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

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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 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. 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.
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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.
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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 $\geq 140$ mmHg and diastolic pressure of $\geq 90$ 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>
<thead>
<tr>
<th>Authors</th>
<th>Inclusion criteria of participants</th>
<th>Main outcomes</th>
<th>Intervention</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indredavik et al., 2000</td>
<td>Admitted to stroke unit, included within seven days post-stroke onset</td>
<td>Basic activities of daily living (Barthel Index) and global disability (modified Rankin Scale score) at 26 weeks Secondary: LOS</td>
<td>A mobile team supported the patient, thereby allowing the patient to live at home as soon as possible after stroke</td>
<td>Patients who were managed by the team had improved functional outcomes and a decreased LOS</td>
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<tr>
<td>Mayo et al., 2000</td>
<td>Patient admitted for acute stroke, exact date prior to admission not specified</td>
<td>Health-related quality of life (ESD-36) Secondary: Impairment, stroke severity, disability handicap (RNL) Assessment done at one and three months post-baseline</td>
<td>On discharge patients received follow-up services from multi-disciplinary team for four weeks in their homes Interventions were individualised according to patients’ needs</td>
<td>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</td>
</tr>
<tr>
<td>Anderson et al., 2000</td>
<td>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</td>
<td>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</td>
<td>Adaptations to home so that patient could be discharged Individually tailored therapy session conducted in the patient’s home</td>
<td>No significant difference between groups at six months, besides carers of intervention group, demonstrated lower mental health LOS significantly reduced in experimental group</td>
</tr>
<tr>
<td>Bautz-Holter., et al., 2002 – not in references, not described in intro paragraph</td>
<td>Stroke patients admitted to acute stroke unit with stroke onset &lt; six days prior to admission</td>
<td>Main outcome: Instrumental activities of daily living (Nottingham) at six months</td>
<td>Managed by multi-disciplinary team that supported the patient whenever needed, treatment provided by community-based services</td>
<td>No significant difference between groups with regard to primary outcome</td>
</tr>
<tr>
<td>Donnelly et al., 2004</td>
<td>Stroke within four weeks prior to admission</td>
<td>Basic ADL (Barthel Index), IADL (Nottingham), Quality of life (SF36), caregiver strain (CSI), patient and carer satisfaction, costs</td>
<td>Patients received treatment at their homes, for a three month period and follow-up team meetings</td>
<td>Only significant difference was that patients in intervention group were more satisfied with services received</td>
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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 (Krančiuikaitė 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 \((r \text{ between } 0.60 \text{ and } 0.79)\) 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 (Rouillard, 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 (κ=0.8) and (MRS) (κw= ≥ 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 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 \( \leq 11 \), and/ or score on leg and trunk function \( \leq 8 \), and/ or score on arm function \( \leq 12 \) 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
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 A² 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

²Pre-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

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Timeline</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
</tr>
<tr>
<td>Socio-economic questionnaire</td>
<td>X</td>
</tr>
<tr>
<td>Bio-demographic questionnaire</td>
<td>X</td>
</tr>
<tr>
<td>NIHSS</td>
<td>X</td>
</tr>
<tr>
<td>RMA</td>
<td>X</td>
</tr>
<tr>
<td>BI</td>
<td>X</td>
</tr>
<tr>
<td>NEADL</td>
<td>X</td>
</tr>
<tr>
<td>EQ-5D</td>
<td>X</td>
</tr>
<tr>
<td>MRS</td>
<td>X</td>
</tr>
</tbody>
</table>

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 interquartile 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)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender: number(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>4 (18.2)</td>
<td></td>
<td>4 (18.2)</td>
</tr>
<tr>
<td>female</td>
<td></td>
<td>18 (81.8)</td>
<td>18 (81.8)</td>
</tr>
<tr>
<td>Age: mean (SD)</td>
<td></td>
<td></td>
<td>32.5 (8.28)</td>
</tr>
<tr>
<td>Number of years qualified median: (Q1-Q3)</td>
<td>6 (3-13.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualification: number(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>diploma</td>
<td></td>
<td></td>
<td>1 (4.4)</td>
</tr>
<tr>
<td>bachelor</td>
<td></td>
<td></td>
<td>19 (86.5)</td>
</tr>
<tr>
<td>masters</td>
<td></td>
<td></td>
<td>2 (9.1)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Northern</th>
<th>Southern</th>
<th>Western</th>
<th>Tygerberg</th>
<th>Khayelitsha</th>
<th>Mitchells</th>
<th>Klipfontein</th>
<th>Eastern</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of thousand of</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3270</td>
</tr>
<tr>
<td>population per district</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Number of CHCs</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Number of physiotherapists</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Number of centres with</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>physiotherapy services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of occupational</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>therapists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of centres with</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>occupational therapy services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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).

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

* = 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).

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Centres with equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Hot packs</td>
<td>20</td>
</tr>
<tr>
<td>Treatment couch</td>
<td>19</td>
</tr>
<tr>
<td>Mobility Assistive devices</td>
<td>19</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>19</td>
</tr>
<tr>
<td>Wheelchairs</td>
<td>19</td>
</tr>
<tr>
<td>Ice</td>
<td>17</td>
</tr>
<tr>
<td>Weights</td>
<td>17</td>
</tr>
<tr>
<td>Gymballs</td>
<td>16</td>
</tr>
<tr>
<td>Treatment mats</td>
<td>16</td>
</tr>
<tr>
<td>Parallel bars</td>
<td>15</td>
</tr>
<tr>
<td>Mirrors</td>
<td>15</td>
</tr>
<tr>
<td>Interferential therapy</td>
<td>13</td>
</tr>
<tr>
<td>Stairs</td>
<td>9</td>
</tr>
<tr>
<td>Tens</td>
<td>9</td>
</tr>
<tr>
<td>Suspension therapy</td>
<td>8</td>
</tr>
<tr>
<td>Wall bars</td>
<td>6</td>
</tr>
<tr>
<td>Nebuliser</td>
<td>6</td>
</tr>
<tr>
<td>Suction machine</td>
<td>5</td>
</tr>
<tr>
<td>Short Wave diathermy</td>
<td>5</td>
</tr>
<tr>
<td>Wax</td>
<td>4</td>
</tr>
<tr>
<td>Orthoses</td>
<td>3</td>
</tr>
<tr>
<td>Functional electrical stimulation</td>
<td>2</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
</tr>
<tr>
<td>Rollers</td>
<td>0</td>
</tr>
<tr>
<td>Wedges</td>
<td>0</td>
</tr>
<tr>
<td>Hand splints</td>
<td>0</td>
</tr>
<tr>
<td>Materials to produce splints</td>
<td>0</td>
</tr>
<tr>
<td>Small balls</td>
<td>0</td>
</tr>
<tr>
<td>Springs</td>
<td>0</td>
</tr>
<tr>
<td>Pulley system</td>
<td>0</td>
</tr>
</tbody>
</table>

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.
100 stroke patients were recruited to take part in the study.

2 months 88

4 died
3 withdrew (refused follow-up assessment)
5 could not be followed up within assessment period
   * 1 moved out of Cape Town
   * 1 returned to work (could not get appointment to conduct assessments)
   * 1 admitted to rehabilitation Centre (permission for patient to be part of study not obtained)
   * 2 were not contactable (no follow-up contact details)

6 months 76

5 died
1 withdrew (refused follow-up assessment)
6 could not be followed up within assessment period
   * 2 moved out of Cape Town
   * 3 were not contactable (no follow-up contact details)
   * returned to work (could not get appointment to conduct assessments)
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)

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

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 \( \leq R \) 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)

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

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)**

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>n%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>90 (90.0)</td>
</tr>
<tr>
<td>Smoking (current)</td>
<td>54 (54.0)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>46 (46.0)</td>
</tr>
<tr>
<td>Heart condition</td>
<td>22 (22.0)</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>8 (8.0)</td>
</tr>
<tr>
<td>Alcohol abuse</td>
<td>5 (5.0)</td>
</tr>
<tr>
<td>Previous Transient Ischaemic Attack</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Oral Contraception</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td>Peripheral vascular disease</td>
<td>1 (1.0)</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Barthel Score</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>1</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>90</td>
<td>12</td>
<td>12.0</td>
<td>13.0</td>
</tr>
<tr>
<td>95</td>
<td>5</td>
<td>5.0</td>
<td>18.0</td>
</tr>
<tr>
<td>100</td>
<td>82</td>
<td>82.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>MRS Scores</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>40</td>
<td>40.0</td>
<td>40.0</td>
</tr>
<tr>
<td>1</td>
<td>47</td>
<td>47.0</td>
<td>87.0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1.0</td>
<td>88.0</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>12.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

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.
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.

4.2.2.2 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>
<thead>
<tr>
<th>Score range</th>
<th>baseline (n = 100)</th>
<th>2 month (n = 88)</th>
<th>6 month (n=76)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean (SD)</td>
<td>mean (SD)</td>
<td>mean (SD)</td>
</tr>
<tr>
<td>RMA- G (0 – 13)</td>
<td>7.3(3.83)</td>
<td>8.70(3.36)</td>
<td>9.09(3.3)</td>
</tr>
<tr>
<td>RMA- LT (0-10)</td>
<td>5.03(2.84)</td>
<td>6.06(2.68)</td>
<td>6.66(2.60)</td>
</tr>
<tr>
<td>RMA- A (0 – 15)</td>
<td>5.10(4.12)</td>
<td>6.93(4.91)</td>
<td>7.53(4.91)</td>
</tr>
</tbody>
</table>

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.
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

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

<table>
<thead>
<tr>
<th>Items</th>
<th>Baseline</th>
<th>2 months</th>
<th>6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>83</td>
<td>83</td>
<td>86</td>
</tr>
<tr>
<td>2</td>
<td>78</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td>3</td>
<td>72</td>
<td>70</td>
<td>74</td>
</tr>
<tr>
<td>4</td>
<td>57</td>
<td>51</td>
<td>50</td>
</tr>
<tr>
<td>5</td>
<td>45</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>6</td>
<td>42</td>
<td>33</td>
<td>37</td>
</tr>
<tr>
<td>7</td>
<td>33</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>8</td>
<td>32</td>
<td>53</td>
<td>45</td>
</tr>
<tr>
<td>9</td>
<td>33</td>
<td>53</td>
<td>54</td>
</tr>
<tr>
<td>10</td>
<td>32</td>
<td>34</td>
<td>57</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>17</td>
<td>28</td>
<td>42</td>
</tr>
<tr>
<td>13</td>
<td>0</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>14</td>
<td>0</td>
<td>8</td>
<td>37</td>
</tr>
<tr>
<td>15</td>
<td>0</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>
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

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

• 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

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

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.
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

<table>
<thead>
<tr>
<th>Score range</th>
<th>baseline (n = 100)</th>
<th>2 month (n = 88)</th>
<th>6 month (n=76)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean (SD)</td>
<td>mean (SD)</td>
<td>mean (SD)</td>
</tr>
<tr>
<td>Barthel Index</td>
<td>62.7(22.6)</td>
<td>74.9(22.9)</td>
<td>78.6(23.7)</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Barthel Index</th>
<th>LS Means</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>baseline -2 months</td>
<td>12.5</td>
<td>(9.24; 15.8)*</td>
</tr>
<tr>
<td>2 months-6 months</td>
<td>0.451</td>
<td>(-3.19; 4.09)</td>
</tr>
<tr>
<td>baseline-6 months</td>
<td>13.0</td>
<td>( 8.74; 17.2)*</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Participants n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 months</td>
</tr>
<tr>
<td></td>
<td>n=88</td>
</tr>
<tr>
<td><strong>Mobility</strong></td>
<td></td>
</tr>
<tr>
<td>Walk outside</td>
<td>66 (75.0)</td>
</tr>
<tr>
<td>Climb stairs</td>
<td>32 (36.4)</td>
</tr>
<tr>
<td>Get in and out of car</td>
<td>55 (62.5)</td>
</tr>
<tr>
<td>Walk over uneven ground</td>
<td>47 (53.4)</td>
</tr>
<tr>
<td>Cross roads</td>
<td>46 (52.3)</td>
</tr>
<tr>
<td>Travel on public transport</td>
<td>16 (18.2)</td>
</tr>
<tr>
<td><strong>Kitchen Activities</strong></td>
<td></td>
</tr>
<tr>
<td>Feed yourself</td>
<td>83 (94.3)</td>
</tr>
<tr>
<td>Make yourself a hot drink</td>
<td>47 (53.4)</td>
</tr>
<tr>
<td>Take hot drinks from one room</td>
<td>48 (54.5)</td>
</tr>
<tr>
<td>Do the washing up</td>
<td>32 (36.4)</td>
</tr>
<tr>
<td>Make yourself a hot snack</td>
<td>33 (37.5)</td>
</tr>
<tr>
<td><strong>Domestic Tasks</strong></td>
<td></td>
</tr>
<tr>
<td>Manage your own money when out</td>
<td>47 (53.4)</td>
</tr>
<tr>
<td>Wash small items of clothing</td>
<td>30 (34.1)</td>
</tr>
<tr>
<td>Do your own housework</td>
<td>23 (26.1)</td>
</tr>
<tr>
<td>Do your own shopping</td>
<td>17 (19.3)</td>
</tr>
<tr>
<td>Do a full clothes wash</td>
<td>8 (9.1)</td>
</tr>
<tr>
<td><strong>Leisure activities</strong></td>
<td></td>
</tr>
<tr>
<td>Read newspaper and books</td>
<td>54 (61.4)</td>
</tr>
<tr>
<td>Use the telephone</td>
<td>44 (50.0)</td>
</tr>
<tr>
<td>Write letters</td>
<td>4 (4.5)</td>
</tr>
<tr>
<td>Go out socially</td>
<td>19 (21.6)</td>
</tr>
<tr>
<td>Manage your own garden</td>
<td>11 (12.5)</td>
</tr>
<tr>
<td>Drive a car</td>
<td>6 (6.8)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>LS mean (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEADL</td>
<td>8.72(5.45)</td>
<td>10.36(5.80)</td>
<td>1.33 (0.577; 2.076) *</td>
</tr>
<tr>
<td>2 month</td>
<td>n = 88</td>
<td>6 month</td>
<td>2-6months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 76</td>
<td></td>
</tr>
</tbody>
</table>

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)

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

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)

<table>
<thead>
<tr>
<th>Roles</th>
<th>Previous Role</th>
<th>Returned to previous role</th>
<th>Unable to return to previous role</th>
<th>Dropout status unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>31(31)</td>
<td>3(9.7)</td>
<td>23(74.2)</td>
<td>5(16.1)</td>
</tr>
<tr>
<td>Family responsibility</td>
<td>45(45)</td>
<td>16(35.6)</td>
<td>25(55.6)</td>
<td>4(8.8)</td>
</tr>
<tr>
<td>Leisure and social</td>
<td>88(88)</td>
<td>17(19.3)</td>
<td>55(62.5)</td>
<td>16(18.2)</td>
</tr>
</tbody>
</table>

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. Only the participants who were able to verbally provide responses were included. The EQ-5D scores are presented in Table 4.20.
Table 4.20: Number and percentage of participants EQ-5D scores at 2 and 6 months

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

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 scores (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.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>t-test:</td>
<td>0.26</td>
</tr>
<tr>
<td>Gender</td>
<td>Chi-square</td>
<td>0.61</td>
</tr>
<tr>
<td>NIHSS score</td>
<td>Mann-Whitney U-test</td>
<td>0.69</td>
</tr>
</tbody>
</table>

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 (0.81) at .01 alpha level.

The RMA-LT was significantly correlated with Age (\(-.23\)), Dysarthria (\(-.28\)) and initial RMA-LT (0.83) 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

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Beta (SE)</th>
<th>Partial R²</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial RMA-G</td>
<td>0.84 (0.06)</td>
<td>0.65</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>No of hours of therapy</td>
<td>0.13 (0.06)</td>
<td>0.02</td>
<td>0.03</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Beta (SE)</th>
<th>Partial R²</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial RMA-LT</td>
<td>0.88 (0.07)</td>
<td>0.66</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

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.
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.

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Beta</th>
<th>(SE)</th>
<th>Partial $R^2$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial BI</td>
<td>0.81</td>
<td>(0.10)</td>
<td>0.47</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Age</td>
<td>-0.50</td>
<td>(0.20)</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Gender</td>
<td>-8.58</td>
<td>(4.08)</td>
<td>0.03</td>
<td>0.04</td>
</tr>
</tbody>
</table>

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.
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.

<table>
<thead>
<tr>
<th>Model</th>
<th>Outcome Variable</th>
<th>Significant predictors</th>
<th>Partial R²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RMA-G</td>
<td>Dysarthria</td>
<td>0.08</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>RMA-LT</td>
<td>Dysarthria</td>
<td>0.09</td>
<td>0.01</td>
</tr>
<tr>
<td>3</td>
<td>RMA-A</td>
<td>Dysarthria</td>
<td>0.12</td>
<td>0.001</td>
</tr>
<tr>
<td>4</td>
<td>BI</td>
<td>Dysarthria, Age, Gender</td>
<td>0.12</td>
<td>0.001</td>
</tr>
</tbody>
</table>

From the Table 4.26 it becomes apparent that dysarthria emerges as a significant predictor of all four outcome variables at an alpha 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

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

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>
<thead>
<tr>
<th>Number of therapy sessions</th>
<th>n (%) of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PT</td>
</tr>
<tr>
<td>0</td>
<td>3(3.0)</td>
</tr>
<tr>
<td>1-5</td>
<td>68(68.0)</td>
</tr>
<tr>
<td>6-10</td>
<td>15(15.0)</td>
</tr>
<tr>
<td>11-15</td>
<td>6(6.0)</td>
</tr>
<tr>
<td>16-36</td>
<td>8(8.0)</td>
</tr>
</tbody>
</table>

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)

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

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](image)

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)

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

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 videotaped.

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)

<table>
<thead>
<tr>
<th>Time (hours)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>&lt;1</td>
<td>24</td>
<td>24.0</td>
</tr>
<tr>
<td>1-2</td>
<td>25</td>
<td>25.0</td>
</tr>
<tr>
<td>&gt;2-4</td>
<td>24</td>
<td>24.0</td>
</tr>
<tr>
<td>&gt;4-7</td>
<td>10</td>
<td>10.0</td>
</tr>
<tr>
<td>&gt;7-10</td>
<td>8</td>
<td>8.0</td>
</tr>
<tr>
<td>&gt;10</td>
<td>6</td>
<td>6.0</td>
</tr>
</tbody>
</table>

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 Health 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 interdisciplinary 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 ($\text{mean}_{RMA-A} = 5.10$) than the lower limb ($\text{mean}_{RMA-LT} = 5.03$). 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 ($\text{mean}_{RMA-LT}=2$, $\text{mean}_{RMA-LT}=0$). 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 ($\text{mean}_{RMA-LT}=4$, $\text{mean}_{RMA-LT}=3$) and Belgium ($\text{mean}_{RMA-LT}=4$, $\text{mean}_{RMA-LT}=2$). 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 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.,
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 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 in-depth 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


Mrs Althea Roda  
Principal Researcher  
University of the Western Cape  
Private Bag X17  
BELLVILLE  
7525  

RE: Permission - To Conduct The Rehabilitation of Stroke Patients at Community Health Centre in the Western Cape Project  

Dear Mrs Roda  

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 your research study and if possible indicate if it can be of value to the Primary Health Care Service.  

Thanking you  

[Signature]  

DR C. Le Grange  
SENIOR MEDICAL SUPERINTENDENT (ACTING)  

COMMUNITY HEALTH SERVICES ORGANISATION  
GEMEENSKAPS GESONDHEIDSDIENSTE-ORGANISASIE  
PRIVATE BAG 7 PRIVAAT BAK 7, WOODSTOCK, CAPE TOWN 7913  
TELEPHONE: 021-469100 TELEGRAAF: 021-469100 FAX: 021-471929
Therapist consent letter:

APPENDIX 2

THE REHABILITATION OF STROKE PATIENTS AT COMMUNITY HEALTH CENTRES IN THE METROPEL 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... 9692542

Mrs Anthea Rhoda

UNIVERSITY OF THE WESTERN CAPE
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?

3. Gender: (Please X applicable option):

4. D.O.B

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?

8. How many years of experience do you have treating patients with neurological impairments?

9. How many years of experience do you have treating stroke patients?
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):

<table>
<thead>
<tr>
<th>STAFF</th>
<th>Mark with X</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiotherapist</td>
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<tr>
<td>Occupational Therapist</td>
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<td>Speech Therapist</td>
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<td>Medical Officer</td>
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<tr>
<td>Nurse</td>
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<tr>
<td>Psychologist</td>
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<tr>
<td>Dietitian</td>
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<tr>
<td>Physiotherapy Assistant</td>
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<td></td>
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<tr>
<td>Occupational Therapy Assistant</td>
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<td></td>
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<tr>
<td>Rehabilitation Centre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home-based care</td>
<td></td>
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</tbody>
</table>

Students:
Please specify group(s):

Other specify:
1. 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.

<table>
<thead>
<tr>
<th>never</th>
<th>sometimes</th>
<th>always</th>
</tr>
</thead>
</table>

1. 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 limbs from side to side.

3. Lying and lying balance:
   - Postural and correcting alignment.

4. Sitting and sitting balance:
   - Posturing, 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; hemineglect; neuro-physiological training (memory, language, orientation, space, body, gestures and planning).

7. Transfers: rolling, sitting to lying & vice versa, sitting to standing, moving from the floor, moving into and out of positions.

8. Ambulatory activities: wheeled or activities, walking with or without assistance, stair climbing with or without assistance.

9. Personal activities of daily living: washing, dressing, toileting, shaving, feeding, preparing food, brushing teeth, combing hair.

10. Domestic activities of daily living: cooking, cleaning dishes, laundry, ironing, tiding 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:

<table>
<thead>
<tr>
<th>Course name</th>
<th>Year attended</th>
<th>Full day/ half day</th>
<th>No days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

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: ..........................................

.............................................
2.7 How often do you document the treatment sessions of stroke patients? Please X applicable option

<table>
<thead>
<tr>
<th>After every treatment session</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Once a week</td>
<td></td>
</tr>
<tr>
<td>Once a month</td>
<td></td>
</tr>
<tr>
<td>Other: please specify</td>
<td></td>
</tr>
</tbody>
</table>

2.8. How often do you treat the stroke patients? Please X applicable option

<table>
<thead>
<tr>
<th>Twice a week</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Once a week</td>
<td></td>
</tr>
<tr>
<td>Every two weeks</td>
<td></td>
</tr>
<tr>
<td>Once a month</td>
<td></td>
</tr>
<tr>
<td>Other: please specify</td>
<td></td>
</tr>
</tbody>
</table>

2.9. On average how long do you spend treating stroke patients? Please X applicable option

<table>
<thead>
<tr>
<th>&lt; ½ hour</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>½ - ¾ hour</td>
<td></td>
</tr>
<tr>
<td>&gt; ¾ - 1 hour</td>
<td></td>
</tr>
<tr>
<td>&gt; 1 hour</td>
<td></td>
</tr>
<tr>
<td>Other: please specify</td>
<td></td>
</tr>
</tbody>
</table>
2.3 Who attends these meetings? Please X applicable option(s).

<table>
<thead>
<tr>
<th>Role</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiotherapist</td>
<td></td>
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<tr>
<td>Occupational Therapist</td>
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<tr>
<td>Speech Therapist</td>
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<td>Medical Officer</td>
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<td>Nurse</td>
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<td>Psychologist</td>
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<td>Dietician</td>
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<td>Physiotherapy Assistant</td>
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<tr>
<td>Occupational Therapy Assistant</td>
<td></td>
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<tr>
<td>Rehabilitation worker</td>
<td></td>
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<tr>
<td>Home-based carer</td>
<td></td>
</tr>
<tr>
<td>Students:</td>
<td></td>
</tr>
<tr>
<td>Please specify group(s)</td>
<td></td>
</tr>
<tr>
<td>Other specify</td>
<td></td>
</tr>
</tbody>
</table>

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
- ICIDH guidelines
- National Rehabilitation Policy
- Bategoa 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):

<table>
<thead>
<tr>
<th>Treatment Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual treatment</td>
</tr>
<tr>
<td>Stroke groups</td>
</tr>
<tr>
<td>Home visits</td>
</tr>
<tr>
<td>Other: Specify</td>
</tr>
</tbody>
</table>

2.6 Do you use a specific format/structure/ neuromusculoskeletal assessment form, to document your stroke patient treatments? Please X applicable option.

- yes
- no
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
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 11 with Diploma / Certificate
   15= Std 12 with Diploma / Certificate (short course less than 2yrs)
   16= Tertiary education: non-degrees/ 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

| List the members of the household and their relationship with the interviewee | Relationship with the interviewee | Male = 1  
| | | Female = 2  

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 - R259  
3. R261 - R500  
4. R501 - R1 600  
5. R1 601 - R1 500  
6. R1 501 - R2 500  
7. R2 501 - R4 500  
8. R4 501 - R6 000  
9. R6 001 - R16 000  
10. > R16 000  

9. 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

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

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TELEPHONE NUMBER:
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 subclass found 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 (e.g. pure motor stroke, sensory 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 >60%)
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%

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<table>
<thead>
<tr>
<th>Classification of Type of Stroke:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Side of Lesion:</strong></td>
</tr>
<tr>
<td>1 = left</td>
</tr>
<tr>
<td>both = 3</td>
</tr>
<tr>
<td>2 = right</td>
</tr>
<tr>
<td>3 = both</td>
</tr>
<tr>
<td><strong>Side of Impairment:</strong></td>
</tr>
<tr>
<td>1 = left</td>
</tr>
<tr>
<td>2 = right</td>
</tr>
<tr>
<td>3 = both</td>
</tr>
<tr>
<td><strong>Diagnosis Based On:</strong></td>
</tr>
<tr>
<td>CT = 1</td>
</tr>
<tr>
<td>MRI = 2</td>
</tr>
<tr>
<td>Clinical assessment only = 3</td>
</tr>
<tr>
<td>Both (CT &amp; MRI) = 4</td>
</tr>
</tbody>
</table>

If applicable: Data of CT, Discolf MRI

DAYS after stroke (CT or MRI) (Day after stroke = day 0)

Neurosurgical Interventions: None = 0, Yes = 1

MRU/CT scan results:
PATIENT CODE

TYPE OF STROKE:  
- Haemorrhagic

- Ischaemic

- Indeterminate

If possible, specify subtype of stroke: yes=1 no=2

- Primary intracerebral haemorrhage

- Ischaemic: Cardio-embolic

- Subarachnoid haemorrhage

- Ischaemic: Indeterminate or >1 cause

- Ischaemic: small vessel

- Ischaemic: large vessel
A. RISK FACTORS:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes/No</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of high blood pressure</td>
<td>Yes = 1</td>
<td></td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>Yes = 1</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>Yes = 1</td>
<td></td>
</tr>
<tr>
<td>Oral Contraception</td>
<td>Yes = 1</td>
<td></td>
</tr>
<tr>
<td>Heart Condition</td>
<td>Yes = 1</td>
<td></td>
</tr>
<tr>
<td>Previous TIA</td>
<td>Yes = 1</td>
<td></td>
</tr>
<tr>
<td>Peripheral vascular disease</td>
<td>Yes = 1</td>
<td></td>
</tr>
<tr>
<td>Previous thrombosis</td>
<td>Yes = 1</td>
<td></td>
</tr>
<tr>
<td>Other Specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
B. DOES THE PATIENT HAVE ANY OF THE FOLLOWING CO-EXISTING ILLNESSES

1. Pulmonary disease e.g. COPD, 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)

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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 (tili 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 spirit, 1 small glass of wine, 300ml/ half pint of beer.)

URINARY INCONTINENCE (ON ADMISSION TO CHC)

Note: Only score “1” if the patient has a score of 0 or 1 (Max: 2, Bladder “1” 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
<table>
<thead>
<tr>
<th>List of Medication Patient's Taking on Admission (From Patient and/or Folder)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Specify other:</td>
</tr>
</tbody>
</table>

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WESTERN CAPE
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 think he or she 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 stereotypic).
3= Responds only with reflex motor or autonomic effects or totally unresponsive, flaccid, areflexic.

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-parietic 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 tightly)
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 holds 90 (or 45) degrees for full 10 seconds
1 = Drift, limb held 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

If the score is '0', give an explanation:
0 = Unstable (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

If the score is '0', give an explanation:
0 = Unstable (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, hand, and leg.

9. Best language (describe picture, name items, read sentences)

0 = No aphasia, normal.
1 = Mild to moderate aphasia, some obvious loss 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/snarling.

If the score is 2, give an explanation;
= 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 = Bilateral and 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.
<table>
<thead>
<tr>
<th>Section Item</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Gross function</strong></td>
<td></td>
</tr>
<tr>
<td>1. Sit unsupported</td>
<td></td>
</tr>
<tr>
<td><em>Without holding on, on edge of bed, feet unsupported.</em></td>
<td></td>
</tr>
<tr>
<td>2. Lying to sitting on side of bed</td>
<td></td>
</tr>
<tr>
<td><em>Using any method.</em></td>
<td></td>
</tr>
<tr>
<td>3. Sitting to standing</td>
<td></td>
</tr>
<tr>
<td><em>May use hands to push up. Must stand up in 15 sec and stand for 15 sec, with an aid if necessary.</em></td>
<td></td>
</tr>
<tr>
<td>4. Transfer from wheelchair to chair towards unaffected side</td>
<td></td>
</tr>
<tr>
<td><em>May use hands.</em></td>
<td></td>
</tr>
<tr>
<td>5. Transfer from wheelchair to chair towards affected side</td>
<td></td>
</tr>
<tr>
<td><em>May use hands.</em></td>
<td></td>
</tr>
<tr>
<td>6. Walk 10 m indoors with an aid</td>
<td></td>
</tr>
<tr>
<td><em>Any walking aid. No stand-by help.</em></td>
<td></td>
</tr>
<tr>
<td>7. Climb stairs independently</td>
<td></td>
</tr>
<tr>
<td><em>Any method. May use banister and aid—must be a full flight of stairs.</em></td>
<td></td>
</tr>
<tr>
<td>8. Walk 10 m indoors without an aid</td>
<td></td>
</tr>
<tr>
<td><em>No stand-by help. No caliper, splint or walking aid.</em></td>
<td></td>
</tr>
<tr>
<td>9. Walk 10 m, pick up bean bag from floor, turn and carry back</td>
<td></td>
</tr>
<tr>
<td><em>Bend down any way, may use aid to walk if necessary. No stand-by help. May use either hand to pick up bean bag.</em></td>
<td></td>
</tr>
<tr>
<td>10. Walk outside 40 m</td>
<td></td>
</tr>
<tr>
<td><em>May use walking aid, caliper or splint. No stand-by help.</em></td>
<td></td>
</tr>
<tr>
<td>11. Walk up and down four steps</td>
<td></td>
</tr>
<tr>
<td><em>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.</em></td>
<td></td>
</tr>
<tr>
<td>12. Run 10 m</td>
<td></td>
</tr>
<tr>
<td><em>Must be symmetrical.</em></td>
<td></td>
</tr>
<tr>
<td>13. Hop on affected leg five times on the spot</td>
<td></td>
</tr>
<tr>
<td><em>Must hop on ball of foot without stopping to regain balance. No help with arms.</em></td>
<td></td>
</tr>
</tbody>
</table>

**Gross function Total**

0
<table>
<thead>
<tr>
<th>Section Item</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Leg and trunk</td>
<td></td>
</tr>
<tr>
<td>1. Roll to affected side</td>
<td></td>
</tr>
<tr>
<td>Starting position should be lying, not crook lying:</td>
<td></td>
</tr>
<tr>
<td>2. Roll to unaffected side</td>
<td></td>
</tr>
<tr>
<td>Starting position should be lying, not crook lying:</td>
<td></td>
</tr>
<tr>
<td>3. Half-bridging</td>
<td></td>
</tr>
<tr>
<td>Starting position – half-crook lying. Patient must put some weight through</td>
<td></td>
</tr>
<tr>
<td>affected leg to lift hip on affected side. Therapist may position leg, but</td>
<td></td>
</tr>
<tr>
<td>patient must maintain position even after movement is completed.</td>
<td></td>
</tr>
<tr>
<td>4. Sitting to standing</td>
<td></td>
</tr>
<tr>
<td>May not use arms – feet must be flat on floor – must put weight through both</td>
<td></td>
</tr>
<tr>
<td>feet.</td>
<td></td>
</tr>
<tr>
<td>5. Half-crook lying: lift affected leg over side of bed and return it to the</td>
<td></td>
</tr>
<tr>
<td>same position. Aﬀected leg in half-crook position. Lift leg oﬀ bed on to</td>
<td></td>
</tr>
<tr>
<td>support; for example, box, stool, floor, so that hip is in neutral and knee</td>
<td></td>
</tr>
<tr>
<td>at 90 degrees while resting on support. Must keep affected knee flexed</td>
<td></td>
</tr>
<tr>
<td>throughout movement. Do not allow external rotation at hip. This tests</td>
<td></td>
</tr>
<tr>
<td>control of hip and knee.</td>
<td></td>
</tr>
<tr>
<td>6. Standing, step unaffected leg on and off block</td>
<td></td>
</tr>
<tr>
<td>Without retraction of pelvis or hyperextension of knee. This tests knee and</td>
<td></td>
</tr>
<tr>
<td>hip control while weight bearing through the affected leg.</td>
<td></td>
</tr>
<tr>
<td>7. Standing, tap ground lightly five times with unaffected foot</td>
<td></td>
</tr>
<tr>
<td>Without retraction of pelvis or hyperextension of knee. Weight must stay on</td>
<td></td>
</tr>
<tr>
<td>leg. This again tests knee and hip control while weight bearing through the</td>
<td></td>
</tr>
<tr>
<td>affected leg but is more difficult than in 6.</td>
<td></td>
</tr>
<tr>
<td>8. Lying, dorsiflexed ankle with leg flexed</td>
<td></td>
</tr>
<tr>
<td>Physiotherapist may hold affected leg in position, knee at 90 degrees. Do not</td>
<td></td>
</tr>
<tr>
<td>allow inversion. Must have full range of movement of unaffected foot.</td>
<td></td>
</tr>
<tr>
<td>9. Lying, dorsiflexed ankle with leg extended</td>
<td></td>
</tr>
<tr>
<td>Same conditions as in 8, with leg extended. Do not allow inversion or knee</td>
<td></td>
</tr>
<tr>
<td>flexion. Foot must reach plantigrade (90°).</td>
<td></td>
</tr>
<tr>
<td>10. Stand with affected hip in neutral position, flex affected knee</td>
<td></td>
</tr>
<tr>
<td>Therapist may not position leg. This is extremely difficult for most</td>
<td></td>
</tr>
<tr>
<td>hemiplegic patients, but is included to assess minimal dysfunction.</td>
<td></td>
</tr>
</tbody>
</table>

Leg and trunk function total

0
<table>
<thead>
<tr>
<th>Section</th>
<th>Item</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Arm</td>
<td>Lying, protract shoulder girdle with arm in elevation Arm may be supported.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sitting, elbow into side, pronation and supination Three-quarters range is acceptable, with elbow unsupported and at right angles.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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, elbow extended, wrist neutral or extended, and fingers extended throughout movement. Palms should be kept in contact with the ball.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stretch arm forward, pick up tennis ball from table, release on affected side, return to table, then release again on table. Repeat five times Shoulders must be protracted, elbow extended and wrist neutral or extended during each phase.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Same exercise as in 6 above with pencil Patients must use thumb and fingers to grip.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stand on spot, maintain upright position, pat large ball on floor with palm of hand for 5 continuous bounces</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>
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 shoulder 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, facial/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 putting, spreading butter, etc.
- 10 = Independent

**6. Transfer (bed to chair and back)**
- 0 = Unable, not sitting balance
- 5 = Major help (one or two people, physical), can sit
- 10 = Minor help (verbal or physical), independent

**7. Mobility**
- 0 = Immobile
- 5 = Walks with independent, including porches
- 10 = Walks with help of one person (without crutches)
- 15 = Independent (but may use any aid. No wheelchair)

**8. Dressing**
- 0 = Dependent
- 5 = Needs help but can do about half unsupervised
- 10 = Independent (excluding buttons, zips, lace, etc.)

**9. Stairs**
- 0 = Unable
- 5 = Needs help (verbal, physical, carrying etc.)
- 10 = Independent

**10. Bathing**
- 0 = Dependent
- 5 = Independent

**Total Score**

---

**UNIVERSITY of the WESTERN CAPE**
Riglyne vir die gebruik van die Barthel-index (Voor herniering)

1. Hierdie index moet gebruik word as 'n rekord van wat 'n pasiënt wel gedoen het, nie as 'n rekord van wat 'n pasiënt soo kon doen nie.
2. Die hoof specializeer oor die mate van afhanklikheid van hulp van te stel, fases of verbale, hoe gering ook al en om watter rede ook al.
3. Die behoefte aan hulpe laat 'n pasiënt nie onafhanklik nie.
4. In Pasiënt se vermoe moet bepaal word deur gebruik te maak van die beste beskikbare geheime. Die pasiënt, vriende, familie en verpleegkundiges kan gewoonlik ander van word, maar direkte wetenskaplike en geseende verstand is 'n belangrik. Direkte toezig is egter nie nodig nie.
5. Middelkategorieë impliseer dat die pasiënt noor as 50 persent van die poging hydra.
6. Die gebruik van hulpmiddels om onafhanklik te wees word toegelaat.

(Wade, '92)

**Barthel**

<table>
<thead>
<tr>
<th>Maakwerk (Maakwerk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = incontinent of benodig 'n lavement</td>
</tr>
<tr>
<td>5 = toevallige ongelukke (een keer per week)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blas</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = incontinent, of gekataterd en kan nie alleen oor die weg kennis nie</td>
</tr>
<tr>
<td>5 = toevallige ongelukke (maksimum een maal per 24 uur)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sefversorging</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = benodig hulp met persoonlike versorging</td>
</tr>
<tr>
<td>5 = onafhanklik met geen, hare, tandes, skerf (geruimearts) versorg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toiletgebruik</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = afhanklik</td>
</tr>
<tr>
<td>5 = benodig hulp, maar kan self doen</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Eet</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = kan nie</td>
</tr>
<tr>
<td>5 = benodig hulp met enige seker iets</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verplaas (van bed na stoel en terug)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = kan nie, geen balans sittend</td>
</tr>
<tr>
<td>5 = benodig baie hulp (een of twee persone, fisiese), kan sit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Onafhanklik</th>
</tr>
</thead>
</table>
**Isalathiso sika-buthi**

1. **Nthemba**
   0 = Akakwazi ukuzihamba (okanye nezidla to be given onema)
   5 = Uyazathaza ngamanye amanxeshi (kanye ngevelo)
   10 = Uyakwazi ukuzihamba

2. **Isinyi**
   0 = Akakwazi ukuzihamba olanye ufunza uncedo ukulse alwaye ukuzihamba
   5 = Uyaphalulweza ngamanye amanxeshi (kanye ngevelo, okanye esingaphansi 24)
   10 = Uyakwazi ukuzihamba

3. **Grooming**
   0 = Ufunza uncedo ukusenzeka ukuzonzo
   5 = Uyaphalulweza ukulse ukusoswa ukukhalaza amazinyo
   10 = Uyakwazi ukusenzeka

4. **Ukusebenzisa izimba linguqinise**
   0 = Ufunza ukusebenza
   5 = Ufunza uncedo kodwa unakho ukusenzeka eyenzeka
   10 = Uyakwazi enganeleizimba (ukuzihamba, okusebenza, okusenzeka ukuzonzo)

5. **Ukuqwaluleza**
   0 = Akakwazi
   5 = Ufunza uncedo isizicatheni isipaphelele lapho lapho
   10 = Uyakwazi ukusenzeka

6. **Ukuthintsha londolo zohamba (usikolokho ezikodwini isikhathi esibonakweni)**
   0 = Akakwazi, ngiyaziyo unyungazwa ukuhamba ukuhamba
   5 = Ufunza uncedo olunamandla (usithatho, ngiyaziyo okanye) abahleli
   10 = Ufunza uncedo ohunjengeni (lsinhelwe 11 ukuhamba izinhlizi okanye afuna ngaphandle)
   15 = Uyakwazi ukusenzeka

7. **Ukukhamba**
   0 = Akakwazi ukukhamba
   5 = Akakwazi ukukhamba kwesikhathi esikhumbisa ukukhamba esimakazini
   10 = Uyakwazi ukukhamba ngomnyama umuntu
   15 = Uyakwazi ukuzihamba (kodwo angasebenza uncedo olufuna nelwane ngaphandle)

---

**APPENDIX 10**

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**UNIVERSITY OF THE WESTERN CAPE**
**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.

<table>
<thead>
<tr>
<th>DID YOU ..........</th>
<th>Not at all</th>
<th>With help</th>
<th>On your own with difficulty</th>
<th>On your own</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Walk around outside?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Climb stairs?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Get in and out of a car?</td>
<td></td>
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</tr>
<tr>
<td>4. Walk over uneven ground?</td>
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<td></td>
</tr>
<tr>
<td>5. Cross roads?</td>
<td></td>
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</tr>
<tr>
<td>6. Travel on public transport?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Manage to feed yourself?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Manage to make yourself a hot drink?</td>
<td></td>
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<td></td>
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<tr>
<td>9. Take hot drinks from one room to another?</td>
<td></td>
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</tr>
<tr>
<td>10. Do the washing up?</td>
<td></td>
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<td></td>
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<tr>
<td>11. Make yourself a hot snack?</td>
<td></td>
<td></td>
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<tr>
<td>12. Manage your own money when you were out?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Wash small items of clothing?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Do your own housework?</td>
<td></td>
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<td>---</td>
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</tr>
<tr>
<td>15. Do your own shopping?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Do a full clothes wash?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Read newspapers or books?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Use the telephone?</td>
<td></td>
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<td></td>
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<tr>
<td>19. Write letters?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Go out socially?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Manage your own garden?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Drive a car?</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
**NOTTINGHAM UITGEBREIDE DAAGLIJSE AKTIVITEITE**
(NOTTINGHAM EXTENDED ACTIVITIES OF DAILY LIVING)

Dit volgende vraag is oor alledaagse dinge. Antwoord asseblief deur n' kruisie in een blokke per vraag te sit. Beskryf asseblief die aktiviteit wat jy werlike die afgelope paar weke gedoen het.

<table>
<thead>
<tr>
<th>HET JY.....</th>
<th>Glad nie</th>
<th>Met hulp</th>
<th>Op my eie maar dit is moeilik</th>
<th>Op my eie</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Buite rondgelooi?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Trappe geklim?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. In on uit 'n motor geklim?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Oor ongelijke grond geloop?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Die pad oorkruis?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Met publieke vervoer gereis?</td>
<td>(bv. Met taxi, bus, trein)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Op jou eie geket?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Jouself 'n warm drankie gemaak? (bv. tee, koffie)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Warm drankies van een kamer na 'n ander geneem?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Skottelgoed gewas?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Jouself 'n warm ligte eie gemaak?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Jou eie geslaap gehanteer (terwyl jy uit was)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13. Licht kledingstukke gewas?
14. Jou eie huiswerk gedaan?
15. Jou eie inkopies gedaan?
16. Volle bondel wasgoed gewas?
17. Koerante of boeke gelees?
18. Die telefoon gebruik?
19. Browe geskryf?
20. Sosiaal verkeer?
21. Tuin gemaak?
22. Motor bestuur?
Imisebenzi
eyongezelelwayo
taNottingham yentlalo
yamihla yonke

Le mibuzo landlelayo imalungu
nemisebenzi yamihla ngamihla.
Nceda ushendule ngaphuhlulilele
uphambili kwakho, ukuba NVE
kumibuzo ngamnaye. Nceda uqine
ikho ulhe wakwenza kwazi veza
zimbalwa ezidululeyo.

| INGABA UKHLE... | Nakanye | Bandicodiswa | Bandizenzela kodwa bekuzimba | Bandizenzela nje ngokwam
ndingenangxaki |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wahambe-hamba ngaphandle?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Wenyuka izipha?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 3. Wakhwezi waphinda ushala
uambwa? |         |              |                               |                         |
| 4. Wahambe kukhona
ongabanganye ngokuphakama? |         |              |                               |                         |
| 5. Wavela indlela? |         |              |                               |                         |
| 6. Wakhwezi kwakhulu
sakwakweleka? |         |              |                               |                         |
| 7. Wakhwezi ukucisile? |         |              |                               |                         |
| 8. Wakhwezi ukuzuzela
lalela esikhulu? |         |              |                               |                         |
| 9. Wahambe lalela esikhulu
kwezimalo? |         |              |                               |                         |
| 10. Wazihlabala izitya? |         |              |                               |                         |
### 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.

<table>
<thead>
<tr>
<th>Does the person require constant care?</th>
<th>Now</th>
<th>Before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 2. ASSISTANCE TO ATTEND TO BODILY NEEDS FOR WALKING

Assistance includes physical assistance, verbal instruction, or supervision by another person.

<table>
<thead>
<tr>
<th>Is assistance essential for eating? (Eating without assistance: Food and implements may be provided by others).</th>
<th>Now</th>
<th>Before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is assistance essential for using the toilet? (Using toilet without assistance: Reach toilet/handrail; unless sufficiently clean self dress and take).</th>
<th>Now</th>
<th>Before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>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).</th>
<th>Now</th>
<th>Before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is assistance essential for walking? (Walking without assistance: Able to walk indoors around house or ward, may use a G9 (e.g. stool/ cane, walking frame/walker), however not requiring physical help or verbal instruction or supervision from another person.</th>
<th>Now</th>
<th>Before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 3. ASSISTANCE TO LOOK AFTER DAILY AFFAIRS

Assistance includes physical assistance, verbal instruction, or supervision by another person.

<table>
<thead>
<tr>
<th>Is assistance essential for preparing a simple meal? (For example, able to prepare breakfast or a snack).</th>
<th>Now</th>
<th>Before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is assistance essential for basic household chores? (For example, feeding 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).</th>
<th>Now</th>
<th>Before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is assistance essential for looking after household expenses?</th>
<th>Now</th>
<th>Before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>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.).</th>
<th>Now</th>
<th>Before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is assistance essential for local shopping? (Local shopping: at least able to buy a single item).</th>
<th>Now</th>
<th>Before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Interview

## 4. Usual Duties and Activities

The next set of questions are about how the patient usually spends their day.

### 4.1 Work

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 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).

- Yes
- No

If Yes:

1. Reduced level of work e.g., change from full-time
   - Reduced level of work due to
     - Reduced ability to work
     - Reduced responsibility
   - Reduced level of work due to
     - Reduced ability to work
     - Reduced responsibility

2. Currently unable to work

### 4.2 Family Responsibilities

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>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)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 4.2.2 Since stroke has there been a change in their ability to look after family at home?

- Yes
- No

If Yes:

1. Reduced responsibility for looking after family
   - Reduced ability to look after family
   - Reduced responsibility for looking after family

2. Currently unable to look after family

### 4.3 Social & Leisure Activities

Social and leisure activities include hobbies and interests. Includes activities outside the home or at home.

#### 4.3.1 Before stroke did the person have regular free-time activities?

- Yes
- No

If the person had very restricted social & leisure activities before stroke then indicate No and go to 4.4

#### 4.3.2 Since stroke has there been a change in their ability to participate?

- Yes
- No

If Yes:

1. Participate a bit less, at least half as often as before the stroke
   - Participate a bit less, at least half as often as before the stroke

2. Participate much less, less than half as often

3. Unable to participate: rarely, if ever, take part
**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? |
|-----------------------------------------------|----------------------------------|
| If Yes, what is the extent of disruption/strain? |
| Occasional - less than weekly | ○ Yes ○ No |
| 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 ○ No |

5.2 **SYMPTOM CHECKLIST**

<table>
<thead>
<tr>
<th>5.2.1 Does the person have difficulty reading or writing?</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes ○ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2.2 Does the person have difficulty speaking or finding the right word?</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes ○ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2.3 Does the person have problems with balance or coordination?</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes ○ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2.4 Does the person have visual problems?</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes ○ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2.5 Does the person have numbness (face, arms, legs, hands, feet)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes ○ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2.6 Has the person experienced loss of movement (face, arms, legs, hands, feet)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes ○ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2.7 Does the person have difficulty with swallowing?</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes ○ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2.8 Any other symptoms? (Please record: ........................................)</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ Yes ○ No</td>
</tr>
</tbody>
</table>

**Ranking Grade = [Blank]**
### Onderhoud

Plaas asseblief 'n krasie in die korrekte blokke. Skryf die antwoord van al die vrae (byvoorbeeld, anders geaard word in die tekst), instel die wat betrekking het tot die toestand voor die beraamte aaral. Raadpleeg die regte woorde onder die vrae genoem wat vir aanvullende inligging.

<table>
<thead>
<tr>
<th>1 VOLTYDSE VERSORGING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltydsse versorging beteken dat iemand die byskepbare moedere wees. Versorging mag deur 'n opgeleide of 'n oorseseleerde persoon verskaf word. Die persoon is dieselfde gewoonlik bedrywende en sal geen bekendheid oor sy of haar kies nie.</td>
</tr>
<tr>
<td>Benefisie die persoon voltydsse versorging?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 HULP MET LIGGAAMLIGE BEHOEFTE / MET LOOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hulp slegs fisiese hulp, mondewinge of opdragte, of toegang van 'n ander persoon in, iemand.</td>
</tr>
<tr>
<td>2.1 Word hulp benodig om te eet? (Byvoorbeeld, kan soek soek na voedsel en matsegeg wegdeur iemand anders aangegaan.)</td>
</tr>
<tr>
<td>2.2 Word hulp benodig om die toilet te gebruik? (Byvoorbeeld, die persoon kan soek soek, kan soek soek, en self dus onders by die toilet verslaa.)</td>
</tr>
<tr>
<td>2.3 Word hulp benodig om die persoon te help by die toilet? (Byvoorbeeld, kan soek soek, kan soek soek, en self dus onders.)</td>
</tr>
<tr>
<td>2.4 Word hulp benodig om loop of te help met loop? (Byvoorbeeld, kan soek soek, kan soek soek, en self dus onders.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3 HULP OM NA EIE SAKEN OM TE SIEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hulp slegs fisiese hulp in, mondewinge of opdragte, of toegang van 'n ander persoon in, iemand.</td>
</tr>
<tr>
<td>3.1 Word hulp benodig om in eienoorgewig自我 voor te lees? (Byvoorbeeld, kan soek soek of 'n kaartjie voorberei.)</td>
</tr>
<tr>
<td>3.2 Word hulp nodenhaal om vir ligte huishoudwerk? (Byvoorbeeld, kan soek soek, kan soek soek, en self dus onders.)</td>
</tr>
<tr>
<td>3.3 Word hulp nodenhaal om vir ligte huishoudlike uitgawe om te sien? (Byvoorbeeld, kan soek soek, kan soek soek, en self dus onders.)</td>
</tr>
<tr>
<td>3.4 Word hulp nodenhaal om uit te gaan met openbare of persoonlike vervoer? (Byvoorbeeld, kan soek soek, kan soek soek, en self dus onders.)</td>
</tr>
<tr>
<td>3.5 Word hulp benodig om daaglijke inkopies te doen? (Byvoorbeeld, kan soek soek, kan soek soek, en self dus onders.)</td>
</tr>
</tbody>
</table>
Onderhoud

4. GEWONE TAKJE EN AKTIVITEITE

Die volgende vrae het betrekking tot hoe die pasiënt gewoonlik sy/haar dag spandeer.

4.1 Werk

<table>
<thead>
<tr>
<th>Vraag</th>
<th>Oplossing</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1 Voor die beroerte, hat die persoon gewerk, of het die persoon werk gesoek of stud纱?</td>
<td>Ja / Neé</td>
</tr>
<tr>
<td>(In die geval dat die persoon nie gewerk het nie, of nie werk gesoek het voor die beroerte aanval nie, antwoord enkele vir &quot;Nee&quot; en gaan na vraag 4.2)</td>
<td></td>
</tr>
<tr>
<td>4.1.2 Na die beroerte aanval, was daar 'n verandering in die persoon se vermoë om te werk of stud纱?</td>
<td>Ja / Neé</td>
</tr>
<tr>
<td>(In verandering in die vermoë om te werk of te stud纱 sluit in die verlies van werk of in vermindering in verantwoordelikhede by die werk, verandering in leervermoë of onvermoë om te stud纱.)</td>
<td></td>
</tr>
<tr>
<td>As die antwoord &quot;Ja&quot; is, in hoe is muls die persoon beïnvloed?</td>
<td></td>
</tr>
<tr>
<td>Verandering in tydseer van werk, bv. van volledige werk na deeltags, of 'n verlaging van die vlak van verantwoordelikhede</td>
<td>Ja / Neé</td>
</tr>
<tr>
<td>Ken tersie werk nie.</td>
<td></td>
</tr>
</tbody>
</table>

4.2 Verantwoordelikhed vir die Familie

<table>
<thead>
<tr>
<th>Vraag</th>
<th>Oplossing</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.1 Hat die persoon voor die beroerte na sy/haar familie by die huis omgasing?</td>
<td>Ja / Neé</td>
</tr>
<tr>
<td>(As dit nie sy/haar hoofrol was nie, werk &quot;Nee&quot; en gaan na 4.2)</td>
<td></td>
</tr>
<tr>
<td>4.2.2 Blyt die beroerte, is die persoon nog in staat om na die familie by die huis om te sien?</td>
<td>Ja / Neé</td>
</tr>
<tr>
<td>(Indien &quot;Ja&quot;, in hoe is muls die persoon beïnvloed?)</td>
<td></td>
</tr>
<tr>
<td>(a) Verminderde verantwoordelikhed van versorging van familie.</td>
<td>Ja / Neé</td>
</tr>
<tr>
<td>(b) Nie meer in staat om familie te versorg nie</td>
<td></td>
</tr>
</tbody>
</table>

4.3 Sosiale & Ontspanningsaktiviteite

Sosiale en ontspanningsaktiviteite sluit stapsgewis en ander belangstellings in. Dit sluit aktiviteite by die huis en weg van die huis in. Aktiviteite weg van die huis: uitgaan vir 'n drankie by 'n krog, uitgaan by 'n restaurant; na die tuinbuis gaan werk toe gaan, boekskoop toe gaan, vriende besoek of vir 'n wandeling gaan. Aktiviteite by die huis: Aktiwitee soos bispel, stik me naaimeisje, vars, speelgoed speel, lees van boek, en verbeterings aanbring aan die woonhuis.
4.3.1 Het die persoon voor die beroerte gereeld aan buitenuurse activiteite deelgeneem? (Als die persoon vanaf geen sociale- of ontspanningsactiviteite voor die beroerte gehelp het nie, merk 'Nee' en gaan na 4.4.)
○ Ja ○ Nee

4.3.2 Bedryt die beroerte, is daar 'n verandering in die vermoe van die persoon om deel te neem aan hierdie aktiviteite?
○ Ja ○ Nee

Indien 'Ja' in hoe 'n mate is hy / sy spesifiek?
(a) Neem minder deel, ten minste halwe soveel as voor die beroorte.
(b) Neem bety waarde minder deel as die helfte soveel.
(c) Kan nie meer deelneem nie: weening, of giet nie.

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 volgende insluit: Kommunikasie probleme, 'n wirmige humor, ritikus, angstigheid, onsensitiviteit teenoor ander, buiengheid, depressie, en ooralelike gedrag.

4.4.1 Bedryt die beroerte aanval, het die persoon probleme met verhoudings met ander om die veld, of begin gedrag te maak?
○ Ja ○ Nee

Indien 'Ja', wat is die omvang van die ontwikkeling van die gedrag?
Soms – minder as wekeliks
○
Dikwels – een keer per week of meer, maar draaglik
○ (2)
Gedrag – daglik en onderdaglik
○ (2)

4.4.2 Was daar soortgelyke probleme voor die beroerte?
○ Ja ○ Nee

6. SYMPTOME AS GEVOLG VAN DIE BEROERTE

Dit kan symptome of probleme wees wat deur die pasiënt geraap en waargeneem is, wat ontstaan is tydens 'n neurologiese onderzoek.

5.1 Het die pasiënt enige symptome wat die gevolg is van die beroerte? ○ Ja ○ Nee
(Skryf spesifiek antwoord op die vraag deur die responser na).

5.2 SYMPTOME CORSGLOS

5.2.1 Vind die persoon dit moeilik om te lees en skryf?
○ Ja ○ Nee

Onderhoud
<table>
<thead>
<tr>
<th></th>
<th>5.2.2 Het die persoon in spreekgebruik of vind hiyby dit moeilik om die regte word te vind?</th>
<th>Ja</th>
<th>Nee</th>
<th>Ja</th>
<th>Nee</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.2.3 Onderwint die persoon probleme met balans of knobelaassie?</td>
<td>Ja</td>
<td>Nee</td>
<td>Ja</td>
<td>Nee</td>
</tr>
<tr>
<td></td>
<td>5.2.4 Het die persoon visuele probleme?</td>
<td>Ja</td>
<td>Nee</td>
<td>Ja</td>
<td>Nee</td>
</tr>
<tr>
<td></td>
<td>5.2.5 Het die persoon 'n doeie gevree (gesig, arme, bene, hands, voetjie)?</td>
<td>Ja</td>
<td>Nee</td>
<td>Ja</td>
<td>Nee</td>
</tr>
<tr>
<td></td>
<td>5.2.6 Het die persoon die gebruik van beweging verloor (gesig, arme, bene, hands, voetjie)?</td>
<td>Ja</td>
<td>Nee</td>
<td>Ja</td>
<td>Nee</td>
</tr>
<tr>
<td></td>
<td>5.2.7 Vind die persoon dit moeilik om te sluk?</td>
<td>Ja</td>
<td>Nee</td>
<td>Ja</td>
<td>Nee</td>
</tr>
<tr>
<td></td>
<td>5.2.8 Enige ander symptome? (Teken aan elke .................</td>
<td>Ja</td>
<td>Nee</td>
<td>Ja</td>
<td>Nee</td>
</tr>
</tbody>
</table>

Klassifiseringgrade = [ ]


### APPENDIX 16

#### Udlivano-nlebe


<table>
<thead>
<tr>
<th>1.1</th>
<th>UNCEDO LWAMAXHESHA ONGOKWAKHE</th>
<th>Ngoku</th>
<th>Phambi kokuba abe ne-stroke</th>
</tr>
</thead>
</table>

| 1.1 | Ucedo lwamashhe yonke lutshetha ukuba ubani kufanele abhekho ngaphumusa onke. Ucedo langanikezela ngumuntu ogcinelelikelo okanye ogcinelelikelo ogcinelelikelo. Umgungo uyaphandle elole ezhinjoni, aze akhodi ukuba ngumuntu ogcinelelikelo yakhombela okanye ukuze kilwulela. Ingaba lo menta afuna uncedo lwamashhe yonke? | Ewe (5) | Ewe, Haji |

<table>
<thead>
<tr>
<th>2.</th>
<th>UNCEDO LOKUJONGANA NEELEMUNO ZOMZIMBA/UKUHAMBA</th>
<th>Ngoku</th>
<th>Phambi kokuba abe ne-stroke</th>
</tr>
</thead>
</table>

| 2.1 | Ingaba uyanaphila uncedo ukuzu atyo? (Uya ngaphandle kokuncodile lusuka raseholo zokuthi angagaphelela ngaphandle abantu.) | Ewe, Haji (4) | Ewe, Haji |

| 2.2 | Ingaba afuna ukuncedwisa uke ukuphumelela ngumuntu ogcinelelikelo? (Umgungo uyaphandle elole ezhinjoni, aze akhodi ukuba ngumuntu ogcinelelikelo yakhombela okanye ukuze kilwulela. Ingaba lo menta afuna uncedo kwamashhe yonke.) | Ewe, Haji (4) | Ewe, Haji |

| 2.3 | Ingaba afuna uncedo kwamashhe yonke yokuze kilwulela ngezelelwe. | Ewe, Haji (4) | Ewe, Haji |

| 2.4 | Ingaba afuna uncedo ukuku umkhulu? (Umlungumbe ngaphandle kuvelile, uyakela ukuze ilunkalala ngumuntu ogcinelelikelo.) | Ewe, Haji (4) | Ewe, Haji |

<table>
<thead>
<tr>
<th>3.</th>
<th>UNCEDO LOKUJONGELA MIBIZI YAKHWE NGOKHWAKHE</th>
<th>Ngoku</th>
<th>Phambi kwistroke</th>
</tr>
</thead>
</table>

| 3.1 | Ingaba ufuna ukuncedwisa ukwenza isilindwa nje sesohelelikelo? (Umzolo, ukuze khwelela nje sekunda olanye isilindwa esikhulw cohesion.) | Ewe, Haji (4) | Ewe, Haji |
3.2. Inqaba ufinana ucedo okwenzene imisedzenza yasekhaya? (Umsebenzi: xombonkho lokhulisele iyikele, xomphaka yi-ikwele.)

3.3. Inqaba ufinana ucedo xa ethabaza uhambo phumulilithana? (izivungule zingawukho okanye odwenza izikhumbulweni izikhumbulweni.)

3.4. Inqaba ufinana ukusendlela ukuthenga kwilwenkile ezikwamphale ekuhlala? (Ukuthenga kwilwenkile ezikwamphale ekuhlala.)

Udlitwano ndlebe

4. IMISEBENZI EHOQELINISO. Olufanele lokho ukuthi kumalunye nendlela ngingakuthi ngamphaka.

4.1. Umsebenzi

4.1.1. Futhi khokha ukuueba ukuba, inqaba kuyisebe eeso nfazi zonke yokanye esenzise ukhulu?

4.1.2. Ukhulisele zonke ukuueba, inqaba kwakakhathi ukuhlati zonke ezikhathi ezikwamphale opelele.

Akakwazi: odwenza ekuhlala.

2.2.

2.1.
4.2. Imisebenzi yakhe elusatsheni lwakhe

4.2.1 Phambi kwe-stroke, ingaba lo muntu ebehunjile kuksi ni usapho lwakhe ekhaya?
   - Ewe
   - Hayi
   (Ukuba oku yawingangasona masubanzi wakhe ekhaya phambi kokubu abe ne-stroke, bonisa ngo-"hayi" ukuthi ukuba kud 3.)

4.2.2 Enyama kokuhlala kwakhe si-stroke, ingaba luba kho utshintsho kwinendla sise
   wakathathi le ngayo usapho lwakhe?
   - Ewe
   - Hayi
   (Ukuba impendulo ngu-ewa, ingaba ubuntu khe njani ukuba engakwazi?
   (a) Khulonywa izinga isisebenzi nokwiplanga ngesapho.
   (b) Kungakungu ebakazi ukugqana lobazisa.
   - (2)

4.3. Ezentialo nolomwabo

Ezentialo nezikelwetelo ziquka lohinto umuntu azikhathisa ukumkwambisa ngaco, kwamcelo
zintozeleloza kuyo. Ziquka imisebenzi ngaphandle okanye ngaphakathi eikhayi lalebe
imisebenzi yaphandle oku kwakhe ukuya kwidawo yentseleni bhabhu, isithunzi,
embuthweni, ukuwazi, kwekhomo kwehlangana kwehlangana ukukhanywa.
Nokuthabathu kusovo lokuluja nje ntilela. Imisebenzi yasekhiya igubha
ukuzibandakanya ngapo, okufane nokuthanda, ukuthungu, ukwenzela misizoba, imindlo,
ukuthanda luncelulo, nokuphuluka ihaya).

4.3.1 Phambi kokuba afanyaye si-stroke, ingaba lo muntu ebebholise ukulwenza
   isimelazana ziyenzwe ngesekela le okubhathanda?
   - Ewe
   - Hayi
   (Ukuba lo muntu emoqag-wordo esibonelo yaphumelwa phambi kokuba anesekela si-
     stroke, bonisa ngo-"hayi", ukuthi ukuba kud 4.)

4.3.2 Enyama kokubile afanyaye si-stroke, ingaba lubo kubuhlohu ushintsho ekuwazi
   ukuthabathu le imbazelo kule biphakathi.
   - Ewe
   - Hayi
   (Ukuba impendulo ngu-ewa, uye zambelelo njani?
   (a) Nokuthabathu isimelazana ziyenzwe ngase ukubapho kubehluka kubaluleka
   (kungakwazi ukubaba), ukuthanda le isizono ziyenzwe ngase ukubaba.
   - (2)
   (b) Nokuthabathu imihola kancane kanimo, ngazophumelela kusifisekile
   kungakwazi ukuthanda.
   - (2)
   (c) Afakwazi ukuthabathu isimelazana ziyenzwe mazophumluleko ekuba
   oku, ukuba uhe
   (ukuthanda, kude.
   - (2)

Udliwano-nlebe

4. IMISEBENZI YESICHELO

4.4 Usapho nobuhlobo

(Ungaka matunga nobuhlobo ziquka lingakhi kumulumano nabanye abantu aphu
akhaya, ukuthathile yena ngaphakathi okanye okubantu kubulelo (ukuba lilesewa okanye
ube wezwa). Unglebo enemfandlezi zingabandakanya, lingakhi zonqothweleni,
ukukuthala ngumshindo, ukusaphuksha, inkelile ukungabangile alehlo,
ukuthala engqinyo, ukuthakama, kwanendlela engamakhosana yokuzezithetha).
4.2 Imisebenzi yakhe elusatshele lwakhe

4.2.1 Phambili kwe-stroke, ingaba lo muta ethekijangile kusani na usapho lwakhe ekhaya?
   a. Ewe  b. Hayi

   (UKuba oku yayingangawo amsani wakhe ekhaya phambili kokubeka abe ne-stroke, bonisa ngo-hayi) manjule ukuye kud 3.)

4.2.2 Emusa kokuhlasela kwakhe si-stroke, ingaba luba khe utshintsho kwindlela abe wakukhathalela ngayo usapho lwakhe?
   a. Ewe  b. Hayi

   (UKuba impendulo ngu-wani), ingaba umbamwe ukuze ukuba engakwazi?
   (a) Kusithwabo isinga fomedekezi wokujungana nqazapho...  c. (2)
   (b) Kungakunjane ukubazazi ukunganga nobapho... c. (2)

4.3 Ezentialo nolomawabo

Ezentialo nezokwamo ziqika lohlo oomuntu azikhelisa ukulondo abasebenza ngazo, kwandla
zokwamiselane kuyo. Ziqika imisebenzi nqaphende, okanye nqaphakathi ekhaya layisephe,
imeshebeni yangaphende kwakhe: ukuya kwendawo yentselelelithini, erathu, embabwane,
sewane, kwimboniso bhatira-bhanyana, ukusinamvela abapho, nokiafeka uhambo lokusuka nje
inilele. Imisebenzi yasekhekaya, igqo ukubandakanya ngapo, okufana nokuthaha,
ukuthunga, ukwenza imizobo, impilo, ukufunda lincwadi, nokuphucula (ikhaya).

4.3.1 Phambili kokubaka afakwanyane si-stroke, ingaba lo muta obokholiswa ukuyenzisa
imisimunyeza zyaneze ngoxeselele lokuphokholo?
   a. Ewe  b. Hayi

   (UKuba lo muta ebenelikilele) embalwa yelusaphawo phambili kokubaka ahlelele si-
   stroke, bongisa ngo-hayi, manjule ukuye kwe4.)

4.3.2 Emusa kokubaka afakwanyane si-stroke, ingaba itshintsho usindiso ukuhlanganise
ukuthathathile ukuthathalela kule tikulu?
   a. Ewe  b. Hayi

   (UKuba impendulo ngu-wani), oye impindle ukuze?
   (a) Uthathanisa inqaphende ngaphandle kwakhe, ukuthathana khangase ngathathwa
   kunokuba eaphethe ukuthi phambili kokubaka ahlelele si-stroke, c. (2)
   (b) Uthathana inkwenza ukuthi phambili kokubaka akhona kusithakaza kunokuhlele
   kuneqaphetho. c. (2)
   (c) Akakwazi ukuthathalisa impezhelele ukukhulu, ukukhukwisa manqapho ngapho
   oku, akuba ubu

Udlwano-nlebe

4. IMISEBENZI YESICHELO
   ...isaqhuba.

4.4 Usapho nobuhlabo

(lingazi matunga nobuhlabo ziquka lingazi kumululukana nabanye abantu aapha
akhaya, ukuthakhekela nqaphilobho okanye ukubona kubulule (ukuba likhewa okanye
uwe wathwa). Lingozoniniso zingabandakanya, lingazi zombelelwano, ukuthakhekela
ngumiso, ukusaphikhise, mtaklobo ukungabacinge abanye, ukuthala engqinyiswa
anqa, ukukhakama, kwandela engakhelelana yokuziphatha.)
4.4.1 Ibangaba olithancisela si-stroke lingaba lo mntu ukhe waneengxaki zonxulumano nezinye abantu, okanye wazibona eyedw?  □ Ewe  □ Hoyi

Ukuba impendulo ngu-ewe, olku komunokalise okanye kumpahazanise kengekana?
Ngamathuba ahile – ngaphantelwe kweviki 

Amonthuba amenzini – kanye ngevuki okanye nangaphakulu, kodwa enyamezela
Ngiyaphakisa ikukuncane – yezinye imihla yase akanyamezela

4.4.2 Phambili ukubuka ahleSalwe si-stroke, zazikhoco lingxaki ezifane nesiz?  □ Ewe  □ Hoyi

---

5. IMPAWU EZISIIPHUMO SE-STROKE
(Senokuba zelapho zisisisipho impawu okanye lingxaki ezichazwa ngumqobi okanye ezifunye nekuphela kwelengcinda)

5.1 "Ingaba umqobi umzamo impawu ze-stroke?
(Ha phakathi zophumela zonke impendulo ezimpungaziscwanga ezitshenzelazayo kufanele zikhona kufanele kwelengcinda)

5.2 ULUKE WE LOKUJONGA IMPAWU

<table>
<thead>
<tr>
<th>Ngoku</th>
<th>Phambili kwe-stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.1</td>
<td>Ingaba lo mntu unengxaki yokufunisa okanye ukubalule? □ Ewe □ Hoyi</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>5.2.2</td>
<td>Ingaba lo mntu unengxaki yokuthetha okanye ukufumana igama eLiliso? □ Ewe □ Hoyi</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>5.2.3</td>
<td>Ingaba lo mntu unengxaki yokuzimela okanye ukuthuthile? □ Ewe □ Hoyi</td>
</tr>
<tr>
<td>5.2.4</td>
<td>Ingaba lo mntu unengxaki yokuhamba? □ Ewe □ Hoyi</td>
</tr>
<tr>
<td>5.2.5</td>
<td>Ingaba lo mntu ukuthathaza bubundindile heleni (boobuselo, bongelo, bhekizwela, bhepelo)? □ Ewe □ Hoyi</td>
</tr>
<tr>
<td>5.2.6</td>
<td>Ingaba lenkaka ukhe kakhona ukuthukumelisa (bubuselo, bongelo, bhekizwela, bhepelo)? □ Ewe □ Hoyi</td>
</tr>
<tr>
<td>5.2.7</td>
<td>Ingaba lenkaka unengxaki yokuginyeya? □ Ewe □ Hoyi</td>
</tr>
<tr>
<td>5.2.8</td>
<td>Ingaba zikhoco ezinye impawu? (Nceda uzelisehlale) □ Ewe □ Hoyi</td>
</tr>
</tbody>
</table>

---

Unlelo ngokonqoba =
Euroqol

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:

5/25/2009
Dui asseblief aan watter stellings u die gesondheidsstoestand van dag die beste beskryf deur 'n regmerkje 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 uiteras angstig of neerslagtig
Om mense te help om te sê hoe goed of sleg hul gesondheidsstoestand is, het ons 'n skaal (baie soos 'n thermometer) geteken waarop die beste gesondheidsstoestand wat u u kan verbeeld, gemerk is met 100 en die slekgste gesondheidsstoestand wat u u kan verbeeld, gemerk is met 0.

Ons wil graag hê dat u op hierdie skaal aandui hoe goed of sleg u die gesondheid vandag na u mening is. Doen dit asseblief deur 'n streep te trek vanaf die blokke hieronder (waar dit sê: "u die gesondheidsstoestand vandag") tot by enige punt op die skaal wat aandui hoe goed of sleg u gesondheidsstoestand vandag is.
APPENDIX 19

Reka epawu kwobokisi ibanye kwilanga ngalinya cehaza imeko yemphi yakho nakhlanje. Kweloi bhoeki zikudelayo.

Musa ukuphawula ngaphezulu kwobokisi enye kwilanga ngalinya.

Ukuhamba

Andinangxazi zokuhambe
Ndinazo ingxakana zokuhambe
Ndumwaneleke obopheleleke obhenendis

Ukuzinonophela isigu

Andinangxazi zukuzenophela
Ndinazo ingxakana zokuhambe okanye ukuzinonophela
Andikwazi ukuzinonophela okanye ukuzinonophela

Izinto zesihlelo (Umsebenzi, Ukuqule beZinhloko)

Umsebenzi wasekhaya, Uqapho, Ezolonye
Andinangxazi nokwenzele izinto zesihlelo
Ndinazo ingxakana zokwenzele izinto zesihlelo
Andikwazi kuzenzela izinto zesihlelo

lenthu, / Ukungaziva kakuhle

Andinzenthu okanye ukungaziva kakuhle
Ndinzenthu okanye ukungaziva kakuhle okungazivela
Ndinzenthu ezikhathakwayo okanye ukungaziva kakuhle okungazivela

Ukushalaba / Ukudakumbala

Andinzalaba okanye akudakumbala
Ndikhulala okanye naidakumbala
Ndikhulala gqitha okanye naidakumbala gqitha

Xa ndikhulala umgeni wobanjani

Inqama

Plasanda

Ibhaxa

lbhaxa

Imandunye

Imandunye

2
Ukuncedu abantu ukuze baxele okokuba imeko yabo yempilo intle okanye imandundu na sizobe isikali (esifuna nethemometha). Eyona meko entle yempilo iphawulwe nge-100, cyona meko imandundu iphawulwe nge-0.

Singathanda ubonise kxesikali ngokolave bvakho ukuba impilo yakho intle okanye imandundu kangakanani namhlanje.
Nceda wenze oku ngokuzoba ungeca osuka ebhokisini engezantsi ukuya kuto ndawo esikalini ibonisa ukuba imeko yempilo yakho intle okanye imbi kangakanani namhlanje.

Imeko yempilo yakho namhlanje

UNIVERSITY of the WESTERN CAPE
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= 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 ACTIVITIES?
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.

<table>
<thead>
<tr>
<th>Name of Hospital or Home</th>
<th>Reason for Admission</th>
<th>Length of stay/Nursing (No. Of nights)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1= Due to stroke</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= Not due to stroke</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Service/Facility</th>
<th>No of times</th>
<th>Mode of transport</th>
<th>Related to stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social worker</td>
<td></td>
<td>Physical therapist</td>
<td></td>
</tr>
<tr>
<td>Physiotherapist</td>
<td></td>
<td>Speech and Language therapist</td>
<td></td>
</tr>
<tr>
<td>Occupational therapist</td>
<td></td>
<td>Vision</td>
<td></td>
</tr>
<tr>
<td>Dietitian</td>
<td></td>
<td>Psychologist</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>Traditional healer</td>
<td></td>
</tr>
<tr>
<td>Community Rehabilitation worker</td>
<td></td>
<td>Home-based Care</td>
<td></td>
</tr>
<tr>
<td>Medical Doctor</td>
<td></td>
<td>Specialized clinic</td>
<td></td>
</tr>
<tr>
<td>Support groups</td>
<td></td>
<td>Self-help groups</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>Other specify</td>
<td></td>
</tr>
</tbody>
</table>
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?

<table>
<thead>
<tr>
<th>Health Care Service</th>
<th>Postponed or Forgone (yes=1, no=2)</th>
<th>Related to stroke (yes=1, no=2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social worker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiotherapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech and Language therapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietitian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychologist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional Healer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Rehabilitation worker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home-based Care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialist Specify</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-help group stroke group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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?

<table>
<thead>
<tr>
<th>Health Care Service</th>
<th>Postponed or Forgone (yes=1, no=2)</th>
<th>Stroke-Related (yes=1, no=2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social worker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiotherapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td></td>
<td></td>
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<tr>
<td>Speech and Language therapist</td>
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</tr>
<tr>
<td>Dietitian</td>
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<td></td>
</tr>
<tr>
<td>Psychologist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional Healer</td>
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<tr>
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<tr>
<td>Home-based Care</td>
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<tr>
<td>Medical Doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialist Specify</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-help group stroke group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 3
3.1 How do you mostly get 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 get 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 afield? (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 afield? (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= Institutional/other home care
4= Other, specify: 
If discharged in 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 one 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=Yes 2= No
4.3.1. During the day?
1=Yes 2= No
4.3.2. 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 (singles, duplex or triplexes)
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
3= Specify approximate number: 

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

4.14. If you use your wheelchair to get around, is it possible to get to the toilet in your wheelchair? 
1= Yes 2= No

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
5= None of the above.

UNIVERSITY of the WESTERN CAPE
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 familielde, 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 sociale kontak beskryf?
   1. Baie bevredigend
   2. Tsaamlik bevredigend
   3. Tsaamlik onbevredigend
   4. Baie onbevredigend

4. Tot welke mate het jou fisiese of emosionele gesondheid verhinder dat jy in die afgelope 2 maande kontak gehad het met familielde, vriende, bues, of die beoefening van groepaktiwiteite?
   1. Glad nie
   2. 'n Bietjie
   3. Baie
   4. Heettemal

5. Tot welke mate het die pyn in die afgelope 2 maande jou werk of ander aktiwiteite negatief beïnvloed?
   1. Glad nie
   2. 'n Bietjie
   3. Baie
   4. Heettemal

6. Kan jy in 'n noodgeval op hou, vriende of familielde, stree om te help?
   1. Ja
   2. Nee

7. Is daar enige een in jou omgewing of in jou familie wat jy in vertrou kan neem, of met wie jy openlik oor jou probleme kan praat?
   1. Ja
   2. Nee
2.1 Was jy binni die afgelope 2 maande in 'n hospitaal of rehabsatiesentrum opgeneem?
1 = Ja
2 = Nee (geen in vraag 2.3)

2.2 Hoeveel keer was jy in 'n hospitaal of vergelykingsinstituut opgeneem (waar u oorweg grbly het)?
Gee asseblief besonderhede. As die redes vir toestelring nie as gevolg van 'n beperkte aantal was nie, gee asseblief die redes.

<table>
<thead>
<tr>
<th>Naam van hospitaal</th>
<th>Rede vir toesteling</th>
<th>Lange van</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

2.3 Het jy in die afgelope 2 maande enige gebruik gemaak van die volgende gesondheidsfasilitate of dienste? Stel asseblief in al u kliniesebeoekte, beoekte aan u medische doktor, enige rehabsatiewelke wat u ontkry het in u eie gemeenskap, beoekte van gesondheidswerkers en afsprake by hospitaal.

CDP

<table>
<thead>
<tr>
<th>Hoofbehoefte</th>
<th>Gepersoonlike hulp en</th>
<th>Fysieke beperking</th>
<th>Emot. beperking</th>
<th>Andere beperking</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>


2.4. Was u in die afgelope 2 maande genoodsaak die gebruik van gesondheidsdienste te kansellof of uit te stel omdat u geen toegang tot vryvoor gehad het nie?  
1=Ja  2=Nee (gaan na 2.5)

2.4.1 Watier mediese dienste sluit dit in? (In die geval van 'n aantal moontlikhede, noem in besonder die wat te doen het met die benoemte.)

<table>
<thead>
<tr>
<th>Gesondheidsdienste</th>
<th>Uitgestel of opgegee?</th>
<th>Te doen met die benoemte?</th>
<th>Gene assisterend benoemtheede</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muzikale veren</td>
<td>Ja=1 Neen=2</td>
<td>Ja=1 Neen=2</td>
<td></td>
</tr>
<tr>
<td>Fisiotherapie</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artetherapie</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spraak- en tekst terapie</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daaldsindige</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eksekutive</td>
<td></td>
<td></td>
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<tr>
<td>Vaste regte</td>
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<td></td>
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<tr>
<td>Tangentiële terapie</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Geneeskundige physisiese</td>
<td></td>
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<tr>
<td>Mediese dokter</td>
<td></td>
<td></td>
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<tr>
<td>Sel-hulp groep/ selfhulp groep</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Spesifiek: Naam assister</td>
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<td></td>
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</tr>
<tr>
<td>Ander: Naam aangeef</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

2.5. Was u in die afgelope 2 maande genoodsaak om die gebruik van gesondheidsdienste uit kansellof of uit te stel om finansiele redes?  
1=Ja  2=Nee

2.5.1 Watier mediese dienste sluit dit in? (In die geval van 'n aantal moontlikhede, noem in besonder die wat te doen het met die benoemte.)

<table>
<thead>
<tr>
<th>Gesondheidsdienste</th>
<th>Uitgestel of opgegee?</th>
<th>Te doen met die benoemte?</th>
<th>Gene assisterend benoemtheede</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maatskaplike werk</td>
<td>Ja=1 Neen=2</td>
<td>Ja=1 Neen=2</td>
<td></td>
</tr>
<tr>
<td>Fisiotherapie</td>
<td></td>
<td></td>
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<tr>
<td>Artetherapie</td>
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<tr>
<td>Spraak- en tekst terapie</td>
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<tr>
<td>Daaldsindige</td>
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<td></td>
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<tr>
<td>Eksekutive</td>
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<tr>
<td>Ander: Naam aangeef</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
AFDELING: 3

3.1 Hoe beweeg u gewoonlijk rond in u woning?
1 = Loop
2 = Rolstoel
3 = Kan niet zelfbewogen of liep
4 = Andere. Neem aant.

3.2 Gebruik u enige van de volgende om u te helpen om rond te bewegen in de huis?
1 = Ja
2 = Nee
3.1. Genummerde stoele
3.2. Knie met 3 of 4 poten
3.3. Elhouders handen
3.4. Loopring
3.5. Eiwitvoeder
4 = Andere. Neem aant.

3.3 Hoe beweeg u gewoonlijk rond buiten uw woning?
1 = Loop
2 = Rolstoel
3 = Kan niet rondbewegen of liep
4 = Andere. Neem aant.

3.4 Gebruik u enige van de volgende om u te helpen om rond te bewegen in de huis?
1 = Ja
2 = Nee
3.1. Genummerde stoele
3.2. Knie met 3 of 4 poten
3.3. Elhouders handen
3.4. Loopring
3.5. Eiwitvoeder
4 = Andere. Neem aant.

3.5 Voor u bevroeite aanval, hoe het u rondbeweeg in uw omgeving en ander plekken buiten uw woning? (Laat tot drie antwoorden toe.)
1 = Auto
2 = Bus
3 = Trein
4 = Motor, bestuurder
5 = Motor, passagier
6 = Motorfiet
7 = Fiet
8 = Ganz
9 = Gehandicapt in rolstoel
10 = Andere. Neem aant.

3.6 Gedurende bevroeite, hoe het u rondbeweeg in uw omgeving en andere plekken buiten uw woning? (Laat tot drie antwoorden toe.)
1 = Auto
2 = Bus
3 = Trein
4 = Motor, bestuurder
5 = Motor, passagier
6 = Motorfiet
7 = Fiet
8 = Ganz
9 = Gehandicapt in rolstoel
10 = Andere. Neem aant.
AFDELING: 4

4.1. Beskryf u huidige verhalelek
1= Diezelfde woning as voordie beroerte aanslag
2= 'n ander woning
3= 'n ander verhalelek
4= Vraag of vervoer/verplaas/dekking

4.2 As u nie teruggekeer het nie vir 'n vorige woning nie, verskaf asseblief die hoofredes daarvoor
1= Nie betrokke nie
2= Vorige woning was nie geskik nie
3= Geen seunsiger by ny woning nie
4= Nie in staat om reg te kom nie (en wel help nodig)
5= 'n ander. Noem asb.

4.3. Is daar toepaslike wet en regte wat u kan help, waar u nou bly? 1= Ja 2= Nee
1.3.1. Gedurende die dag[ ] 1.3.2. Snaags[ ]

4.4. Beskryf u huidige woning
1= Huis
2= Woonwag
3= Huis en Woonwag of kamer in 'n agtereeksel of of wat gedit word
4= Dorpshuis, meestal van koppieshuis
5= Aflewe-ond
6= Informele bewoening/integrasie in 'n informele seteling
7= Informele bewoening/plekje in 'n agtereeksel
8= 'n ander. Noem asb.

4.5. Mostu trappe op klim om by u woning in te kom?
1= Ja 2= Nee

4.6. Is daar 'n huisbak?
1= Ja 2= Nee

4.7. Het u trappen, of verskillende vlakke in u woning?
1= Ja 2= Nee

4.8. Het u elektriese bak?
1= Ja 2= Nee

4.9. Het u laapda 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 ongelijke 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 rolstoel?
1=Ja 2=Nee 3=Na toepaslik

4.15. Het u 'n telefoon?
1=Ja 2=Nee

Boere asb:

1=Landline binne woning
2=Satellite
3=Huis sa telefoon
4=Publiek Telephone nearby
5=Geen hierbo genoem nie
QUESTIONNAIRE COMPLETED 2 MONTHS POST STROKE

SECTION 1

1. Ungayichaza njani imeko yakho jikelile?
   1. Illange kakhulu
   2. Ilangile
   3. Imhi
   4. Imhi kakhulu

2. Ingaba udubana rhaso nezalamane, nabantwano, uyikwazi ukudibana nabantu, njalo-njalo?
   1. Ngaphenzu kwestinye ngevelo
   2. Kanye ngeveki
   3. Ubunzima kanye ngcayana
   4. Mlingwa kanye ngonyaka
   5. Zangekhange

3. Ukuthanda kwakho ukudibana nabantu ungalubeka kweliphili izinga?
   1. Iyakwameliisa kakhulu
   2. Iyakwameliisa kakhulu
   3. Ayikwameliisi kakhulu
   4. Ayikwameliisi kakhulu

4. Ngokuyisebenzi rezinyanga zimbini z'idlutuleyo impilo yakho ngokomzemba okanye
   uvala/dlo lwenzilo yakho lakuthintile njani uklaba udibana nezalamane zakofo,
   nabaho/bo okanye abahlelweza okanye imisebenzi yesihlo
   1. Hlayi konke-konke/khanye kwaphela
   2. Kancinci
   3. Kakhulu
   4. Ngunamthila kakhulu

5. Ingaba lindlungu zikhumbela njani enyebenzi yakho okanye kweminyo
   imisebenzi yakho kuze uza ziyange zimbini z'idlutuleyo?
   1. Khanye konke-konke
   2. Kancinci
   3. Kakhulu
   4. Ngunamthila kakhulu

6. Ungayikwazi ukuthembela kobahlela, kwizibolo, okanye kusaphelo kwakho xa ufuna
   uncedo ngerhubhuga ngasebenzi yokuzo akakho?
   1. Ewe
   2. Hlayi
7. Inguba uthina emuntu kwabukungensa kuyo okanye kanaphe lukuhi ekunjule ukuthi izinye ukuze kuyo emuntu okunjule ukusiza naye ngesikhumbulekileyo?
   1. Ewe
   2. Haya

**SECTION 2: Ukusebenzisa uncedo**


<table>
<thead>
<tr>
<th>Ignalokuhlebile</th>
<th>Izithathu zokubhekileza</th>
<th>Izithathu zokubhekileza</th>
</tr>
</thead>
<tbody>
<tr>
<td>Okanye</td>
<td>1=Okubhekileza</td>
<td>2=Okufuna</td>
</tr>
<tr>
<td>Kubhekileza</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kubhekileza</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. 
2. 
3. 
4. 
5. 

2.2. Ngendlela nje izikhululekile okanye ukuze 1=Ukuthi ukuchukela, 2=Ukuthi ukucabange, 3=Ukuthi ukuze ngakho zokuhlebile komakhulu, 4=Ukuthi ukuzimbilo, 5=Ukuthi ukuzindlela, 6=Ukuthi ukuze ngakho zokuhlebile komakhulu, 7=Ukuthi ukuzimbilo, 8=Ukuthi ukuze ngakho zokuhlebile komakhulu, 9=Ukuthi ukuzindlela, 10=Ukuthi ukuze ngakho zokuhlebile komakhulu, 11=Ukuthi ukuzimbilo, 12=Ukuthi ukuze ngakho zokuhlebile komakhulu, 13=Ukuthi ukuzindlela.

<table>
<thead>
<tr>
<th>Amasata</th>
<th>Ukuphila</th>
<th>Nkomo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1=Ukuphila</td>
<td>2=Ukuphila</td>
<td>3=Ukuphila</td>
</tr>
<tr>
<td>2=Ukuphila</td>
<td>3=Ukuphila</td>
<td>4=Ukuphila</td>
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<tr>
<td>3=Ukuphila</td>
<td>4=Ukuphila</td>
<td>5=Ukuphila</td>
</tr>
<tr>
<td>4=Ukuphila</td>
<td>5=Ukuphila</td>
<td>6=Ukuphila</td>
</tr>
</tbody>
</table>

Kukunantshisa

- [ ]
- [ ]
- [ ]

Phytotherapy

- [ ]
- [ ]
- [ ]

Occupational therapy

- [ ]
- [ ]
- [ ]
Speech and Language Therapy
Crichton
Psychologist
UnPhakathi Unesi
Ishwani
Community Rehabilitation Worker
(Unisebere) waxekwilwini qojonge ntabantu abalula)
uQopho
Self Help Group eg. Stroke Support Group
Cockes

2.3. Kwazi nyanga zintandathu zidulululeyo ukhwe wanyenziswa ukuya okanye uhlilisa
kusebenzisa inkonzo zempilo ngenxa yokungaba kukufikelela kwazinto ezihamba yo?
1= Ewe
2= Hayi

2.4. Kwazi nyanga zintandathu ukhwe wanyenziswa uyeke okanye unyebiswe inkonzo
zempiro ngenxa yengasakal eYemali?
1= Ewe
2= Hayi

Section 3

3.1. Ukusenzisa ntoni ukufikelela phakathi kwaksana?
1= uyekezi ukulwenzisa
2= uyekezi ukufikelela phakathi kwaksana
3= uyekezi ukufikelela phakathi kwaksana
4= ezinye

3.2. Usebenzisa uye yazi zinto ukufikelela ngaphakathi endlini?
2.2.1. Intonga aqaphakathi
2.2.2. Intonga yasephakathi uqaphakathi emi 3 okanye 4
2.2.3. Elbow crutches: intonga zintsho ezibekwa ephakathi kwaksana
2.2.4. (Rory) yelephembe
2.2.5. Ankle splint into uqaphakathi uqaphakathisa ngaphakathi kra ka lesa.
2.2.6. Ezinye: Cacina

3.3. Usebenzisa ntoni kudlululo ukufikelela phathila kwakhe?
1= uyekezi ukulwenzisa
2= laphakathi
ezinye
3= uyekezi uqaphakathi
4= ezinye

3.4. Usebenzisa uye yazi zinto ukufikelela ngaphandle eNkwezani lekhobe?
2.4.1. Intonga aqaphakathi
3.5 Phambili kokuba ubo nesitrowukhi. Ukuhlekilela ngani azindaweni kwandawo

Oohlala kuyo (kwingomjad yakhlo) nakude? (khetha zibentathu)

2.5.1 □ 2.5.2 □ 2.5.3 □
1 = ibhisi
2 = imizo
3 = iPhanya ukovelo
4 = imizo, unguqunkwazi
5 = imizo, ushoba
6 = isukusho
7 = ibhayisle
8 = ulolhamba
9 = ubuhlasana ngesilo
10 = esinye injibilo zokuhlamba. Cadise:

3.5. Oko unesitrowukhi ulihlelela ngani azindaweni ekuhlalelisa nakude? (khetha zibentathu)

2.5.4 □ 2.5.5 □ 2.5.6 □
1 = isitshahlukazi
2 = ibhisi
3 = imizo
4 = imizo, unguqunkwazi
5 = imizo, ushoba
6 = esukusho
7 = iPhanya ukovelo
8 = ulolhamba
9 = ubuhlasana ngesilo
10 = esinye injibilo zokuhlamba. Cadise:

SECTION 4: DETAILS OF THE HOME ENVIRONMENT

4.1. Ungqalaba ezilando eliyise olulwa kuyo olakahle?
1 = Yиндu
2 = yindingu
3 = Yindlela
4 = Yifunzi usha
5 = iNkaxa
6 = Yinka
7 = Yinka
8 = Yinka
9 = Yinka
10 = Yinka

4.2. Usenqaba izikhulusi ukhuhlekilela kwezikhulu lebofo?

2 = izikhulusi
cadise: ngathwane
1 = izikhulusi

4.3. Kukho ilithlukhethe?
1 = Evwo 2=Hajii

4.4. Kukho izikhulilele endlelele olunya ngaphakathi endlelele yakho?
1 = Evwo 2=Hajii

4.5. Unawo umbangane?
1 = Evwo 2=Hajii
4.6. Unawo amanzi aceckileyo endini?

4.7. Unayo indawo yokuhlambela okanye isithwana ekhaya?

4.8. Ingaba ithoyilethi ingaphakathli ekanye ingaphandle? 1= Ngaphakathi

4.9. Kufuneka unwele indawo ezipakamileyo uluwa ethoyilethi?

4.10. Kufuneka unyeke izithetheli akufikile ethoyilethi?

4.11. Ukuva sesebenzisa lwenkho chair uukujikelza ekhaya, uyakwazi ukufikileza ishowe — whole chair ethoyilethi?

4.12. Unayo ilowuni?

Nanda cuclidisa:
1= Ixolakhi yokuhlambela ngaphakathi
2= I-cellphone
3= Ilowuni phsepanti
4= Ilowuni kwonke-wonke
5= Acini kwensi okusintsho
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 ACTIVITIES?
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?

<table>
<thead>
<tr>
<th>Health Care Service</th>
<th>Postponed or Forgone (yes=1, no=2)</th>
<th>Related to stroke (yes=1, no=2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social worker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiotherapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech and Language Therapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietician</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychologist</td>
<td></td>
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</tr>
<tr>
<td>Nurse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional Healer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Rehabilitation worker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home-based Care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General: Specify</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-help group/stroke group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other: Specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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?

<table>
<thead>
<tr>
<th>Health Care Service</th>
<th>Postponed or Forgone (yes=1, no=2)</th>
<th>Stroke-Related (yes=1, no=2)</th>
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<td>Other: Specify</td>
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<td></td>
</tr>
</tbody>
</table>
Section 3
3.1 How do you mostly get 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

<table>
<thead>
<tr>
<th>Ordinary walking stick</th>
<th>Elbow Crutches</th>
<th>Walking frame</th>
<th>Walking stick with 3 or 4 feet</th>
<th>Wheelchair</th>
<th>Armic splint</th>
<th>Other</th>
<th>Please specify</th>
</tr>
</thead>
</table>

3.3 How do you mostly get 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

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<th>Walking stick with 3 or 4 feet</th>
<th>Wheelchair</th>
<th>Armic splint</th>
<th>Other</th>
<th>Please specify</th>
</tr>
</thead>
</table>

3.5 Before you had your stroke, how did you mostly get to places in the community and further afield? (Allow up to three responses.)
1 = Taxi
2 = Bus
3 = Train
4 = Car, driver
5 = Car, passenger
6 = Motorbike
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 afield? (Allow up to three responses.)
1 = Taxi
2 = Bus
3 = Train
4 = Car, driver
5 = Car, passenger
6 = Motorbike
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
   4=Transferred 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  4= Unable to manage (needs too much help)
   5= No carer at home

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/farm rooms 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 stairs or stairs to get into your home? □
   1= Yes 2= No
   Please specify:
   1= Stairs
   2= Flights of stairs
   3= Subject answers flights of stairs

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 a 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 steps to get to your toilet facilities? □
   1= Yes 2= No

4.14. 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. Ongereëlineerde contracte vir sekere tydperke. Nom assosieef spesifieke ure per week.


5.4. Doen u nou dieselfde werk as voor u beroerte aanval?
1. Ja, gregige dieselfde werk
2. Dieselfde werk, maar verskilende werksoordeel
3. Ander werk
4. Aanvaar nie (3) nie
5. Wat kind of werk doen jy nou?

5.6. As u nou nie werk nie, wat is die hoof rede daarvoor?
1. Ek werk nie, ek soms werk
2. Ek werk nie en ek is nie te werk nie
3. Ek werk nie omdat ek nou swak of ongeskik vir werk is (ontvang 'n Ongeskiktheidstipset, of private vereniging)
4. Ek werk nie omdat ek nou swak of ongeskik vir werk is (ontvang geen.
Ongeskiktheidstipset, of)
5. Algoorfe / Pensioeninkomste
6. Sorg vir die huishouding, geen finansiële laste nie (dit sluit in om kinders op te pas)
7. Leerling of student
8. Ondergaan werk heropleiding / beroepsopleiding

Indien (4), vra: Is 'n samevaar vir 'n Ongeskiktheidstipset gemaak?
1. Ja
2. Nee

Indien ja, vra: Wat is die huidige status van u aansoek?
1. Aansoek word steeds geraadpleeg of geproceseer
2. Aansoek geweier

6.6. Vandat u uit die hooiplaas ontlaas is, het u in enige van die volgende aktiwiteite deelgeneem?
1. Ja
2. Nee

3.6.1. Ontbetaalde werk as 'n vrywilliger
3.6.2. Ontbetaalde werk in 'n familiebedryf
3.6.3. Sorg vir ander, soos byvoorbeeld kinders, bejaardes of diélikes
3.6.4. Werk in die huis, soos byvoorbeeld onderhoud, kos, kuiswerk, 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/radio/telephone
2= Cellular phone
3= Neighbour’s phone
4= Public telephone
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 5.2.)  
2= No, not paid employment (Please go to question 6.5.)

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= Full-time Specified hours/week______
2= Part-time Specified hours/week______
3= Full-time (More than 20 hours a week)
4= Irregular hours, occasional work as a casual employee
5= Irregular fixed term contracts. Specify typical hours/week______
6= 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 (Including 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 (9), 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
6.6. Since you had your, have you participated in any of the following activities?

6.6.1. Unpaid work as a volunteer
6.6.2. Unpaid work helping in family business
6.6.3. Looking after others, e.g. children, the elderly or the sick.
6.6.4. Work around the home such as cleaning, cooking, gardening, maintenance or repairs.

1= Yes  2=No
AFDELING 1:

1. Hoe sal jy jou algemene toestand beskryf?
   1. Baie goed
   2. Goed
   3. Sowat
   4. Baie swak

2. Is jy gevoel in kontak met jou familieledes, kinders, bekendes, en so?
   1. Meer as een keer per week
   2. Een keer per week
   3. Te minsye een keer per maand
   4. Ongeveer een keer per jaar
   5. Nooit

3. Hoe sal jy jou sosiale kontak beskryf?
   1. Baie bevredigend
   2. Tanslik bevredigend
   3. Tanslik onbevredigend
   4. Baie onbevredigend

4. Tot watter mate het jou fisiese of smerwaarlike gesondheid verhinder dat jy in die agtergrond 4 maande lang gesondheid van familieledes, vriende, buur, of diens?
   1. Gedien
   2. 'n Bietjie
   3. Baie
   4. Heeltemal

5. Tot watter mate is jou in die agtergrond 4 maande lang werk of ander aktiwiteite negatief beinvloed?
   1. Gedien
   2. 'n Bietjie
   3. Baie
   4. Heeltemal

6. Kan jy in jou noodgeval op buur, vriende of familieledes plaas waak om te help?
   1. Ja
   2. Nee

7. Is daar enigtemand in jou omgeving of in jou familie wat jy in vertrou kan neem, of met wie jy ooplik of jou probleme kan praat?
   1. Ja
   2. Nee
2.1 Was jy binne die afgelope 4 maande in 'n hospitaal of rehabilitasie sentrum opgeneem?
1=Ja
2=Nee (gaan na vraag 2.2)

2.2 Hoeveel keer was jy in 'n hospitaal of verpleegingsinrichting opgeneem (waar u oomag gebleef)? Gee asseblief besonderhede. As die redes vir toelating nie as gevolg van 'n benoemde aanval was nie, gee asseblief die rede.

<table>
<thead>
<tr>
<th>Naam van hospitaal</th>
<th>Lengte van of Verpleegingsinrichting verblyf</th>
<th>Rede vir toelating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>1=Baraante aanval</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>2=Ander rede (Hoeveel nage?)</td>
</tr>
<tr>
<td>3</td>
<td></td>
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<tr>
<td>4</td>
<td></td>
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<tr>
<td>5</td>
<td></td>
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</tr>
</tbody>
</table>

2.3 Het jy in die afgelope 4 maande enige gebruik gemaak van die volgende gesondheidsfaciliteite of diens: Stell en/ of klinieksbeoekte, beoekte aan 'n mediese dokter, enige rehabilitasie wat u ontvang het in u eie gemeenskap, beoekte van gesondheidswerkers en afsprake by hospitaal.

Maatskappike werker
Fysiotherapee
Arbeidsbeoekte
Sprak- en taalbeoekte
Dieetbeoekte
Ski en toubeoekte
Vituspleister
Tradisionele geneesmiddel
Gemeenskapsgeneesmiddel
Rehabilitasiewerker
Mediese dokter
Self-hulp groep
Spesialis:
Ander:
Noem asb.
2.4. Was u in die afgelope 4 maande geneesweek diens deel van gesondheidsdiens te konselleer 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 medisene, noem in besonder die wat te doen het met die klient.)

<table>
<thead>
<tr>
<th>Gesondheidsdiens</th>
<th>Uitgestel of opgegee? (Ja/Nee)</th>
<th>Te doen met die diens? (Ja/Nee)</th>
<th>Gee assisterende besonderhede</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moedelslike werker</td>
<td></td>
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<tr>
<td>Fysiotherapie</td>
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<td>Arbeidsgerapie</td>
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<td>Spraak- en taal terapie</td>
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<td>Tradisionele geneesmiddels</td>
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<td>Genacooprehabilitasiewerk</td>
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<td>Self-help groep / stroke groep</td>
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<tr>
<td>Spesiaal - Noem assisterende</td>
<td></td>
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<tr>
<td>Ander - Noem assisterende</td>
<td></td>
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</tbody>
</table>

2.5. Was u in die afgelope 4 maande geneesweek om die gebruik van gesondheidsdiens te konselleer 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 medisene, noem in besonder die wat te doen het met die klient.)

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<tr>
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</tr>
</tbody>
</table>
APPELIGE: 3

3.1 Hoe beweeg u gewoonlijk 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 hulp om rond te beweeg in die huis?
1= Ja 2= Nee
3.4.1. Gewone kierie
3.4.2. Kierie met 3 of 4 potte
3.4.3. Elmoong kierie
3.4.4. Loopwiel
3.4.5. Enkelskiplaat
3.4.6. Ander
Noem asb.

3.3 Hoe beweeg u gewoonlijk 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 hulp om rond te beweeg in die huis?
1= Ja 2= Nee
3.4.1. Gewone kierie
3.4.2. Kierie met 3 of 4 potte
3.4.3. Elmoong kierie
3.4.4. Loopwiel
3.4.5. Enkelskiplaat
3.4.6. Ander
Noem asb.

3.5 Voor u benoteer aanval, hoe het u rondbeweeg in u woonbuurt en ander plekke buite u woonbuurt? (Laat tot drie antwoordde toe.)
2.5.1 2.5.2 2.5.3
1= Mini-bus taxi
2= Bus
3= Trein
4= Motor, bestuurder
5= Motor, passasjer
6= Motorfiets
7= Fietse
8= Enkelskiplaat
9= Gestoot in rolstoel
10= Ander. Noem asb.
3.0 Sedert u beroerte, hoe het u rondbeweeg in u woonbuurt en ander plekke toe en by u woonbuurt? (Laat 'n drie antwoorde toe)

1= Mini-bus taxi
2= Bus
3= Trein
4= Motor, heeleander
5= Motor, passasier
6= Motorfiets
7= Plaas
8= Geloop
9= Gedoct in reëls
10= Andere. Noem asb.

APSLING: 4

4.1. Beskryf u huidige verblyfplek:

1= Dieselfde woning as voor die beroerte aanval
2= 'n Ander woning
3= Hoëring / verpligting
Indien u nie 'n ontstaal in 'n ander huis

4.2 As u nie teruggeskuur het na u vorige woning nie, vereik asseblief die hoofredes daarvoor:

1= Nie toepaslik
2= Vorige woning was nie goude nie
3= Groot verskeie by my vorige woning nie
4= Nie in staat om nog te kom nie (te veel tuin nodig)
5= Andere. Noem asb.

4.3. In daardie omgevend wat u kry het, waar u kry dit?

1.3.1 Gedurende die dag
1.3.2 Nokas

4.4 Beskryf u huidige woonplek:

1= Huur
2= Wooncel
tje Huur / Wooncel of bant in 'n agterplaas of en wat gedeel word
4= Dorpskuit, meerhuil of koophuil
5= Afrika-card
6= Informeel bybewoning / rondte in 'n informeel bybewoning
7= Informeel bybewoning / rondte in 'n agterplaas
8= Andere. Noem asb.

4.5. Moe deur trappe op klim om by u woning in te kom?

1= Ja
2= Nee

Noem asseblief:

1= Trap. Omtrent hoeveel?
2= 'n Trap – omtrent hoeveel trappes op die trap?
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 elektriesiteit?
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 oppervlak 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 rolstoel?
1= Ja 2= Nee 3= Nie toeganklik

4.15. Het u 'n telefoon?
1= Ja 2= Nee
Noem tel.
1= Landline binne woning
2= Selfoon
3= Buie se telefoon
4= Public Telephone nearby
5= Gaans hierdie gomme nie

DEEL 5: TERRUGKEER NA WERK OF PRODUKTEWIESE AKTIVITEITE

5.1. Is u tens in betaalde inkomensing?
1= Ja, betaalde inkomensing (Gaan assosieer na Vraag 3.2)
2= Nee, nie betaalde inkomensing (Gaan assosieer na Vraag 3.5)

5.2. Wat is die volgende na of op 'n huidige situasie?
1= Indienensoort
2= Ek is baie opgevoed om help in 'n familiese bekrachting
3= Ander. Noem self

5.3. Wat is die volgende werklike huur u nou?
1= Onbetaalde, hoeveel ure per week
2= Voltooi (Meer as 20 ure per week)
3= Onbetaalde werk, werk soms as lydelike wetker
4: Ongerepelte kontrakte vir sekere tydperke. Nom assosialief tipese ure per week.

5= Ander. Nom assosialief

5.4. Doen u nou diéselfde werk as voor u benotse aanval?
1= Ja, geregrees diéselfde werk
2= Diéselfde werk geregrees, maar verskillende werksoepragte
3= Ander werk

If answer is (3), ook
What kind of work do you do now?

5.6. As u nou nie werk nie, wat is die hoof redêe daarvoor?
1= Ek werk nie, ek soek nou werk
2= Ek werk nie omdat ek nou werk nie
3= Ek werk nie, ek sou werk, maar ongeskik vir werk is (ontvang in Ongeskiktheidslop of private versekeringstelsel)
4= Ek werk nie omdat ek nou werk, maar ongeskik vir werk is (ontvang geen Ongeskiktheidslop)
5= Algoms (Pensiônpensie)
6= Soog vir die huishouding, geen finansiële laste nie (dit wil in om kinders op te pas)
7= Leerling of student
8= Ondergaan werk heropleiding / beroepsopleiding

Indien (4), vra: Is in aanseens vir 'n Ongeskiktheidslop opgemerk?
1= Ja 2= Nee

Andere vra: Wat is die huidige status van u aanseens?
1= Aanseens word steeds gesersoete of geprocesseer
2= Aanseens gewen

6.4. Vandaar dat u uit die hooiplaag ontstaan is, het u in enige van die volgende aktiwiteite deelgeneem?
1= Ja 2= Nee

3.8.1. Onbetalde werk as in vrywillige
3.8.2. Onbetalde werk in in familiebeleid
3.8.3. Eet en ander, soos kykordoor kinders, bepaalde of stedelike
3.8.4. Werk in die huis, soos buitebeeld, onderhoud, kook, huismake, instandhouding, of herstelwerk
QUESTIONNAIRE COMPLETED 6 MONTHS POST STROKE

SECTION 1

1. Ungayiciczana njanso imeko yakho jikidele?  □
   1. Iilungu kakhulu
   2. Ilungile
   3. Inzi
   4. Imibh kakhulu

2. Ingaba udidiba rhoqo nezalamanc, nabuntuwana, ayakwazi ukudibana nabantu, njolo-ajalo?
   1. Ngephoni kwestinye ngasekwi □
   2. Kanye ngeveki
   3. Ubuncane kanye ngenyangange
   4. Maphanga kanye ngonyaka
   5. Zange khangwe

3. Ukuthanda kwakho ukudibana nabantu ungakubeka kweliphi izinga?
   □
   1. Iyakwanele isikhalu
   2. Iyakwenelele isikhalu
   3. Ayikwanele isikhalu
   4. Ayikwenelele isikhalu

4. Ngokuyazinywe nezalanyanga ezilulileyo impilo yakho ngokumzimba okanye uvalisekile 6 impilo yakho lozithathetha njani utubho udidibana nezalamana zaakho, nabalithole okanye abamvela, okanye imisebenzi yeqeta?
   □
   1. Hayi kusko-kusko/khange kwaphela
   2. Kacchina
   3. Kakhulu
   4. Ngamanadla kakhulu

5. Ingaba linthunja zikhathintela njani ezebenzini wakho okanye kweminye imisebenzi yakho kwesi nyanga ezilulileyo?
   □
   1. Khange korke-korke
   2. Kacchina
   3. Kakhulu
   4. Ngamanadla kakhulu

6. Ungakwazi ukuthembela kubamvelwe, kwizikhobo, okanye kusapho lwakho xamutshana uncedo ngezimhlabungexeka loxamakheka?
   □
   1. Ewe
   2. Hayi
7. Ingabu ukhonza umaantu kwabukuungqungqungu olanye kusapho lwakho onokuthi uzhinaye igala kuye/ubheke kuye, umaantu onokuthi umseko naye ngokuhluleka olanye lingakisi zakhe?
   1. Ewe
   2. Hayi

SECTION 2: Ukusebenzisa umcedo

2.1. Ungamase kunjaphi olomhlabolo olanye kwakhe listhokazi ololo wathlsa (ulathoto phelo olaho wondweswe) isihlakazi indawo izithetha?
   Nceda nika sizathu zokukudwa kwakhe, ukuba ayezo lisetsho, Nceda chiza sizathu.
   1. Ewe
   2. Hayi

<table>
<thead>
<tr>
<th>Igama lekhethela</th>
<th>Isizima okukakhetha</th>
<th>Ikhetla olukazi</th>
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<td>2nd listhokazi</td>
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</table>


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Kuhntenhlane

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Physiotherapy

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- [ ]
- [ ]
Occupational therapy [ ]
Speech and Language Therapy [ ]
Dietician [ ]
Psychologist [ ]
Umgcilo/uncile [ ]
Inhale [ ]
Community Rehabilitation Worker [ ]
(OMBENZI mukukuthi kugqama nabantu ababa)
ugqine [ ]
Self Help Group eg. Stroke Support Group [ ]
Cardiac [ ]
(qunyiruti umbhubho wezimakhosi wabahlobo)
Ukuba zikhomba ezinye, cacao [ ]

2.3. Kwezi nyanga zintandathu zishilaleyo ukho wanyanekwa ukuuya okanye uhlaliwe kusibonza inkingo zempilo engenza yokumphakalingeni kululipilelela kwinzelo ezishambaye?
1= Eve
2= Hayi

2.4. Kwezi nyanga zintandathu ukho wanyanekwa ukuuya okanye uhlaliwe inkingo zempilo engenza yengenza yemali?
1= Eve
2= Hayi

Section 3

3.1. Usbenzisa ntoni ukuphileleza phakathi kusikhaya?
1= uyalokho ukuthi amaba 2= hlafelele alelo amaba ngaraweni 3= ake wakhe 4= ezinci

3.2. Usbenzisa anye yezi zintlo ukuphileleza ngaphakathi ondinithi?
2.2.1. Intonga ekukhokhelo
1= Eve 2= Hayi
2.2.2. Intonga nasebhilela enemelweni emi 3 okanye 4
1= Eve 2= Hayi
2.2.3. Elbow crutches: intonga zokuthamba azibhika ezingizimbele
1= Eve 2= Hayi
2.2.4. Thyrhini yekuhamba
1= Eve 2= Hayi
2.2.5. Aheke spirit: intlo eloqinokhona ukucirenza injabhala inkho
1= Eve 2= Hayi
2.2.6. Ezinci, Cawka

3.3. Usbenzisa ntoni kakhulu ukuphileleza phandle kwakwazi?
1= uyalokho ukuthi amaba 2= hlafelele alelo amaba ngaraweni 3= ake wakhe 4= ezinci
3.5 Phambili kokuba uba nasitholwukhi, Ulufikela lula njani ezindaweni kwedawo
Othala kuyo (kwalingelo yakho) nakude? (khetha zibentathu)

<table>
<thead>
<tr>
<th>25.1.</th>
<th>25.2.</th>
<th>25.3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Igama</td>
<td>8 = Sibuzalo</td>
<td>10 = Ezinye Fihlo Zokuhamba, Cacisa:</td>
</tr>
<tr>
<td>2 = Ichazi</td>
<td>7 = Lhayisika</td>
<td></td>
</tr>
<tr>
<td>3 = Itshakinyi/Unicolive</td>
<td>8 = Ubuhmanda</td>
<td></td>
</tr>
<tr>
<td>4 = Imvo, ungomthetho/Passaport</td>
<td>9 = Ubuhlangana ngenkuluko</td>
<td></td>
</tr>
<tr>
<td>5 = Imvo, Uqutsha</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.6. Oku unesitholwukhi ufullela njani ezindaweni okuhaleseni nakude? (khetha zibentathu)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1 = Ichazi</td>
<td>6 = Sibuzalo</td>
<td></td>
</tr>
<tr>
<td>2 = Anicazi</td>
<td>7 = Lhayisika</td>
<td></td>
</tr>
<tr>
<td>3 = Itshakinyi/Unicolive</td>
<td>8 = Ubuhmanda</td>
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<td>9 = Ubuhlangana ngenkuluko</td>
<td></td>
</tr>
<tr>
<td>5 = Imvo, Uqutsha</td>
<td>10 = Ezinye Fihlo Zokuhamba, Cacisa:</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 4: DETAILS OF THE HOME ENVIRONMENT

4.1. Ungayishaka njani iSawula othala kuyo ngakho?

| 1 = Yindi |
| 2 = Ixololo (kwifuthi) |
| 3 = Ingotla | |
| 4 = Yewu, hlosi |
| 5 = Kwisawula yenke umncwane |
| 6 = Emakolyobeni | |
| 7 = Emakolyobeni, iThabi, umncwane (kukhethe yokho) |
| 8 = Enye, Cacisa |

4.2. Ubenzisa izithophu ukufikela kwiEsigciso yilitho?

| 1 = Izithophu, Cacisa isengakenni iqinzi izithophu |
| 2 = Izithophu, ziyuka, njengoba Hlobo |
| 3 = Izithophu, izinkalo, njengoba Hlobo |
| 4 = Izithophu, izinokuthula, njengoba Hlobo |

4.3. Kukho iImikhekhtshi?

1 = Ewe 2 = Hluphi

4.4. Kukho izithophu endwimi okanye ngaphakathi endwimi yakho?

1 = Ewe 2 = Hluphi
4.5. Unawa umbane?
1 = Ewe 2 = Hajiy

4.6. Unawa amanzi aceekeleko endimi?
1 = Ewe 2 = Hajiy

4.7. Unayo indawo yokuhlalaela okanye lakwawa okhaya?
1 = Ewe 2 = Hajiy

4.8. Ingaba etholilethi ngaphakathi okanye ingaphandle?
1 = Ngaphakathi 2 = Ngaphandle

4.9. Kufunda okanye indawo ezikhakamileyo ukuya etholilethi?
1 = Ewe 2 = Hajiy

4.10. Kufunda usukuze izwelephu ukufikilela etholilethi?
1 = Ewe 2 = Hajiy

4.11. Ukuba usebenzisa lwenzi chahir ukujikula ekhaya, uyakwazi ukufikilela etholilethi?
1 = Ewe 2 = Hajiy 3 = Engasebenzisa

4.12. Unayo ikhowu?
Noda izindo:
1 = Indlela yokuhlala ngaphakathi
2 = Ikhowu
3 = Inthombakwazi evumadlala
4 = Ikhowu kawonke-wonke
5 = Ayiko kwedlwa zingasentla

ICANDELO 5: Ukubeyela emsebenzisi okanye indlela osebenza ngayo

5.1. Ingaba usebenzisa obhalaayo iyasebenza? Uholo ophangaza ngale?
1 = Ewe, kunsabeni obhalaayo, izindlela yokuhlala 3-4
2 = Hajiy, emsebenzisi engaphakathi

5.2. Kwenzi indlela zilandlayo yomphakathi ophuza ngelo ukhambela yakho?
1 = Ndlela 2 = Inthombakwazi evumadlala
3 = Inthombakwazi evumadlala

5.3. Kwenzi indlela zilandlayo, lelithi olungaza ngucwonyo iyasebenza?
1 = Isikhathi – Cociisa iyume kwenzi
2 = Ingaphakathi
3 = Isikhathi
4 = Iyume kwenzi ukuhlala

5.4. Ingaba le sebenzisi akumwo, nguwaye kwa ngaphambi kokuphaka sisikhowukhwa?
1 = Ewe, lovumulo kweshe
2 = Umlazi emume, lomu obhebenzisa kwenzi
3 = Ingaphakathi

Ukuba ngu (3), chaza ukuba ubungenza ntoni?
5.5. Ukuba awusebenzini, yintoni unobanga wokungasebenzini kwakho?

1. Awusebenzini uyekhlongwe
2. Awusebenzini ukhethe ukungasebenzini
3. Awakhekhezi ukususa seengele ngokuphika nokuhubazeka (uhumana imali yoku/Akhubazeka/Five Insurances/Inhlopo ngokuphika okanye inzuko kwi-inhlopo seyibudlazi)
4. Awakhekhezi ukususa seengele ngokuphika nokuhubazeka (uhumana imali yoku/Akhubazeka)
5. Uhumana imali yomhalti phambili kunthumela
6. Uqonda khaya, akulayo nope ukuthi ukungasebenzini kwakhekhezi (kuqonda ukuselina abantu)
7. Uqonda khaya
8. Uqonda ukhatho (lomsebenzi kwakhekhezi kwehlidlo/wuphatho lobuchana)
9. Ezihle, Cisoxa

Ukuba impintafo kumtho (4) kuye, baza lingabe imali yoku?
1= Ewe 2= Haya

Khabele yenzwa?
1= tinzi ukuphila ngokubalulekile okanye sakhe ngakho
2= tinzi ukuphila ngakho

5.6. Ukususa olkho uphumlile esithathlelo, ukho wathatha inoxheba inkwazi zintlo zilondelayo?

5.6.1. Ukususa olkho njengevelindlu ugnathathelwa
5.6.2. Ukususa olkho njengevelindlu lef铲eli ungathathelwa
5.6.3. Ukususa olkhaya ukumaha abantu, abantu abakhele olkho abagcaka
5.6.4. Ukususa olkhaya kuzo izono umsebenzi olwococo akothleka, ukususa egezi, ukususa okanye akukho lephiko lisepe.
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, the person who have suffered a stroke or in my capacity as of the person who has had a stroke staying at

1. I have been invited to participate in a study, which forms part of a PhD thesis undertaken at the University of the Western Cape.

2. 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 meantime 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 selected 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 will allow 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.................................

UNIVERSITY of the WESTERN CAPE
Patiënte-inligting-/ Toestemmingstovorm

Die Rehabilitasie van Beroertepatiënte by Gemeenskapgesondheidsentums in die Metropoolstreek van die Wes-Kaap

Veeringenmerke:

Klaring deur of namens die deelnemer:

Ek, die ondergeteken de persoon wat in beroerte gehad het * of in my hoedanigheid as deelnemer de persoon wat in beroerte gehad het en te woon, bevestig dat:

1. ek genoeg is om deel te neem aan ’n studie wat deel vorm van h Ph.D-tesis wat aan die Universiteit van Wes-Kaapland ondernem word;

2.1 daar aan my verduidelik is dat die doel van die studie is om die uitkomstes en rehabilitasieprosesse van beroertepatiënte wat by Gemeenskapgesondheidsentums 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 versameld word met behulp van vraelyste en Miniie neurologiiese skote, 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 behandeling. As u teenwoordig ontstaan word, sal die navorsers u tuis besoek om die opvolgingssessies te doen.

Deel 2:

Vir hierdie deel word’n filmstoepof’n arbeidsbeoordelings met ’n videokamera opgeneem. Natuurlik uit die persoon word vir hierdie omdrae gegee. ’n Span terapeut sal sodoende die video-opname sal analiseer. U privaatheid word gewaarborg.

Deel 3:

Hierdie deel het nie met u te doen nie, maar wel met die terapeut en die organisatoriekse struktuur van die entums. Dit stel ook onderzoek in na die duur en die frekwensie van verg. Hierdie inligting sal bekend word deur middel van onderhoud na die terapeut.

2.3 Daar is aan my verduidelik dat standard Miniie skote 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 te beoordeel. Die video-opnames (opname 2) sal nie my normale terstgie beïnvloed nie. Ek is versker dat hierdie materiaal net bronne die manlike van hierdie wetenskaplike projek gebruik sal word. Al die data sal met groot respek behandel word om my privaatheid te verseker. Elke deelnemende patiënt 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 finansiële drukte sal baai nie.

2.5 Daar is aan my verduidelik dat die bevindings van hierdie studie in hie lede
aangebied sal word en in h professionele tydskrif gepubliseer kan word of as h
professionele verslag aangebied kan word.

3. Vrywillige en ingesigde toestemming

Ek het die vermoe om die inligting op hierdie bladsy te lees en ek neem die
vrywillige besluit om aan hierdie projek deel te neem. Ek is ingelig dat ek op
eenige stadium aan die projek kan onttrek. Dit sal geen gevolge hé vir my
toekomstige behandeling by die sentrum of in ander hospitale nie.

Geleken.......................................................... Datum..................

Versorger.......................................................... Datum..................

Navorser.......................................................... Datum..................
APPENDIX 28

iFomu yolwazi / ndeWwume yeSigulana

UBuyiselo kwiliMako yeSigulana iweSigulana ezifelwe ngumazimba kuMaziko ezeMphilo oLuntu kwilNgila kaMaspa koMbsa weNtoshona Koloni

iNombolo yeSalahlisi:

iN gloyo yomhlabathi-maxhabe okanye agamani laha:
Mn a ubhathwe apha, .......... mutu u-thi wafelwa ngumzimba * okanye kwakhuddla sam njenge .....
walo mutu u-thi wafelwa ngumzimba ohiha a ............... ndiyavuma ukuba.

1. Ndizinyekele ukuba uthathatho maxhabe kuphando, eyinolegenye yehezi el ye-
PhD efuguthwe kunYunikathile yeNtoshona Koloni.

2.1 Kucadziwe kum ukuba injengolo yolu phando kukuqundakala isiphumo

nenkubho zombieuyiselo kwimo yeSigulana ezifelwe ngumzimba

ozinyanga kaMaziko oLuntu ezeMphilo kwilNgila kaMaspa koMbsa weNtoshona Koloni

2.2 Kucadziwe kum ukuba olu phando lunemacakelo amakhathu:

iCandelo 1:

Ukazi olumuselume nokuqalisa kwakhe luya kufangela, ngokusebenza

imizano nentlinganisiyo yenzakalisa kwelekayo yezifundo zemhlabo kahlanjalo

owlazi olufanisheko zonyanga kwakhe. Olu phoncezelo luya kwenzakala xa uqalisa

ime yakubusela esihletho. Kh ukuhlati esihlelwa kwaxesigulana ez0-2, nesel-

lenkubho zonyanga ngumzimba.

Ukuba sele ukuhlulewe esihlelwa ngesi umuhando luya kulukulela ekrabe nayo inko

ukuze enko uphando tolandelelana.

iCandelo 2:

Luphathu ukuseleni ngaakhamera yevidwo mhlawumilo kwesinshani yomzango

lonzimba ngamatholambo okanye umzango linghamlo ngomakwazi ukuthembani

onjaniyo ihiraphi. Kuphela sithe kwizigulana ezine esikhawaliwayo keku

nakholiselo. Emva koko isipho lengcane zonyanga zize kuqashulayo ezi vidwo. Kuyaqinisekile omphila

ukusa akufamba ukuthi umusa umgubani na.

iCandelo 3:

Lena akhulawumilanga nabhe kodwa linxelume nengcane yezonyanga kwakanye

nenkubho yemazefo. Kodwa shanda yamsekhe nokukhomba koryango. Olu lwa

luza kutungana ngokuphube udlakananiyo nesigathini zonyanga.

2.3 Kucadziwe kum ukuba llinganiselo ecacileyo yomzangotho iyaseyiyenzezelela

kwinqanana lubukala lekuphela ukuqaleka lonye ulwazi. Inti yokuva olu

phoncezelo lupilindana amasekhe ngamakhosha indleko titheka lokalandela

usisho lekuwa. Ilirekho zeviyo (icandelo 2) aziyi kubalapho kuyengango

iwam kwisiqhele. Suyaqinisekile ukuba oku kufandalwenye luza kusethi

iskhe kwiseko salo phumya yunzi ulwazi. Lonye ulwazi luza kuphathwa
ngayona mbele okazi ukugciniski ikhosi loquatla lam. Zonke iziculana
ciphathu hinxheba ziza kuthuma likhwadi kwaye nentlelo ise
kuqinisekisana.

2.4 Kucadlise k而来 ukuba andiziluthawela zindleko zonqacelwane
cyokuthathu hinxheba kantu phendo, kwaye andi lekuza mali kulu.

2.5 Kucadlise k而来 ukuba iziphozo zokuthaphezo ziza kuthwa liphinda kwesiyazi
zingakakhuluma kwimlathulamela yenzigqicile otkayi zizikhwe liphinda
nyebe esti.

3. Ixhoma yokuzulandela nemfumla
Ndathabisa ukuphinda olu kuba manjeza kwaye ngesikhetha ngokukhulu
ukuthathu hinxheba kule prousukhile. Ndazakwa ukuba ndikuthukile ukuba
ndihloko kule prousukhile ngakaphila ngesi. Olu kuba nafutha ku
lwem khweza elizaya kwiziko otkayi ezinike ezibhedi.
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: ________________________, discloses 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/Afrikaans/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...9902542.

Mrs Anthea Rhode
APPENDIX 30

Pasiënt se toestemmingsvorm:

DIE REHABILITASIE VAN BEROERTEPASIËNTE BY GEMEENSKAPSKESONDHEIDSCENTRUMS IN DIE METROPOOLSTREEK VAN DIE WES-KAAP

EK STEM VRYWILLIKLIK IN OM AAN BOGENOEMDE NAVORSINGSPROJEK DEEL TE NEEM:

Goteken te…………………………………….. op ……………………………………….. 20.

…………………………………………………………………………………………………………………………

Deelnemer/verteenwoordiger se * handteken of regterdiumafdruk

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 homheflike versoek het om vrae te vra en dié nie duidelik is nie.
3. die gesprek in Afrikaans/Engels/Khoosa plaasgevind het en dat geen tolk gebruik is nie.

Goteken te……………………………………………………………………………… 20.

………………………………………………………………………………………………………………

Navorser

* Sterp in die 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 ontkom as gevolg van die studie, of
2. enige ademale inligting oor die studie nodig kry,

skakel my asseblief telefoonies by 021 9592542

Mrs Anthea Rhodes
LIITA YEMVUMA YESIGIULANA:

UBUYISELO KWIMEKO YESIQHELO LWEZIGULANA EZIFELWE NGUMZIMBA
KURAZIKO EZEMPIOLO OLUNTU KWINGILA KAMASPALA OMBAXA WENTSHONA
KOLONI

NDIYAVUMA NGOKUZITHANDELA UKUTHABATHA INKAXHEBA KULE
PROWULEKTHI YOPHANDO IKHANKANYWE NGENTLA APHA:

Ityikwe e...............................................ngo.............................................20.

.................................................................
Umtetykwa umthuthathini-xinkanhele/immelti * okanye ubhontsi wasakunene

Intetho yomphambi

Mna, ................................ ndziza ukuba:

1. Ndlicolisisile ulwazi oluphathwa kolwenzu kwabheku, .., sakulokanye
   umphambi wakhe.
2. Ndlicolisisile yena okanye ibone ukuba abange abanye nje ukuba isebheku into
   engacocanga.
3. Lo nesiko laphuphe ngesiMzimakwaziShitaulaKhosa kwaye uluku teliko
   isiyenzahlwano.

Ityikwe e...............................................ngo.............................................20.

.................................................................
UMphambi

* Yindrome ukuba ayifanelelithwa

ULWAZI OLUBALULEKWE:

Mthethwa-xinkanhele othandojwayo:

Ndiyakubulela ngokushabathana inxokheba kolwenzu phakathi. Ukuba kule naphaphila
ikelela kule provuwilelithi:

1. Kukho impexeni eziyukayo ngenxa yophandla okanye,
2. Uluna ulwazi olungemelelelithwa malungo nophando

Nokudlala ngametilizifanyika kuze nomzolo: 021...5602542
Nkaz Anthea Rhoda