 Referred Hypertensive Patients. *Saudi Journal of Kidney Diseases and Transplantation, 10*(3), 286-297

Ayala, C., Greenlund, K. J., Croft, J. B., Keenan, N. L., Donehoo, R. S., Giles, W. H., et al. (2001). Racial/Ethnic Disparities in Mortality by Stroke Subtype in the United States, 1995 - 1998. *American Journal of Epidemiology, 154*, 1057-1063.

Bagley, P., Hudson, M., Forster, A., Smith, J., & young J. (2005). A randomised trial evaluation of the Oswestery Standing Frame for patients after stroke. *Clinical Rehabilitation, 19*(4), 354-364.

Ballinger, C., Ashburn, A., Low, J., & Roderick, P. (1999). Unpacking the black box of therapy - a pilot study to describe occupational therapy and physiotherapy interventions for people with stroke. *Clinical Rehabilitation, 13*, 301 - 309.

Bamford, J. (1991). Classification and natural history of clinically identifiable subtypes of cerebral infarction. *Lancet, 337*(8756), 1521-1526.

Banks, N. J. (1998). Designing medical record abstraction forms. *International Journal for Quality in Health Care, 10*(2), 163-167.

Barret-Connor, E., & Khaw, K. (1988). Diabetes Mellitus: An Independent Risk Factor for Stroke? *American journal of Epidemiology, 128*(1), 116-123.

Bautz-Holter, E., Sveen, U., Rygh, J., Rodgers, H., Bruun Wyller, T. (2002). Early supported discharge of patients with acute stroke: a randomized controlled trial. *Disability & Rehabilitation, 24*(7), 348-355.

Berhardt, J., Dewey, H., Thrift, A., & Donnan, G. (2004). Inactive and alone: physical activity within the first 14 days of acute stroke unit care. *Stroke, 85*, 1599-1601.

Bonita, R., Broad, J., & Beaglehole, R. (1997). Ethnic Differences in Stroke Incidence and Case Fatality in Auckland, New Zealand. *Stroke, 28*, 758-761.

Bonita, R., & Beaglehole, R. (1993). Explaining stroke mortality trends. *Lancet 341*, 1510 - 1511.

Bonita, R. (1992). Epidemiology of Stroke. *Lancet, 339*, 342-344.

Bradshaw, D., Nannan, N., Laubsher, R., Groenewald, P., Joubert, J., Nojilana, B., et al. (2004). *South African National Burden of Disease Study 2000. Estimates of provincial mortality,Cape Town*: Medical research council.

Bradshaw, D., Groenewald, R., Laubscher, R., Nannan, N., Nojilana, B., Norman, B., et al. (2003). Initial Burden of Disease Estimates for South Africa, 2000.

Brott, T. G., Adams Jr., H. P., Olinger, C. P., Marler, J. R., Barsan, W. G., Biller, J., et al. (1989). Mesurement cerebral infarction: a clinical examination scale. *Stroke, 20*, 964 - 970.

Bryer, A., Tipping, B., & De Villiers, L. (2006). Health In Transition: Stroke Profile IN A South African Urban Population. *International Journal of Stroke, 1*(1), 29.

Bugge, C., Alexander, H., and Hagen, S. (1999), Stroke Patients' Caregivers: Patient, Caregiver, and Service Factors That Affect Caregiver Strain. *Stroke, 30*, 1517-1523

Burn, J., Dennis, M., Bamford, J., Sandercock, P., Wade, D., & Warlow, C. (1994). Long-term risk of recurrent stroke after first ever stroke. The Oxfordshire Community Stroke Project. *Stroke 25*(2): 333-337

Burton, C. (2000). Living with a stroke: A phenomenological study. *Journal of Advanced Nursing, 32*(2), 301-309.

Carod-Artal, J., Egido, J. A., Gonzalez, J. L., & de Seijas, V. (2000). Quality of Life Among Stroke Survivors Evaluated 1 Year After Stroke: Experience of a Stroke Unit. *Stroke, 31*, 2995 - 3000.

Cifu, D., & Stewart, D. (1999). Factors affecting functional outcome after stroke: A critical review of rehabilitation interventions. *Archives of Physical Medicine and Rehabilitation, 80*, 35-39.

Chae, J., Johnston, M., Hekung, K., Zorowitz, R. (1995). Admission motor impairments as a predictor of physical disability after stroke

rehabilitation. *American Journal of Physical Medicine & Rehabilitation, 74*(3), 218-223.

Clarke, P., Black, S., Badley, E., Lawrence, J., & Williams, J. (1999). Handicap in Stroke Survivors. *Disability and Rehabilitation, 21*(3), 116-123.

Cochrane Collaborative. Early Supported Discharge Trialists*. (2008) The Cochrane Library*, Issue 4.

Connor, M. (2006a). Imaging in Stroke: When? *International Journal of Stroke, 1*(1), 45.

Connor, M. (2006b). Stroke facilities in South Africa. *International Journal of Stroke, 1*(1), 3.

Connor, M., & Bryer, A. (2006). Stroke in South Africa. *Chronic Diseases of Lifestyle in South Africa: 1995-2005. MRS Technical Report.*

Culebras, A. (2006). Introduction: WSF Advocacy and Daly Numbers. *International Journal of Rehabilitation, 1*(1), 3.

Department of Health. (2000). *National Rehabilitation Policy*.

de Haan, R., Aaronson, N., Limburg, M., Hewer, R., & van Crevel, H. (1993). Measuring quality of life in stroke. *Stroke, 24*, 320 - 327.

Dekker, R., Drost, M., Groothoff, J., Arendzen, J., van Gijn, J., Eisma, W. (1998). Effects of day-hospital rehabilitation in stroke patients: A Review of randomized clinical trials. *Scandanavian Journal of Rehabilitation Medicine, 30*, 87-94.

Desrosiers, J., Rochette, A., Noreau, L., Boubonnais, D., Bravo, G., & Bourget, A. (2006). Long-term changes in participation after stroke. *Topics in Stroke Rehabilitation, 13*(4), 86-97.

Desrosiers, J., Malouin, F., Bourbonnais, D., Richards, C. L., Rochette, A., & Bravo, G. (2003). Arm and leg impairments and disabilities after stroke rehabilitation: relation to handicap. *Clinical Rehabilitation, 17*(666 - 673), 666.

De Villiers, L., Kalula, S., Burch, V. (2009) Does multidisciplinary stroke care improve outcome in a secondary-level hospital in South Africa? *International Journal of Stroke 4*(2), 89-93

De Villiers, L., Kalula, S., Bryer, A., & Ferreira, M. (2006). Stroke Outcomes in Sub-Saharan Africa. *International Journal Of Rehabilitation 11*(1), 25

De Wit, L., Putman, K., Lincoln, N., Baert, I., Berman, P., Beyens, H., et al. (2006). Stroke Rehabilitation in Europe. What Do Physiotherapists and Occupational Therapists Actually Do? *Stroke, 37*, 1483 - 1489.

De Wit, L., A. (2006). Collaborative Evaluation of Rehabilitation in stroke Rehabilitation across Europe: Clinical Aspects. Katholieke Universiteit Leuven.

De Wit, L., Putman, K., Dejaeger, E., Baert, I., Berman, P., Bogaerts, K., et al. (2005). Use of Time by Stroke Patients A Comparison of Four European Rehabilitation Centres. *Stroke, 36*, 1977-1983.

Domholdt, E. (2000). *Physical Therapy Research* (2 ed.). Philadelphia, London, New York, St. Louis, Sydney, Toronto: W.B. Saunders Company.

Donnelly, M., Power, M., Russell, M., & Fullerton, K. (2004). Randomised Controlled Trial of an Early Discharge Rehabilitation Service. The Belfast Community Stroke Trial. *Stroke, 35*, 127-137.

Dorman, P. J., Dennis, M., & Sandercock, P. (1999). How do scores on the EuroQol relate to scores on the SF-30 after stroke? *Stroke, 30*, 2146 - 2151.

Dorman, P. J., Slattery, J., Farrell, B., Dennis, M., & Sandercock, P. (1998). Qualitative comparison of the reliability of health status assessments with the EuroQol and SF-36 questionnaires after stroke. *Stroke, 29*, 63 - 68.

Dowswell, G., Lawler, J., Dowswell, T., Young, J., Forster, A., & Hearn, J. (2000). Investigating recovery from stroke: a qualitative study. *Journal of Clinical Nursing, 9*(4), 507-515.

Duncan, P., Zorwitz, R., Bates, B., Choi, J., Glasberg, J., Graham, G et al., (2005). Management of Adults Stroke Rehabilitation Care. A Clinical Practice Guideline. *Stroke, 36*, e100-e143.

Duncan, P., Jorgensen, H., & Wade, T. (2000a). Outcome Measure in Acute Stroke Trials. A Systematic Review and Some Recommendations to Improve Practice. *Stroke, 31*, 1429-1438

Duncan, P., Lai, S., & Keighly, J. (2000b). Defining post-stroke recovery: implications for design and interpretation of drug trials. *Neuropharmacology, 39*, 835-841.

Duncan, P., Wallace, D., Lai, S., Johnson, D., Embretson, S., Laster, L. (1999). The stroke impact scale version2.0: Evaluation of reliability, validity, and sensitivity to change. *Stroke, 30*, 2131-2140.

Duncan, P. (1994). Stroke Disability. *Physical Therapy, 74*(5), 399-407.

Duncan, P., Goldstein, L., Matchar, D., Divine, G., & Feussner, J. (1992). Outcome assessment and sample size requirements. *Stroke, 23*, 1084-1089.

Early Supported Discharge Trialists. Services for reducing duration of hospital care for acute stroke patients. *Cochrane Database of Systematic Reviews* 2005, Issue 2. Art. No.: CD000443. DOI: 10.1002/14651858.CD000443.pub2.

Ferrucci, L., Bandinelli, S., Guralnik, J., Lamponi, M., Bertini, C., Falchini, M., Baroni, A. (1993). Recovery of functional status after stroke. A Postrehabilitation follow-up study. *Stoke, 24,* 200-205.

Feign, V., Lawes, C., Bennet, D., & Anderson, C. (2003). Stroke epidemiology: A review of population-based studies of incidence, prevalence, and case-fatality in the late 20th century. *Lancet Neurology, 2*, 43-53.

Fieschi, C., Falcou, A., Sacchetti, M., & Toni, D. (1998). Pathogenesis, Diagnosis and Epidemiology of Stroke. *CNS Drugs, 1*(1), 1-9.

Finch, C., Brooks, D., Stratford, P., Mayo, N. (2002). Physical Rehabilitation Outcomes: A Guide to Enhanced Clinical Decision-making. Canada: Lippincott Williams & Wilkins.

Flemming, K., & Brown, D. (2004). Secondary prevention Strategies in Ischemic Stroke: Indentifixation and Optimal Management of Modifiable Risk Factors. *Mayo Clinic Proceedings, 79*(10), 1330-1340.

Frank,B., Scholte, A., Hasenbein, U., & Wallesch, C. (2006). Prognosis and prognostic factors in ADL-dependent stroke patients during first in-patient rehabilitation – a prospective multicentre study. *Disability and Rehabilitation, 28*(21), 1311-1318.

Fritz, V. (2006a). Stroke in South Africa. *International Journal of Stroke, 1*(1), 47-48.

Fritz, V. (2006b). Stroke is a catastrophic disease in South Africa. *International Journal of Stroke, 1*(1), 3.

Garraway, W., Whisnant, J., Kurland, L., & O'Fallon, W. (1979). Changing pattern of cerebral infarction: 1945 - 1974. *Stroke, 10*, 657 - 663.

Geyh, S., Cieza, A., Schouten, J., Dickson, H., Frommelt, P., Omar, Z., et al. (2004). ICF Core Sets For Stroke. *Journal of Rehabilitation Medicine, 44*, 135-141.

Gladman, J., Forster, A., & Young, J. (1995). Hospital and Home-based Rehabilitation after Discharge from Hospital for Stroke Patients: Analysis of Two Trials. *Age and Ageing, 24*, 49 - 53.

Gladman, J., Lincoln, N., Barer D. (1993). A randomised controlled trial of domiciliary and hospital-based rehabilitation for stroke patients after discharge from hospital. *Journal of Neurology, Neurosurgery, and Psychiatry, 56,* 960-966.

Granger, C., Dewis, L., Peters, N., Sherwood, C., and Barret, J. (1979). Stroke Rehabilitation: analysis of repeated Barthel Index Measures. *Archives of Physical Medicine and Rehabilitation, 60*, 14-17.

Greenhalgh, J., Long, A., Brettle, A., Grant, M. (1998). Reviewing and selecting outcome measures for use in routine practice. *Journal of Evaluation in Clinical Practise, 4* (4), 339–350.

Gresham, G., Alexander, D., Bishop, D., Giuliani, C., Goldberg, G., Holland, A., et al. (1997). American Heart Association Prevention Conference IV: Prevention and Rehabilitation of Stroke: Rehabilitation *Stroke, 28*, 1522-1526.

Hacke, W., Kaste, M., Bluhmki, E., Brozman, M., Davalos, A., Guidetti, D., et al. (2008). Thrombolysis with Alteplase 3 to 4.5 Hours after Acute Ischemic Stroke. *The New England Journal of Medicine, 359*(13), 1317 - 1329.

Hackett, M., Duncan, J., Anderson, C., Broad, J., & Bonita, R. (2000). Health-Related Quality of Life Among Long-Term Survivors of Stroke. Results from the Auckland Stroke Study, 1991 - 1992. *Stroke, 31*, 440 - 447.

Hale, L., & Eales, C. (2001). Consulting the South African Experts in Physiotherapeutic Stroke Rehabilitation. *South African Journal of Physiotherapy 57*(2), 32-40.

Hale, L., & Wallner, P. (1996). The Challenge of Service Provision in South Africa for Patients with hemiplegia. *Physiotherapy, 82*(3), 156-158.

Hankey, G. (2003). Long-term outcome after ischaemic stroke/transient ischaemic attack. *Cerebrovascular Diseases, 16*, 14 -19.

Hartman-Maeir, A., Soroker, N., Ring, H., Avni, N., & Katz, N. (2007). Activities, participants and satisfaction one-year post stroke. *Disability and Rehabilitation, 29*(7), 559 - 566.

Hawkins, G. C., Bonita, R., Broad, J., & Anderson, C. (1995). Inadequacy of Clinical Scoring Systems to Differentiate Stroke Subtypes in Population-Based Studies. *Stroke, 26*, 1338 - 1342.

Hayn, M. A. (1997). Stroke Rehabilitation: Salvaging ability after the storm.

Helander, E. (1999). *Prejudice and Dignity - An Introduction to Community-Based Rehabilitation* (Second ed.). New York: United Nations Development Programme.

Hendricks, H., van Liembeek, J., Geurts, A., Zwarts, M. (2002). Motor recovery after stroke: a systematic review of the literature. *Archives of Physical Medicine and Rehabilitation, 83*, 1629-1637.

Hershkovitz, A., & Brill, S. (2007). The association between patients' cognitive status and rehabilitation outcomes in a geriatric day hospital. *Disability and Rehabilitation, 29*(4), 333-337.

Hershkovitz, A., Beloosesky, Y., Brill, S., & Gottlieb, D. (2004). Is a day hospital rehabilitation programme associated with reduction of handicap in stroke patients? *Clinical Rehabilitation, 18*, 261 - 266.

Hoenig, H., Sloane, R., Horner, R., Zolkewitz, M., Duncan, P., & Hamilton, B. (2000). A Taxonomy for Classification of Stroke Rehabilitation Services. *Archives of Physical Medicine and Rehabilitation, 81*, 853-862.

Hoenig, H., Horner, R., Duncan, P., Clipp, E., & Hamilton, B. (1999). New Horizons in stroke rehabilitation research. *Journal of Rehabilitation Research and Development, 36*(1), 19-31.

Holmqvist, L., von Koch, L., Kostulas, V., Holm, M., Widsell, G., Tegler, H., et al. (1998). A Randomised Controlled Trial of Rehabilitation at Home After Stroke in Southwest Stockholm. *Stroke, 29*, 591-597.

Howell, D. C. (2008). Mixed Models for repeated (Longitudinal) Data (Publication no.http://www.uvm.edu/~dhowell/StatPages/More_Stuff/Mixed%20Models%20for%20Repeated%20Measures.pdf). Retrieved 18 June 2008 @ 16h35:

Hsieh, R., Wang, L., Lee, W. (2007). Additional therapeutic effects of electro-acupuncture in conjunction with conventional rehabilitation for patients with first-ever ischaemic stroke. *Journal of Rehabilitation Medicine, 39*, 205-211.

Hsueh, I., Lin, J., & Hsieh, C. (2002). Comparison of the psychometric characteristics of the functional independence measure, 5 item Barthel index, and 10 item Barthel Index in patients with stroke. *Journal of Neurology Neurosurgery and Psychiatry, 73*, 188-190.

Hui, E., Woo, J., & Kay, R. L. C. (1995). Outcome of Elderly Stroke Patients. Day Hospital Versus Conventional Management. *Stroke, 26*, 1616 - 1619.

Hulley, S., & Cummings, S. (1988). *Designing clinical research*. Baltimore: Williams & Wilkins.

Huybrechts, K., Caro, J. (2007). The Barthel Index and modified Rankin Scale as prognostic tools for long-term outcomes after stroke: a qualitative review of the literature. *Current Medical Research and Opinion*, *23*(7), 1627-1636.

Indredavik, B., Fjaertoft, H., Ekeberg, G., Loge, A., & Morch, B. (2000). Benefit of an Extended Stroke Unit Service with Early Supported Discharge. A Randomised Controlled Trial. *Stroke, 31*, 2989-2994.

Jelsma, J., Mkoka, S., & Amosun, L. (2008). Health-related quality of life (HRQoL) domains most valued by urban isiXhosa-speaking people. *Quality of Life Research, 17*, 137-145.

Jelsma, J., & Ferguson, G. (2004a). The determinants of self-reported health-related quality of life in a culturally and socially diverse South African community. *Bulletin of the World Health Organisation, 82*, 206-212.

Jelsma, J., Mkoka, S., Amosun, L., & Nieuwveldt, J. (2004b). The reliability and validity of Xhosa version of the EQ-5D. *Disability and Rehabilitation, 26*(2), 103 - 108.

Jimenez, M., de Pedro-Cuesta, J., Almazan, J., & Widen Holmqvist, L. (2000). Stroke Patients in South Madrid: Function and Motor Recovery, Resource Utilization, and Family Support. *Stroke, 31*, 1352 - 1359.

Jørgensen, H., Nakayama, H., Raaschou H., Vive-Larsen, J., Stoier, M., Olsen, T. (1995a) Outcome and Time Course of Recovery in Stroke. Part 11: Time course of recovery. The Copenhagen Stroke Study. *Archives of Physical Medicine and Rehabilitation, 76*(5),406-412

Jørgensen, H., Nakayama, H., Raaschou H., Vive-Larsen, J., Stoier, M., Olsen, T. (1995b) Outcome and Time Course of Recovery in Stroke. Part 1. Outcome. The Copenhagen Stroke Study. *Archives of Physical Medicine and Rehabilitation, 76*(5), 399-405

Kalache, A., & Aboderin, I. (1995). Stroke: global burden. *Health Policy and Planning, 10*(1), 1 - 21.

Kaplan, S. L. (2007). *Outcome Measurement & Management*. Newark, New Jersey: F.A Davis Company.

Kawachi, I., Colditz, G., Stamfer, M., Willet, W., Manson, J., Rosner, B., et al. (1993). Smoking cessation and decreased risk of stroke in women. *Journal of American Medical Association, 269*, 232-236.

Kengne, A., & Anderson, C. (2006). The neglected burden of stroke in Sub-Saharan Africa. *International Journal of Stroke, 1*, 180 - 190.

Khondowe, O., Rhoda, A., and Mpofu, R. (2007) Perceived Needs of Caregivers of Stroke Patients' Receiving Out-Patient Physiotherapy Treatment in Lusaka, Zambia. South African Journal of Physiotherapy,63(1), 14-17.

King, R. (1996). Quality of Life After Stroke. *Stroke, 27*, 1467 - 1472.

Kranciukaite, D., & Rastenyte, D. (2006). Measurement of quality of life in stroke patients. *Medicina (Kaunas) 42*(9), 709 - 716.

Kwakkel, G., Kollen, B., & Twisk, J. (2006). Impact of Time on Improvement of Outcome after Stroke. *Stroke, 37*, 2348 - 2353.

Kwakkel, G., van Peppen, R., Wagenaar, R., Wood-Dauphine, S., Richards, C., Ashburn, A., et al. (2004a). Effects of Augmented Exercise Therapy Time After Stroke A Meta-Analysis. *Stroke, 35*, 2529-2536.

Kwakkel, G., Kollen, B., &Lindeman, E. (2004b). "Understanding the pattern of Functional Recovery after Stroke: Facts and Theories. *Restorative Neurology and Neuroscience, 22*, 281-299.

Kwakkel, G., Wagenaar, R., Kollen, B., & Lankhorst, G. (1996). Predicting Disability in Stroke - A Critical review of the Literature. *Age and Ageing, 25*(6), 479-489.

Langhorne, P., & Pollock, A. (2002). What are the components of effective stroke unit care? *Age and Ageing, 31*, 365 - 371.

Law, M. (2002). *Evidence-Based Rehabilitation: A Guide to Practice*. United States of America: SLACK Incorporated.

Lawrence, E., Coshall, C., Dundas, R., Stewart, J., Rudd, A., Howard, R., et al. (2001). Estimates of the Prevalence of Acute Stroke Impairments and Disability in a Multi-ethnic Population. *Stroke, 32*, 1279-1284.

Lee, C., Folsom, A., & Blair, S. (2003). Physical activity and stroke risk. *Stroke, 34*, 2475-2482.

Lin, K., Wu, C., Liu, J. (2009). Constraint-Induced Therapy Versus Dose-Matched Control Intervention to Improve Motor Ability, Basic/Extended Daily Functions, and Quality of Life in Stroke. (2009). *Neurorehabilitation and Neural Repair, 23*(2), 160-165

Lincoln, N., Walker, M., Dixon, A., Knights, P. (2004).Evaluation of multiprofessional community stroke team: a randomized controlled trial. *Clinical Rehabilitation, 18*, 40 - 47.

Lincoln, N., & Gladman, J. (1992). The Extended Activities of Daily Living Scale: A Further Validation. *Disability and Rehabilitation, 14*, 41 - 43.

Lincoln, N., & Leadbitter, D. (1979). Assessment of Motor Function in Stroke Patients. *Physiotherapy, 65*(2), 48 - 51.

Mahoney, F. I., & Barthel, D. (1965). Functional evaluation: the Barthel Index. *Maryland State Medical Journal, 14*, 56 - 61.

Mant, J., Carter, J., Wade, D., & Winner, S. (2000). Family support for stroke: a randomised controlled trial. *The Lancet, 356*(9232), 808-813.

Masiero, S., Avesani, R., Armani, M., Verena, P., & Ermani, M. (2007). Predictive factors for ambulation in stroke patients in the rehabilitation setting: A multivariate analysis. *Clinical Neurology and Neurosurgery, 109*, 763 - 769.

Mayo, N., Wood-Dauphine, R., Cote, R., Gayton, D., Carlton, J., Buttery, J., et al. (2000). "There's No Place Like Home: An Evaluation of Early Supported Discharge for Stroke". *Stroke, 31*, 1016-1023.

Mayo, N., Wood-Dauhinee, S., Ahmed, S., Gordon, C., Higgins, J., McEwen, S., et al. (1999). Disablement following stroke. *Disability and Rehabilitation, 21*(5/6), 258 - 268.

Meijer, R., Ihnenfeldt, D., de Groot, I., van Liembeek, J., Vermeulen, M., & de Haan, R. (2003). Prognostic factors for ambulation and activities of

daily living in the subacute phase after stroke. A systematic review of literature. *Clinical Rehabilitation, 17*, 119-129.

Mkoka, S., Jelsma, J., Vaughan, J. (2003). The pitfalls of translations. *South African Medical Journal,* 93(4), 265-266.

Mower, D. (1997). Brain Attack treating acute ischemic CVA. *Nursing*, 34-39.

Munro, B. H. (2001). *Statistical Methods for Health Care Research*. Philadelphia, New York, Baltimore: Lippincott.

Nouri, F. M., & Lincoln, N. (1987). An extended activities of daily living scale for stroke patients. *Clinical Rehabilitation, 1*(4), 301 - 305.

Office of the Deputy President, (1997). *White Paper on an Integrated National Disability Strategy*.

Office of the Premier of the Western Cape. (2002). Integrated Provincial Disability Strategy.

Olsson, B. G., & Sunnerhagen, K. S. (2006). Effects of Day Hospital Rehabilitation After Stroke. *Journal of Stroke and Cerebrovascular Diseases, 15*(3), 106 - 113.

Orencia, A. J., & Ballard, D. J. (1993). *Stroke: Populations, Cohorts and Clinical Trials*: Butterworth-Heinemann Ltd 1993.

Ottenbacher, J., Hsu, Y., Granger, C., & Fiedler. (1996). The reliability of the functional independence measure: A quantitative review. *Archives of Physical Medicine and Rehabilitation, 77*(12), 1226-1232.

Ovbiagele, B., Weir, C., Saver, J., Muir, K., & Lees, K. (2006). Effects of smoking status on outcome after acute ischaemic stroke. *Cerebrovascular Disorders, 21*, 260 - 265.

Paolucci, S., Antonucci, G., Grasso, M., Morelli, D., Troisi, E., Coiro, P., et al. (2000). Early versus delayed inpatient stroke rehabilitation: a matched comparison conducted in Italy. *Archives of Physical Medicine and Rehabilitation, 81*, 695-700.

Patel, M., Tilling, K., Lawrence, E., Rudd, A., Wolfe, C., & Mckett, C. (2006). Relationships between long-term stroke disability, handicap and health-related quality of life. *Age and Aging, 35*, 273-279.

Petrea, R., Beiser, A., Seshadri, S., Kelly-Hayes, M., Kase, C., & Wolf, P. (2009). Gender differences in stroke incidence and poststroke disability in the Framingham Heart Study. *Stroke, 40*(4), 1032-1037.

Pollock, A., Baer, G., Langhorne, P., & Pomeray, V. (2007). Physiotherapy treatment approaches for the recovery of postural control and lower limb function following stroke: A systematic review. *Clinical Rehabilitation, 21*, 395-410.

Pougvarin, N. (1998). Stroke in the Developing World. *Lancet, 352*(III), 19-22.

Provincial Government of the Western Cape. (2007). Comprehensive Service Plan for the Implementation of Healthcare 2010.

Putman, K., De Wit, L., Schoonacker, M., Baert, I., Beyens, H., Brinkman, N., et al. (2007). Effect of socioeconomic status on functional and motor recovery after stroke: a European multicentre study. *Journal of Neurology Neurosurgery and Psychiatry, 78*, 593-599.

Putman, K. (2006). Collaborative Evaluation of Rehabilitation in Stroke Across Europe. Unpublished Thesis. Department of Health Sciences and Medical Sociology, Faculty of Medicine and Pharmacy, Vrije Universiteit Brussel.

Redfern, J., Mckevitt, C., Dundas, R., & Rudd, A. (2000). Behavioural Risk Factor Prevalence and Lifestyle Change After Stroke: A Prospective Study. *Stroke, 31*, 1877-1881.

Reynolds, K., Lewis, B., Nolen, J., Kinney, G., Sathya, B., & He, J. (2003). Alcohol consumption and risk of stroke: a meta-analysis. *Journal of American Medical Association, 289*(5), 579 - 588.

Rhoda, A. (2002). *A profile of stroke patients treated at the Bishop Lavis Rehabilitation Centre: 1995-1999.* Stellenbosch University, Cape Town.

Rhoda, A., & Hendry, J. (2003). Profile of stroke patients treated at a Community-Based rehabilitation Centre in a Cape Town Health District. *South African Journal of Physiotherapy, 59*(4), 20-24.

Robbins, A., Manson, J., Lee, I. M., Satterfield, S., & Hennekens, C. (1994). Cigarette smoking and stroke in a cohort of U.S. Male Physicians. *Annals of Internal Medicine, 120*, 458-462.

Rochette, A., Desrosiers, J., Bravo, G., St-Cyr/Tribble, D., & Bourget, A. (2007). Changes in participation after a mild stroke: quantitative and qualitative perspectives. *Topics In Stroke Rehabilitation, 14*(3), 59-69.

Roderick, P., Low, J., Day, R., Peasgood, T., Mullee, M. A., Turnbull, J. C., et al. (2001). Stroke rehabilitation after hospital discharge: a randomized trial comparing domiciliary and day-hospital care. *Age and Ageing, 30*, 303 - 310.

Rosmand, W., Folsom, A., Chambless, L., Wang, C., McGovern, P., Howard, G., et al. (1999). Stroke Incidence and Survival Among Middle-Aged Adults 9 year follow-up of the Atherosclerosis Risk in Communities (ARIC) Cohort. *Stroke, 30*, 736-743.

Rouillard, S. (2006). *Pattern of recovery and Outcome after Stroke in Patients Accessing a Western Cape Rehabilitation facility.* Cape Town, Cape Town.

Sackett, D.L., Richardson, W.S., Rosenberg, W., & Heyns, R.B. (1997). Evidence-based medicine: how to practice and teach EBM. New York, NY: Churchill Livingstone.

Sacco, R., Benjamin, E., Broderick, J., Dyken, M., Easton, J., Feinberg, W., et al. (1997). American Heart Association Prevention Conference. IV. Prevention and Rehabilitation of Stroke. Risk Factors. *Stroke, 28*(7), 1507-1517.

Salter, K. L., Moses, M. B., Foley, N. C., & Teasell, R. W. (2008). Health-related quality of life after stroke: what are we measuring? *International Journal of Rehabilitation Research, 31*(2), 111 - 117.

Salter, K., Teasall, R., Foley, N., Bhogal, S., & Speechley, M. (2007). Secodary Prevention of Stroke. *Evidenced-Based Review of Stroke Rehabilitation* Retrieved 26/03/2008, from www.ebrsr.com

Salter, K., Jutai, J., Hartley, M., Foley, N., Bhogal, S., Bayona, N., & Teasall, R. (2006). Impact of Early vs Delayed admission to Rehabilitation on Functional Outcomes in persons with Stroke. *Journal of rehabilitation Medicine, 38*(2), 113-117

Salter, K., Jutai, J., Teasall, R., Foley, N., & Bitensky, J. (2005). Issues for selection of outcome measures in stroke rehabilitation: ICF body functions. *Disability and Rehabilitation, 27*(4), 191-207.

Salter, K., Teasell, R., Bhogal, S., & Speechley, M. (2004). Secondary Prevention of Stroke. . *Evidence-Based Review of Stroke Rehabilitation 5th edition* Retrieved 08 January 2008, from www.ebsr.com

SASPI Project Team. (2004). Prevalence of Stroke Survivors in Rural South Africa: Results from the Southern African Stroke Prevention Initiative (SASPI) Agincourt Field Site. *Stroke, 36*, 627-632.

Seshadri, S., Beiser, A., Kelly-Hayes, M., Kase, C., Rhoda, A., Kannel, W., et al. (2006). The Lifetime risk of stroke: estimates from the Framingham Study. *Stroke, 37*, 345-350.

Shah, S., Cooper, B., & Maas, F. (1992). The Barthel Index and ADL evaluation in stroke rehabilitation in Australia, Japan, the Us and the USA. . *The Australian Occupational Therapy Journal, 39*, 5 - 13.

Shumway-Cook, A., & Woollacott, M. (2001). Baltimore, Maryland: Lippincott Williams and Wilkins.

Smith, F., & Smith, J. (2003). *Clinical Research* (1 ed.). Oxford: BIOS Scientific Publishers.

South African Medical Association-Neurological Association of South Africa working group (2000). Stroke Therapy guideline. *South African Medical Journal, 90(3),* 274-306

Soyuer, F., & Soyuer, A. (2005). Ischemic Stroke: Motor impairment and disability with relation to age and lesion location. *The Internet Journal of Neurology, 3*(2), Retrieved 20/05/2007, from http://www.ispub.com/journal/the_internet_journal_of_neurology

Stansbury, J. P., Jia, H., Williams, L. S., Vogel, W. B., & Duncan, P. W. (2005). Ethnic Disparities in Stroke: Epidemiology, Acute Care, and Postacute Outcomes. *Stroke, 36*, 374 - 386.

Statistics South Africa (2006). Provincial Profile 2004: Western Cape. Pretoria, Statistics South Africa.

Statistics South Africa (2005/ 2006) Income and expenditure of households. Retrieved 02/05/07, from www.statssa.gov.za.

Steultjens, E., Dekker, J., Bouter, L., van de Nes, J., & Cup, E. (2003). Occupational Therapy for Stroke Patients. A Systematic Review. *Stroke, 34*, 676-687.

Stewart, J. A., Dundas, R., Howard, R. S., Rudd, A. G., & Wolfe, C. D. A. (1999). Ethnic differences in incidence of stroke: prospective study with stroke register. *British Medical Journal, 318*, 967 - 971.

Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. *Cochrane Database of Systematic Reviews* 2007, Issue 4. Art. No.: CD000197. DOI: 10.1002/14651858.CD000197.pub2.

Stroke Unit Trialists' Collaboration, (1997). Collaborative systematic review of the randomised trials of organised inpatient (stroke unit) care after stroke. *British Medical Journal, 314*, 1151-1158.

Stucki, G., Ewert, T., & Cieza, A. (2002). Value and applications of the ICF in rehabilitation medicine. *Disability and Rehabilitation, 24*(17), 932 - 938.

Sturm, J. W., Donnan, G. A., Dewey, H. M., Macdonell, R. A. L., Gilligan, A. K., & Thrift, A. G. (2004). Determinants of Handicap after Stroke. *Stroke, 35,* 715 - 720.

Sturm, J., Dewewy, H., Donnan, G., Macdonell, R., McNeil J, & Thrift, A. (2002). "Handicap After Stroke: How does it relate to disability, perception of recovery and stroke subtype?" *Stroke, 33*, 762-768.

Sudlow, C., & Warlow, C. (1997). Comparable Studies of the Incidence of Stroke and its Pathological Types. Results from an International Collaboration. *Stroke, 28*, 491-499.

Sulter, G., Steen, C., & De Keyser, J. (1999). Use of the Barthel Index and Modified Rankin Scale in Acute Stroke Trials. *Stroke, 30*, 1538-1541.

Teasall, R., Foley, N., Bhogal, S., Jutai, J., & Speechley, M. (2008), Outpatient Stroke Rehabilitation. *Evidenced-Based Review of Stroke Rehabilitation* Retrieved 15/10/08, from www.ebrsr.com

Teasell, R. W., Foley, N. C., Bhogal, S., & Speechley, M. (2007). The Elements of Stroke Rehabilitation. *Evidence-Based Review of Stroke Rehabilitation* Retrieved 01 August, 2008

Teasall, R., Foley, N., Salter, K., Bhogal, S., Jutai, J., & Speechley, M. (2006). Interdisciplinary Specialized Stroke Rehabilitation Units. *Evidenced-Based Review of Stroke Rehabilitation* Retrieved 08/01/08, from www.ebrsr.com

Teasall, R., Bayona, A., Britensky, J. (2005a). Plasticity and Reorganization of the Brain Post Stroke. *Topics in Stroke Rehabilitation, 12*(3), 11-26.

Teasall, R., Bitensky, J., Salter, K., Nestor, A., & Bayon, A. (2005b). The role of timing and intensity of rehabilitation therapies. *Topics in Stroke Rehabilitation, 12*(3), 46-57.

Teasall, R., & Kalra, L. (2005c). What's New in Stroke Rehabilitation Back to Basics. *Stroke, 36*, 215-217.

Teasall, R., Bayona, A., Britensky, J. (2004). Background Concepts in Stroke Rehabilitation. *Evidenced-based review of Stroke Rehabilitation* Retrieved 08/01/08, 2008, from www.ebrsr.com.

Teasall, R., McRae, M., Finestone, H. (2000). Social issues in the Rehabilitation of Younger Stroke Patients. *Archives of Physical Medicine and Rehabilitation, 81*, 205-209.

Treger, I., Shames, J., Giaquinto, S., & Ring, H. (2007). Retrun to work in stroke patients. Disability and Rehabilitation, 29(17), 1397-1403.

Tegos, T. J., Kalodiki, E., Daskalopoulou, S., & Nicolaides, A. (2000). Stroke: Epidemiology, Clinical Picture, and Risk Factors: Part I of III. *Angiology. The Journal of Vascular Diseases, 51*(10), 793 - 808.

Terent, A. (1993). *Stroke Morbidity*: Boston: Butterworth-Heinman Ltd.

Thorsveld, P., Asplund, K., Kuulasmaa, K., Rajakangas, A., & Schroll, M. (1995). Stroke Incidence, Case Fatality and Mortality in the WHO Monica Project *Stroke, 26*(3), 361-367.

Tilling, K., Sterne, J., Rudd, A, Glass, T, Wityk, R., & Wolfe C. (2001). A New Method for Predicting Recovery After Stroke. *Stroke, 32,* 2867-2873.

van Peppen, R. P. S., Kwakkel, G., Wood-Dauhinee, S., Hendriks, H. J. M., Van der Wees, P., & Dekker, J. (2004). The impact of physical therapy on functional outcomes after stroke: what's the evidence? *Clinical Rehabilitation, 18*, 833 - 862.

Van Swieten, J. C., Koudstaal, P. J., Visser, M. C., Schouten, H. J. A., & van Gijn, J. (1988). Interobserver agreement for the assessment of handicap in stroke patients. *Stroke, 19*, 604 - 607.

van Wijk, I., van Gijn, J., Franke, C., Vermeulen, M., Gorter, J., & Algra, A. (2005). Long-term survival and vascular event risk after transient ischaemic attack or minor ischaemic stroke: a cohort study. *The Lancet, 365*, 2098-2104.

Wade, T. W. (1992). *Measurement in Neurological Rehabilitation*. New York: Oxford University Press.

Wade, T. W., & de Jong, B. (2000). Recent advances in rehabilitation. *British Medical Journal, 320*, 1385 - 1388.

Walker, M., Gladman, J., Lincoln, N., Siemonsma, P., & Whiteley, T. (1999). Occupational Therapy for stroke patients not admitted to hospital: a randomised controlled trial. *Lancet, 354*, 278 - 280.

Walker , R., Mclarty, D., Kitange, H., Whiting, D., Masuki, G., Mtasiwa, D., et al. (2000a). Stroke mortality in Urban Rural Tanzania. Adult Morbidity and Mortality Project. *Lancet, 355*, 1684-1687.

Walker, R., Mclarty, D., Masuki, G., Kitange, H., Whiting, D., Moshi, A., et al. (2000b). Age Specific Prevalence of impairment and disability relating to hemiplegic stroke in the Hai District of Northern Tanzania. *Journal of Neurology Neurosurgery and Psychiatry, 68*, 744-749.

Warlow, C. (1998). Epidemiology of Stroke. *Lancet, 352*(supp 111), 1-4.

Weimar, C., Kurth, T., Kraywinkel, K., Wagner, D., Busse, R., Harbel, R., et al., (2002). Assessment of functioning and Disability after Ischaemic Stroke. *Stroke, 33*, 2053-2059.

Weir, C., Murray C, Adams, F., Muir, K., Gosset, D., & Lees, K. (1994). Poor accuracy of stroke scoring systems for differential clinical diagnosis of intracranial haemorrhage and infarction. *Lancet, 344*, 999-1000.

Whitlaw, D., Meyer, C., Bawa, S., & Jennings, K. (1994). Post-discharge follow-up of stroke patients at Groote Schuur hospital - a prospective study. *South African Medical Journal, 84*(2), 11-13.

Wilson, E., Taylor, G., Phillips, S., Stewart, P., Dickson, G., Ramsden, V., et al. (2001). Creating a Canadian Stroke System. *Canadian Medical Association Journal, 164*(13), 1853-1855.

Wilson, L., Hareendran, A., Hendry, A., Potter, J., Bone, I., & Muir, K. (2005). Reliability of the Modified Rankin Across Multiple Raters. *Stroke, 36*, 777- 781.

Wilson, L., Hareendran, A., Grant, M., Baird, T., Schultz, U., Muir, K., et al. (2002). Improving the Assessment of Outcomes in Stroke: Use of a Structured Interwiev to Assign Grades on the Modified Rankin Scale. *Stroke, 33*, 2243 - 2246.

Wolf, A. P., Abbott, R. D., & Kannel, W. B. (1991). Atrial Fibrillation as an Independent Risk Factor for Stroke: The Framingham Study. *Stroke, 22*, 983 - 988.

Wolfe, C., Tilling, K., & Rudd, A. G. (2000). The effectiveness of community-based rehabilitation for stroke patients who remain at home. *Clinical Rehabilitation, 4*(6), 563-569.

Wolfe, C. D. A., Ralph, B., D'Agostino, R. B., Kannel, W. B., Bonita, R., & Belanger, A. J. (1988). Cigarette smoking as a risk factor for stroke: The Framingham Study. *Journal of American Medical Association, 259*, 1025 - 1029.

Woolard, I. (2003). Social Assistance Grants, Poverty and Economic Growth in South Africa. Retrieved 04/11/2009, from http://www.tips.org.za/node/359

World Confederation of Occupational Therapy. (2007). Definition of Occupational therapy. Retrieved 10/05/2007, from www.wfot.org

World Confederation of Physical Therapy. (2007). Definition of Physical Therapy. Retrieved 10/05/2007, from www.wcpt.org

World Health Organisation. (2001). *International Classification of Functioning, Disability and Health: ICF short version*: WHO Library Cataloguing-in-Publication Data.

World Health Organisation. (1995). WHOQOL Group. The World Health Organization Quality of Life Assessment (WHOQOL): Position paper from the World Health Organization. *Social Science Medicine, 41*, 1403 - 1409.

World Health Organisation. (1980). *International Conference of Impairments, Disabilities and Handicaps*.

World Health Organisation. (1989). *Recommendations on Stroke Prevention, Diagnosis And Therapy. Report of the WHO Task Force on Stroke and other Cerebrovascular Disorders*.

Young, J., & Foster, A. (2007). Review of stroke rehabilitation. *British Medical Journal, 334*(7584), 86 - 90.

Young, J., & Forster, A. (1992). The Bradford community stroke trial: Results at six months. *British Medical Journal, 304*, 1085-1089.

ENQUIRIES Dr C. Le Grange
TELEPHONE (021) 4609118
FAX (021) 4476728

REFERENCE

DATE 21 May 2003

PROVINCIAL ADMINISTRATION: WESTERN CAPE
DEPARTMENT OF HEALTH

PROVINSIALE ADMINISTRASE: WES-KAAP
DEPARTEMENT GESONDHEID

ULAWULO LWEPHONDO: INTSHONA KOLONI
ISEBE LEZIMPILO

Mrs Althea Rhoda
Principal Researcher
University of the Western Cape
Private Bag X17
BELLVILLE
7535

RE: Permission - To Conduct The Rehabilitation of Stroke Patients at Community Health Centre in the Western Cape Project

Dear Mrs Rhoda

Your request to conduct the abovementioned project at the Community Health Centres has been granted on condition that you

- Complete the enclosed indemnity form
- Cause no disruption to the service and patient flow
- Carry or bear full responsibility for any complications resulting from your intervention.
- Work closely and through the management of the Health sub-district and the Community Health Centre.
- Adhere to research ethics.
- Provide a final summary report of their research study and if possible indicate if it can be of value to the Primary Health Care Service.

Thanking you

DR CA LE GRANGE
SENIOR MEDICAL SUPERINTENDENT (ACTING)

APPENDIX 2

Therapist consent letter:

THE REHABILITATION OF STROKE PATIENTS AT COMMUNITY HEALTH CENTRES IN THE METROPOLE REGION OF THE WESTERN CAPE

I AGREE VOLUNTARILY TO PARTICIPATE IN THE ABOVE MENTIONED RESEARCH PROJECT:

Signed at.....on .....20..

.....
Participant/representative's * signature or right thumb print

Statement by researcher

I,....., declares that I:

1. Have explained the information contained in this document to.....and/or her/his representative.
2. Have requested her/him/or them to ask questions should anything not be clear.
3. That the conversation took place in English.

Signed at.....on.....20..

.....
Researcher

* Delete if not relevant

IMPORTANT INFORMATION

Dear Participant
Thank you for agreeing to participate in this study. If at anytime during the project :

1. Any problems arise as a result of the study or,
2. You require any additional information regarding the study

Please contact me by telephone at 021...9592542
Mrs Anthea Rhoda

APPENDIX 3

The Rehabilitation of Stroke Patients at Community Health Centres in the Metropole Region of the Western Cape

Therapist Questionnaire:

SECTION A: DEMOGRAPHICS

1. What is your Profession?:.....

2. At which Community Health Centre do you work?

   .....

2. Gender: (Please X applicable option):

M	F

4. D.O.B

d	d	m	m	Y	y

5. In which year did you obtain your undergraduate degree?

   .....

6. What is your highest qualification?.....

7. How many years of experience do you have working as a Physiotherapist?.....years

8. How many years of experience do you have treating patient with neurological impairments?.....years

9. How many years of experience do you have treating stroke patients?

   .....years

SECTION B: STRUCTURE OF CARE:

1. **Information relating to Personnel:**

1.1 Indicate the category and number of health professionals who are involved in the rehabilitation of stroke patients at your centre: Please X applicable option(s):

STAFF	Mark with X	Number
Physiotherapist		
Occupational Therapist		
Speech Therapist		
Medical Officer		
Nurse		
Psychologist		
Dietician		
Physiotherapy Assistant		
Occupational Therapy Assistant		
Rehabilitation Centre		
Home-based carer		
Students: Please specify group(s)……		
Other specify:……		

UNIVERSITY of the
WESTERN CAPE

1.3 In the past 12 months have you made use of any prefabricated ankle foot orthoses (AFO) when treating stroke patients? Please X the most appropriate option.

never	
sometimes	
always	

1. 4 Using a number from 1- 12 indicate which activities you spend the most time on when treating a stroke patient.
1 = most time spent
12 = least time spent.

1. **Mobilisation, manual joint mobilization, stretching, palpation** (including pain assessment): passive relaxation and massage. e.g. passive or self-assisted movements, weight-bearing on upper limb.	
2. **Re-educating selective movements**: coordination exercises, strengthening exercises: bridging, moving knees from side to side	
3.**Lying and lying balance:** Positing and correcting alignment	
4.**Sitting and sitting balance:** Positioning, weight-shifting, equilibrium reactions	
5. **Standing and standing balance:** Positioning, weight-shifting, equilibrium Reactions, walking on spot, stepping on and off step, practicing swing phase of walking from standing position.	
6. **Sensory and visual perceptual and training and cognition:** treating neglect, hemianopia, neuro-physiological training (memory, language, orientation, space, body, gestures and planning).	
7. **Transfers:** rolling, sitting to lying & visa versa, sitting to standing, moving from the floor, moving into and out of positions.	
8.**Ambulatory activities**: wheelchair activities, walking with or without assistance, stair climbing with or without assistance.	
9.**Personal activities of daily living:** washing, dressing, toiletting, Shaving, feeding, preparing food, brushing teeth, combing hair	
10.**Domestic activities of daily living:** Cooking, cleaning dishes, laundry, ironing, tyding house, others	
11. **Leisure and work related activities:** painting, printing, woodwork, basketwork, needlework, office and computer work, others	
12. **Miscellaneous techniques:** chest physiotherapy, electrotherapy, hydrotherapy, others.	

1.5 Since completing your undergraduate training have you attended any continuing education courses/workshops/lectures seminars etc. relating to the rehabilitation of stroke patients? : Please X applicable option:

yes	no

1.6 If yes please list the courses continuing education courses/workshops lectures/seminars etc. relating to the rehabilitation of stroke patients you have attended?

Course name:	Year attended	Full day/ half day	No days

2. Coordination of services:

2.1 Do you have team meetings at your center or in your department to discuss management of stroke patients:
Please X applicable option. If no proceed to 4.4

yes	no

2.2 How often do you have these meetings? Please X applicable option.

Once a week	
Once a fortnight	
Once a month	
Other: Specify……	
……	

If yes please specify.....

2.7 How often do you document the treatment sessions of stroke patients?
Please X applicable option

After every treatment session	
Once a week	
Once a month	
Other:specify	

2.8. How often do you treat the stroke patients?
Please X applicable option

Twice a week	
Once a week	
Every two weeks	
Once a month	
Other: please specify	

2.9 On average how long do you spend treating stroke patients?
Please X applicable option

< ½ hour	
½ - ¾ hour	
> ¾ - 1 hour	
> 1 hour	
Other: please specify	

2.3 Who attends these meetings? Please X applicable option(s).

Physiotherapist	
Occupational Therapist	
Speech Therapist	
Medical Officer	
Nurse	
Psychologist	
Dietician	
Physiotherapy Assistant	
Occupational Therapy Assistant	
Rehabilitation worker	
Home-based carers	
Students: Please specify group(s)…… ……	
Other specify:……	

2.4 Please indicate if you follow any of the following guidelines to guide your rehabilitation of stroke patients? Please X applicable option(s):

South African stroke rehab guidelines	
ICIDH2 guidelines	
National Rehabilitation Policy	
Batopele principles	
National guidelines on stroke & transient Ischaemic attack management	
International classification of functioning disability and health	
Other: please specify……	

2.5 Please indicate the treatment options used for stroke patients at your centre: Please X applicable option(s):

Individual treatment	
Stroke groups	
Home visits	
Other: Specify…… ……	

2.6 Do you use a specific format/structure/ neuro assessment form, to document your stroke patient treatments? Please X applicable option.

yes	no

If yes please specify.....

2.7 How often do you document the treatment sessions of stroke patients?
Please X applicable option

After every treatment session	
Once a week	
Once a month	
Other:specify	

2.8. How often do you treat the stroke patients?
Please X applicable option

Twice a week	
Once a week	
Every two weeks	
Once a month	
Other: please specify	

2.9 On average how long do you spend treating stroke patients?
Please X applicable option

< ½ hour	
½ - ¾ hour	
> ¾ - 1 hour	
> 1 hour	
Other: please specify	

APPENDIX 4

SOCIO-ECONOMIC STATUS QUESTIONNAIRE

Questions to the patient ./ Caregiver
The following questions are intended to provide personal data for the study. The data will only be used for the research. If you think several answers might apply, please choose the one that best describes your view(s).

1. WHAT IS THE HIGHEST LEVEL OF EDUCATION /SCHOOLING YOU HAVE COMPLETED?
1= No formal education /Pre-primary
2= Sub A
3= Sub B
4= Std 1
5= Std 2
6= Std 3
7= Std 4
8= Std 5
9= Std 6
10= Std 7
11= Std 8
12= Std 9
13= Std 10
14= Std 8 with Diploma/ Certificate
15=Std 9, with Diploma/ Certificate
15= Std 10 with Diploma/ Certificate (short course less than 2yrs)
16= Tertiary education: non-degree/diploma (minimum 2 years)
17= Tertiary education: B degree
18= Tertiary education: M degree
19= Tertiary education: Doctorate
20= Other, please specify:.....
Comments:_____

_____

2. WERE YOU IN PAID EMPLOYMENT /WORKING WHEN YOU HAD YOUR STROKE?
1= Yes, paid employment
2= No, not paid employment [Please proceed to question No. 8]

3. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR EMPLOYMENT STATUS BEFORE YOU HAD YOUR STROKE?
1= Employed (includes formal and informal sector)
2= Self-employed or helping in a family business
3= Other.
Specify:_____

3. What kind of work did you do?

Please specify:.....

4.WHICH OF THE FOLLOWING BEST DESCRIBES YOUR WORKING HOURS?

1=Full time: more than 20 hours a week
2= Part-time: Specify hours/week
3= Irregular hours: occasionally work as casual
4= Contract worker: Specify term & hours _____
5= Other. Specify:_____

5. What was the reason for your not working?
1=Unemployed, looking for work
2=Unemployed, preferred not work
3=Unable to work due to illness or disability (Receiving disability Grant or private Insurance benefit)
4= Unable to work due to illness or disability (No disability grant)
5= Retired/Pensioner
6= Looking after the home, no income/ benefits (includes looking after children)
7= Student
8= Other, Specify_____

6. COMPOSITION OF THE HOUSEHOLD

		Age	Sex
List the members of the household and their relationship with the interviewee	Relationship with the interviewee		Male = 1 Female = 2
Interviewee			

*Relationship with the interviewee: 1=partner; 2=parent; 3=child; 4=other kinship ties; 5=no relation

7. IN WHICH INCOME BRACKET **CAN THE TOTAL MONTHLY NET DISPOSABLE INCOME OF YOUR HOUSEHOLD** BE PUT? BY NET INCOME WE MEAN THE **INCOME YOU ACTUALLY RECEIVE, AFTER TAXES AND SOCIAL CONTRIBUTIONS HAVE BEEN DEDUCTED. IF THIS INCOME VARIES FROM ONE MONTH TO ANOTHER, PLEASE GIVE AN AVERAGE.**

1= No income
2= R1 –R200
3= R201 – R500
4= R501 - R1 000
5= R1 001 – R1 500
6= R1 501 – R2 500
7.R2 501 – R4 500
8. R4 501 – R8 000
9. R8 0001 – R16 000
10. > R16 000

8. CAN YOU MAKE ENDS MEET WITH THE TOTAL MONTHLY DISPOSABLE INCOME?

1= with great difficulty
2= With difficulty
3= With some difficulty
4= Fairly easily
5= Easily
6= Very easily

APPENDIX 5

PATIENT CODE_____

QUESTIONNAIRE COMPLETED ON ADMISSION TO REHABILITATION AT CHC

GENERAL DEMOGRAPHIC DATA

STRICTLY CONFIDENTIAL!!!!

CHC / FOLDER NUMBER:	
PATIENT NAME:	
GENDER:	
RACE: (included to assess equality of services)	
ADDRESS	
TELEPHONE NUMBER:	

DATE OF BIRTH:	
DATE OF STROKE:	
DATE OF INTAKE AT COMMUNITY HEALTH CENTRE:	
DATE OF ASSESSMENT:	
PLACE OF ASSESSMENT:	

GUIDELINES FOR MEDICAL QUESTIONNAIRE AT ADMISSION

CLASSIFICATION OF STROKE

Haemorrhagic, Ischaemic or indeterminate
Classification of type of stroke is made on the basis of CT or MRI findings only. If no imaging results are available, the type of stroke is recorded as indeterminate, and no attempt is made to specify subtype.

Absence of blood on initial CT excludes primary intracerebral haemorrhage and subarachnoid haemorrhage. If imaging results are available, the stroke is further classified into sub-group in conjunction with other clinical findings and the results of investigations. See definitions below.

CLASSIFICATION OF STROKE SUBTYPE (only applies if Ct or MRI results are available)

HAEMORRHAGIC STROKE SUBTYPE

Primary Intracerebral Haemorrhage:
As identified on CT/ MRI

Subarachnoid Haemorrhage:
As identified on CT/ MRI

ISCHAEMIC STROKE SUBTYPE

Ischaemic: Small Vessel Disease (Includes lacunar Stroke)
- presence of one of the traditional lacunar syndromes (eg. Pure motor stroke pure sensory stroke, sensorimotor stroke, ataxic hemiparesis, dysarthria/ clumsy hand syndrome)
- infarction < 1.5.cm diameter or normal CT/ MRI
- absence of acute cerebral cortical dysfunction
- potential cardiac source absent
- potential large artery atherosclerotic source absent (i.e. Large extra-cranial arteries should not demonstrate an occlusion of >50%)

Ischaemic: Large Vessel Disease (Includes Large Artery Atherosclerosis)

- presence of an occlusion or stenosis with >50% diameter reduction found on Doppler Ultrasound or angiography
- potential source of cardiogenic embolism absent

Ischaemic: Cardioembolic

- presence of high risk or medium risk source of cardiac embolism: (for example atrial fibrillation, recent myocardial infarction in the last 6 weeks, infective endocarditis, prosthetic heart valve)
- potential large artery atherosclerotic source absent

Ischaemic: Other Determined Etiology

- Ischaemic stroke not meeting criteria of above categories but of other determined cause
- These include: spontaneous dissection, traumatic dissection, vasculitis, haematological disorders and coagulopathies.
- Diagnoses of above revealed by diagnostic studies
- Potential cardiac sources of embolism absent
- Potential large artery atherosclerotic sources absent

Ischaemic: Indeterminate or >1 cause.

- no likely etiology identified despite investigations, OR
- no etiology identified, but investigations incomplete, OR
- more than one likely etiology eg. Potential cardioembolic source, and atherosclerosis of >50%

PATIENT CODE_____

MEDICAL DATA

CLASSIFICATION OF TYPE OF STROKE:

SIDE OF LESION: 1= left right = 2 both = 3

SIDE OF IMPAIRMENT: 1= left right = 2 both = 3

DIAGNOSIS BASED ON: CT = 1 MRI = 2 Clinical assessment only = 3 Both (CT & MRI) = 4

If applicable: Date of CT_____

Dateof MRI_____

DAYS after stroke (CT or MRI)
(Day after stroke = day 0)

Neurosurgical interventions **No=0** **Yes = 1**

MRI/CT scan results:

PATIENT CODE_____

TYPE OF STROKE: yes=1 no=2

Heamorrhagic	
Ischaemic	
Indeterminate	

If possible, specify subtype of stroke: yes=1 no=2

Primary intracerebral haemorrhage		Ischaemic: Cardio-embolic	
Sub arachnoid haemorrhage		Ischaemic: indeterminate or >1 cause	
Ischaemic: small vessel		Ischaemic: large vessel	

Patient code _____

A. **RISK FACTORS:**

History of high blood pressure **No=0** **Yes = 1**

(Defined as systolic blood pressure > 160 mmHg and/or diastolic blood pressure > 95 mmHg based on several measurements or on a 24-hours registration. Note: patients, who are treated with anti-hypertensive, are in this study –always considered as patients with a history of hypertension.

Diabetes Mellitus No=0 Yes = 1

(defined as repeated fasting glucose level of more than 7.8 mmol/L according to WHO diagnostic criteria or a recorded history of diabetes treated or untreated)

Hyperlipidemia **No= 0** **Yes = 1**
(WHO-def cholesterol >200mg/100ml)

Oral Contraception **No= 0** **Yes = 1**
(Only current use is documented)

Heart Condition **No= 0** **Yes = 1**

Previous T I A **No= 0** **Yes = 1**

Peripheral vascular disease **No= 0** **Yes = 1**

Previous thrombosis **No= 0** **Yes = 1**

Other Specify:.....

B. DOES THE PATIENT HAVE ANY OF THE FOLLOWING CO-EXISTING ILLNESSES

1.Pulmonary disease e.g. COAD, TB **No=0** **Yes = 1** ☐

Specify .....

2.Disorders of musculoskeletal system e.g. arthritis, gout **No=0** **Yes = 1** ☐

Specify.....

3.Other **No=0** **Yes = 1** ☐

Specify.....

C.HIV/AIDS STATUS

According to the patient's medical records, which of the following is applicable? ☐

1= Documented negative HIV/AIDS Status
2= Documented positive HIV/AIDS Status
3= Unknown HIV/AIDS Status (not documented in medical records)

UNIVERSITY of the
WESTERN CAPE

QUESTIONS TO PATIENT OR CAREGIVER

Smoking

A) Did this patient ever smoke? No=0 Yes = 1

If "Yes" go to question B.
If "No" go to next risk factor

B) Is the patient a current smoker (till date of stroke onset)?

No=0 Yes = 1

(B.1) If the answer is "**Yes**" please specify number of cigarettes per day.
Number per day: Less than 20 cig/day = 1
More than 20 cig/day = 2

(B.2) If the answer is "**No**" please specify the number of cigarettes per day and the moment the patient stopped smoking.
Number per day: **Less than 20 cig/day = 1**
More than 20 cig/day =2

Moment giving up smoking: **Less than 5 years before stroke-onset = 1**
More than 5 years before stroke-onset = 2

Excess alcohol intake: No=0 Yes = 1
(Defined as > 3 units per day for men and 2 units per day for women.

Specify no. of units.....

(1 unit = 1 tot spirits, 1 small glass of wine, 300ml/ half pint of beer.)

URINARY INCONTINENECE (ON ADMISSION TO CHC)

Note: Only score "1" if the patient has a score of 0 or 5 item "2. Bladder " of Post stroke Barthel ADL Index.

1= incontinent

2 = continent

3 = catheter (if "3" specify reason)

Reason for "3"

THE FOLLOWING QUESTION RELATES TO TRANSPORTATION USED TO ACCESS THE COMMUNITY HEALTH CENTRE:

1. WHICH METHOD OF TRANSPORT WAS USED? (tick appropriate block)

1.	Walk	
2.	Own Vehicle	
3.	Own Wheelchair	
4.	Hospital Transport	
5.	Hired vehicle	
6.	Hired Wheelchair	
7.	Hospital Wheelchair	
8.	Bus	
9.	Taxi	
10.	Other	

Specify Other.....

THE FOLLOWING QUESTIONS ARE RELATED TO THE CAREGIVER:

WHO IS THE PRIMARY CAREGIVER OF THE PATIENT:

(please tick appropriate block)

* Spouse	
* Mother	
* Father	
* Daughter	
* Son	
* Grandchild	
* Relative	
* Neighbour	
* Other	

THE FOLLOWING QUESTIONS ARE RELATED TO THE REFERRAL:

1. REFERRAL AGENCY:

1	Tertiary hospital	
2	Secondary hospital	
3	Local CHC	
4.	Other CHC	
5	Community based organisation	
6	NGO	
7	Other	

Specify other.....

Name of referral Institution.....

Patient Folder number at referring institution:.....

2. PERSON REFERRING: (tick appropriate block)

1.	Physiotherapist	
2.	Occupational Therapist	
3.	Speech Therapist	
4.	Dr	
5.	Community Worker	
6.	Self	
7	Family member	
8.	Neighbour	
9.	other	

Specify Other.....

3. DATE OF REFERRAL TO COMMUNITY HEALTH CENTRE

Y	Y	M	M	D	D

LIST OF MEDICATION PATIENT'S TAKING ON ADMISSION: (FROM PATIENT AND/OR FOLDER)

Specify other:.....

Guidelines to use the National Institutes of Health Stroke Scale

Administer stroke scale items in the order listed. Record performance in each category after each subscale exam. Do not go back and change scores. Follow directions provided for each exam technique. Scores should reflect what a patient does, not what you thinks the patient can do.

You should record answers while administering the exam and work quickly. Except where indicated, the patient should not be coached. (i.e. repeated requests to patient to make a special effort).

IF ANY ITEM IS LEFT UNTESTED, A DETAILED EXPLANATION MUST BE CLEARLY WRITTEN DOWN. QUESTIONS 5, 6,7 AND 10 HAVE ALLOWED SCORES OF 9. DO NOT ADD THE 9' s INTO THE TOTAL SCORE. IF YOU DOUBT ABOUT A SCORE OR THE PERFORMANCE OF A TEST ITEM, YOU CAN ALWAYS GET ADDITIONAL INFORMATION IN APPENDIX 1 (Chapter 5-The NIH Stroke Scale).

2. NIHSS (National Institutes of Health Stroke Scale)

1.a. Level of consciousness

0= Alert, keenly responsive.
1= Not alert, but arousable with minimal stimulation to obey, answer or respond.
2= Not alert, requires repeated stimulation to attend, or is obtunded and requires strong or painful stimulation to make movements (not stereotyped).
3= Responds only with reflex motor or autonomic effects or totally unresponsive, flaccid, arereflic.

1.b. Ask patient the month and their age
Must be exactly right

0= Answers both questions correctly.
1= Answers one question correctly.
2= Answers neither question correctly.

1.c. Ask patient to open and close eyes and then grip and release non-paretic hand

0= Performs both tasks correctly.
1= Performs one task correctly.
2= Performs neither correctly.

2. Best gaze (only horizontal eye movement)

0= Normal
1= Partial gaze palsy. This score is given when gaze is abnormal in one or both eyes, but where forced deviation or total gaze paresis are not present.
2= Forced deviation, or total gaze paresis not overcome by the oculocephalic maneuver

3. Visual field testing

0= No visual loss
1= Partial hemianopia
2= Complete hemianopia
3= Bilateral hemianopia (blind including cortical blindness)

4. Facial Paresis (Ask patient to show teeth or raise eyebrows and close eyes tightley)

0= Normal symmetrical movement
1= Minor paralysis (flattened nasolabial fold, asymmetry on smiling)
2= Partial paralysis (total or near total paralysis of lower face)
3= Complete paralysis of one or both sides (absence of facial movement in the upper and lower face)

5. Motor function - Arm (right and left)

0= No drift , limb hold 90 (or 45) degrees for full 10 seconds
1= Drift, limb hold 90 (or 45) degrees, but drifts down before full 10 seconds; does not hit bed or other support
2= Some effort against gravity, limb cannot get to or maintain (if cued) 90 (or 45) degrees, drifts down to bed, but has some effort against gravity
3= No effort against gravity, limb falls
4= No movement

arm right:
arm left:

If the score is '9', give an explanation:
9= Untestable (Joint fused or limb amputated)

6. Motor function- Leg (right and left)

0= No drift, leg holds 30 degrees position for full 5 seconds.
1= Drift, leg falls by the end of the 5 second period but does not hit bed.
2= Some effort against gravity; leg falls to bed by 5 seconds, but has some effort against gravity.
3= No effort against gravity, leg falls to bed immediately.
4= No movement

leg right:
leg left:

If the score is '9', give an explanation:
9= Untestable (Joint fused or limb amputated)

7. Limb ataxia
0= No ataxia
1= Present in one limb
2= Present in two limbs

If present, is ataxia in
right arm
1= Yes
0= No

If the score is '9', give an explanation:
9= Untestable (Joint fused or limb amputated)

left arm
1= Yes
0= No

If the score is '9', give an explanation:
9= Untestable (Joint fused or limb amputated)

right leg
1= Yes
0= No

If the score is '9', give an explanation:
9= Untestable (Joint fused or limb amputated)

left leg
1= Yes
0= No

If the score is '9', give an explanation:
9= Untestable (Joint fused or limb amputated)

8. Sensory (Use pinprick to test arms, legs , trunk and face -- compare side to side)

0= Normal, no sensory loss.
1= Mild to moderate sensory loss; patient feels pinprick is less sharp or is dull on the affected side; or there is a loss of superficial pain with pinprick but patient is aware he/she is being touched.
2= Severe to total sensory loss; patient is not aware of being touched in the face, and leg.

9. Best language (describe picture, name items, read sentences)

0= No aphasia, normal.
1= Mild to moderate aphasia; some obvious loss of of fluency or facility of comprehension, without significant limitation on ideas expressed or form of expression. Reduction of speech and/or comprehension, however, makes conversation about provided material difficult or impossible. For example in conversation about provided materials examiner can identify picture or naming card from patient's response.
2= Severe aphasia; all communication is through fragmentary expression; great need for interference, questioning, and guessing by the listener. Range of information that can be exchanged is limited; listener carries burden of communication. Examiner cannot identify materials provided from patient's response.
3= Mute, global aphasia; no usable speech or auditory comprehension.

10. Dysarthria (read several words)

0= Normal articulation
1= Mild to moderate; patient slurs at least some words and, at worst, can be understood with some difficulty.
2= Severe; patient's speech is so slurred as to be unintelligible in the absence of or out of proportion to any dysphasia, or is mute/anarthric.

If the score is '9', give an explanation:
9= Intubated or other physical barrier, explain:

11. Extinction or inattention

0= No abnormality.
1= Visual, tactile, auditory, spatial, or personal inattention or extinction to bilateral simultaneous stimulation in one of the sensory modalities.
2= Profound hemi-inattention or hemi-inattention to more than one modality. Does not recognize own hand or orients to only one side of space.

TOTAL SCORE: 0

Additional item, not a part of the NIH Stroke Scale score.

A. Distal Motor function

0 = Normal (no flexion after 5 seconds)
1= At least some extension after 5 seconds, but not fully extended. Any movement of the fingers which is not command is not scored.
2= No voluntary extension after 5 seconds. Movements of the fingers at another time are not scored.

Left arm
right arm

Section Item	Score
A. Gross function	
1. Sit unsupported *Without holding on, on edge of bed, feet unsupported.*	
2. Lying to sitting on side of bed *Using any method.*	
3. Sitting to standing *May use hands to push up. Must stand up in 15 sec and stand for 15 sec, with an aid if necessary*	
4. Transfer from weelchair to chair towards unaffected side *May use hands.*	
5. Transfer from weelchair to chair towards affected side *May use hands.*	
6. Walk 10 m indoors with an aid *Any walking aid. No stand-by help.*	
7. Climb stairs independently *Any method. May use bannister and aid--must be a full flight of stairs.*	
8. Walk 10 m indoors without an aid *No stand-by help. No caliper, splint or walking aid.*	
9. Walk 10m , pick up bean bag from floor, turn and carry back *Bend down any way, may use aid to walk if necessary. No stand-by help. May use either hand to pick up bean bag.*	
10. Walk outside 40 m *May use walking aid, caliper or splint. No stand-by help.*	
11.Walk up and down four steps *Patient may use an aid if he would normally use one, but may not hold on to rail. This is included to test ability to negotiate curb or stairs without a rail.*	
12. Run 10 m *Must be symmetrical.*	
13. Hop on affected leg five times on the spot *Must hop on ball of foot without stopping to regain balance. No help with arms.*	
Gross function Total	0

Section Item	Score
B. Leg and trunk	
1. Roll to affected side *Starting position schould be lying, not crook lying.*	
2. Roll to unaffected side *Starting position should be lying, not crook lying.*	
3. Half-bridging *Starting position -- half-crook lying. Patient must put some weight through affected leg to lift hip on affected side. Therapist may position leg, but patient must maintain position even after movement is completed.*	
4. Sitting to standing *May not use arms-- feet must be flat on floor--must put weight through both feet.*	
5. Half-crook lying: lift affected leg over side of bed and return it to the same position. *Affected leg in half-crook position. Lift leg off bed on to support; for example, box, stool, floor, so that hip is in neutral and knee at 90 degrees while resting on support. Must keep affected knee flexed throughout movement. Do not allow external rotation at hip. This tests control of hip and knee.*	
6. Standing, step unaffected leg on and off block *Without retraction of pelvis or hyperextension of knee. This tests knee and hip control while weight bearing through the affected leg.*	
7. Standing, tap ground lightly five times with unaffected foot *Without retraction of pelvis or hyperextension of knee. Weight must stay on leg. This again tests knee and hip control while weight bearing through the affected leg but is more difficult than in 6.*	
8. Lying, dorsiflex affected ankle with leg flexed *Physiotherapist may hold affected leg in position, knee at 90 degrees. Do not allow inversion. Must have half range of movement of unaffected foot.*	
9. Lying, dorsiflex affected ankle with leg extended *Same conditios as in 8, with leg extended. Do not allow inversion or knee flexion. Foot must reach plantigrade (90°).*	
10. Stand with affected hip in neutral position, flex affected knee *Therapist may not position leg. This is extremely difficult for most hemiplegic patients, but is included to assess minimal dysfunction.*	
Leg and trunk function total	0

Section Item	Score
C. Arm	
1. Lying, protract schoulder girdle with arm in elevation *Arm may be supported.*	
2. Lying, hold extended arm in elevation (some external rotation) for at least 2 sec *Therapist should place arm in position and patient must maintain position with some external rotation. Do not allow pronation. Elbow must be held within 30 degrees of full extension.*	
3. Flexion and extension of elbow, with arm as in 2 above *Elbow must extend to at least 20 degrees full extension. Palm should not face out during any part of movement.*	
4. Sitting, elbow into side, pronation and supination *Three-quarters range is acceptable, with elbow unsupported and at right angles.*	
5. Reach forward, pick up large ball with both hands and place down again *Ball should be on table so far in front of patient that he has to extend arms fully to reach it. Shoulders must be protracted, elbows extended, wrist neutral or extended, and fingers extended throughout movement. Palms should be kept in contact with the ball.*	
6. Stretch arm forward, pick up tennis ball from table, release on affected side, return to table, then release again on table. Repeat five times *Shoulder must be protracted, elbow extended and wrist neutral or extended during each phase.*	
7. Same exercise as in 6 above with pencil *Patients must use thumb and fingers to grip.*	
8. Pick up a piece of paper from table in front and release five times *Patient must use thumb and fingers to pick up paper and not to pull it to edge of table. Arm position as in 6 above.*	
9. Cut putty with a knife and fork on plate with non-slip mat and put pieces into container at side of plate *Bite-size pieces.*	
10. Stand on spot, maintain upright position, pat large ball on floor with palm of hand for 5 continuous bounces	
11. Continuous opposition of thumb and each finger more than 14 times in 10 sec *Must do movement in consistent sequence. Do not allow thumb to slide from one finger to the other.*	
12. Supination and pronation on to palm of unaffected hand 20 times in 10 sec *Arm must be away from body, the palm and dorsum of hand must touch palm of good hand. Each tap counts as one. This is similar to 4 above, but introduces speed.*	

13. Standing, with affected arm abducted to 90 degrees with palm flat against wall. Maintain arm in position. Turn body towards wall and as far as possible towards arm, i.e. rotate body beyond 90 degrees *Do not allow flexion at elbow, and wrist must be extended with palm of hand fully in contact with wall.*	
14. Place string around head and tie bow at back *Do not allow neck to flex. Affected hand must be used for more than just supporting string. This tests function of hand without help of sight.*	
15. 'Pat- a-cake' seven times in 15 sec *Mark crosses on wall at schoulder level. Clap both hands together (both hands touch crosses.) Each sentence counts as one. Give patients three tries. This is a complex pattern which involves co-ordination, speed,and memory, as well as good arm function.*	
Arm function total	0

Barthel ADL Index

1. Bowels
0= incontinent (or needs to be given enema)
5= occasional accident (once a week)
10= continent

2. Bladder
0= incontinent, or catheterized and unable to manage alone
5= occasional accident (maximum once per 24 hours)
10= continent

3. Grooming
0= needs help with personal care
5= independent face/hair/teeth/shaving (implements provided)

4. Toilet use
0= dependent
5= needs some help, but can do something alone
10= independent (on and off, dressing, wiping)

5. Feeding
0= unable
5= needs help cutting, spreading butter, etc.
10= independent

6. Transfer (bed to chair and back)
0= unable, no sitting balance
5= major help (one or two people, physical), can sit
10= minor help (verbal or physical)
15= independent

7. Mobility
0= immobile
5= wheelchair independent, including corners
10= walks with help of one person (verbal or physical)
15= independent (but may use any aid; for example, stick)

8. Dressing
0= dependent
5= needs help but can do about half unaided
10= independent (including buttons, zips, laces, etc.)

9. Stairs
0= unable
5= needs help (verbal, physical, carrying aid)
10=independent

10. Bathing
0= dependent
5= independent

TOTAL SCORE	0

Riglyne vir die gebruik van die Barthel-Indeks (Voor beroerte)

1. Hierdie indeks moet gebruik word as 'n rekord van wat 'n pasiënt wel gedoen het, **nie** as 'n rekord van wat 'n pasiënt sou kon doen nie.
2. Die hoofdoel is om die mate van afhanklikheid van hulp vas te stel, fisies of verbaal, hoe gering ook al en om watter rede ook al.
3. Die behoefte aan toesig laat 'n pasiënt **nie** onafhanklik nie.
4. 'n Pasiënt se vermoë moet bepaal word deur gebruik te maak van die beste beskikbare getuienis. Die pasiënt, vriende, familie en verpleegkundiges kan gewoonlik ondervra word, maar direkte waarneming en gesonde verstand is ook belangrik. Direkte toetsing is egter nie nodig nie.
5. Middelkategorieë impliseer dat die pasiënt meer as 50 persent van die poging bydra.
6. Die gebruik van hulpmiddele om onafhanklik te wees word toegelaat.
   (Wade, '92)

Barthel

1. Stoelgang (maagwerk) ☐

0 = inkontinent (of benodig 'n lawement)
5 = toevallige ongelukke (een keer per week)
10 = kontinent

2. Blaas ☐

0 = inkontinent, of gekateriseer en kan nie alleen oor die weg kom nie
5 = toevallige ongelukke (maksimum een maal per 24 uur)
10 = kontinent

3. Selfversorging ☐

0 = benodig hulp met persoonlike versorging
5 = onafhanklik met gesig, hare, tande, skeer (gebruiksartikels voorsien)

4. Toiletgebruik ☐

0 = afhanklik
5 = benodig hulp, maar kan iets self doen
10 = onafhanklik (op en af, aantrek, afvee)

5. Eet ☐

0 = kan nie
5 = benodig hulp met sny, botter smeer, ens.
10 = onafhanklik

6. Veplasing (van bed na stoel en terug) ☐

0 = kan nie, geen balans sittend
5 = benodig baie hulp (een of twee persone, fisies), kan sit
10 = benodig min hulp (verbaal of fisies)
15 = onafhanklik

Isalathiso sika-barth

1. Amathumbu

0 = Akakwazi ukuzibamba (okanye needs to be given enema)
5 = Uyazenzela ngamanye amaxesha (kanye ngeveki)
10 = uyakwazi ukuzibamba

2. Isinyi

0 = Akakwazi ukuzibamba okanye ufuna uncedo ukuze akwazi ukuzilawula
5 = Uyaphulukwa ngamnye amaxesha (ubuninzi kanye ngeeyure ezinggama-24)
10 = Uyakwazi ukuzibamba

3. Grooming

0 = Udinga uncedo ukuzeakkwazi ukuzicoca
5 = Uyaukuzihoya: ukucoca ubuso/ukukama iinwele/ukuhlamba amazinyo/ ukucheba amazinyo/ukucheba iindevu (xa ethe wanikwa izixhobo zokuzicoca ngomnye umntu

4. Ukusebenzisa igummbi langasese

0 = Ufuna ukucediswa
5 = Ufuna uncedo kodwa unakho ukuzenzela eyedwa
10 = Uyakwazi engancedisawanga (ukuzikhulula nokuzinxibisa,nokuzosula akugqiba ukuzinceda)

5. Ukuzityisa

0 = akakwazi
5 = ufuna uncekusikeni nasekuqabeni ibhotolo,njl njl.
10 = Uyakwazi ukuzenzela

6. Ukutshintsha indawo yokuhlala (ukusuka ebhedini ukuya esitulweni Nokuphinda abuye)

0 = akakwazi, ngenxa yokungakwazi ukuzihlalela/ukuchopha

5 = Ufuna uncedo olumandla (anediswe ngumtu omnye okanye ababini)
10 = Ufuna uncedo olungephi (ukuyalelwa ukuba enzeni okanye afunqulwe)
15 = Uyakwazi ukuzitshintshela ngokwakhe

7. Ukuhamba

0 = Akakwazi ukuhambe

5 = Akaxhomekekanga kwisitulo sokuncedisa ukuhmba esinamavili independent,including corners
10 = Uyahamba ngocedo lomnye umntu (ngokuthi afunqulwe okanye ayalelwe amakakwenze)
15 =Uyakwazi ukuzihambela (kodwa angasebenzisa uncedo, olufana nolwentoga youkusimelela)

Nottingham Extended Activities of Daily Living

The following questions are about everyday activities. Please answer by ticking **ONE** box for each question. Please record what you have ACTUALLY done in the last few weeks.

DID YOU.....	Not at all	With help	On your own with difficulty	On your own
1. Walk around outside?	☐	☐	☐	☐
2. Climb stairs?	☐	☐	☐	☐
3. Get in and out of a car?	☐	☐	☐	☐
4. Walk over uneven ground?	☐	☐	☐	☐
5. Cross roads?	☐	☐	☐	☐
6. Travel on public transport?	☐	☐	☐	☐
7. Manage to feed yourself?	☐	☐	☐	☐
8. Manage to make yourself a hot drink?	☐	☐	☐	☐
9. Take hot drinks from one room to another?	☐	☐	☐	☐
10. Do the washing up?	☐	☐	☐	☐
11. Make yourself a hot snack?	☐	☐	☐	☐
12. Manage your own money when you were out?	☐	☐	☐	☐
13. Wash small items of clothing?	☐	☐	☐	☐
14. Do your own housework?	☐	☐	☐	☐

15. Do your own shopping?				
16. Do a full clothes wash?				
17. Read newspapers or books?				
18. Use the telephone?				
19. Write letters?				
20. Go out socially?				
21. Manage your own garden?				
22. Drive a car?				

NOTTINGHAM UITGEBREIDE DAAGLIKSE AKTIWITEITE
(NOTTINGHAM EXTENDED ACTIVITIES OF DAILY LIVING)

Die volgende vrae is oor alledaagse dinge. Antwoord asseblief deur n' kruisie in een blokkie per vraag te sit. Beskryf asseblief die aktiwiteite wat jy werklik die afgelope paar weke gedoen het.

HET JY.....	Glad nie	Met hulp	Op my eie maar dit is moeilik	Op my eie
1. Buite rondgeloop?	☐	☐	☐	☐
2. Trappe geklim?	☐	☐	☐	☐
3. In en uit 'n motor geklim?	☐	☐	☐	☐
4. Oor ongelyke grond geloop?	☐	☐	☐	☐
5. Die pad oorkruis?	☐	☐	☐	☐
6. Met publieke vervoer gereis? (bv. Met taxi, bus, trein)	☐	☐	☐	☐
7. Op jou eie geëet?	☐	☐	☐	☐
8. Jouself 'n warm drankie gemaak? (bv. tee, koffie)	☐	☐	☐	☐
9. Warm drankies van een kamer na 'n ander geneem?	☐	☐	☐	☐
10. Skottelgoed gewas?	☐	☐	☐	☐
11. Jouself 'n warm ligte ete gemaak?	☐	☐	☐	☐
12. Jou eie geldsake gehanteer (terwyl jy uit was)?	☐	☐	☐	☐

13. Ligte kledingstukke gewas?	☐	☐	☐	☐
14. Jou eie huiswerk gedoen?	☐	☐	☐	☐
15. Jou eie inkopies gedoen?	☐	☐	☐	☐
16. Volle bondel wasgoed gewas?	☐	☐	☐	☐
17. Koerante of boeke gelees?	☐	☐	☐	☐
18. Die telefoon gebruik?	☐	☐	☐	☐
19. Briewe geskryf?	☐	☐	☐	☐
20. Sosiaal verkeer?	☐	☐	☐	☐
21. Tuin gemaak?	☐	☐	☐	☐
22. Motor bestuur?	☐	☐	☐	☐

Imisebenzi eyongezelelweyo kaNottingham yentlalo yamihla yonke

Le mibuzo ilandelayo imalunga nemisebenzi yemihla ngemihla. Nceda uphendule ngokuthi ubeke uphawu kwibhokisi ibe NYE kumbuzo ngamnye. Nceda ugcine oko uthe wakwenza kwezi veki zimbalwa ezidlulileyo.

INGABA UKHE.....	Nakanye	Bendincediswa	Bendizenzela kodwa bekunzima	Bendizenzela nje ngokwam ndingenangxaki
1. Wahamba-hamba ngaphandle?				
2. Wenyuka izitepsi?				
3. Wakhwela waphinda wehla emotweni?				
4. Wahamba kumhlaba ongalinganiyo ngokuphakama?				
5. Wawela iindlela?				
6. Wakhwela kwisithusthi sikawonkewonke?				
7. Wakwazi ukuzityisa?				
8. Wakwazi ukuzenzela isiselo esishushu?				
9. Wathatha isiselo esishushu kwelinye igumbi usisa kwelinye?				
10. Wazihlambela izitya?				

11. Wazenzela ukutyana okushushu? Umzelekelo – isonka esineqanda.				
12. Wakwazi ukuziphathela imali ngethuba ubuphumile?				
13. Wazihlambela ubumpahlana obumbalwa?				
14. Wazenzela umsebenzi wakho wasekhaya?				
15. Wazithengela izinto ozifunayo?				
16. Wazihlambela zonke iimpahla zakho?				
17. Wafunda iphepha-ndaba okanye incwadi?				
18. Wasebenzisa ifowuni?				
19. Wazibhalela iileta?				
20. Waphuma uye kuzonwabisa?				
21. Wazenzela umsebenzi wakho wasegadini?				
22. Waqhuba imoto?				

Interview

Please mark (X) in the appropriate box. Please record responses to all questions (unless otherwise indicated in the text), including those concerning status before stroke. See guidelines on the facing page for further information.

1	CONSTANT CARE		
	Constant care means that someone needs to be available at all times. Care may be provided by either a trained or an untrained caregiver. The patient will usually be bedridden and may be incontinent.	**Now**	**Before stroke**
1.1	**Does the person require constant care?**	□ Yes □ No (5)	□ Yes □ No

2	ASSISTANCE TO ATTEND TO BODILY NEEDS/ FOR WALKING		
	Assistance includes physical assistance, verbal instruction, or supervision by another person	**Now**	**Before stroke**
2.1	**Is assistance essential for eating?** (Eating without assistance: food and implements may be provided by others).	□ Yes □ No (4)	□ Yes □ No
2.2	**Is assistance essential for using the toilet?** (Using toilet without assistance: reach toilet/commode; undress sufficiently; clean self; dress and leave).	□ Yes □ No (4)	□ Yes □ No
2.3	**Is assistance essential for routine daily hygiene?** (Routine hygiene: washing face, doing hair, cleaning teeth/ fitting false teeth. Implements may be provided by others and this should not be considered assistance).	□ Yes □ No (4)	□ Yes □ No
2.4	**Is assistance essential for walking?** (Walking without assistance: Able to walk indoors around house or ward, may use any aid (e.g. stick/ cane, walking frame/ walker), however not requiring physical help or verbal instruction or supervision from another person).	□ Yes □ No (4)	□ Yes □ No

3	ASSISTANCE TO LOOK AFTER OWN AFFAIRS		
	Assistance includes physical assistance, or verbal instruction, or supervision by another person.	**Now**	**Before stroke**
3.1	**Is assistance essential for preparing a simple meal?** (For example, able to prepare breakfast or a snack)	□ Yes □ No (3)	□ Yes □ No
3.2	**Is assistance essential for basic household chores?** (For example, finding and putting away clothes, clearing up after a meal. Exclude chores that do not need to be done every day, such as using a vacuum cleaner.)	□ Yes □ No (3)	□ Yes □ No
3.3	**Is assistance essential for looking after household expenses?**	□ Yes □ No (3)	□ Yes □ No
3.4	**Is assistance essential for local travel?** (Patients may drive or use public transport to get around. Ability to use a taxi is sufficient, provided the person can phone for it themselves and instruct the driver.)	□ Yes □ No (3)	□ Yes □ No
3.5	**Is assistance essential for local shopping?** (Local shopping: at least able to buy a single item)	□ Yes □ No (3)	□ Yes □ No

Interview

4. USUAL DUTIES AND ACTIVITIES. The next sets of questions are about how the patient usually spends his/ her day.

4.1 Work

4.1.1	**Before stroke, was the person working or seeking work (or studying as a student)?** If the person was not employed or seeking work before stroke, or the person was retired then indicate 'No' and go to 4.2)	□ Yes □ No
4.1.2	**Since stroke has there been a change in the person's ability to work or study?** (change in ability to work or study includes loss of employment or reduction in level of responsibility; change in education or problems with study). **If 'Yes', how restricted are they?** Reduced level of work e.g. change from full-time To part-time or change in level of responsibility. □ (2) Currently unable to work. □ (2)	□ Yes □ No

4.2 Family responsibilities

4.2.1	**Before stroke was the person looking after family at home?** (If this was not a major role before stroke, indicate 'No" and go to 4.3)	□ Yes □ No
4.2.2	**Since stroke has there been a change in their ability to look after family at home?** If 'Yes", how restricted are they? (a) Reduced responsibility for looking after family. □ (2) (b) Currently unable to look after family. □ (2)	□ Yes □ No

4.3 Social & leisure activities

Social and leisure activities include hobbies and interests. Includes activities outside the home or at home. Activities outside the home: going to the pub/ bar, restaurant, club, church, cinema, visiting friends, going for walks. Activities at home: involving "active" participation including knitting, sewing, painting, games, reading books, home improvements).

4.3.1	**Before stroke did the person have regular free-time activities?** (If the person had very restricted social & leisure activities before stroke then indicate 'No' and go to 4.4	□ Yes □ No
4.3.2	**Since stroke has there been a change in their ability to participate in these activities?** If 'Yes', how restricted are they? (a) Participate a bit less: at least half as often as before the stroke. □ (b) Participate much less: less than half as often. □ (2) (c) Unable to participate: rarely, if ever, take part. □ (2)	□ Yes □ No

Interview

4. USUAL DUTIES AND ACTIVITIES. ....Contd.

4.4 Family & Friendships

(Problems with relationships include difficulties in relationships with people at home, loss of friendships or increase in isolation. Changes in the person may include: communication problems, quick temper, irritability, anxiety, insensitivity to others, mood swings, depression, and unreasonable behaviour).

4.4.1 Since the stroke has the person had problems with relationships or become isolated?	□ Yes	□ No
If 'Yes', what is the extent of disruption/strain?		
Occasional – less than weekly □		
Frequent – once a week or more, but tolerable □ (2)		
Constant – daily & intolerable □ (2)		
4.4.2 Before stroke were any similar problems present?	□ Yes	□ No

5. SYMPTOMS AS A RESULT OF THE STROKE

(Can be any symptoms or problems reported by the patient or found on neurological examination).

5.1 **"Does the patient have any symptoms resulting from stroke?"** (Record spontaneous answer to the question from respondent)	□ Yes (1)	□ No		
5.2 SYMPTOM CHECKLIST	Now		Before Stroke	
5.2.1 **Does the person have difficulty reading or writing?**	□ Yes (1)	□ No	□ Yes	□ No
5.2.2 **Does the person have difficulty speaking or finding the right word?**	□ Yes (1)	□ No	□ Yes	□ No
5.2.3 **Does the person have problems with balance or co-ordination?**	□ Yes (1)	□ No	□ Yes	□ No
5.2.4 **Does the person have visual problems?**	□ Yes (1)	□ No	□ Yes	□ No
5.2.5 **Does the person have numbness (face, arms, legs, hands, feet)?**	□ Yes (1)	□ No	□ Yes	□ No
5.2.6 **Has the person experienced loss of movement (face, arms, legs, hands, feet)?**	□ Yes (1)	□ No	□ Yes	□ No
5.2.7 **Does the person have difficulty with swallowing?**	□ Yes (1)	□ No	□ Yes	□ No
5.2.8 **Any other symptoms?** (Please record: .....)	□ Yes (1)	□ No	□ Yes	□ No

Ranking Grade = [ ]

Onderhoud

Plaas asseblief 'n kruisie in die korrekte blokkie. Skryf die antwoorde van al die vrae (tensy andersins aangedui word in die teks), insluitende die wat betrekking het tot die toestand voor die beroerte aanval. Raadpleeg die riglyne wat onder die vraag gedruk is vir aanvullende inligting.

1	VOLTYDSE VERSORGING		
	Voltydse versorging beteken dat iemand ten alle tye beskikbaar moet wees. Versorging mag deur 'n opgeleide of 'n onopgeleide persoon verskaf word. Die pasiënt is dan gewoonlik bedleënd en het geen beheer oor sy of haar blaas nie.	**Nou**	**Voor beroerte**
1.1	**Benodig die persoon voltydse versorging?**	□ Ja □ Nee (5)	□ Ja □ Nee

2	HULP MET LIGAAMLIKE BEHOEFTES / MET LOOP		
	Hulp sluit fisiese hulp, mondelinge opdragte, of toesig van 'n ander persoon, in.	**Nou**	**Voor Beroerte**
2.1	**Word hulp benodig om te eet?** (Eet sonder hulp: kan self eet maar voedsel en messegoed word deur iemand anders aangegee).	□ Ja □ Nee (4)	□ Ja □ Nee
2.2	**Word hulp benodig om die toilet te gebruik?** (Gebruik die toilet sonder hulp; kan self die toilet bereik, ontklee; reining en self weer aantrek en toilet verlaat).	□ Ja □ Nee (4)	□ Ja □ Nee
2.3	**Word hulp benodig vir daaglikse reinigingsroetine?** (Reinigingsroetine: was van gesig, borsel van hare, borsel van tande / insit van vals tande. Benodighede vir reiniging mag deur iemand anders aangegee word maar word nie as hulp beskou nie).	□ Ja □ Nee (4)	□ Ja □ Nee
2.4	**Word hulp benodig vir loop?** (Loop sonder hulp: kan binne die huis of saal rondloop, mag van 'n hulpmiddel gebruik maak (bv. stok of kierie, loopraam), maar het nie fisiese hulp of mondelinge opdragte of toesig van 'n ander persoon nodig nie).	□ Ja □ Nee (4)	□ Ja □ Nee

3	HULP OM NA EIE SAKE OM TE SIEN		
	Hulp sluit fisiese hulp in, mondelinge opdragte, of toesig van 'n ander persoon, in.	**Nou**	**Voor Beroerte**
3.1	**Word hulp benodig om 'n eenvoudige maaltyd voor te berei?** (Byvoorbeeld: kan ontbyt of 'n peuselhappie voorberei)	□ Ja □ Nee (3)	□ Ja □ Nee
3.2	**Word hulp noodsaaklik benodig vir ligte huiswerk?** (Byvoorbeeld: die vind en wegpak van klere, skoonmaak na die maak en eet van 'n maaltyd. Uitsluitende take wat nie elke dag gedoen hoef te word nie, soos stofsuig.)	□ Ja □ Nee (3)	□ Ja □ Nee
3.3	**Word hulp noodsaaklik benodig om na die huishoudlike uitgawes om te sien?**	□ Ja □ Nee (3)	□ Ja □ Nee
3.4	**Word hulp benodig om uit te gaan met openbare of persoonlike vervoer?** (Pasiënte mag bestuur of van openbare vervoer gebruik maak. Die vermoë om 'n taxi te gebruik is voldoende, op voorwaarde dat die persoon self die taxi kan ontbied en self die taxibestuurder opdragte kan gee.)	□ Ja □ Nee (3)	□ Ja □ Nee
3.5	**Word hulp benodig om daaglikse inkopies te doen?** (Daaglikse inkopies: koop ten minste 'n enkele item)	□ Ja □ Nee (3)	□ Ja □ Nee

4. GEWONE TAKE EN AKTIWITEITE

Die volgende vrae het betrekking tot hoe die pasiënt gewoonlik sy/haar dag spandeer.

4.1 Werk

4.1.1	**Voor die beroerte, het die persoon gewerk, of het die persoon werk gesoek (of studeer)?** □ Ja □ Nee (In die geval dat die persoon nie gewerk het nie, of nie werk gesoek het voor die beroerte aanval nie, antwoord asseblief "Nee" en gaan na vraag 4.2)
4.1.2	**Na die beroerte aanval, was daar 'n verandering in die persoon se vermoë om te werk of studeer?** □ Ja □ Nee ('n Verandering in die vermoë om te werk of te studeer sluit in die verlies van werk of 'n vermindering in verantwoordelikhede by die werk; verandering in leervermoë of onvermoë om te studeer.) **As die antwoord "Ja" is, in hoe 'n mate is die persoon beperk?** Verandering in tydsduur van werk, bv. van voltydse werk na deeltydse, of 'n verlaging van die vlak van verantwoordelikhede □ (2) Kan tans nie werk nie. □ (2)

4.2 Verantwoordelikheid vir die Familie

4.2.1	**Het die persoon voor die beroerte na sy/haar familie by die huis omgesien?** □ Ja □ Nee (As dit nie sy/haar hoofrol was nie, merk "Nee" en gaan na 4.3)
4.2.2	**Sedert die beroerte, is die persoon nog in staat om na die familie by die huis om te sien?** □ Ja □ Nee Indien "Ja", in hoe 'n mate is dit nou onmoontlik? (a) Verminderde verantwoordlikheid van versorging van familie. □ (2) (b) Nie meer in staat om familie te versorg nie. □ (2)

4.3 Sosiale & Ontspanningsaktiwiteite

Sosiale en ontspanningsaktiwiteite sluit stokperdjies en ander belangstellings in. Dit sluit aktiweite by die huis en weg van die huis in. Aktiwiteite weg van die huis: uitgaan vir 'n drankie by 'n kroeg, uiteet by 'n restaurant, na die klubhuis gaan, kerk toe gaan, bioskoop toe gaan, vriende besoek of vir 'n wandeling gaan. Aktiwiteite by die huis: Aktiewe take soos brei, stik me naaimasjien, verf, speletjies speel, lees van boeke en verbeterings aanbring aan die woonhuis.

4.3.1	**Het die persoon voor die beroerte gereeld aan buitemuurse aktiwiteite deelgeneem?** (As die persoon min of geen sosiale- en ontspanningsaktiwiteite voor die beroerte gehad het nie, merk "Nee" en gaan na 4.4.)	□ Ja □ Nee
4.3.2	**Sedert die beroerte, is daar 'n verandering in die vermoë van die persoon om deel te neem aan hierdie aktiwteite?** Indien "Ja" in hoe 'n mate is hy / sy beperk? (a) Neem minder deel: ten minste helfte soveel as voor die beroerte. (b) Neem baie minder deel: minder as die helfte soveel. (c) Kan nie meer deelneem nie: weining, of glad nie.	□ Ja □ Nee □ □ (2) □ (2)

Onderhoud

4. ALLEDAAGSE PLIGTE EN AKTIWITEITE .... Voorstetting.

4.4 Famille en Vriende

Probleme met verhoudings sluit probleme in verhoudings met persone tuis, verlies van vriendskappe of 'n toename in isolasie in. Veranderinge in die persoon kan die volende insluit: Kommunikasie probleme, 'n vinnige humeur, irritasie, angstigheid, onsensitiwiteit teenoor ander, buierigheid, depressie, en onredelike gedrag.

4.4.1 Sedert die beroerte aanval, het die persoon probleme met verhoudings met ander ondervind, of begin geisoleerd te raak?	□ Ja □ Nee
Indien "Ja", wat is die omvang van die ontwrigting / spanning?	
Soms – minder as weekliks	□
Dikwels – een keer per week of meer, maar draaglik	□ (2)
Gedurig – daagliks and ondraaglik	□ (2)
4.4.2 Was daar soortgelyke probleme voor die beroerte	□ Ja □ Nee

5. SIMPTOME AS GEVOLG VAN DIE BEROERTE

Dit kan simptome of probleme wees wat deur die pasiënt gerapporteer is, of wat ontdek is tydens 'n neurologiese ondersoek.

5.1	**Het die pasiënt enige simptome wat die gevolg is van die beroerte?** (Skryf spontane antwoord op die vraag deur die respondent neer).	□ Ja (1)	□ Nee	
5.2	**SIMTOME OORSIGLYS**	**Nou**		**Voor Beroerte**
5.2.1	**Vind die persoon dit moelik om te lees en skryf?**	□ Ja (1)	□ Nee	□ Ja □ Nee

5.2.2	Het die persoon 'n spraakgebrek of vind hy/sy dit moeilik om die regte word te vind?	□ Ja (1)	□ Nee	□ Ja	□ Nee
5.2.3	Ondervind die persoon probleme met balans of koördinasie?	□ Ja (1)	□ Nee	□ Ja	□ Nee
5.2.4	Het die persoon visuele probleme?	□ Ja (1)	□ Nee	□ Ja	□ Nee
5.2.5	Het die persoon 'n dooie gevoel (gesig, arms, bene, hande, voete)?	□ Ja (1)	□ Nee	□ Ja	□ Nee
5.2.6	Het die persoon die gebruik van beweging verloor (gesig, arms, bene, hande, voete)?	□ Ja (1)	□ Nee	□ Ja	□ Nee
5.2.7	Vind die persoon dit moeilik om te sluk?	□ Ja (1)	□ Nee	□ Ja	□ Nee
5.2.8	Enige ander simptome? (Teken aan asb. .....)	□ Ja (1)	□ Nee	□ Ja	□ Nee

Klasifiseeringsgraad = ☐

Udliwano-ndlebe

Nceda ufake olu phawu (X) kwibhokisi efanelekileyo. Uyacelwa ukuba ubhale iimpendulo zayo yonke imibuzo (ngaphandle kokuba uyalelwe ukuba ungakwenzi oko), kuquka nezo zimalunga nesimo somguli phambi kokuba ahlaselwe si-stroke. Jonga izikhokhelo kwiphepha elingaphambili ukufumana ulwazi oluthe vetshe.

1	**UNCEDO LWAMAXESHA ONKE**		
	Uncedo lwamihla yonke luthetha ukuba ubani kufuneka abekho ngamaxesha onke. Uncedo lunganikezelwa ngumntu oqeqeshiweyo okanye ongaqeqeshwanga ojangana nomguli. Umguli uya kusoloko elele ebhedini, aze akholise ukuba ngumntu ongakwaziyo ukuzibamba okanye ukuzilawula.	**Ngoku**	**Phambi kokuba abe ne-stroke**
1.1	**Ingaba lo mntu ufuna uncedo lwamihla yonke?**	□Ewe □Hayi (5)	□ Ewe □ Hayi

2	**UNCEDO LOKUJONGANA NEEMFUNO ZOMZIMBA/UKUHAMBA**		
	Uncedo luquka uncedo ngokwasemzimbeni, imiyalelo ngokomlomo okanye ukujongwa ngomnye umntu.	**Ngoku**	**Phambi kokuba abe ne-stroke**
2.1	**Ingaba uyalufuna uncedo ukuze atye?** (Utya ngaphandle kokuncediswa: ukutya nezixhobo zokutya angaziphathelwa ngabanye abantu).	□ Ewe □Hayi (4)	□ Ewe □ Hayi
2.2	**Ingaba ufuna ukuncediswa ukusebenzisa igumbi langasese?** (Usebenzisa igumbi langasese ngaphandle kokuncediswa: uyafikelela kwindawo yokuchopha; uyakwazi ukuzikhulula ngokupheleleyo; uyakwazi ukuzosula; uyazinxibisa aphume esakuggiba).	□ Ewe □Hayi (4)	□ Ewe □ Hayi
2.3	**Ingaba ufuna uncedo kwimisebenzi yamihla yonke yokujongana nococeko lwakhe?** (Ucoceko lwamihla yonke: ukuhlamba ubuso, ukukama iinwele, ukucoca amazinyo okanye ukufaka amazinyo emboleko. Angazinikwa izinto zokusebenza ngabanye abantu, yaye oko makungathatyathwa njengoncedo.)	□ Ewe □Hayi (4)	□ Ewe □ Hayi
2.4	**Ingaba ufuna uncedo ukuze ahambe?** (Uhamba ngaphandle koncedo: Uyakwazi ukuhamba-hamba ngaphakathi endlwini, ajikeleze indlu okanye ahambe apha kwigumbi lakhe lasesibhedlele, angasebenzisa nayiphi na into yokumncedisa (umzekelo. intonga/umsimelelo, intsimbi yokuncedisa ukuhamba), nangona kunjalo akafuni luncedo okanye ukuyalelwa, okanye ukunyamekelwa ngomnye umntu.)	□ Ewe □Hayi (4)	□ Ewe □ Hayi

3	**UNCEDO LOKUZIJONGELA IMICIMBI YAKHE NGOKWAKHE**		
	Uncedo luquka ukuncediswa ngokwasemzimbeni, okanye ukuyalelwa ngomlomo, okanye ukunyamekelwa ngomnye umntu.	**Ngoku**	**Phambi kwestroke**
3.1	**Ingaba ufuna ukuncediswa ukwenza isidlwana nje esiqhelekileyo?** (Umzekelo, ukukwazi ukuzenzela isidlo sakusasa okanye isidlwana esikhawulezileyo)	□ Ewe □ Hayi (3)	□ Ewe □ Hayi

3.2	**Ingaba ufuna uncedo ekwenzeni imisetyenzana yasekhaya?** (Umzekelo, ukukhangela iimpahla nokuzibuyisela endaweni yazo, ukuqoqosha emva kwesidlo. Ungabandakanyi imisebenzi engafuni kwenziwa yonke imihla, efana nokusebenzisa umatshini wokufunxa inkunkuma.)	□ Ewe □ Hayi (3)	□ Ewe □ Hayi
	Ingaba ufuna uncedo lokujongana nokusetyenziswa kwemali ekhaya?	□ Ewe □ Hayi (3)	□ Ewe □ Hayi
3.3	**Ingaba ufuna uncedo xa ethabatha uhambo olufutshane?** (Izigulane zingaqhuba okanye zisebenzise izithuthi zikawonke-wonke ukuya kwindawo nje ekufutshane. Ukukwazi ukusebenzisa nje iteksi kwanele, kuphela ukuba umntu angakwazi ukuyifowunela ngokwakhe aze akwazi nokunika umqhubi wayo imiyalelo.)	□ Ewe □ Hayi (3)	□ Ewe □ Hayi
3.4	**Ingaba ufuna ukuncediswa ukuthenga kwiivenkile ezikwalapha ekuhlaleni?** (Ukuthenga kwiivenkile ezikwalapha ekuhlaleni: ubuncinane akwazi ukuthenga into ibe nye.)	□ Ewe □ Hayi (3)	□ Ewe □ Hayi

Udliwano-ndlebe

4. IMISEBENZI EQHELEKILEYO. Olu ludwe lwemibuzo lulandelayo lumalunga nendlela isigulane esichitha ngayo usuku lwaso.

4.1. Umsebenzi

4.1.1	**Phambi kokuba abe ne-stroke, ingaba lo mntu ebesebenza okanye ebesafuna umsebenzi (okanye efunda)?** □ Ewe □ Hayi Ukuba lo mntu ebengasebenzi okanye ebesafuna umsebenzi phambi kokuba abe ne-stroke, okanye ebesele ethathe umhlala-phantsi, bonisa ngo – hayi', wandule ukuya ku-4.2)
4.1.2	**Ukuhlaselwa kwakhe si-stroke, ingaba kwabakho utshintsho ekukwazini kwakhe ukusebenza okanye ukufunda?** □ Ewe □Hayi (utshintsho ekukwazini ukusebenza okanye ukufunda kuquka ukulahlekelwa ngumsebenzi okanye ukuthotywa kwezinga lomsebenzi ebekade ewenza; utshintsho emfundweni okanye iingxaki malunga nokufunda). **Ukuba impendulo ngu-'ewe', ingaba oku kumbophelele kangakanani?** Kuthotywe umgangatho womsebenzi umz. Ususwe ekubeni ngumsebenzi osisigxina wenziwa umsebenzi wethutyana/ongxungxileyo, okanye utshintsho kumgangatho wesikhundla ebesibambile. □ (2) Akakwazi ukusebenza kungokunje □ (2)

4.2. Imisebenzi yakhe elusatsheni lwakhe

4.2.1	**Phambi kwe-stroke, ingaba lo mntu ebelujongile kusini na usapho lwakhe ekhaya?** ☐ Ewe ☐ Hayi (Ukuba oku yayingenguwona msebenzi wakhe ekhaya phambi kokuba abe ne-stroke, bonisa ngo-'hayi' wandule ukuya ku-4.3)
4.2.2	**Emva kokuhlaselwa kwakhe si-stroke, ingaba lube kho utshintsho kwindlela athe walukhathalela ngayo usapho lwakhe?** ☐ Ewe ☐ Hayi Ukuba impendulo ngu-'ewe', ingaba ubambeke njani ukuba angakwazi? (a) Kuthotywe izinga lomsebenzi wokujongana nosapho. ☐ (2) (b) Kungokunje akakwazi ukujongana nosapho. ☐ (2)

4.3. Ezentlalo nolonwabo

Ezentlalo nezolonwabo ziquka izinto umntu aziqhelisa ukuzonwabisa ngazo, kwanezo zinomtsalane kuye. Ziquka imisebenzi ngaphandle okanye ngaphakathi ekhayeni lakhe. Imisebenzi yangaphandle kwekhaya: ukuya kwindawo yentselo/ebharini, erestyu, embuthweni, ecaweni, kwimiboniso bhanya-bhanya, ukundwendwela abahlobo, nokuthabatha uhambo lokolula nje imilenze. Imisebenzi yasekhaya: iquka ukuzibandakanya ngqo, okufana nokunitha, ukuthunga, ukwenza imizobo, imidlalo, ukufunda iincwadi, nokuphucula ikhaya).

4.3.1	**Phambi kokuba afunyanwe si-stroke, ingaba lo mntu ebekholisa ukuyenza imisetyenzana ayenza ngexesha lokuzipholela?** ☐ Ewe ☐ Hayi (Ukuba lo mntu ebenemisebenzi embalwa yokuzonwabisa phambi kokuba ahlaselwe si-stroke, bonisa ngo- 'hayi', wandule ukuya ku-4.4
4.3.2	**Emva kokuba efunyenwe si-stroke, ingaba kubekho utshintsho ekubeni akwazi ukuthabatha inxaxheba kule misebenzi** ☐ Ewe ☐ Hayi Ukuba impendulo ngu-'ewe', uye wathinteleka njani? (a) Uthabatha inxaxheba ngaphantsi kunesiqhelo: ubuncinane kangangesiqingatha kunokuba ebeqhele ukwenza phambi kokuba ahlaselwe si-stroke. ☐ (2) (b) Uthabatha inxaxheba kancinane kakhulu: ngaphantsi kunesiqingatha kunesiqhelo. ☐ (2) (c) Akakwazi ukuthabatha inxaxheba: ukwenza manqapha-nqapha oko, ukuba uthe wakwenza. ☐ (2)

4. IMISEBENZI YESIQHELO. ....isaqhuba.

4.4 Usapho nobuhlobo

(Iingxaki malunga nobuhlobo ziquka iingxaki kunxulumano nabanye abantu apha ekhaya, ukulahlekelwa ngabahlobo okanye ukwanda kobulolo (ukuba likheswa okanye ube wedwa). Iinguqu emntwini zingabandakanya: iingxaki zonxibelelwano, ukukhawulezelwa ngumsindo, ukucaphukisa, inkxalabo ukungabacingeli abanye, ukuhlala engatyhilekanga, ukudakumba, kwanendlela engamkelekanga yokuziphatha).

4.2. Imisebenzi yakhe elusatsheni lwakhe

4.2.1	**Phambi kwe-stroke, ingaba lo mntu ebelujongile kusini na usapho lwakhe ekhaya?** ☐ Ewe ☐ Hayi (Ukuba oku yayingenguwona msebenzi wakhe ekhaya phambi kokuba abe ne-stroke, bonisa ngo-'hayi' wandule ukuya ku-4.3)
4.2.2	**Emva kokuhlaselwa kwakhe si-stroke, ingaba lube kho utshintsho kwindlela athe walukhathalela ngayo usapho lwakhe?** ☐ Ewe ☐ Hayi Ukuba impendulo ngu-'ewe', ingaba ubambeke njani ukuba angakwazi? (a) Kuthotywe izinga lomsebenzi wokujongana nosapho. ☐ (2) (b) Kungokunje akakwazi ukujongana nosapho. ☐ (2)

4.3. Ezentlalo nolonwabo

Ezentlalo nezolonwabo ziquka izinto umntu aziqhelisa ukuzonwabisa ngazo, kwanezo zinomtsalane kuye. Ziquka imisebenzi ngaphandle okanye ngaphakathi ekhayeni lakhe. Imisebenzi yangaphandle kwekhaya: ukuya kwindawo yentselo/ebharini, erestyu, embuthweni, ecaweni, kwimiboniso bhanya-bhanya, ukundwendwela abahlobo, nokuthabatha uhambo lokolula nje imilenze. Imisebenzi yasekhaya: iquka ukuzibandakanya ngqo, okufana nokunitha, ukuthunga, ukwenza imizobo, imidlalo, ukufunda iincwadi, nokuphucula ikhaya).

4.3.1	**Phambi kokuba afunyanwe si-stroke, ingaba lo mntu ebekholisa ukuyenza imisetyenzana ayenza ngexesha lokuzipholela?** ☐ Ewe ☐ Hayi (Ukuba lo mntu ebenemisebenzi embalwa yokuzonwabisa phambi kokuba ahlaselwe si-stroke, bonisa ngo- 'hayi', wandule ukuya ku-4.4
4.3.2	**Emva kokuba efunyenwe si-stroke, ingaba kubekho utshintsho ekubeni akwazi ukuthabatha inxaxheba kule misebenzi** ☐ Ewe ☐ Hayi Ukuba impendulo ngu-'ewe', uye wathinteleka njani? (a) Uthabatha inxaxheba ngaphantsi kunesiqhelo: ubuncinane kangangesiqingatha kunokuba ebeqhele ukwenza phambi kokuba ahlaselwe si-stroke. ☐ (2) (b) Uthabatha inxaxheba kancinane kakhulu: ngaphantsi kunesiqingatha kunesiqhelo. ☐ (2) (c) Akakwazi ukuthabatha inxaxheba: ukwenza manqapha-nqapha oko, ukuba uthe wakwenza. ☐ (2)

4. IMISEBENZI YESIQHELO. ....isaqhuba.

4.4 Usapho nobuhlobo

(Iingxaki malunga nobuhlobo ziquka iingxaki kunxulumano nabanye abantu apha ekhaya, ukulahlekelwa ngabahlobo okanye ukwanda kobulolo (ukuba likheswa okanye ube wedwa). Iinguqu emntwini zingabandakanya: iingxaki zonxibelelwano, ukukhawulezelwa ngumsindo, ukucaphukisa, inkxalabo ukungabacingeli abanye, ukuhlala engatyhilekanga, ukudakumba, kwanendlela engamkelekanga yokuziphatha).

4.4.1 Emva kokuba ethe wahlaselwa si-stroke ingaba lo mntu ukhe waneengxaki zonxulumano nabanye abantu, okanye wazibona eyedwa?	□ Ewe □ Hayi
Ukuba impendulo ngu-'ewe', oku kumonakalise okanye kumphazamise kangakanani?	
Ngamathuba athile – ngaphantsi kweveki nganye	□ (2)
Amathuba amaninzi – kanye ngeveki okanye nangaphezulu, kodwa enyamezeleka	□ (2)
Ngalo lonke ixesha – yonke imihla yaye akanyamezeleki	□ (2)
4.4.2 Phambi kokuba ahlaselwe si-stroke, zazikho iingxaki ezifana nezi?	□ Ewe □ Hayi

5. **IIMPAWU EZISISIPHUMO SE-STROKE**
(Isenokuba zizo naziphi iimpawu okanye iingxaki ezichazwe ngumguli okanye ezifunyenwe kuvavanyo lwengqondo).

5.1	**"Ingaba umguli unazo iimpawu ze-stroke?** (Bhala phantsi zonke iimpendulo ezingacingisiswanga/ezizenzekelayo kulo mbuzo ezivela kulowo uphendulayo. (1)	□ Ewe	□ Hayi
5.2	**ULUDWE LOKUJONGA IIMPAWU**	**Ngoku**	**Phambi kwe-stroke**
5.2.1	**Ingaba lo mntu unengxaki yokufunda okanye ukubhala?** (1)	□ Ewe □ Hayi	□ Ewe □ Hayi
5.2.2	**Ingaba lo mntu unengxaki yokuthetha okanye ukufumana igama elililo?** (1)	□ Ewe □ Hayi	□ Ewe □ Hayi
5.2.3	**Ingaba lo mntu unengxaki yokuzimela okanye ukuxhathisa?** (1)	□ Ewe □ Hayi	□ Ewe □ Hayi
5.2.4	**Ingaba lo mntu unengxaki yokubona?** (1)	□ Ewe □ Hayi	□ Ewe □ Hayi
5.2.5	**Ingaba lo mntu ukhathazwa bubundindisholo (bobuso, beengalo, bemilenze, bezandla, beenyawo)?** (1)	□ Ewe □ Hayi	□ Ewe □ Hayi
5.2.6	**Ingaba lomntu ukhe akakwazi ukushukumisa (ubuso, iingalo, imilenze, iinyawo)?** (1)	□ Ewe □ Hayi	□ Ewe □ Hayi
5.2.7	**Ingaba lomntu unengxaki yokuginya?** (1)	□ Ewe □ Hayi	□ Ewe □ Hayi
5.2.8	**Ingaba zikho ezinye iimpawu?** (Nceda uzibhale : .....) (1)	□ Ewe □ Hayi	□ Ewe □ Hayi

Uhlelo ngokodidi =	

Euroquol

By placing a cross in **one** box in each group below, please indicate which statements indicate best your own health state today.

Mobility
I have no problems in walking about ☐
I have some problems in walking about ☐
I am confined to bed ☐

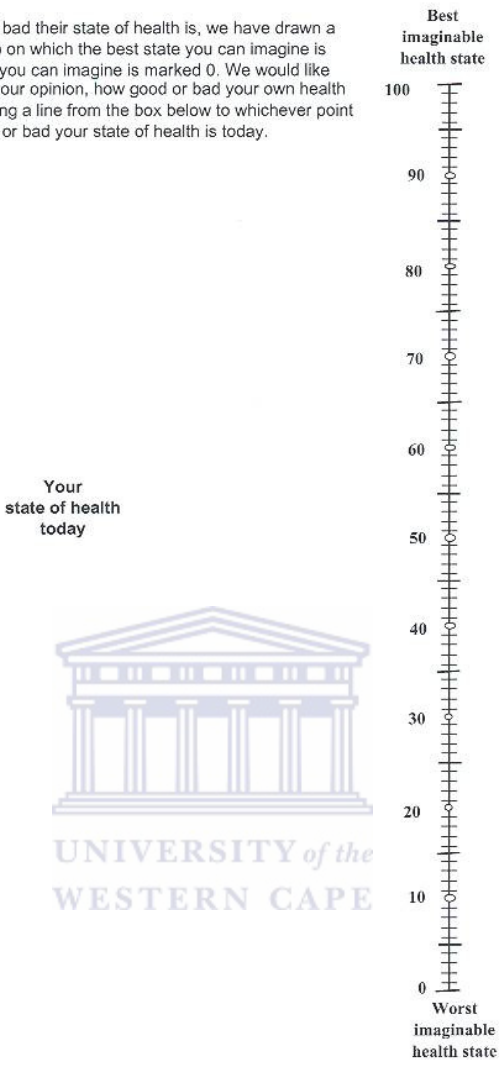
Self-Care
I have no problems with self-care ☐
I have some problems washing or dressing myself ☐
I am unable to wash or dress myself ☐

Usual Activities (e.g. work, study, housework, family or leisure activities)
I have no problems with performing my usual activities ☐
I have some problems with performing my usual activities ☐
I am unable to perform my usual activities ☐

Pain/Discomfort
I have no pain or discomfort ☐
I have moderate pain or discomfort ☐
I have extreme pain or discomfort ☐

Anxiety/Depression
I am not anxious or depressed ☐
I am moderately anxious or depressed ☐
I am extremely anxious or depressed ☐

To help people say how good or bad their state of health is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked 100 and the worst state you can imagine is marked 0. We would like you to indicate on this scale, in your opinion, how good or bad your own health is today. Please do this by drawing a line from the box below to whichever point on the scale indicates how good or bad your state of health is today.



Your state of health today:

Dui asseblief aan watter stellings u eie gesondheidstoestand vandag die beste beskryf deur 'n regmerkie in een blokkie by elkeen van die onderstaande groepe te maak.

Beweeglikheid

Ek het geen probleme om rond te loop nie ❑
Ek het sommige probleme om rond te loop ❑
Ek is beperk tot die bed ❑

Selfversorging

Ek het geen probleme om myself te versorg nie ❑
Ek het sommige probleme om myself te was of aan te trek ❑
Ek is nie in staat om myself te was of aan te trek nie ❑

Gewone Aktiwiteite (*bv. werk, studeer, huiswerk, familie- of ontspanningsaktiwiteite*)

Ek het geen probleme om my gewone aktiwiteite uit te voer nie ❑
Ek het sommige probleme om my gewone aktiwiteite uit te voer ❑
Ek is nie in staat om my gewone aktiwiteite uit te voer nie ❑

Pyn/ Ongemak

Ek het geen pyn of ongemak nie ❑
Ek het matige pyn of ongemak ❑
Ek het uiterste pyn of ongemak ❑

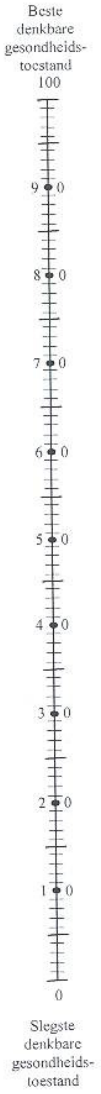
Angstigheid/ Neerslagtigheid

Ek is nie angstig of neerslagtig nie ❑
Ek is matig angstig of neerslagtig ❑
Ek is uiters angstig of neerslagtig ❑

Om mense te help om te sê hoe goed of sleg hul gesondheidstoestand is, het ons 'n skaal (baie soos 'n termometer) geteken waarop die beste gesondheidstoestand wat u u kan verbeel, gemerk is met 100 en die slegste gesondheidstoestand wat u u kan verbeel, gemerk is met 0.

Ons wil graag hê dat u op hierdie skaal aandui hoe goed of sleg u eie gesondheid vandag na u mening is. Doen dit asseblief deur 'n streep te trek vanaf die blokkie hieronder (waar dit sê: "u eie gesondheidstoestand vandag") tot by enige punt op die skaal wat aandui hoe goed of sleg u gesondheidstoestand vandag is.

U eie gesondheids-toestand vandag



APPENDIX 19

Beka uphawu kwibhokisi ibenye kwiqela ngalinye echaza imeko yempilo yakho namhlanje, kwezi bhokisi zilandelayo.

Musa ukuphawula ngaphezulu kwebhokisi enye kwiqela ngalinye.

Ukuhamba

Andinangxaki zokuhamba ❑
Ndinazo ingxakana zokuhamba ❑
Ndingumlwelwe obopheleleke ebhedini ❑

Ukuzinonophela isiqu

Andinangxaki zokuzinonophela ❑
Ndinazo ingxakana zokuhlamba okanye ukuzinxibisa ❑
Andikwazi ukuzihlamba okanye ukuzinxibisa ❑

Izinto zesiqhelo (Umsebenzi, Ukufunda izifundo Umsebenzi wasekhaya, Usapho, Ezolonwabo)

Andinangxaki nokuzenzela izinto zesiqhelo ❑
Ndinazo iingxakana zokuzenzela izinto zesiqhelo ❑
Andikwazi kuzenzela izinto zesiqhelo ❑

Iintlungu / Ukungaziva kakuhle

Andinazintlungu okanye ukungaziva kakuhle ❑
Ndinentlungwana okanye ukungaziva kakuhle okungephi ❑
Ndinentlungu ezigqithileyo okanye ukungaziva kakuhle okugqithileyo ❑

Ukuxhalaba / Ukudakumba

Andinaxhala okanye andidakumbanga ❑
Ndibuxhalaba okanye ndibudakumba ❑
Ndixhalabe gqitha okanye ndidakumbe gqitha ❑

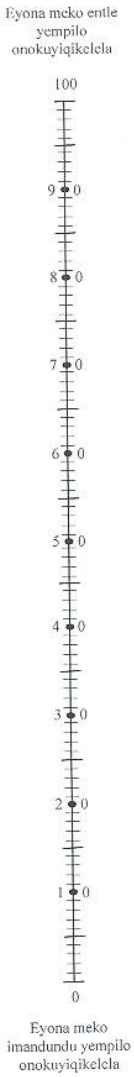
Xa ndithelekisa umgangatho wobunjani bempilo yam jikelele kwezi nyanga zili-12 zidlulileyo imeko yempilo yam namhlanje:

Ingcono ❑ Phawula
Ibufana ❑ ibhokisana
Imandundu ❑ efanelekileyo

Ukunceda abantu ukuze baxele okokuba imeko yabo yempilo intle okanye imandundu na sizobe isikali (esifana nethemometha). Eyona meko entle yempilo iphawulwe ngo-100, eyona meko imandundu iphawulwe ngo-0.

Singathanda ubonise kwesi sikali ngokoluvo lwakho ukuba impilo yakho intle okanye imandundu kangakanani namhlanje.
Nceda wenze oku ngokuzoba umgca osuka ebhokisini engezantsi ukuya kulo ndawo esikalini ibonisa ukuba imeko yempilo yakho intle okanye imbi kangakanani namhlanje.

Imeko yempilo yakho namhlanje



QUESTIONNAIRE COMPLETED 2 MONTHS POST STROKE

SECTION 1

1. 1. HOW WOULD YOU DESCRIBE YOUR GENERAL CONDITION?
1= Very good
2= Good
3= Poor
4= Very poor

1.2. ARE YOU IN REGULAR CONTACT WITH RELATIVES, CHILDREN, ACQUAINTANCES, ETC?
1= More than once a week
2= Once a week
3= At least once a month
4= Approximately once a year
5= Never

1.3. HOW WOULD YOU RATE YOUR SOCIAL CONTACTS?
1= Very satisfactory
2= Fairly satisfactory
3= Fairly unsatisfactory
4= Very unsatisfactory

1.4. WHAT IS THE EXTENT TO WHICH OVER THE PAST 2 MONTHS YOUR PHYSICAL OR EMOTIONAL HEALTH HAS HINDERED CONTACTS WITH YOUR RELATIVES, FRIENDS, OR NEIGHBOURS, OR THE PERFORMANCE OF GROUP ACTIVITES?
1= Not at all
2= A little
3= A lot
4= Very much

1.5. WHAT IS THE EXTENT TO WHICH PAIN HAS HINDERED YOUR WORK OR OTHER ACTIVITIES OVER THE PAST 2 MONTHS?
1= Not at all
2= A little
3= A lot
4= Very much

1.6. WOULD YOU BE ABLE TO COUNT ON NEIGHBOURS, FRIENDS, OR FAMILY FOR HELP IN CASE OF AN EMERGENCY?
1= Yes
2= No

1.7. IS THERE ANYBODY IN YOUR SURROUNDINGS OR IN YOUR FAMILY THAT YOU CAN CONFIDE IN AND WITH WHOM YOU CAN FREELY DISCUSS YOUR PROBLEMS?
1= Yes
2= No

SECTION 2

2.1 Have you been admitted to hospital or rehabilitation in the past 2 months?
1= Yes ☐
2= No (proceed to question 2.3)

2.2. How many times have you been admitted to a hospital or nursing home in the last two months: (i.e. where you have stayed overnight)? Please give details. If reason for admission is not due to stroke, please specify reason

Name of Hospital or Home	Reason for Admission 1= Due to stroke 2= Not due to stroke.	Length of stay Nursing (No. Of nights)
1.		
2.		
3.		
4.		
5.		

2.3 Have you used any of the following health care facilities or services over the past 2 months? These include visits to clinics, Drs, home visits from community health workers and appointments at hospitals.

Services/facilities	No of times	More(1), Less(2) Equal (3) than before The stroke	Place of contact 1=own home 2=CHCC/Clinic 3=Hospital 4=Rehab centre	Related to stroke 1=yes 2=no
Social worker				
Physiotherapist				
Occupational Therapist				
Speech and Language therapist				
Dietician				
Psychologist				
Nurse				
Traditional Healer				
Community Rehabilitation worker				
Home-based Carer				
Medical Doctor				
Specialist .Specify:				
Self-help group/ stroke group				
Other specify				

2.3. Have you in the past 2 months been forced to forgo or postpone the use of health care services because of lack of accessibility of transport? ☐

1= Yes
2= No (If no proceed to question 2.5)

2.4 What kind of care did it involve?

Health Care Service	Postponed or Forgone (yes=1; no=2)	Related to stroke (yes=1; no=2)
Social worker		
Physiotherapist		
Occupational Therapist		
Speech and Language therapist		
Dietician		
Psychologist		
Nurse		
Traditional Healer		
Community Rehabilitation worker		
Home-based Carer		
Medical Doctor		
Specialist .Specify:		
Self-help group/ stroke group		
Other specify		

2.5. Have you in the past 2 months been forced to forgo or postpone the use of health care services because of financial reasons? ☐

1= Yes 2= No

2.6 If yes, what kind of care did it involve?

Health Care Service	Postponed or Forgone (yes=1; no=2)	Stroke-Related (yes=1; no=2)
Social worker		
Physiotherapist		
Occupational Therapist		
Speech and Language therapist		
Dietician		
Psychologist		
Nurse		
Traditional Healer		
Community Rehabilitation worker		
Home-based Carer		
Medical Doctor		
Specialist .Specify:		
Self-help group/ stroke group		
Other specify		

Section 3

3. 1How do you mostly around inside your house ☐

1= walk
2= wheelchair
3= Unable
4= Other Specify_____

3.2 Do you use any of the following to help you get around inside your house?
1=Yes 2=No

Ordinary walking stick	
Elbow Crutches	
Walking frame	
Walking stick with 3 or 4 feet	
Wheelchair	
Ankle splint	
Other. Please specify_____	

3.3 How do you mostly around outside your house ☐

1= walk
2= wheelchair
3= Unable
4= Other Specify_____

3.4 Do you use any of the following to help you get around outside your house?
1=Yes 2=No

Ordinary walking stick	
Elbow Crutches	
Walking frame	
Walking stick with 3 or 4 feet	
Wheelchair	
Ankle splint	
Other. Please specify_____	

3.5 Before you had your stroke, how did you mostly get to places in the community and further a field? (Allow up to three responses.) 3.5.1. ☐ **3.5.2.** ☐ **3.5.3.** ☐

1 =Taxi
2 =Bus
3 =Train
4 = Car, driver
5 = Car, passenger
6 = Motor Bike
7 = Bicycle
8 = Walked
9 = Wheeled in wheelchair
10 =Other. Please specify _____

3.6. Since your stroke, how do you mostly get to places in the community and further a field? (Allow up to three responses.) **3.6.1.** ☐ **3.6.2.** ☐ **3.6.3.** ☐

1 =Taxi
2 =Bus
3 =Train
4 = Car, driver
5 = Car, passenger
6 = Motor Bike
7 = Bicycle
8 = Walked
9 = Wheeled in wheelchair
10 =Other. Please specify _____

SECTION 4: DETAILS OF THE HOME ENVIRONMENT

4.1. How would you best describe the place where you are living now? ☐

1= Same home as before the stroke 2= Alternative home 3= Institution/ nursing home/ care facility

If discharged to alternative home, then complete Section 6

4.2 If you are not staying at your previous home, what is the *main* reason for this? ☐

1= Not applicable
2= Previous home was unsuitable
3= No carer at home
4= Unable to manage (needs too much help)
5= Other. Specify

4.3. Where you stay now, is there anyone at home to help you:

1.3.1. During the day? 1= Yes 2=No ☐ 1.3.2. At night? 1= Yes 2=No ☐

4.4. How would you best describe the place where you live? ☐

1= House
2= Block of flats
3= House/ flat/ room in back yard or on shared property
4= Townhouse, cluster, semi-detached (simplex, duplex or triplex)
5= Retirement village
6= Informal dwelling/ shack in informal settlement
7= Informal dwelling/ shack in backyard
8= Other. Specify: _____

4.5. Do you need to go up steps or stairs to get into your home? 1= Yes 2= No ☐

Please specify.
1= Steps. Specify approximate number: _____
2= Flights of stairs. Specify approximate number: _____
☐ If subject answers flights of stairs, go to question 4, if not go to question 5.

4.6. Is there a lift? 1= Yes 2= No ☐

4.7. Do you have steps, or different levels inside your home? 1= Yes 2= No ☐

4.8. Do you have electricity? 1= Yes 2= No ☐

4.9. Do you have running water inside the house? 1= Yes 2= No ☐

4.10. Do you have a bath or shower in your home? 1= Yes 2= No ☐

4.11 Are your toilet facilities inside or outside? 1= Inside 2= Outside ☐

4.12. Do you have to cross uneven ground to get to your toilet facilities? 1= Yes 2= No ☐

4.13. Do you have to go up stairs to get to your toilet facilities? 1= Yes 2= No ☐

4.1 If you use your wheelchair to get around, is it possible to get to the toilet in your wheelchair? 1= Yes 2= No 3= Not applicable ☐

4.15. Do you have access to a telephone? 1= Yes 2= No ☐

If yes, please specify telephone mostly used:
1= Landline inside dwelling 2= Cell phone 3= Neighbour's phone 4= Public telephone ☐
nearby 5= None of the above.

QUESTIONNAIRE COMPLETED 2 MONTHS POST STROKE

AFDELING 1:

1. Hoe sal jy jou algemene toestand beskryf? ☐

   1. Baie Goed
   2. Goed
   3. Swak
   4. Baie Swak

2. Is jy gereeld in kontak met jou familielede, kinders, bekendes, ens.? ☐

   1. Meer as een keer per week
   2. Een keer per week
   3. Te minste een keer per maand
   4. Ongeveer een keer per jaar
   5. Nooit

3. Hoe sal jy jou sosiale kontak beskryf? ☐

   1. Baie bevredigend
   2. Taamlik bevredigend
   3. Taamlik onbevredigend
   4. Baie onbevredigend

4. Tot watte mate het jou fisiese of emosionele gesondheid verhinder dat jy in die afgelope 2 maande kontak gehad het met familielede, vriende, bure, of die beoefening van groepaktiwiteite? ☐

   1. Glad nie
   2. 'n Bietjie
   3. Baie
   4. Heeltemal

5. Tot watter mate het pyn in die afgelope 2 maande jou werk of ander aktiwiteite negatief beinvloed? ☐

   1. Glad nie
   2. 'n Bietjie
   3. Baie
   4. Heeltemal

6. Kan jy in 'n noodgeval op bure, vriende of familielede staat maak om te help? ☐

   1. Ja
   2. Nee

7. Is daar enigiemand in jou omgewing of in jou familie wat jy in vertroue kan neem, of met wie jy openlik oor jou probleme kan praat? ☐

   1.Ja
   2. Nee

AFDELING: 2

2.1 Was jy binne die afgelope 2 maande in 'n hospitaal of rehabilitasie sentrum opgeneem?

1= Ja ☐
2= Nee (gan na vraag 2.3)

2.2 Hoeveel keer was u in 'n hospital of verplegingsinrigting opgeneem (waar u oornag gebly het)? Gee asseblief besonderhede. As die redes vir toelating nie as gevolg van 'n beroerte aanval was nie, gee asseblief die rede.

Naam van hospitaaal of Verplegingsinrigting	Rede vir toelating 1= Beroerte aanval 2= Ander rede	Lengte van verblyf (Hoeveel nagte?)
1. _____	☐	☐
2. _____	☐	☐
3. _____	☐	☐
4. _____	☐	☐
5. _____	☐	☐

2.3 Het jy in die afgelope 2 maande enige gebruik gemaak van die volgende gesondheidsfasiliteite of dienste. Sluit asseblief in al u kliniekbesoeke, besoeke aan u mediese doktor, enige rehabilitasie wat u ontvang het in u eie gemeenskap, besoeke van gesondheidswerkers en afsprake by hospitale.

Hoeveelheid	No X	Ongeveerde hoeveelheid 1= Meer as voor beroerte 2= Minder as voor beroerte 3=Dieselfde as voor beroerte	Plek 1= eie woning 2= CHCC of Kliniek 3= Hospitaal 4 = Rehabilitasiesentrum	In verband met beroete Ja=1 Nee=2
Maatskaplike werker	☐	☐	☐	☐
Fisioterapie	☐	☐	☐	☐
Arbeidsterapie	☐	☐	☐	☐
Spraak- en taal terapie	☐	☐	☐	☐
Dieetkundige	☐	☐	☐	☐
Sielkundige	☐	☐	☐	☐
Verpleegster	☐	☐	☐	☐
Tradisionele geneser	☐	☐	☐	☐
Gemeenskapsrehabilitasiewerker	☐	☐	☐	☐
Mediese doktor	☐	☐	☐	☐
Self-help groep	☐	☐	☐	☐
Specialis:	☐	☐	☐	☐
Ander. Noem asb.	☐	☐	☐	☐

2.4. Was u in die afgelope 2 maande genoodsaak die gebruik van gesondheidsdienste te kanselleer of uit te stel omdat u geen toegang tot vervoer gehad het nie? 1= Ja 2= Nee (gaan na 2.5)

☐

2.4.1 Watter mediese dienste sluit dit in? (in die geval van 'n aantal moontlikhede, noem in besonder die wat te doen het met die beroerte.)

Gesondheidsdienste	Uitgestel of opgegee? Ja=1 Nee=2	Te doen met die beroerte? Ja=1 Nee=2	Gee asseblief besonderhede
Maatskaplike werker			
Fisioterapie			
Arbeidsterapie			
Spraak- en taal terapie			
Dieetkundige			
Sielkundige			
Verpleegster			
Tradisionele geneser			
Gemeenskapsrehabilitasiewerke			
Mediese doktor			
Self-help groep/ stroke groep			
Specialis: Noem asseblief			
Ander. Noem asseblief			

2.5 . Was u in die afgelope 2 maande genoodsaak om die gebruik van gesondheidsdienste uit kanselleer of uit te stel om finansiële redes?
1= Ja 2= Nee ☐

2.5.1 Watter mediese dienste sluit dit in? (in die geval van 'n aantal moontlikhede, noem in besonder die wat te doen het met die beroerte.)

Gesondheidsdienste	Uitgestel of opgegee? Ja=1 Nee=2	Te doen met die beroerte? Ja=1 Nee=2	Gee asseblief besonderhede
Maatskaplike werker			
Fisioterapie			
Arbeidsterapie			
Spraak- en taal terapie			
Dieetkundige			
Sielkundige			
Verpleegster			
Tradisionele geneser			
Gemeenskapsrehabilitasiewerke			
Mediese doktor			
Self-help groep/ stroke groep			
Specialis: Noem asseblief			
Ander. Noem asseblief			

AFDELING: 3

3.1 Hoe beweeg u gewoonlik rond in u woning? ☐

1= Loop
2= Rolstoel
3= Kan nie rondbeweeg nie
4= Ander. Noem asb. _____

3.2 Gebruik u enige van die volgende om u te help om rond te beweeg in die huis?

1= Ja 2= Nee

3.4.1. Gewone kierie ☐
3.4.2. Kierie met 3 of 4 pote ☐
3.3.3. Elmboog krukke ☐
3.4.4. Loopraam ☐
3.4.5. Enkelsplint ☐
3.4.6. Ander ☐ Noem asb.

3.3 Hoe beweeg u gewoonlik rond buite u woning? ☐

1= Loop
2= Rolstoel
3= Kan nie rondbeweeg nie
4= Ander. Noem asb. _____

3.4 Gebruik u enige van die volgende om u te help om rond te beweeg in die huis?

1= Ja 2= Nee

3.4.1. Gewone kierie ☐
3.4.2. Kierie met 3 of 4 pote ☐
3.3.3. Elmboog krukke ☐
3.4.4. Loopraam ☐
3.4.5. Enkelsplint ☐
3.4.6. Ander ☐ Noem asb.

3.5 Voor u beroerte aanval, hoe het u rondbeweeg in u woonbuurt en ander plekke buite u woonbuurt? (Laat tot drie antwoorde toe.)

2.5.1. ☐ 2.5.2. ☐ 2.5.3. ☐

1= Mini-bus taxi
2= Bus
3= Trein
4= Motor, bestuurder
5= Motor, passassier
6= Motorfiets
7= Fiets
8= Geloop
9= Gestoot in rolstoel
10= Ander. Noem asb.

_____

3.6 Sedert u beroerte, hoe het u rondbeweeg in u woonbuurt en ander plekke buite u woonbuurt? (Laat tot drie antwoorde toe.)

2.5.1. ☐ 2.5.2. ☐ 2.5.3. ☐

1= Mini-bus taxi
2= Bus
3= Trein
4= Motor, bestuurder
5= Motor, passassier
6= Motorfiets
7= Fiets
8= Geloop
9= Gestoot in rolstoel
10= Ander. Noem asb.

_____

AFDELING: 4

4.1. Beskryf u huidige verblyplek ☐

1= Dieselfde woning as voor die beroerte aanval
2= 'n Ander woning
3= Inrigting / verpleeginrigting

Indien u na u ontslag in 'n ander huis

4.2 As u nie terruggekeer het na u vorige woning nie, verskaf asseblief die hoofredes daarvoor

1= Nie toepaslik
☐
2= Vorige woning was nie geskik nie
3= Geen versorger by my woning nie
4= Nie in staat om reg te kom nie (te veel hulp nodig)
5= Ander. Noem
asb._____

4.3. Is daar tans enigiemand wat u kan help, waar u nou bly? 1= Ja 2= Nee

1.3.1. Gedurende die dag ☐ 1.3.2. Snags ☐

4.4 Beskryf u huidige woonplek ☐

1= Huis
2= Woonstel
3= Huis / Woonstel of kamer in 'n agterplaas of erf wat gedeel word
4= Dorpshuis, meenthuis of koppelhuis
5= Aftree-oord
6= Informele behuising / pondok in an informal settlement
7= Informele behuising / pondok in 'n agterplaas
8= Ander. Noem asb. _____

4.5. Moet u trappe op klim om by u woning in te kom? 1= Ja 2= Nee ☐

Noem asseblief. ☐

1= Trappies. Omtrent hoeveel? _____
2= 'n Trap – omtrent hoeveel trappies op die trap? _____

As pasiënt laasgenoemde antwoord, gaan na vraag 3. So nie, gaan na Vraag 4.

4.6. Is daar 'n huisbak? 1= Ja 2= Nee

☐

4.7. Het u trappies, of verskillende vlakke in u woning? 1= Ja 2= Nee

☐

4.8. Het u elektrisiteit? 1= Ja 2= Nee

☐

4.9. Het u lopende water in u woning? 1= Ja 2= Nee

☐

4.10. Het u 'n bad of 'n stort in u woning? 1= Ja 2= Nee
☐

4.11. Is u toilet binne of buite u woning? 1= Binne 2= Buite
☐

4.12. Moet u oor 'n ongelyke oppervlakte om tot by die toilet te kom? 1= Ja 2= Nee
☐

4.13. Moet u by trappe op loop om by die toilet te kom? 1= Ja 2= Nee
☐

4.14. As u gebruik maak van 'n rolstoel, is dit vir u moontlik om by die toilet te kom met u u rolstoel? 1= Ja 2= Nee 3= Nie toepaslik
☐

4.15. Het u 'n telefoon?
1= Ja 2= Nee ☐
Noem asb.: ☐

1= Landlyn binne woning
2= Selfoon
3= Bure se telefoon
4= Public Telephone nearby
5= Geen hierbo genoem nie

QUESTIONNAIRE COMPLETED 2 MONTHS POST STROKE

SECTION 1

1. Ungayichaza njani imeko yakho jikelele?
   1. Ilunge kakhulu
   2. Ilungile
   3. Imbi
   4. Imbi kakhulu

2. Ingaba udibana rhoqo nezalamane, nabantwana, uyakwazi ukudibana nabantu, njalo-njalo?
   1. Ngaphezu kwesinye ngeveki
   2. Kanye ngeveki
   3. Ubuncinane kanye ngenyanga
   4. Malunga kanye ngonyaka
   5. Zange/khange

3. Ukuthanda kwakho ukudibana nabantu ungakubeka kweliphi izinga?
   1. Iyakwanelisa kakhulu
   2. Iyakonelisa kakuhle
   3. Ayikwanelisi kakuhle
   4. Ayikwnelisi kakhulu

4.Ngokuyinxenye nezinyanga zimbini zidlulileyo impilo yakho ngokomzimba okanye uvakalelo lwempilo yakho lukuthintela njani ukuba udibane nezalamane zakho, nabahlobo okanye abamelwane okanye imisebenzi yeqela?
   1. Hayi konke-konke/Khange kwaphela
   2. Kancinci
   3. Kakhulu
   4. Ngamandla kakhulu

   5. Ingaba iintlungu zikuthintela njani emsebenzini wakho okanye kweminye imisebenzi yakho kwezi nyanga zimbini zidlulileyo?

   1. Khange konke-konke
   2. Kancinci
   3. Kakhulu
   4. Ngamandla kakhulu

6. Ungakwazi ukuthembela kubamelwane, kwizihlobo, okanye kusapho lwakho xa ufuna uncedo ngethuba/ngexesha lokuxakeka?
   1. Ewe
   2. Hayi

7.Ingaba ukhona umntu kwabakungqongileyo okanye kusapho lwakho onokuthi uzityande igila kuye/ uhlebe kuye, umntu onokuthi uxoxe naye ngokukhululekileyo iingxaki zakho?

1. Ewe
2. Hayi

SECTION 2: Ukusebenzisa uncedo

2.1. Ungeniswe kangaphi esibhedlele okanye kwikhaya labongikazi oko washiya (ukutsho apho ukhe wandwendwela isibhedlele walaliswa)? Nceda nika isizathu sokulaliswa kwakho , ukuba ayisiso isitrowukhi, Nceda chaza isizathu.

Igama lesibhedlele Okanye Ikhaya labongikazi	isizathu sokulaliswa 1= sisitrowukhi 2= asositrowukhi	ixesha olihleliyo/ iintsuku olaliswe ngazo
1.		
2.		
3.		
4.		
5.		

2.2. Nceda nika iinkcukacha ngegalelo othe wanalo kwinkonzo zempilo kwezi nyanga zintandathu zidlulileyo, quka ukuhambela isibhedlele, I, GP's (ugqirha ozisebe nzelayo), zingaba zikhona indawo zogcina abantu ekuhlaleni, ukuhambela abongi kazi, izimiselo zexesha esibhedlele.

	Amaxesha Wonyango	Ukuya qho 1= Ngaphezu kwaphambi kwesitrowukhi 2= Ngaphantsi phambi kwesitrowukhi 3= Ngokulinganayo phambi kwesitrowukhi	Indawo yendibano 1= Ekhaya 2= CHCC okanye klinikhi 3= Esibhedlele 4= WCRC
KuNontlalontle	☐	☐	☐
Physiotherapy	☐	☐	☐
Occupational therapy	☐	☐	☐

Speech and Language Therapy	☐	☐	☐
Dietician	☐	☐	☐
Psychologist	☐	☐	☐
Umongikazi/ unesi	☐	☐	☐
Ixhwele	☐	☐	☐
Community Rehabilitation Worker (Umsebenzi wasekuhlaleni ojongene nabantu aba)	☐	☐	☐
uGqirha	☐	☐	☐
Self Help Group eg. Stroke Support Group	☐	☐	☐

Cacisa: _____
(Iqumrhu/ umbutho wenkxaso wabazincedayo)
Ukuba zikhona ezinye , cacisa _____

2.3. Kwezi nyanga zintandathu zidlulileyo ukhe wanyanzelwa ukuya okanye uhlehlise kusebenzisa inkonzo zempilo ngenxa yokunqaba kukufikelela kwizinto ezihambayo?
1= Ewe 2= Hayi ☐

2.4. Kwezi nyanga zintandathu ukhe wanyanzeliswa uyeke okanye unyenyise inkonzo zempilo ngenxa yengxaki yemali?
1= Ewe 2= Hayi ☐

Section 3

3.1. Usebenzisa ntoni ukujikeleza phakathi kwekhaya ? ☐
1= uyakwazi ukuzihambela 2= I-wheel chair / isitulo esihamba ngamavili 3= awukwazi 4= ezinye

3.2. Usebenzisa enye yezi zinto ukujikeleza ngaphakathi endlini?
2.2.1. Intonga eqhelekileyo 1= Ewe 2= Hayi ☐
2.2.2. Intonga yasesibhedlele enemilenze emi 3 okanye 4 1= Ewe 2= Hayi ☐
2.2.3. Elbow crutches: intonga zokuhamba eziphela ezingqinibeni 1= Ewe 2= Hayi ☐
2.2.4. Ifreyimi yokuhamba 1= Ewe 2= Hayi ☐
2.2.5. Ankle splint: into esetyenziswa ukuncedisana neqatha lakho 1= Ewe 2= Hayi ☐
2.2.6. Ezinye. Cacisa. _____

3.3. Usebenzisa ntoni kakhulu ukujikeleza phandle kwekhaya? ☐
1= uyakwazi ukuzihambela 2= I-wheelchair/ isitulo esihamba ngamavili 3= awukwazi 4= ezinye

3.4. Usebenzisa enye yezi zinto ukujikeleza ngaphandle ekhayeni lakho?
2.4.1. Intonga eqhelekileyo 1= Ewe 2= Hayi ☐

2.4.2. Intonga yasesibhedlele enemilenze emi 3 okanye 4 — 1= Ewe 2= Hayi ☐
2.4.3. Elbow crutches: intonga zokuhamba eziphela ezingqinibeni — 1= Ewe 2= Hayi ☐
2.4.4. Ifreyimi yokuhamba — 1= Ewe 2= Hayi ☐
2.4.5. Ankle splint: into esetyenziswa ukuncedisana neqatha lakho — 1= Ewe 2= Hayi ☐
2.4.6. Ezinye. Cacisa. _____

3.5 Phambi kokuba ube nesitrowukhi, Ubufikelela njani ezindaweni kwindawo Ohlala kuyo (kwingingqi yakho) nakude? (khetha zibentathu)

2.5.1. ☐ 2.5.2. ☐ 2.5.3. ☐
1 = iteksi
2 = ibhasi
3 = itreyini/ uloliwe
4 = imoto , ungumkhweli
5 = imoto , uqhuba
6 = isithuthuthu
7 = ibhayisikile
8 = ubuhamba
9 = ubuhanjiswa ngesitulo.
10= ezinye iintlobo zokuhamba. Cacisa: _____

3.6. Oko unesitrowukhi ufikelela njani ezindaweni ekuhlaleni nakude? (khetha zibentathu)

2.6.1. ☐ 2.6.2. ☐ 2.6.3. ☐
1 = iteksi
2 = ibhasi
3 = itreyini/ uloliwe
4 = imoto , ungumkhweli
5 = imoto , uqhuba
6 = isithuthuthu
7 = ibhayisikile
8 = ubuhamba
9 = ubuhanjiswa ngesitulo.
10 = ezinye iintlobo zokuhamba. Cacisa: _____

SECTION 4: DETAILS OF THE HOME ENVIRONMENT

4.1. Ungayichaza njani indawo ohlala kuyo ngoku ? ☐
1= Yindlu
2= Iuludwe lweflethi
3= Yindlu/ yiflethi/ unxusile okanye uhlala nabantu
4= Yitown house
5= Kwindawo yabantu abadla umhlalaphantsi
6= Ematyotyombeni okanye kwindawo enematyotyombe
7= Ematyotyombeni/ etyotyombeni okanye ngasemva endlwini
8= Enye. Cacisa: _____

4.2. Usebenzisa izitephusi ukufikelela kwikhaya lakho? 1= Ewe 2=Hayi ☐
Nceda cacisa .
1= Izitephusi . cacisa lingakanani inani lezitephusi _____ ☐
2= Izitephusi zinyuka nqo. Cacisa inani _____
(Ukuba impendulo linani lezitephusi yiya kumbuzo 6.3., ukuba hayi yiya kumbuzo 6.4.)

4.3. Kukho ilifti/ikhetshi? 1= Ewe 2=Hayi ☐

4.4. Kukho izitephusi endlwini okanye ngaphakathi endlwini yakho? 1= Ewe 2=Hayi ☐

4.5. Unawo umbane? 1= Ewe 2=Hayi ☐

4.6. Unawo amanzi acocekileyo endlini? 1= Ewe 2=Hayi ☐

4.7. Unayo indawo yokuhlambela okanye ishawa ekhaya? 1= Ewe 2=Hayi ☐

4.8. Ingaba ithoyilethi ingaphakathi okanye ingaphandle? 1= Ngaphakathi 2= Ngaphandle ☐

4.9 Kufuneka uwele indawo eziphakamileyo ukuya ethoyilethi? 1= Ewe 2=Hayi ☐

4.10. Kufuneka unyuke izitephusi ukufikelela ethoyilethi? 1= Ewe 2=Hayi ☐

4.11.Ukuba usebenzisa iwheel chair ukujikeleza ekhaya, uyakwazi ukufikelela nge –wheel chair ethoyilethi ? 1=Ewe 2=Hayi 3= Engasebenziyo

4.12. Unayo ifowuni? 1= Ewe 2=Hayi ☐
☐

Nceda cacisa :
1= Indlela yokuhlala ngaphakathi
2= I-cellphone
3= Ifowuni yasebumelwaneni
4= Ifowuni kawonke-wonke
5= Ayikho kwezi zingasentla

QUESTIONNAIRE COMPLETED 6 MONTHS POST STROKE

SECTION 1

1. 1. HOW WOULD YOU DESCRIBE YOUR GENERAL CONDITION?
1= Very good
2= Good
3= Poor
4= Very poor

1.2. ARE YOU IN REGULAR CONTACT WITH RELATIVES, CHILDREN, ACQUAINTANCES, ETC?
1= More than once a week
2= Once a week
3= At least once a month
4= Approximately once a year
5= Never

1.3. HOW WOULD YOU RATE YOUR SOCIAL CONTACTS?
1= Very satisfactory
2= Fairly satisfactory
3= Fairly unsatisfactory
4= Very unsatisfactory

1.4. WHAT IS THE EXTENT TO WHICH OVER THE PAST 4 MONTHS YOUR PHYSICAL OR EMOTIONAL HEALTH HAS HINDERED CONTACTS WITH YOUR RELATIVES, FRIENDS, OR NEIGHBOURS, OR THE PERFORMANCE OF GROUP ACTIVITES?
1= Not at all
2= A little
3= A lot
4= Very much

1.5. WHAT IS THE EXTENT TO WHICH PAIN HAS HINDERED YOUR WORK OR OTHER ACTIVITIES OVER THE PAST 4 MONTHS?
1= Not at all
2= A little
3= A lot
4= Very much

1.6. WOULD YOU BE ABLE TO COUNT ON NEIGHBOURS, FRIENDS, OR FAMILY FOR HELP IN CASE OF AN EMERGENCY?
1= Yes
2= No

1.7. IS THERE ANYBODY IN YOUR SURROUNDINGS OR IN YOUR FAMILY THAT YOU CAN CONFIDE IN AND WITH WHOM YOU CAN FREELY DISCUSS YOUR PROBLEMS?
1= Yes
2= No

2.3. Have you in the past 4 months been forced to forgo or postpone the use of health care services because of lack of accessibility of transport?

1= Yes ☐
2= No (If no proceed to question 2.5)

2.4 What kind of care did it involve?

Health Care Service	Postponed or Forgone (yes=1; no=2)	Related to stroke (yes=1; no=2)
Social worker		
Physiotherapist		
Occupational Therapist		
Speech and Language therapist		
Dietician		
Psychologist		
Nurse		
Traditional Healer		
Community Rehabilitation worker		
Home-based Carer		
Medical Doctor		
Specialist .Specify:		
Self-help group/ stroke group		
Other specify		

2.5. Have you in the past 4 months been forced to forgo or postpone the use of health care services because of financial reasons?

1= Yes 2= No ☐

2.6 If yes, what kind of care did it involve?

Health Care Service	Postponed or Forgone (yes=1; no=2)	Stroke-Related (yes=1; no=2)
Social worker		
Physiotherapist		
Occupational Therapist		
Speech and Language therapist		
Dietician		
Psychologist		
Nurse		
Traditional Healer		
Community Rehabilitation worker		
Home-based Carer		
Medical Doctor		
Specialist .Specify:		
Self-help group/ stroke group		
Other specify		

Section 3

3. 1How do you mostly around inside your house ☐

1= walk
2= wheelchair
3= Unable
4= Other Specify_____

3.2 Do you use any of the following to help you get around inside your house?
1=Yes 2=No

Ordinary walking stick	
Elbow Crutches	
Walking frame	
Walking stick with 3 or 4 feet	
Wheelchair	
Ankle splint	
Other. Please specify_____	

3.3 How do you mostly around outside your house ☐

1= walk
2= wheelchair
3= Unable
4= Other Specify_____

3.4 Do you use any of the following to help you get around outside your house?
1=Yes 2=No

Ordinary walking stick	
Elbow Crutches	
Walking frame	
Walking stick with 3 or 4 feet	
Wheelchair	
Ankle splint	
Other. Please specify_____	

3.5 Before you had your stroke, how did you mostly get to places in the community and further a field? (Allow up to three responses.) 3.5.1. ☐ 3.5.2. ☐ 3.5.3. ☐

1 =Taxi
2 =Bus
3 =Train
4 = Car, driver
5 = Car, passenger
6 = Motor Bike
7 = Bicycle
8 = Walked
9 = Wheeled in wheelchair
10 =Other. Please specify _____

3.6. Since your stroke, how do you mostly get to places in the community and further a field? (Allow up to three responses.) 3.6.1. ☐ 3.6.2. ☐ 3.6.3. ☐

1 =Taxi
2 =Bus
3 =Train
4 = Car, driver
5 = Car, passenger
6 = Motor Bike
7 = Bicycle
8 = Walked
9 = Wheeled in wheelchair
10 =Other. Please specify _____

SECTION 4: DETAILS OF THE HOME ENVIRONMENT

4.1. How would you best describe the place where you are living now? ☐
1= Same home as before the stroke 2= Alternative home 3= Institution/ nursing home/ care facility
If discharged to alternative home, then complete Section 6

4.2 If you are not staying at your previous home, what is the *main* reason for this? ☐
1= Not applicable
2= Previous home was unsuitable
3= No carer at home
4= Unable to manage (needs too much help)
5= Other. Specify

4.3. Where you stay now, is there anyone at home to help you:
1.3.1. During the day? 1= Yes 2=No ☐ 1.3.2. At night? 1= Yes 2=No ☐

4.4. How would you best describe the place where you live? ☐
1= House
2= Block of flats
3= House/ flat/ room in back yard or on shared property
4= Townhouse, cluster, semi-detached (simplex, duplex or triplex)
5= Retirement village
6= Informal dwelling/ shack in informal settlement
7= Informal dwelling/ shack in backyard
8= Other. Specify: _____

4.5. Do you need to go up steps or stairs to get into your home? 1= Yes 2= No ☐
Please specify.
1= Steps. Specify approximate number: _____
2= Flights of stairs. Specify approximate number: _____
☐ If subject answers flights of stairs, go to question 4, if not go to question 5.

4.6. Is there a lift? 1= Yes 2= No ☐

4.7. Do you have steps, or different levels inside your home? 1= Yes 2= No ☐

4.8. Do you have electricity? 1= Yes 2= No ☐

4.9. Do you have running water inside the house? 1= Yes 2= No ☐

4.10. Do you have a bath or shower in your home? 1= Yes 2= No ☐

4.11 Are your toilet facilities inside or outside? 1= Inside 2= Outside ☐

4.12. Do you have to cross uneven ground to get to your toilet facilities? 1= Yes 2= No ☐

4.13. Do you have to go up stairs to get to your toilet facilities? 1= Yes 2= No ☐

4.1 If you use your wheelchair to get around, is it possible to get to the toilet in your wheelchair? 1= Yes 2= No 3= Not applicable ☐

4= Ongereelde kontrakte vir sekere typdperkte. Noem asseblief tipiese ure per week ___

5= Ander. Noem asseblief _____

5.4. Doen u nou dieselfde werk as voor u beroerte aanval?

1= Ja, presies dieselfde werk
2= Dieselfde werkgewer as tevore, maar verskillende werksopdragte
3= Ander werk

If answer is (3), ask:
What kind of work do you do now? _____

5.5. As u tans nie werk nie, wat is die hoof rede daarvoor?

1= Ek werk nie, ek soek tans werk
2= Ek verkies om nie te werk nie
3= Ek werk nie omdat ek nou siek of ongeskik vir werk is (ontvang 'n Ongeskiktheidstoelae/ of private versekeringstoelae)
4= Ek werk nie omdat ek nou siek of ongeskik vir werk is (ontvang geen Ongeskiktheidstoelae nie)
5= Afgetree / Pensioenaris
6= Sorg vir die huishouding, geen finanisiële toelae nie (dit sluit in om kinders op te pas)
7= Leerling of student
8= Ondergaan werk her-opleiding / beroepsopleiding
9= Ander. Noem asb.

_____

Indien (4), vra: Is 'n aansoek vir 'n Ongeskikheidstoelae gemaak? 1= Ja 2=Nee

Indien ja, vra: Wat is die huidige status van u aansoek?

1= Aansoek word steeds geassesseer of geprosesseer
2= Aansoek geweier

5.6. Vandat u uit die hospitaal ontslaan is, het u in enige van die volgende aktiwiteite deelgeneem? 1= Ja 2= Nee

3.6.1. Onbetaalde werk as 'n vrywilliger
3.6.2. Onbetaalde werk in 'n familiebesigheid
3.6.3. Sorg vir ander, soos byvoorbeeld kinders, bejaardes of siekes.
3.6.4. Werk in die huis, soos byvoorbeeld skoonmaak, kook, tuinmaak, instandhouding, of herstelwerk

4.15. Do you have access to a telephone? 1= Yes 2= No ☐

If yes, please specify telephone mostly used:
1= Landline inside dwelling 2= Cell phone 3= Neighbour's phone 4= Public telephone nearby 5= None of the above. ☐

SECTION 5: RETURN TO WORK OR PRODUCTIVE ACTIVITY

5.1. Are you currently in paid employment/ working? ☐
1= Yes, paid employment (Please go to question 3.2.)
2= No, not paid employment (Please go to question 3.5)

5.2. Which of the following best describes your current employment status? ☐
1= Employed.
2= Self-employed or helping in a family business
3= Other.
Specify:_____

5.3. Which of the following best describes your working hours? ☐
1= Part-time. Specify hours/ week _____
2= Full-time (More than 20 hours a week)
3= Irregular hours, occasional work as a day casual
4= Irregular fixed term contracts. Specify typical hours/ week _____
5= Other

5.4. Is this the same job as you did before you had your stroke? ☐
1= Yes, exactly the same job
2= Same employer but different job description
3= Completely different job

If answer is (3), ask:
What kind of work do you do now? _____

5.5. If you are not in paid employment, what is the main reason for your not working? ☐
1= Unemployed, looking for work
2= Unemployed, prefers not to work
3= Unable to work due to illness or disability (Receiving Disability Grant or Private Insurance Benefit)
4= Unable to work due to illness or disability (No Disability Grant)
5= Retired/ Pensioner
6= Looking after the home, no benefits (includes looking after children)
7= Scholar or student
8= Undergoing work retraining/ vocational training
9= Other. Specify:
If (4), ask: Has an application for a Disability Grant been made? 1= Yes 2=No ☐

If yes, ask: What is the current status of your application? ☐
1= Application still being assessed or processed
2= Application denied

5.6. Since you had your, have you participated in any of the following activities?

5.6.1.	Unpaid work as a volunteer	1= Yes 2=No	☐
5.6.2.	Unpaid work helping in family business	1= Yes 2=No	☐
5.6.3.	Looking after others, e.g. children, the elderly or the sick.	1= Yes 2=No	☐
5.6.4.	Work around the home such as cleaning, cooking, gardening, maintenance or repairs	1= Yes 2=No	☐

UNIVERSITY of the
WESTERN CAPE

APPENDIX 24

QUESTIONNAIRE COMPLETED 6 MONTHS POST STROKE

AFDELING 1:

1. Hoe sal jy jou algemene toestand beskryf? ☐

   1. Baie Goed
   2. Goed
   3. Swak
   4. Baie Swak

2. Is jy gereeld in kontak met jou familielede, kinders, bekendes, ens.? ☐

   1. Meer as een keer per week
   2. Een keer per week
   3. Te minste een keer per maand
   4. Ongeveer een keer per jaar
   5. Nooit

3. Hoe sal jy jou sosiale kontak beskryf? ☐

   1. Baie bevredigend
   2. Taamlik bevredigend
   3. Taamlik onbevredigend
   4. Baie onbevredigend

4. Tot watte mate het jou fisiese of emosionele gesondheid verhinder dat jy in die afgelope 4 maande kontak gehad het met familielede, vriende, bure, of die beoefening van groepaktiwiteite? ☐

   1. Glad nie
   2. 'n Bietjie
   3. Baie
   4. Heeltemal

5. Tot watter mate het pyn in die afgelope 4 maande jou werk of ander aktiwiteite negatief beinvloed? ☐

   1. Glad nie
   2. 'n Bietjie
   3. Baie
   4. Heeltemal

6. Kan jy in 'n noodgeval op bure, vriende of familielede staat maak om te help? ☐

   1. Ja
   2. Nee

7. Is daar enigiemand in jou omgewing of in jou familie wat jy in vertroue kan neem, of met wie jy openlik oor jou probleme kan praat? ☐

   1.Ja
   2. Nee

AFDELING: 2

2.1 Was jy binne die afgelope 4 maande in 'n hospitaal of rehabilitasie sentrum opgeneem?

1= Ja
2= Nee (gan na vraag 2.3) ☐

2.2 Hoeveel keer was u in 'n hospital of verplegingsinrigting opgeneem (waar u oornag gebly het)? Gee asseblief besonderhede. As die redes vir toelating nie as gevolg van 'n beroerte aanval was nie, gee asseblief die rede.

Naam van hospitaaal of Verplegingsinrigting	Lengte van verblyf	Rede vir toelating 1= Beroerte aanval 2= Ander rede (Hoeveel nagte?)
1.		
2.		
3.		
4.		
5.		

2.3 Het jy in die afgelope 4 maande enige gebruik gemaak van die volgende gesondheidsfasiliteite of dienste. Sluit asseblief in al u kliniekbesoeke, besoeke aan u mediese doktor, enige rehabilitasie wat u ontvang het in u eie gemeenskap, besoeke van gesondheidswerkers en afsprake by hospitale.

	Hoeveel Keer	Plek 1= eie woning 2= CHCC of Kliniek 3= Hospitaal 4= Ander	In verband met beroete Ja=1 /nee=2
Maatskaplike werker			
Fisioterapie			
Arbeidsterapie			
Spraak- en taal terapie			
Dieetkundige			
Sielkundige			
Verpleegster			
Tradisionele geneser			
Gemeenskaps rehabilitasiewerker			
Mediese doktor			
Self-help groep			
Specialis:			
Ander. Noem asb.			

2.4. Was u in die afgelope 4 maande genoodsaak die gebruik van gesondheidsdienste te kanselleer of uit te stel omdat u geen toegang tot vervoer gehad het nie? 1= Ja 2= Nee
(gaan na 2.5)

2.4.1 Watter mediese dienste sluit dit in? (in die geval van 'n aantal moontlikhede, noem in besonder die wat te doen het met die beroerte.)

Gesondheidsdienste	Uitgestel of opgegee? Ja=1 Nee=2	Te doen met die beroerte? Ja=1 Nee=2	Gee asseblief besonderhede
Maatskaplike werker			
Fisioterapie			
Arbeidsterapie			
Spraak- en taal terapie			
Dieetkundige			
Sielkundige			
Verpleegster			
Tradisionele geneser			
Gemeenskapsrehabilitasiewerke			
Mediese doktor			
Self-help groep/ stroke groep			
Specialis: Noem asseblief			
Ander. Noem asseblief			

2.5 . Was u in die afgelope 4 maande genoodsaak om die gebruik van gesondheidsdienste uit kanselleer of uit te stel om finansiële redes?
1= Ja 2= Nee

2.5.1 Watter mediese dienste sluit dit in? (in die geval van 'n aantal moontlikhede, noem in besonder die wat te doen het met die beroerte.)

Gesondheidsdienste	Uitgestel of opgegee? Ja=1 Nee=2	Te doen met die beroerte? Ja=1 Nee=2	Gee asseblief besonderhede
Maatskaplike werker			
Fisioterapie			
Arbeidsterapie			
Spraak- en taal terapie			
Dieetkundige			
Sielkundige			
Verpleegster			
Tradisionele geneser			
Gemeenskapsrehabilitasiewerke			
Mediese doktor			
Self-help groep/ stroke groep			
Specialis: Noem asseblief			
Ander. Noem asseblief			

AFDELING: 3

3.1 Hoe beweeg u gewoonlik rond in u woning?

1= Loop
2= Rolstoel
3= Kan nie rondbeweeg nie
4= Ander. Noem asb. _____

3.2 Gebruik u enige van die volgende om u te help om rond te beweeg in die huis?

1= Ja 2= Nee

3.4.1. Gewone kierie
3.4.2. Kierie met 3 of 4 pote
3.3.3. Elmboog krukke
3.4.4. Loopraam
3.4.5. Enkelsplint
3.4.6. Ander Noem asb.

3.3 Hoe beweeg u gewoonlik rond buite u woning?

1= Loop
2= Rolstoel
3= Kan nie rondbeweeg nie
4= Ander. Noem asb. _____

3.4 Gebruik u enige van die volgende om u te help om rond te beweeg in die huis?

1= Ja 2= Nee

3.4.1. Gewone kierie
3.4.2. Kierie met 3 of 4 pote
3.3.3. Elmboog krukke
3.4.4. Loopraam
3.4.5. Enkelsplint
3.4.6. Ander Noem asb.

3.5 Voor u beroerte aanval, hoe het u rondbeweeg in u woonbuurt en ander plekke buite u woonbuurt? (Laat tot drie antwoorde toe.)

2.5.1. 2.5.2. 2.5.3.

1= Mini-bus taxi
2= Bus
3= Trein
4= Motor, bestuurder
5= Motor, passassier
6= Motorfiets
7= Fiets
8= Geloop
9= Gestoot in rolstoel
10= Ander. Noem asb.

3.5 Voor u beroerte aanval, hoe het u rondbeweeg in u woonbuurt en ander plekke buite u woonbuurt? (Laat tot drie antwoorde toe.)

2.5.1. 2.5.2. 2.5.3.

1= Mini-bus taxi
2= Bus
3= Trein
4= Motor, bestuurder
5= Motor, passassier
6= Motorfiets
7= Fiets
8= Geloop
9= Gestoot in rolstoel
10= Ander. Noem asb.

3.6 Sedert u beroerte, hoe het u rondbeweeg in u woonbuurt en ander plekke buite u woonbuurt? (Laat tot drie antwoorde toe.)

2.5.1. □ 2.5.2. □ 2.5.3. □

1= Mini-bus taxi
2= Bus
3= Trein
4= Motor, bestuurder
5= Motor, passassier
6= Motorfiets
7= Fiets
8= Geloop
9= Gestoot in rolstoel
10= Ander. Noem asb.

_____

AFDELING: 4

4.1. Beskryf u huidige verblyplek

□

1= Dieselfde woning as voor die beroerte aanval
2= 'n Ander woning
3= Inrigting / verpleeginrigting

Indien u na u ontslag in 'n ander huis

4.2 As u nie terruggekeer het na u vorige woning nie, verskaf asseblief die hoofredes daarvoor

1= Nie toepaslik

□

2= Vorige woning was nie geskik nie
3= Geen versorger by my woning nie
4= Nie in staat om reg te kom nie (te veel hulp nodig)
5= Ander. Noem

asb._____

4.3. Is daar tans enigiemand wat u kan help, waar u nou bly? 1= Ja 2= Nee

1.3.1. Gedurende die dag □ 1.3.2. Snags □

4.4 Beskryf u huidige woonplek

□

1= Huis
2= Woonstel
3= Huis / Woonstel of kamer in 'n agterplaas of erf wat gedeel word
4= Dorpshuis, meenthuis of koppelhuis
5= Aftree-oord
6= Informele behuising / (pondok in an informal settlement)
7= Informele behuising / pondok in 'n agterplaas
8= Ander. Noem asb. _____

4.5. Moet u trappe op klim om by u woning in te kom? 1= Ja 2= Nee

□

Noem asseblief.

□

1= Trappies. Omtrent hoeveel? _____
2= 'n Trap – omtrent hoeveel trappies op die trap? _____

As pasiënt laasgenoemde antwoord, gaan na vraag 3. So nie, gaan na Vraag 4.

4.6. Is daar 'n huisbak? 1= Ja 2= Nee

4.7. Het u trappies, of verskillende vlakke in u woning? 1= Ja 2= Nee

4.8. Het u elektrisiteit? 1= Ja 2= Nee

4.9. Het u lopende water in u woning? 1= Ja 2= Nee

4.10. Het u 'n bad of 'n stort in u woning? 1= Ja 2= Nee

4.11. Is u toilet binne of buite u woning? 1= Binne 2= Buite

4.12. Moet u oor 'n ongelyke oppervlakte om tot by die toilet te kom? 1= Ja 2= Nee

4.13. Moet u by trappe op loop om by die toilet te kom? 1= Ja 2= Nee

4.14. As u gebruik maak van 'n rolstoel, is dit vir u moontlik om by die toilet te kom met u u rolstoel? 1= Ja 2= Nee 3= Nie toepaslik

4.15. Het u 'n telefoon?
1= Ja 2= Nee
Noem asb.:

1= Landlyn binne woning
2= Selfoon
3= Bure se telefoon
4= Public Telephone nearby
5= Geen hierbo genoem nie

DEEL 5: TERRUGKEER NA WERK, OF PRODUKTIEWE AKTIWITEITE

5.1. Is u tans in betaalde indiensneming?

1= Ja, betaalde indiensneming (Gaan asseblief na Vraag 3.2.)
2= Nee, nie betaalde indiensneming (Gaan asseblief na Vraag 3.5)

5.2. Watter van die volgende is toepaslik op u huidige situasie?

1= Indiensneming
2= Eie besigheid, of help in 'n familiebesigheid
3= Ander. Noem asb. _____

5.3. Watter van die volgende werksure het u nou?

1= Deeltyds. Noem asseblief hoeveel ure per week _____
2= Voltyds (Meer as 20 ure per week)
3= Ongereelde ure, werk soms as tydelike werker

4= Ongereelde kontrakte vir sekere typdperkte. Noem asseblief tipiese ure per week ___

5= Ander. Noem asseblief _____

5.4. Doen u nou dieselfde werk as voor u beroerte aanval?

1= Ja, presies dieselfde werk
2= Dieselfde werkgewer as tevore, maar verskillende werksopdragte
3= Ander werk

If answer is (3), ask:
What kind of work do you do now? _____

5.5. As u tans nie werk nie, wat is die hoof rede daarvoor?

1= Ek werk nie, ek soek tans werk
2= Ek verkies om nie te werk nie
3= Ek werk nie omdat ek nou siek of ongeskik vir werk is (ontvang 'n Ongeskiktheidstoelae/ of private versekeringstoelae)
4= Ek werk nie omdat ek nou siek of ongeskik vir werk is (ontvang geen Ongeskiktheidstoelae nie)
5= Afgetree / Pensioenaris
6= Sorg vir die huishouding, geen finanisiële toelae nie (dit sluit in om kinders op te pas)
7= Leerling of student
8= Ondergaan werk her-opleiding / beroepsopleiding
9= Ander. Noem asb.

_____

Indien (4), vra: Is 'n aansoek vir 'n Ongeskikheidstoelae gemaak? 1= Ja 2=Nee

Indien ja, vra: Wat is die huidige status van u aansoek?

1= Aansoek word steeds geassesseer of geprosesseer
2= Aansoek geweier

5.6. Vandat u uit die hospitaal ontslaan is, het u in enige van die volgende aktiwiteite deelgeneem? 1= Ja 2= Nee

3.6.1. Onbetaalde werk as 'n vrywilliger
3.6.2. Onbetaalde werk in 'n familiebesigheid
3.6.3. Sorg vir ander, soos byvoorbeeld kinders, bejaardes of siekes.
3.6.4. Werk in die huis, soos byvoorbeeld skoonmaak, kook, tuinmaak, instandhouding, of herstelwerk

QUESTIONNAIRE COMPLETED 6 MONTHS POST STROKE

SECTION 1

1. **Ungayichaza njani imeko yakho jikelele?**
   1. Ilunge kakhulu ☐
   2. Ilungile
   3. Imbi
   4. Imbi kakhulu

2. **Ingaba udibana rhoqo nezalamane, nabantwana, uyakwazi ukudibana nabantu, njalo-njalo?**
   1. Ngaphezu kwesinye ngeveki ☐
   2. Kanye ngeveki
   3. Ubuncinane kanye ngenyanga
   4. Malunga kanye ngonyaka
   5. Zange/khange

3. **Ukuthanda kwakho ukudibana nabantu ungakubeka kweliphi izinga?** ☐
   1. Iyakwanelisa kakhulu
   2. Iyakonelisa kakuhle
   3. Ayikwanelisi kakuhle
   4. Ayikwnelisi kakhulu

4. **Ngokuyinxenye nezinyanga zi 6 zidlulileyo impilo yakho ngokomzimba okanye uvakalelo lwempilo yakho lukuthintela njani ukuba udibane nezalamane zakho, nabahlobo okanye abamelwane okanye imisebenzi yeqela?** ☐
   1. Hayi konke-konke/Khange kwaphela
   2. Kancinci
   3. Kakhulu
   4. Ngamandla kakhulu

5. **Ingaba iintlungu zikuthintela njani emsebenzini wakho okanye kweminye imisebenzi yakho kwezi nyanga 6 zidlulileyo?** ☐
   1. Khange konke-konke
   2. Kancinci
   3. Kakhulu
   4. Ngamandla kakhulu

6. **Ungakwazi ukuthembela kubamelwane, kwizihlobo, okanye kusapho lwakho xa ufuna uncedo ngethuba/ngexesha lokuxakeka?**
   1. Ewe ☐
   2. Hayi

7.Ingaba ukhona umntu kwabakungqungileyo okanye kusapho lwakho onokuthi uzityande igila kuye/ uhlebe kuye, umntu onokuthi uxoxe naye ngokukhululekileyo iingxaki zakho?

1. Ewe ☐
2. Hayi

SECTION 2: Ukusebenzisa uncedo

2.1. Ungeniswe kangaphi esibhedlele okanye kwikhaya labongikazi oko washiya (ukutsho apho ukhe wandwendwela isibhedlele walaliswa)? Nceda nika isizathu sokulaliswa kwakho , ukuba ayisiso isitrowukhi, Nceda chaza isizathu.

1. Ewe ☐
2. Hayi

Igama lesibhedlele Okanye Ikhaya labongikazi	isizathu sokulaliswa 1= sisitrowukhi 2= asositrowukhi	ixesha olihleliyo/ iintsuku olaliswe ngazo
1.		
2.		
3.		
4.		
5.		

2.2. Nceda nika iinkcukacha ngegalelo othe wanalo kwinkonzo zempilo kwezi nyanga zintandathu zidlulileyo, quka ukuhambela isibhedlele, I, GP's (ugqirha ozisebe nzelayo), zingaba zikhona indawo zogcina abantu ekuhlaleni, ukuhambela abongi kazi, izimiselo zexesha esibhedlele.

	Amaxesha Wonyango	Ukuya qho 1= Ngaphezu kwaphambi kwesitrowukhi 2= Ngaphantsi phambi kwesitrowukhi 3= Ngokulinganayo phambi kwesitrowukhi	Indawo yendibano 1= Ekhaya 2= CHCC okanye klinikhi 3= Esibhedlele 4= WCRC
KuNontlalontle	☐	☐	☐
Physiotherapy	☐	☐	☐

Occupational therapy	☐	☐	☐
Speech and Language Therapy	☐	☐	☐
Dietician	☐	☐	☐
Psychologist	☐	☐	☐
Umongikazi/ unesi	☐	☐	☐
Ixhwele	☐	☐	☐
Community Rehabilitation Worker (Umsebenzi wasekuhlaleni ojongene nabantu aba)	☐	☐	☐
uGqirha	☐	☐	☐
Self Help Group eg. Stroke Support Group	☐	☐	☐

Cacisa: _____
(Iqumrhu/ umbutho wenkxaso wabazincedayo)
Ukuba zikhona ezinye , cacisa _____

2.3. Kwezi nyanga zintandathu zidlulileyo ukhe wanyanzelwa ukuya okanye uhlehlise kusebenzisa inkonzo zempilo ngenxa yokunqaba kukufikelela kwizinto ezihambayo?
1= Ewe 2= Hayi ☐

2.4. Kwezi nyanga zintandathu ukhe wanyanzeliswa uyeke okanye unyenyise inkonzo zempilo ngenxa yengxaki yemali?
1= Ewe 2= Hayi ☐

Section 3

3.1. Usebenzisa ntoni ukujikeleza phakathi kwekhaya ? ☐
1= uyakwazi ukuzihambela 2= I-wheel chair / isitulo esihamba ngamavili 3= awukwazi 4= ezinye

3.2. Usebenzisa enye yezi zinto ukujikeleza ngaphakathi endlini?

2.2.1. Intonga eqhelekileyo	1= Ewe 2= Hayi	☐
2.2.2. Intonga yasesibhedlele enemilenze emi 3 okanye 4	1= Ewe 2= Hayi	☐
2.2.3. Elbow crutches: intonga zokuhamba eziphela ezingqinibeni	1= Ewe 2= Hayi	☐
2.2.4. Ifreyimi yokuhamba	1= Ewe 2= Hayi	☐
2.2.5. Ankle splint: into esetyenziswa ukuncedisana neqatha lakho	1= Ewe 2= Hayi	☐

2.2.6. Ezinye. Cacisa. _____

3.3. Usebenzisa ntoni kakhulu ukujikeleza phandle kwekhaya? ☐
1= uyakwazi ukuzihambela 2= I-wheelchair/ isitulo esihamba ngamavili 3= awukwazi 4= ezinye

3.4. Usebenzisa enye yezi zinto ukujikeleza ngaphandle ekhayeni lakho?

2.4.1. Intonga eqhelekileyo 1= Ewe 2= Hayi ☐
2.4.2. Intonga yasesibhedlele enemilenze emi 3 okanye 4 1= Ewe 2= Hayi ☐
2.4.3. Elbow crutches: intonga zokuhamba eziphela ezingqinibeni 1= Ewe 2= Hayi ☐
2.4.4. Ifreyimi yokuhamba 1= Ewe 2= Hayi ☐
2.4.5. Ankle splint: into esetyenziswa ukuncedisana neqatha lakho 1= Ewe 2= Hayi ☐
2.4.6. Ezinye. Cacisa. _____

3.5 Phambi kokuba ube nesitrowukhi, Ubufikelela njani ezindaweni kwindawo Ohlala kuyo (kwingingqi yakho) nakude? (khetha zibentathu)

2.5.1. ☐ 2.5.2. ☐ 2.5.3. ☐

1 = iteksi
2 = ibhasi
3 = itreyini/ uloliwe
4 = imoto , ungumkhweli(passenger)
5 = imoto , uqhuba
6 = isithuthuthu
7 = ibhayisikile
8 = ubuhamba
9 = ubuhanjiswa ngesitulo.
10= ezinye iintlobo zokuhamba. Cacisa: _____

3.6. Oko unesitrowukhi ufikelela njani ezindaweni ekuhlaleni nakude? (khetha zibentathu)

2.6.1. ☐ 2.6.2. ☐ 2.6.3. ☐

1 = iteksi
2 = ibhasi
3 = itreyini/ uloliwe
4 = imoto , ungumkhweli
5 = imoto , uqhuba
6 = isithuthuthu
7 = ibhayisikile
8 = ubuhamba
9 = ubuhanjiswa ngesitulo.
10 = ezinye iintlobo zokuhamba. Cacisa: _____

SECTION 4: DETAILS OF THE HOME ENVIRONMENT

4.1. Ungayichaza njani indawo ohlala kuyo ngoku ? ☐

1= Yindlu
2= Iuludwe lweflethi
3= Yindlu/ yiflethi/ unxusile okanye uhlala nabantu
4= Yitown house
5= Kwindawo yabantu abadla umhlalaphantsi
6= Ematyotyombeni okanye kwindawo enamatyotyombe
7= Ematyotyombeni/ etyotyombeni okanye ngasemva endlwini
8= Enye. Cacisa: _____

4.2. Usebenzisa izitephusi ukufikelela kwikhaya lakho? 1= Ewe 2=Hayi ☐

Nceda cacisa . ☐
1= Izitephusi . cacisa lingakanani inani lezitephusi _____
2= Izitephusi zinyuka nqo. Cacisa inani _____
(Ukuba impendulo linani lezitephusi yiya kumbuzo 6.3., ukuba hayi yiya kumbuzo 6.4.)

4.3. Kukho ilifti/ikhetshi? 1= Ewe 2=Hayi ☐

4.4. Kukho izitephusi endlwini okanye ngaphakathi endlwini yakho? 1= Ewe 2=Hayi ☐

4.5. Unawo umbane? 1= Ewe 2=Hayi ☐

4.6. Unawo amanzi acocekileyo endlini? 1= Ewe 2=Hayi ☐

4.7. Unayo indawo yokuhlambela okanye ishawa ekhaya? 1= Ewe 2=Hayi ☐

4.8. Ingaba ithoyilethi ingaphakathi okanye ingaphandle? 1= Ngaphakathi 2= Ngaphandle ☐

4.9 Kufuneka uwele indawo eziphakamileyo ukuya ethoyilethi? 1= Ewe 2=Hayi ☐

4.10. Kufuneka unyuke izitephusi ukufikelela ethoyilethi? 1= Ewe 2=Hayi ☐

4.11.Ukuba usebenzisa iwheel chair ukujikeleza ekhaya, uyakwazi ukufikelela nge –wheel chair ethoyilethi ? 1=Ewe 2=Hayi 3= Engasebenziyo ☐

4.12. Unayo ifowuni? 1= Ewe 2=Hayi ☐ ☐

Nceda cacisa :
1= Indlela yokuhlala ngaphakathi
2= I-cellphone
3= Ifowuni yasebumelwaneni
4= Ifowuni kawonke-wonke
5= Ayikho kwezi zingasentla

ICANDELO 5: Ukubuyela emsebenzini okanye indlela osebenza ngayo

5.1. Ingaba usemsebenzini obhalayo /uyasebenza? Uhlobo ophangela ngalo. ☐
1 = Ewe, kumsebenzi obhatalayo (nceda yiya kumbuzo 3.2)
2 = Hayi , emsebenzini ongabhataliyo (nceda yiya kumbuzo 3.5)

5.2. Kwezi ndlela zilandelayo yeyiphi echaza ngcono uhlobo lempangelo yakho. ☐
1 = Ndiqeshiwe
2 = Uziqeshile okanye uncedisa kwishishini lefemeli
3 = Olunye uhlobo lwengqesho. Cacisa: _____

5.3. Kwezi ndlela zilandelayo, loluphi oluchaza ngcono iiyure ozisebenzayo? ☐
1= Ixeshana – Cacisa iiyure ngeveki _____
2= Uqeshwe ngokupheleleyo (iiyure ezingaphezu kwe 20)
3= Usebenza iiyure ezingaqingqwanga ngeveki, ngamaxesha athile (uyangxungxa/ uyangxungxa)
4= Iiyure ezingenasigxina, ikhontrakhi eqingqiweyo. Cacisa iiyure ozisebenzayo. _____
5= Ezinye iinkcukacha . Cacisa: _____

5.4. Ingaba lo msebenzi ukuwo, ngulo wawukuwo ngaphambi kokuqalwa sisitrowukhi? ☐
1 = Ewe, isenguwo kanye
2 = Umqeshi omnye , kodwa umsebenzi wahlukile.
3 = Ngumsebenzi owahlukileyo mpela

Ukuba ngu (3), chaza ukuba ubusenza ntoni? _____

5.5. Ukuba awusebenzi, yintoni unobangela wokungasebenzi kwakho? ☐

1= Awusebenzi uyakhangela
2= Awusebenzi ukhetha ukungasebenzi
3= Awukwazi ukusebenza ngenxa yokugula nokukhubazeka (Ufumana imali yokukhubazeka/ kwi Insurance/ Inshorensi yakho/ okanye inzuzo kwi-inshorensi yabucala)
4= Awukwazi ukusebenza ngenxa yokugula nokukhubazeka (awufumani mali yakukhubazeka)
5= Ufumana imali yomhlala phantsi kurhulumente
6= Ujonga ikhaya , akukho ncedo ulufumanayo lwemali (kuquka ukujonga abantwana)
7= Ungumfundi
8= Uthatha uqeqesho lomsebenzi kwakhona/ uqeqesho lobuchule
9= Ezinye. Cacisa _____

Ukuba impendulo kumbuzo (4) inye, buza: Ingaba imali yoku? 1= Ewe 2= Hayi ☐

Khubazeka yenziwe?
1= Isicelo sisaphunyeleliswa okanye sisalungiswa ☐
2= Isicelo sikhatyiwe/ asivunywanga

5.6. Ukususela oko uphumile esibhedlele, ukhe wathatha inxaxheba kwezi zinto zilandelayo?

5.6.1. Ukusebenza njengevolontiya ungahlawulwa 1= Ewe 2= Hayi ☐
5.6.2. Ukuncedisa kwishishini le femeli ungahlawulwa 1= Ewe 2= Hayi ☐
5.6.3. Ukugcina abanye umzkI: abantwana, abantu abadala okanye abagulayo. 1= Ewe 2= Hayi ☐
5.6.4. Ukusebenza phakathi kwekhaya usenza umsebenzi ofana nokucoca, ukupheka , ukusebenza egadini, ukulungisa okanye ukuxola (repair) izinto. 1= Ewe 2= Hayi ☐

Patient Information / Consent Form

The Rehabilitation of Stroke Patients at Community Health Centers in the Metropole Region of the western Cape

Reference Number:

Statement by or on behalf of the participant;
I the undersigned,.....person who have suffered a stroke * or in my capacity as ..... of the person who has had a stroke staying at .....acknowledges that:

1. I have been invited to partake in a study, which forms part of a PhD thesis undertaken at the University of the Western Cape.

2.1 It has been explained to me that the aim of the study is to determine the outcome and rehabilitation processes of stroke patients treated at Community Health Centers in the Metropole region of the Western Cape.

2.2 It has been explained to me that the study consists of three parts:

Part 1:
Information relating to your recovery will be collected, by using questionnaires and clinical neurological scales as well as information in your medical records. These assessments will be done when you start rehabilitation, at discharge and at 2, and 6 months post stroke-onset. If you are discharged in the mean time the researcher will visit you at home to do the follow-up assessments.

Part 2:
Consists of recording either a physiotherapy or an occupational therapy session with a video camera. Only one out of four patients is considered for these recordings. Afterwards a team of therapists will analyse these video tapes. Your privacy is guaranteed.

Part 3:
Does not relate to you but to the therapist and the organizational structure of the centers. It also enquires about the duration and frequency of care. This information will be obtained by conducting interviews with the therapists.

2.3 It has been explained to me that standard clinical scales are used in the first part of the study to collect all the data. The fact that these assessments are repeated over time allows me to follow my own recovery. The video recordings (part 2) will not influence my normal therapy. I am ensured that this material will only be used in the framework of this scientific project. All data will be treated with great respect to ensure my privacy. Every participating patient will get a code and confidentiality will be guaranteed.

2.4 It has been explained to me that I will not be incurring any additional costs by partaking in this study, and I will not benefit financially from it.

2.5 It has been explained to me that the findings of this study will be presented in a thesis and could be published in a professional journal or presented as a professional report.

3. Voluntary and informed consent
I have the ability to understand the information on these pages and I choose freely to participate in this project. I have been informed that I am free to withdraw from this project at any time. This will have no consequences for my future treatment at the center or in other hospitals.

Signed..... Date.....

Researcher..... Date.....

Caregiver..... Date.....

Pasiënte-Inligting- / Toestemmingsvorm

Die Rehabilitasie van Beroertepasiënte by Gemeenskapsgesondheidsentrums in die Metropoolstreek van die Wes-Kaap

Verwysingsnommer:

Verklaring deur of namens die deelnemer:

Ek, die ondergetekende persoon wat 'n beroerte gehad het * of in my hoedanigheid as ..... van die persoon wat 'n beroerte gehad het en te ..... woon, bevestig dat:

1. ek genooi is om deel te neem aan 'n studie wat deel vorm van 'n PhD-tesis wat aan die Universiteit van Wes-Kaapland onderneem word;

2.1 daar aan my verduidelik is dat die doel van die studie is om die die uitkomste en rehabilitasieprosesse van beroertepasiënte wat by Gemeenskapsgesondheid-sentrums in die Metropoolstreek van die Wes-Kaap behandel word, te bepaal;

2.2 daar aan my verduidelik is dat die studie uit drie dele bestaan:

Deel 1:
Inligting in verband met u herstel sal versamel word met behulp van vraelyste en kliniese neurologiese skale, sowel as uit u mediese rekords. Hierdie assesserings sal gedoen word wanneer die rehabilitasie begin, tydens ontslag en 2 en 6 maande na die aanvang van die beroerte. As u intussen ontslaan word, sal die navorser u tuis besoek om die opvolgassesserings te doen.

Deel 2:
Vir hierdie deel word 'n fisioterapie- of 'n arbeidsterapiesessie met 'n videokamera opgeneem. Net een uit elke vier pasiënte word vir hierdie opnames gekies. 'n Span terapeute sal agtema die video-opnames analiseer. U privaatheid word gewaarborg.

Deel 3:
Hierdie deel het nie met u te doen nie, maar wel met die terapeut en die organisatoriese struktuur van die sentrums. Dit stel ook ondersoek in na die duur en die frekwensie van sorg. Hierdie inligting sal bekom word deur middel van onderhoude met die terapeute.

2.3 Daar is aan my verduidelik dat standard kliniese skale in die eerste deel van die studie gebruik word om al die data te versamel. Die feit dat hierdie assesserings deur die loop van tyd herhaal word, laat my toe om my eie herstel waar te neem. Die video-opnames (deel 2) sal nie my normale terapie beïnvloed nie. Ek is verseker dat hierdie material net binne die raamwerk van hierdie wetenskaplike projek gebruik sal word. Al die data sal met groot respek behandel word om my privaatheid te verseker. Elke deelnemende pasiënt sal 'n kode ontvang en vertroulikheid sal gewaarborg word.

2.4 Daar is aan my verduidelik dat ek nie bykomende koste sal aangaan deur aan hierdie studie deel te neem nie en dat ek nie finansieel daarby sal baat nie.

2.5 Daar is aan my verduidelik dat die bevindings van hierdie studie in 'n tesis aangebied sal word en in 'n professionele tydskrif gepubliseer kan word of as 'n professionele verslag aangebied kan word.

3. Vrywillige en ingeligte toestemming

Ek het die vermoë om die inligting op hierdie bladsye te lees en ek neem die vrywillige besluit om aan hierdie projek deel te neem. Ek is ingelig dat ek op enige stadium aan die projek kan onttrek. Dit sal geen gevolge hê vir my toekomstige behandeling by die sentrum of in ander hospitale nie.

Geteken..... Datum.....

Versorger..... Datum.....

Navorser..... Datum.....

IFomu yoLwazi / neMvume yeSigulana

UBuyiselo kwiMeko yeSiqhelo lweZigulana eziFelwe nguMzimba kuMaziko ezeMpilo oLuntu kwiNqila kaMaspala oMbaxa weNtshona Koloni

INombolo yeSalathisi:

INgxelo yomthabathi-nxaxheba okanye egameni lakhe;
Mna ubhalwe apha,.....mntu uthe wafelwa ngumzimba * okanye kwisikhundla sam njenge ..... walo mntu uthe wafelwa ngumzimba ehlala e .....ndiyavuma ukuba:

1. Ndimenyiwe ukuba ndithabathe inxaxheba kuphando, eyinxalenye yethesisi ye-PhD eqhutywe kwiYunivesithi yeleNtshona Koloni.

2.1 Kucacisiwe kum ukuba injongo yolu phando kukubonakalisa isiphumo neenkqubo zobuyiselo kwimo yesiqhelo yezigulana ezifelwe ngumzimba ezinyangwa kuMaziko oLuntu ezeMpilo kwinqila kaMaspala oMbaxa weNtshona Koloni.

2.2 Kucacisiwe kum ukuba olu phando lunamacandelo amathathu:

ICandelo 1:
Ulwazi olunxulumene nokuchacha kwakho luza kuqokelelwa, ngokusebenzisa imibuzo nemilinganiselo yenzululwazi ecacileyo yezifo zemithambo kananjalo nolwazi olukwiirekhodi zonyango lwakho. Olu phononongo luza kwenziwa xa uqalisa imo yokubuyela esiqhelweni, xa ukhululwa esibhedlele kwanakwiinyanga ezi-2, nesi-6 emva kokufelwa ngumzimba.
Ukuba sele ukhululwe esibhedlele ngoku umphandi uza kukutyelela ekhayeni lakho ukuze enze uphando lolandelelwano.

ICandelo 2:
Liqulathe ukurekodwa ngekhamera yevidiyo mhlawumbi kweseshoni yonyango lomzimba ngemithambo okanye unyango logmuli ngomnika umsebenzi omfaneleyo itheraphi. Kuphela sinye kwizigulana ezine esiqwalaselwayo kolu rekhodisho. Emva koko iqela leengcali zonyango ziza kuhlalutya ezi vidiyo. Kuyaqinisekiswa ukuba akuzi kuxelwa ukuba ungubani na.

ICandelo 3:
Lona alinxulumananga nawe kodwa linxulumene nengcali yezonyango kwakunye nenkqubo yamaziko. Kodwa iphanda ngexesha nokuhamba konyango. Olu lwazi luza kufunyanwa ngokuqhuba udliwanondlebe neengcali zonyango.

2.3 Kucacisiwe kum ukuba imilinganiselo ecacileyo yomgangatho iyasetyenziswa kwinqanaba lokuqala lophando ukuqokelela lonke ulwazi. Into yokuba olu phononongo luphindwe amaxesha ngamaxesha indinika ithuba lokulandela uchacho lwam. Iirekhodi zevidiyo (icandelo 2) aziyi kuba nefuthe kunyango lwam lwesiqhelo. Siyaqinisekisa ukuba oku kuvelisiweyo kuza kusetyenziswa kuphela kwisiseko sale prowujekthi yenzululwazi. Lonke ulwazi luza kuphathwa

ngeyona mbekokazi ukuqinisekisa ikhusi lobuqu bam. Zonke izigulana ezithabatha inxaxheba ziza kufumana ikhowudi kwaye nemfihlo iza kuqinisekiswa.

2.4 Kucacisiwe kum ukuba andizi kuthwala zindleko zongezelelweyo ngokuthabatha inxaxheba kolu phando, kwaye andiyi kuzuza mali kulo.

2.5 Kucacisiwe kum ukuba iziphumo zolu phando ziza kuthiwa thaca kwithesisi kwaye zingapapashwa kwincwadana yeengcali okanye zithiwe thaca njengengxelo yeengcali.

3. Imvume yokuzithandela nenolwazi
Ndiyakwazi ukuluqondo olu kula maphepha kwaye ndizikhethela ngokukhululekileyo ukuthabatha inxaxheba kule prowujekthi. Ndazisiwe ukuba ndikhululekile ukuba ndirhoxe kule prowujekthi nangaliphina ixesha. Oku akuyi kuba naziphumo kunyango lwam lwexesha elizayo kwiziko okanye ezinye izibhedlele.

Ityikiwe (patient signature)..... Date.....

Umphandi (researcher signiture..... Date.....

Patient consent letter:

THE REHABILITATION OF STROKE PATIENTS AT COMMUNITY HEALTH CENTRES IN THE METROPOLE REGION OF THE WESTERN CAPE

I AGREE VOLUNTARILY TO PARTICIPATE IN THE ABOVE MENTIONED RESEARCH PROJECT:

Signed at.....on .....20..

.....
Participant/representative's * signature or right thumb print

Statement by researcher

I,....., declares that I:

1. Have explained the information contained in this document to.....and/or her/his representative.
2. Have requested her/him/or them to ask questions should anything not be clear.
3. That the conversation took place in English/Afrikans/Xhosa and that no translator was used.

Signed at.....on.....20..

....
Researcher Witness

* Delete if not relevant

IMPORTANT INFORMATION

Dear Participant
Thank you for agreeing to participate in this study. If at anytime during the project :

1. Any problems arise as a result of the study or,
2. You require any additional information regarding the study

Please contact me by telephone at 021...9592542
Mrs Anthea Rhoda

Pasiënt se toestemmingsvorm:

DIE REHABILITASIE VAN BEROERTEPASIËNTE BY GEMEENSKAPS-GESONDHEIDSENTRUMS IN DIE METROPOOLSTREEK VAN DIE WES-KAAP

EK STEM VRYWILLIGLIK IN OM AAN BOGENOEMDE NAVORSINGSPROJEK DEEL TE NEEM:

Geteken te.....op .....20..

.....
Deelnemer/verteenwoordiger se * handteken of regterduimafdruk

Verklaring deur navorser:

Ek,....., verklaar dat:

1. ek die inligting wat in hierdie dokument vervat is, aan.....en/of sy/haar verteenwoordiger verduidelik het.
2. ek hom/haar/hulle versoek het om vrae te vra as enigiets nie duidelik is nie.
3. die gesprek in Afrikaans/Engels/Xhosa plaasgevind het en dat geen tolk gebruik is nie.

Geteken te.....op.....20..

.....
Navorser

* Skrap indien nie van toepassing nie

BELANGRIKE INLIGTING

Beste Deelnemer

Dankie vir u bereidwilligheid om aan hierdie studie deel te neem. As u op enige stadium gedurende die projek:

1. enige probleme teekom as gevolg van die studie, of
2. enige addisionele inligting oor die studie nodig kry,

skakel my asseblief telefonies by 021 9592542

Mrs Anthea Rhoda

UNIVERSITY of the
WESTERN CAPE

Ileta yemvume yesigulana:

UBUYISELO KWIMEKO YESIQHELO LWEZIGULANA EZIFELWE NGUMZIMBA KUMAZIKO EZEMPILO OLUNTU KWINQILA KAMASPALA OMBAXA WENTSHONA KOLONI

NDIYAVUMA NGOKUZITHANDELA UKUTHABATHA INXAXHEBA KULE PROWUJEKTHI YOPHANDO IKHANKANYWE NGENTLA APHA:

Ityikitywe e.....ngo .....20..

.....
Umtyikityo womthabathi-nxaxheba/wommeli * okanye ubhontsi wasekunene

Intetho yomphandi

Mna,....., ndazisa ukuba:

1. Ndilicacisile ulwazi oluqulathwe kolu xwebhu ku.....naku/okanye ummeli wakhe.
2. Ndimcelile yena okanye /bona ukuba abuze imibuzo nje ukuba kubekho into engacacanga.
3. Le ncoko iqhube ngesiNgesi/isiBhulu/isiXhosa kwaye akukho toliki isetyenzisiweyo.

Ityikiwe e.....ngo.....20..

....
UMphandi INgqina

* Yicime ukuba ayifanelekanga

ULWAZI OLUBALULEKILEYO

Mthabathi-nxaxheba othandekayo
Ndiyakubulela ngokuthabatha inxaxheba kolu phando. Ukuba kulo naliphina ixesha kule prowujekthi :

1. Kukho iingxaki ezivukayo ngenxa yophando okanye,
2. Ufuna ulwazi olongezelelekileyo malunga nophando

Nceda unditsalele ngemfonomfono kule nombolo: 021...9592542
Nksz Anthea Rhoda