

**A PROFILE OF STROKE CLIENTS TREATED AT THE  
BISHOP LAVIS REHABILITATION CENTRE BETWEEN  
1995-1999**

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## DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my original work and that I have not previously in its entirety or part been submitted it at any university for a degree.

**Signature**

**Date**

## ABSTRACT

The objective of this retrospective survey of client documentation, was to develop a profile of the stroke clients attending the Bishop Lavis Rehabilitation Centre between 1995 and 1999. Reviewed during the survey, was the medical status of the clients, as well as certain aspects of the rehabilitation process. The data was analysed using the Statistical Package of Social Sciences (SPSS) as well as the Statistical Analysis System (SAS) computer programmes. The study sample consisted of 168 clients. A significant finding in the study was that the mean age of the study population was 59 years. Hypertension was the most common risk factor present in this group. There is some indication from the results that approximately half of the clients were not hospitalised post-stroke. A positive finding in the study was that the majority of clients were referred for rehabilitation within 12 weeks post-stroke. Although a team of professionals was available to manage the stroke clients, the services of the dietician and the social worker appear to have been under utilised. An overall improvement in the functional status of the group was noted when comparing the function on admission to that which was recorded at the last treatment session.

## ABSTRAK

Die doelwit van hierdie retrospectiewe studie van kliente dokumentasie was om a profiel van die beroerte kliente wat Bishop Lavis Rehabilitasie Sentrum tussen 1995-1999 bygewoon het, te verkry. Tydens hierdie studie is die kliente se mediese toestand as ook sekere aspekte van die rehabilitasie proses, ondersoek. Die SPSS en die SAS komperprogramme was aangewend om die inligting te analiseer. Die streekproef het bestaan uit 168 kliente. 'n Insiggewende bevinding in die studie is dat die gemiddelde ouderdom van die studie-populasie 59 jaar was. In hierdie groep was hoëbloedruk die mees algemene risiko factor. Vanuit die resultate is daar 'n aanduiding dat ongeveer die helfte van die groep nie na die beroerte gehospitaliseer was nie.

'n Positiewe bevinding van die studie was dat die oorgrote meerderheid kliente vir rehabilitasie verwys was binne 12 weke na die beroerte. Alhoewel 'n professionele span beskikbaar was om die beroerte kliente te bestuur, was die dienste van die dieetkundige en maatskaplike werker skynbaar onderbenut. 'n Algehele verbetering in die funksionele status van die groep was waargeneem nadat die funksie, by toelating, met die van die laaste behandelingssessie vergelyk was.

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## CHAPTER 1.0

### INTRODUCTION

Stroke is the third leading cause of death and a major cause of disability in most societies (Duncan 1994; Bonita 1992). South African society has not been spared from being affected by this condition. Fritz (1995) indicates that in South Africa, stroke contributes to 7.2% of all deaths and 7.9% of deaths in persons between the ages of 35 and 64 years. The author also reports that stroke is among the most common chronic diseases of lifestyle as well as cause of disability (Fritz 1995).

Stroke has also been found to be a major cause of disability amongst communities in the Western Cape. Futter (1996) found that among a group of individuals who were bedbound, almost half were stroke survivors. It was also identified as the most common cause of physical disability in the Bishop Lavis Community (Disler, Jacka, Sayed, Rip, Hurford, Collis 1986).

The impact of stroke is profound, frequently leaving a large percentage of the survivors disabled (Mayo, Wood-Dauphine, Ahmed, Gordon, Higgins, Mcewen, Salbach 1999; Reddy & Reddy 1997; Duncan 1994), who are costly to manage. (Kaste, Fogelholm, Rissamen 1998).

Besides having a major effect on the quality of life of the individual, a stroke also affects those with whom the stroke survivor is in close contact. A large percentage of carers of stroke clients experience emotional problems (Teel,

Duncan, Lai, 2001; Dennis, O' Rourke, Lewis, Sharpe, Warlow 1998; Anderson, Linto, Stewart-Wynne 1995) such as depression and anxiety (Flick 1999).

It is a well-known fact that stroke can, to a certain extent, be prevented (Gorelick, Sacca, Smith, Alberts, Mustone-Alexander, Rader, Ross, Raps, Ozer, Brass, Malone, Goldberg, Boos, Hanley, Toole, Greenhold, Rhew 1999). Prevention therefore remains an important strategy in substantially reducing the incidence, mortality, recurrence and subsequent disability of stroke (Joseph, Babikian, Allen, Winter 1999).

Rehabilitation is seen as important in order to address the problems faced by clients post-stroke. In developed countries where the medical model still predominates, institution-based rehabilitation is still the first choice for the management of stroke clients. However, in developing countries where resources are scarce and the move towards the social model is occurring, stroke clients are mainly managed in the community.

Like many other developing countries, South Africa has adopted the primary health care approach as the most appropriate strategy to meet its health care needs (Department of Health 1995). Primary health care, as determined at Alma Ata by the World Health Organisation, is "essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost the community and the country can afford" (World Health Organisation 1978).

In a primary health care approach, more emphasis is placed on Community Health Centres, as they are the first point of entry into the health care system.

The objective of Community Health Centres is to provide primary level care to all its clients. As the services at these centers includes preventative, promotive,

rehabilitative as well as curative services, the Community Health Centre is in most cases, the first medical facility the post- stroke client would access for care.

The Bishop Lavis Rehabilitation Centre, which forms part of the Bishop Lavis Community Health Centre, aims to provide a comprehensive rehabilitation service to the community it serves. The Bishop Lavis Rehabilitation Centre has been in operation since 1994, and stroke is the most common neurological condition treated. Approximately thirty new patients are referred each year.

The overall aim of this study was to compile a profile of the stroke clients treated at the Bishop Lavis Rehabilitation Centre. This profile was developed by reviewing the patient records kept at the Rehabilitation Centre. The study aimed to provide relevant information about stroke clients accessing a primary care setting and would assess, to some extent, whether the present rehabilitation programme offered at the centre was suitable for these clients. The information obtained from the study would also assist efforts to develop stroke preventative programmes and health promotion programmes relating to stroke, activities which form an essential part of primary health care.

## **CHAPTER 2.0**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

The body of literature relating to stroke is vast, covering topics which range from the aetiology, epidemiology, risk factors and preventative medicine to relevant aspects relating to post-stroke management.

For the purpose of this thesis, the literature review will be confined to key areas covering the following:

- 1) Definition of stroke
- 2) Epidemiology
- 3) Risk factors associated with stroke
- 4) Stroke outcomes
- 5) Stroke rehabilitation

#### **2.2 DEFINITION OF STROKE**

Stroke is defined as “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 of vascular origin” (Bonita 1992).

Stroke, which is also referred to as a cerebrovascular accident, is caused by the sudden interruption of blood flow to part of the brain. It leads to death of brain cells which results in impaired body functions controlled by that part of the brain (Mower 1997; Wade 1974).

Strokes are classified as either ischaemic or haemorrhagic in origin. An ischaemic stroke occurs as a result of an embolus or thrombus blocking a cerebral artery.

A haemorrhagic stroke on the other hand occurs as a result of a ruptured cerebral artery (Mower 1997). Most strokes are ischaemic (Mower 1997) with haemorrhagic stroke only constituting about 10% of all strokes (Stewart 1999).

Computerised axial tomography (CT scan) is the most reliable way of differentiating between an infarct or a haemorrhage (Poungvarin 1998; Kalache & Aboderin 1995; Wade 1974). As CT scan investigations are expensive and therefore not freely available, Poungvarin (1998), suggests the use of the Sirija stroke score to clinically distinguish between the two types.

## **2.3 EPIDEMIOLOGY OF STROKE**

### **2.2.1 Mortality of Stroke.**

Following heart disease and cancer, stroke is the third most common cause of death in industrialised countries (Kaste *et al* 1998; Warlow 1998; Kalache & Aboderin 1995; Bonita 1992). This also appears to be the case in developing countries, as Murray and Lopez (1997) reported in their global burden of disease study that stroke was the second most common cause of death in 1990. Out of a total of 4.38 million people who suffered a stroke, 3.9 million were in developing countries.



Variations in mortality rates exist globally. Kalache & Aboderin (1995), using data from the World Health Organisation's Statistics Annual, compared the mortality rates of men older than 55 years. The USA had the lowest mortality rates at 182.3/100 000 while the UK had mortality rates of 317.4/100 000 and Bulgaria reporting the highest mortality rates at 926.3/100 000. Mortality rates are higher in poorer developing countries, than in the more affluent developed countries (Murray and Lopez 1997; Kalache & Aboderin 1995).

There are two opposing trends visible in the literature regarding mortality. Although the mortality rate following stroke has decreased in developed countries such as the United States (Helgason & Wolf 1997), this has not been the case for developing countries such as Poland (Rylgiewicz, Polakowska, Broda, Roskiewicz, Jasinki, Hier 1997). A possible explanation for the decrease in mortality, especially in the United States, is the improved management of risk factor control, especially the control of hypertension (Bonita & Beaglehole 1993).

In South Africa, stroke is the third most frequent cause of death. In 1990 stroke accounted for 7.2% of all deaths and 7.9% of deaths in the age group 35 years-64 years (Steyn, Fourie, Bradshaw/ 1992). When investigating mortality trends of CVA in South Africa, a 13% decrease in the mortality of white males was noted although there was no similar observable decline in coloured and asian males (Wyndham 1982).

### **2.2.2 Incidence / Prevalence of Stroke.**

The incidence rate of stroke is usually given as the number of new cases/

100 000 of the population during one year (Kaste *et al* 1998; Kalache & Aboderin 1995; Bonita 1992).

Following eleven comparable community-based studies during the 1980's and 1990's the following incidence rates (given in increasing frequency) were found: (Sudlow & Warlow 1997).

France	238/100 000
New Zealand	350/100 000
Australia	361/100 000
USA	362/100 000
England	379/100 000
Italy	393/100 000
Denmark	413/100 000
Sweden	484/100 000
Russia	627/100 000

As in the case of mortality, incidence of stroke increases with an increase in age (Kaste *et al* 1998; Kalache & Aboderin 1995, Terent 1993; Bonita 1992). Terent (1993) reports that on average in a population of 100 000, thirty three (33) people aged between 33-45 years will experience a first ever stroke, while in the age group 75-84 years, the figure increases by 50-fold.

The incidence rate also appears to be higher in blacks than in whites. Rosmand, Folsom, Chambless, wang, McGovern, Howard, Copper, Shahar (1999) found that blacks in the Unites States were at a 38% greater risk of experiencing a

stroke than whites. Similarly Bonita, Broad, Beaglehole (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.

The best measure of the total burden of stroke is however, prevalence (Bonita 1992). The prevalence of stroke is the proportion of the population that is affected by a stroke at any given time (Terent 1993; Bonita 1992). The average age-adjusted prevalence is reported to be 501 per 100 000 of the world population (Terent 1993). There is however no accurate data available on the incidence and prevalence of stroke in South Africa (Fritz 1995). In a study of 212 blacks in Atteridgeville and Mamelodi in South Africa, Rosman (1986) found an incidence rate of 615 per 100 000 in the age group 65 years to 74.

With the incidence of stroke remaining stable and the mortality decreasing, together with a progressively aging population, the number of stroke victims is increasing substantially in developed countries (Gresham, Alexander, Bishop, Giuliani, Goldberg, Holland, Kelly-Hayes, Linn, Roth, Stason, Trombly 1997). The burden of care for stroke would therefore increase. This would greatly impact on the rehabilitation services needed post-stroke.

### **2.3 RISK FACTORS ASSOCIATED WITH STROKE**

Risk factors for stroke can be divided into modifiable and non-modifiable risk factors (Wolf 1998; Kalache & Aboderin 1995).

Age, race and gender are regarded as the non-modifiable risk factors, whereas modifiable risk factors include: hypertension, diabetes, elevated blood lipid levels, obesity, smoking, alcohol consumption, atrial fibrillation, as well as carotid artery

disease (Gorelick *et al* 1999; Wolf 1998; Kalache & Aboderin 1995; Bonita 1992). Information concerning the effects of race and age (non-modifiable risk factors) as they relate to stroke has already been mentioned in the section on the epidemiology of stroke. With regards to gender it appears that the life-time risk of having a stroke is higher in males than in females (Kalache & Aboderin 1995; Terent 1993; Bonita 1992). Stroke incidence rates are also higher in males than in females in the younger population. (Thordsvaldsen *et al* 1995).

The following well-established risk factors for stroke will be discussed: hypertension, smoking and diabetes. Hypertension is widely considered as the major contributor to stroke in the general population (Tegos, Kalodiki, Daskaslopoulou, Nicolaidis 2000; Gorelick *et al* 1999; You, McNeil, O'Malley, Davis, Thrift, Donnan 1997; Levien & Fritz 1997; Kalache & Aboderin 1995; Bonita 1992; WHO 1989). In the WHO Monica Project, blood pressure was considered to be elevated if the systolic blood pressure was >160mmhg or the diastolic pressure was >95mmhg (Thorsvaldson *et al* 1995). It has been found in various studies with large population sizes, that the treatment of hypertension reduces the incidence of stroke (Wolf 1998; SHEP Co-operative Research Group 1991; Collins, Peto, MacMahon, Herbert, Fienbach, Eberlein, Godwin, Qizilibash, Taylor, Hennekens 1990). Smoking is another important modifiable risk factor for stroke (Tegos *et al*)2000; Wolf 1998; Tanne, Shlomit, Goldbourt 1998; Levien & Fritz 1997; Kalache & Aboderin 1995). In a meta-analysis of thirty-two studies Shinton & Beevers (1989) reported that the relative risk of stroke for smokers is 1.5 times higher compared with non-smokers. There appears to be some

correlation between the number of cigarettes smoked and the risk of experiencing a stroke, the risk increasing with an increase in the number of cigarettes smoked (Tegos *et al* 2000; Gorelick *et al* 1999; Boysen 1993; Wolf 1988).

Diabetes is another well-established modifiable risk factor for stroke. (Gorelick *et al* 1999; Tanne *et al* 1998; Kalache & Aboderin 1995). As diabetes is a major risk for large artery atheroma, the presence of diabetes could predispose one to ischemic stroke (WHO 1989).

The knowledge of risk factors for any condition is important if strategies for the prevention of the specific condition are envisaged.

The above modifiable risk factors are also prevalent in the South African society (Fritz 1995; Steyn *et al* 1992). Steyn *et al* (1992) estimated that 4,88 million South Africans smoked while 5,5 million had blood pressures above 140/90 mmHg.

## **2.4 STROKE OUTCOMES**

### **2.4.1 Post-stroke Disability:**

Stroke is an undisputed major cause of disability (White & Johnstone 2000; Helgason & Wolf 1997). In the United States, of the 500 000 people who have a stroke, 300 000 are left disabled (Agency for Health Care Research 1995). Bonita *et al* (1997) reports an estimated disability rate in New Zealand of 4.6 per 1000 of the population 15 years and older. No specific data relating to the extent of disability post-stroke is available in South Africa (Hale & Eales 2001). This is to

be expected, as data relating to the prevalence and nature of disability in South Africa are also seriously lacking (Department of Health 1997).

It is important to note that stroke is a sudden event and not a progressive disabling condition. The impacts of stroke occur therefore immediately and not over a period of time (White & Johnstone 2000; Wyller & Kirkevold 1999). The World Health Organisation's International Classification of Impairment, Disability and Handicap (ICIDH-1), first published in 1980, has been found to be the most popular referred to framework for understanding the effects of stroke and the impacts that it would have on the individual. The World Health Organisation classifies disablement at three levels: "impairment" relates to the loss experienced at the level of the organ or body part; "disability" relates to the restriction of the person to be involved in activities and the term "handicap" refers to the limitations experienced by the person to fulfill specific roles (WHO 1980).

Due to the changes in health care and the new social framework of disability, it became evident the ICIDH-1 needed revision (WHO 1999). It has therefore recently been amended and is now known as "The International Classification of Functioning, Disability and Health" (ICIDH-2). In the new version, the term disability is replaced by "activity limitation" where an activity is seen as a task or action performed by an individual. Activity limitations are the difficulties the individual has in performing the task. "Handicap" has also been replaced by the term "participation restriction" which refers to the individual's problems regarding the manner or extent of involvement in life situations (WHO 1999). The new classification is social model orientated and, for the first time includes an in-depth

analysis of environmental factors that may further impede an individual's participation in society (WHO 1998).

It has been commented by Wade & De Jong 2000 that this model is useful in analyzing a client's problems and therefore encourages a more systematic approach to rehabilitation. One weakness that has been identified however, is a failure to consider the quality of life of the client and therefore not allowing for the client's subjective experience of disablement (Wade & De Jong 2000).

The most common impairments that occur following stroke are impaired motor function, sensory deficits, abnormal tone, perceptual and cognitive limitations, speech impairments and depression (Mayo *et al* 1999; Clarke, Black, Badley, Lawrence, Williams 1999; Duncan 1994). Functional limitations experienced following stroke are restrictions in transfers, gait and activities of daily living (Mayo *et al* 1999; Duncan 1994). The participation restrictions that are experienced by stroke clients are a decrease in mobility in the home and community, an inability to return to previous employment as well as limited involvement in recreational and social activities (Clarke *et al* 1999). Participation factors that are known to be affected are the social interaction of the clients and the ability to assume their pre-stroke roles (Dowswell, Lawler, Dowswell, Young, Forster, Hearn 2000). In the qualitative study done by Dowswell *et al* (2000), the subjects expressed the view that social isolation was not only due to physical obstacles that limited their social functioning, but also the client's feelings of shame. These clients also felt that they had no purpose, and could not fulfill their

prior roles. Emotional and behavioral problems experienced by stroke survivors therefore also impact on their social functioning (Hostenbach 2000).

Over and above the latter, it is important to note that stroke also has an effect on the quality of life of the individual (Hochstenbach 2000). The quality of life of an individual relates to the individuals perceptions of his or her emotional, social and physical well-being, and is said to encompass more than the sum of the effects of the impairment, the activity limitation and the participation restriction (Duncan 1994). However, the vast body of literature on the subject of stroke appears to be primarily research related to the impairments.

A number of impairments and activity limitations have been identified as indicators that can predict poor functional outcome post-stroke: these are disability level on admission, incontinence, degree of motor paresis, cognitive status, recurrent stroke, sitting balance and level of perceived social support (Reddy & Reddy 1997, Kwakkel, Wagenaar, Kollen, Lankhorst 1996; Jongbloed 1986). The use of predictive factors of poor functional outcomes post-stroke assists in the establishment of realistic goals and planning of appropriate interventions for stroke clients (Kwakkel *et al* 1996; Duncan 1994).

#### **2.4.2 RECOVERY POST-STROKE:**

When investigating the recovery process post-stroke it has been found that stroke clients progress mostly within the first three months post-stroke, with the majority of improvement seen within the first month (*Mayo et al 1999; Gresham et al 1997; Jorgenson, Nakayama, Raaschou, Vive-Larsen, Stoier, Olsen 1995*).



In a community-based study performed by Jorgenson *et al* (1995), 95% of the population achieved their best neurological recovery i.e. recovery of motor function, sensation and speech by 11 weeks post-stroke, while their best activity of daily living scores was recorded at 12.5 weeks.

The recovery rate post-stroke is however, linked to the initial severity of the stroke. Clients with milder strokes reach their highest functional levels earlier than those with more severe strokes (Jorgenson *et al* 1995; Duncan 1994).

A reliable prognosis can however be made regarding all stroke clients who are engaged in a rehabilitation programme, within the first 12 weeks post-stroke (Jorgenson *et al* 1996).

The recovery of both impairments and functional status post-stroke as discussed previously has however, been investigated in groups of stroke survivors undergoing rehabilitation. In developed countries where rehabilitation services are accessible to almost all stroke clients it would be ethically unacceptable to include a non- treatment group as a control group when conducting research. It is therefore difficult to deduce whether the results obtained are due to the natural recovery process of the disease or due to the effects of rehabilitation (Ward & Madison 2000; Gresham *et al* 1997). As rehabilitation services are not available to all people with disabilities in developing countries such as South Africa, it would be easier to include a control group.

### 2.4.3 IMPACT OF STROKE ON CARERS

It is widely known that stroke does not only affect the individual but affects the whole family. The family system should be seen as a sensitive structure. A change in one member of the family therefore affects all the members, disrupting the family unit (Medallie 1997). Stroke clients who, post0stroke are left with a resultant activity limitation and participation restriction often need the assistance of someone in the community to assist them with their function (Anderson *et al* 1995). "The person that is most closely involved with the person's ability to function independently in the home, is regarded as the caregiver" (Teel *et al* 2001; Anderson *et al* 1995).

A large percentage of caregivers experience emotional problems (Teel *et al* 2001; Anderson *et al* 1995; Dennis *et al* 1998) as well as a decreased social life (Anderson *et al* 1995). Psychosocial factors, such as dementia and changes in behavior, rather than physical factors such as the inability to walk have the greatest effect on carers (Han & Haley 1999; Dennis *et al* 1998; Anderson *et al* 1995).

In the majority of cases, caregivers are family members, with spouses being the most likely caregiver, followed by the client's own children (Teel *et al* 2001; Dennis *et al* 1998; Anderson *et al* 1995). As most stroke survivors are between 60 years and 80 years, most of the caregivers are elderly and therefore often have illnesses of their own, which negatively influences their ability to act as caregivers for the stroke client (Anderson *et al* 1995). Caregivers at greatest risk of experiencing a high burden of care, are those with a low income and minimal

social support, and those having to care for patients with dementia and aphasia as well as a stroke (Flick 1999).

As institution-based care is becoming more expensive, there is a global move to early discharge of patients who are then managed in the community. This places increased responsibility on the carers which, in turn, could lead to greater carer stress. The assessment of stroke clients should therefore include the assessment of the status of the carer. The social support provided to stroke clients should also be extended to their carers, as some evidence exists that suggests that community support programmes reduce caregiver anxiety. (Weir 1999)

## **2.5 STROKE REHABILITATION:**

### **2.5.1 Introduction**

As previously mentioned in this chapter, stroke survivors are often left with a resultant activity limitation, and/or participation restriction, and a reduced quality of life. Rehabilitation is aimed at reducing the impacts of the above on the individual in an attempt to regain the previous level of functioning of the person (Wressle 1999; Reddy & Reddy 1997; WHO 1994). Included in the concept of rehabilitation is the social integration of the person with a disability (Integrated National Disability Strategy 1997; Hellander 1993).

Due to the multifaceted nature of the effects of a stroke, the goals of rehabilitation should not only address the impairments but also improve the

patient's quality of life. It should as far as possible aim at allowing the person to live independently at home and take advantage of job and recreational activities.

(Hoening, Horner, Duncan, Clipp, Hamilton 1999; Mayo *et al* 1999; Ward & Madison 1997; Reddy & Reddy 1997; Gresham *et al* 1995; Duncan 1994).

Factors that seem to have a positive effect on the outcome of the rehabilitation of stroke patients include: the manner in which the rehabilitation is structured, the severity of the stroke, the starting time and the intensity of rehabilitation as well as the availability of social support (Rosenberg & Popelka 2000; Reddy & Reddy 1997).

### **2.5.2 Rehabilitation Strategies:**

There are different strategies for rehabilitation: institution-based, outreach and community-based (WHO 1994). Stroke rehabilitation may therefore be provided in an acute setting such as a stroke unit, or a sub-acute setting such as a nursing home or sub-acute rehabilitation hospital, out-patient department and /or within the home environment (Flick 1999; WHO 1989). It is widely accepted that stroke clients who are admitted to hospital are better managed in stroke units than in general medical wards (Langhorne 1997; Van Gijn & Dennis 1998; Ronning & Guldvug 1997; Indredavik, Slordahl, Bakke, Rokseth, Haheim 1997; Djikerman, Wood, Hower 1996). This may be due to the multidisciplinary rehabilitation programmes offered in stroke units by specialist rehabilitation staff (Van Gjin & Dennis 1998). These programmes include education and training of both staff and caregivers, as well as services provided by specialized medical and nursing

staff (Van Gijn and Dennis 1998). It has been reported that management of clients in stroke units decreases mortality, as well as the number of clients needing institutionalization. Quality of life for these clients is reportedly also improved (Longhorne 1997; Indredavik *et al* 1998).

As time spent in hospital incurs large costs, there has been a move to earlier discharge. Studies indicate that there is no difference in the outcome of those clients who are discharged early from hospital and managed in the community by a multidisciplinary team of therapists, compared with those who spend a longer period of time in hospital for rehabilitation (Anderson, Mhurchu, Rubenach, Spencer, Winsor 2000; Holmqvist, Von Koch, Kostalus, Holm, Widsell, Tegler, Johansson, Alamazan, Depedro-Cuesta 1998; Rudd, Wolf, Tilling, Beech 1997). The home as opposed to day hospital visits, seems to be the more appropriate setting for this follow-up care (Young & Forster 1992). Managing the clients in their homes facilitates better integration into the community (Leichfuss 2001). It also provides the therapist with an opportunity to assess the client within his unique environment (Leichfuss 2001; Holmqvist *et al* 1998).

However, it is important to note that not all stroke clients are necessarily hospitalised. While ninety five percent of clients in Sweden are admitted to hospital, (Holmqvist *et al* 1998) the admission of stroke clients in the United Kingdom varies from 70% (Rudd *et al* 1997) to 55% (Van Gijn & Dennis 1998) while Germany has a 94% admission rate (Kolominsky-Rabas, Sarti, Heuschmann, Graf, Siemonsen, Neundoerfer, Katalinic, Lang, Gassman, Von Stokert 1998). Not all stroke survivors are therefore managed on a continuum of

care which starts in the acute hospital-based setting and ends in the clients home.

In South Africa there is lack of co-ordination of stroke rehabilitation programmes as well as a lack of a central health plan for the rehabilitation of stroke patients (Fritz 1995). Those stroke patients who are hospitalized are often discharged with naso-gastric tubes and catheters as the beds are needed by patients who are seen to be more ill (Fritz 1995). Stroke clients are discharged early from hospitals, even though community rehabilitation services have been found to be inadequate (Hale & Walker 1996).

According to the experience of the researcher, rehabilitation of stroke clients in the Western Cape lacks definite structure. Stroke clients are only admitted to acute settings if they are medically unstable, irrespective of the severity of their functional inabilities. Those clients admitted to hospital will receive acute in-patient rehabilitation services for the time that they are hospitalized. They will then be referred to community rehabilitation services with a small number being referred to sub-acute in-patient rehabilitation facilities. The stroke clients who are not admitted to hospital may receive out-patient rehabilitation. In some cases these services are totally inaccessible and therefore rehabilitation is very limited. These clients could theoretically be referred to in-patient rehabilitation centers, but to date there is no clear protocol to indicate the referral process and likelihood of admission of clients following a stroke. An analysis of the rehabilitation services in South Africa in 1997, revealed that these services are largely underdeveloped and inaccessible to the majority of the population,

especially those living in the rural areas. In a response to this the National Rehabilitation Policy does state that rehabilitation services should be made available to all (Department of Health 2000).

### **2.5.2 Starting times and intensity of rehabilitation**

In addition to the fact that recovery post-stroke is likely to reach a plateau within the first three months, studies have also indicated that there is a definite positive relationship between the starting time of rehabilitation and the outcome. The sooner rehabilitation is started post-stroke the better the functional outcomes will be (Inouye, Hashimoto, Mio, Sumino 2001; Rosenberg & Popelka 2000; Cifu & Stewart 1999; Hoening *et al* 1999;).

The relationship between the intensity of rehabilitation and improved functional outcome is however weak (Cifu & Stewart 1999). Although Kwakkel *et al* (1997) in a systematic review of 20 articles, found a small increase in activity of daily living scores of patients who had received more rehabilitation, they warn against the generalization of these results due to the methodological quality of the studies analysed. To date there is therefore no evidence that proves that an increase in the intensity of rehabilitation would result in better functional outcomes.

### **2.5.3 REHABILITATION TEAMS**

As the clinical manifestations of stroke are vast and complex, stroke rehabilitation is best implemented through the co-ordinated efforts of a team of professionals (Gibbon 1999; Gresham *et al* 1997).

The core group of professionals usually involved in the rehabilitation of stroke clients are the physiotherapist, occupational therapist, doctor and the nurse. Other professionals who are usually co-opted as needed are: the dietician, the speech and language therapist, social workers and psychologists (Gibbon 1999). As rehabilitation advocates the involvement of the patient and his family in rehabilitation, they also form a vital part of the team.

Rehabilitation teams differ in the manner in which they operate. Three different approaches to team work exist, namely multidisciplinary, interdisciplinary and trans-disciplinary.

In the multidisciplinary team approach, each professional independently carries out the assessment and treatment of the client. Communication of team members occurs where each member reports on the progress of the clients as experienced during their individual sessions. The physician or doctor is usually the team leader in this approach (Bakheit 1996; King & Titus 1993).

In the interdisciplinary approach assessment and treatment could be carried out separately by each member or two members of the team could assess the client simultaneously. However, in this approach goal setting and treatment aims are decided on collectively by the team (Bakheit 1996; King & Titus 1993). There is greater communication between the members of the interdisciplinary team and any of the members could act as leader (Bakheit 1996). The trans-disciplinary team approach is the latest of the approaches. The uniqueness of this approach lies in the blending of professional boundaries. Assessments and treatments are



carried out simultaneously, with team members broadening their skills and learning from each other (King & Titus 1993).

The benefits of management of stroke clients by a multidisciplinary team in stroke units has previously been mentioned in this report. In a critical review done by Cifu *et al* (1999) the authors reviewed eleven well-designed, studies comparing multidisciplinary rehabilitation with interdisciplinary units. They found that in units where the teams operated on an interdisciplinary basis, the outcomes were even better. The results indicated improved functional outcomes, improved quality of life, shorter hospital stay and decreased costs.

It appears however, from the literature, that rehabilitation of stroke clients is still primarily multidisciplinary and not interdisciplinary. Although many studies in the literature mention structured rehabilitation using teams of professionals, whether a multidisciplinary, interdisciplinary or even trans-disciplinary approach is used is not stated clearly.

## **2.6 SOCIAL SUPPORT FOR STROKE CLIENTS:**

Although stroke clients regain functional ability as well as the ability to perform self-care skills, socialization and life satisfaction remain a problem for many clients (Agency for Health Care Policy and Research 1995). Many stroke clients experience social isolation and therefore require social support

(Dowswell *et al* 2000; Mcoll & Skinner 1995; Santus, Ranzenigo, Caregnato, Inzoli 1990). Loss of energy and stamina, inaccessibility, as well as a decrease in self- image and feelings of shame are some of the reasons for social isolation

(Dowswell *et al* 2000). Belonging to community programmes such as social support groups and even day hospital visits decreases feelings of isolation (Maher, Kinne, Patrick 1999; Dowswell *et al* 2000). It also appears to decrease depression and improves the life satisfaction of the stroke survivor (Robinson-Smith, Johnson, Allen 2000).

Versveld (1997) found in the participatory evaluation of a group of stroke patients belonging to a stroke support group, that the stroke group played an important role in giving support, encouragement and hope to its members. Participating in a group can unlock the potential of the individual for self reliance and empowerment in individuals who are disabled (Bhagwanjee & Stewart 1999).

Social support in the community is therefore essential. Stroke support groups appear to be one manner in which support can be provided to clients following a stroke.

## **2.7 SUMMARY OF LITERATURE REVIEW**

From reviewing the literature it is clear that stroke is a condition that mainly affects the elderly, although it can affect people of all ages. The main risk factors for stroke have been well-established in the literature and a clear picture is available of the extent of the condition as it affects populations globally. More epidemiological studies are however needed in South Africa and other developing countries to ascertain the exact status of the disease in these countries.

The effects of stroke on those affected are vast and most of them have to adapt their lifestyles post-stroke. The literature is clear about the positive effects of those managed in stroke units in the acute stages. There is however, no evidence that indicates that institution-based care is better than out-patient or community-based care. It is also important to note that the manner in which rehabilitation occurs differs between developed countries and developing countries. Rehabilitation services such as stroke units and long-term facilities such as nursing homes are not available in most developing countries. In the developing countries, if the stroke client is admitted to hospital following a stroke he will be discharged as soon as he is medically stable. These clients are mostly managed in the community where rehabilitation services are not always ideal.

Although many authors recognize that the effect of stroke goes beyond the difficulties with movement i.e. the functional limitations, research which investigates the effects of quality of life and participation restrictions of the individual post-stroke is greatly lacking. To date there is a large need for research relating to stroke in South Africa, information regarding the epidemiology, preventative strategies as well as rehabilitation.

## **CHAPTER 3.0**

### **METHODOLOGY**

#### **3.1 INTRODUCTION**

The following aspects pertaining to the methodology of the study will be discussed in the following chapter: objectives, aims, research setting, study design, study population, data capture sheet, pilot study, procedure, data analysis and the ethical considerations.

#### **3.2 OBJECTIVE:**

The overall objective of this study was to review the hospital records of stroke clients who were treated at the Bishop Lavis Rehabilitation Centre (BLRC) between 1995 and 1999, in order to obtain information about the profile and outcomes of these clients, following their stroke and subsequent rehabilitation process.

#### **3.3 AIMS:**

The specific aims of the study were to review the hospital notes of stroke clients treated at BLRC from 1/1/95 to 31/12/99 in order to obtain descriptive information regarding:

##### **3.3.1 The profile of the clients, which included the following:**

- (i) Demographic status (i.e. age, gender, residential location, marital status).

- (ii) The presence of documented risk factors.
- (iii) The presence of documented associated illnesses.
- (v) Descriptive data relating to the stroke (side of lesion and the episode of stroke).

### **3.3.2 The process of management of the clients, highlighting:**

- (i) The referral process, stating the level and source of referral
- (ii) Type of interventions e.g.(physiotherapy, occupational therapy, medical officer, social work and dietetics).
- (iii) The time lapses between the date of stroke, the date of referral and date of admission to the Bishop Lavis Rehabilitation Centre.
- (iv) The number of physiotherapy and occupational therapy treatment sessions.
- (v) The number of patients visited at home.
- (vi) Utilization of groups (number of clients attending the different groups).
- (vii) The duration of the rehabilitation programme

### **3.3.3 The out-come post-stroke:**

- (i) Functional status at the start of rehabilitation and the time of last attendance.
- (ii) The employment status on admission and at time of last attendance.

## **3.4 RESEARCH SETTING**

The Bishop Lavis Rehabilitation Centre was developed as part of the Bishop Lavis Primary Health Care Project. This project was initiated through the

combined efforts of the University of Stellenbosch, the former Department of Health and Welfare (House of Representatives), the former Regional Services Council and representatives of the Bishop Lavis Community. One of the objectives of this project was to provide integrated, comprehensive primary health care services. Before the initiation of the project, the paediatric clinic and the day hospital operated from different buildings. Following the initiation of the project, the curative services provided by the day hospital, the preventative services provided by the paediatric clinic and the maternity unit now all operate from the same building. The Rehabilitation Centre was established and housed in the building previously occupied by the clinic. The above services, although housed in different buildings, all form part of the Bishop Lavis Community Health Centre. The Rehabilitation Centre is managed by a full time physio- and occupational therapist and offers speech therapy on a part-time basis. The Centre provides out-patient treatment to clients with a variety of diagnoses, on an individual basis as well as in groups. Home visits are carried out to assess a patient's re-integration into his home and community. As previously stated in the introduction of this study, stroke clients form the second largest group of patients treated by the physiotherapist at the Centre.

### **3.5 STUDY DESIGN**

The study design was descriptive, utilizing a retrospective survey of patient documentation. This was considered to be the most appropriate design to gather epidemiological information of a defined group of persons with a disability.

Surveys are non-experimental, descriptive studies which try to estimate health-related events in the community (Katzenellenbogen et al 1997; Treece and Treece 1982).

The advantage of a survey is that it provides information about a population that can be gathered relatively easily at a low cost. Information gained by surveys frequently forms the basis for larger analytical studies.

A limitation of this study design, in comparison to analytical studies however, is that it does not involve a control group. However, as little information is available about the present population, a descriptive study was embarked upon to gather information that would assist in formulating hypotheses for future studies.

### **3.6 POPULATION**

All stroke clients referred to the Bishop Lavis Rehabilitation Centre between the 1 January 1995 to 31 December 1999 were included in the study. Although 194 stroke clients were treated at the Centre during this period, the records for 26 clients were either not available or were markedly incomplete, excluding these clients from the study. The final study population therefore consisted of 168 clients.

#### **3.6.1 CRITERIA FOR INCLUSION:**

All persons who had suffered a stroke resulting in a sensorimotor impairment and who were referred to the Centre during the study period were included in the study.

### **3.6.2 CRITERIA FOR EXCLUSION:**

Patients who had a hemiplegia as a result of a head injury or causes not related to a stroke were excluded.

### **3.7 DATA CAPTURE SHEET**

Following perusal of the files of the patients kept at the Rehabilitation Centre and based on information gained from reviewing the literature, the researcher developed a data capture sheet. The final data capture sheet comprised of six sections to capture information about the following variables: demographic data, documented medical information, factors relating to the stroke, the referral process, treatment interventions as well as the functional status of the clients on admission as well as on at time of last attendance. (Addendum 1)

#### **SECTION A: DEMOGRAPHIC PROFILE:**

Section A of the data capture sheet summarized demographic data:

##### **(i) Gender**

Gender was included to assess whether the research population consisted of more males or females.

##### **(ii) Date of Birth**

The client's age at the time of the stroke was calculated from the patient's date of birth. According to the literature, age has been found to be a definite risk for stroke, the risk of stroke increasing with an increase in age (Kalache et al 1995; Bonita 1992).



### **(iii) Area of Residence**

The area of residence was included in the analysis of the demographic profile to determine whether clients referred for rehabilitation came from the primary feeder areas serviced by the Bishop Lavis Community Health Centre.

### **(iv) Employment Status**

Employment status at the time of admission to the Rehabilitation Centre as well as at the time of last attendance at the Centre was recorded. Information regarding the employment status pre- and post- stroke would give an indication of the return- to- work rate post- stroke. The number of clients receiving either a disability grant or a State pension may be an indication of the financial impact on the State, due to stroke.

Work assessment and work rehabilitation services are available to clients following a stroke. Recording the numbers of clients who need these services would give some indication as to how many of the clients had the potential to either return to their previous employment or to be trained to do another job.

### **(v) Marital Status**

Information on the marital status of the clients was obtained to identify how many persons were single, which could be problematic if there was reliance on a care-giver.

## **SECTION B: MEDICAL HISTORY**

### **(i) Documented risk factors**

Many epidemiological studies, as indicated in Chapter 2, have revealed a number of risk factors associated with stroke. It was therefore considered important to collect data regarding the documented risk factors when compiling a profile of stroke clients. The following risk factors (found to be most common in stroke populations) were collated if these had been documented: hypertension, diabetes, ischaemic heart disease, obesity, alcohol use, smoking, elevated blood lipid levels, peripheral vascular disease and carotid artery stenosis. It is important to note that risk factors were noted if the information had been recorded in the client's medical files or the files kept at Rehabilitation. It was therefore possible that risk factors, if present, may have not been recorded for some clients.

### **(ii) Documented associated illnesses.**

When reviewing the client's files during the pilot study, several associated illnesses in particular appeared most frequently: rheumatoid arthritis, osteoarthritis, gout, respiratory illness, visceral illness and psychiatric illness. Associated illnesses frequently affect the rehabilitation process as well as the outcome of rehabilitation. It is again important to note that these associated illnesses were noted if the information had been recorded in the client's medical files of rehabilitation files and therefore may have been present in some of the clients and not recorded.

## **SECTION C: FACTORS RELATING TO THE STROKE**

### **(i) Date of stroke.**

Excessive delay between the date of incident and initiation of rehabilitation negatively affects the outcome of rehabilitation. The date of stroke was therefore recorded to give an indication of time lapses between date of stroke and date of referral or date of commencement of rehabilitation.

### **(ii) Episode of stroke**

The stroke recurrence rate is about 5% per annum, tending to be higher in the first few months and weeks (Hankey et al 1998; Warlow 1998). If large numbers of the population studied were having more than one stroke, secondary prevention activities, which should be initiated soon after the primary incident, could then be recommended.

### **(iii) Hemisphere of the lesion**

Depending on the location of the lesion, clients present differently following a stroke. Clients who have a lesion in the left side of the brain frequently have speech and language deficits, whereas those who have a lesion on the right side of the brain could have spatial and perceptual deficits (Hayn 1997). The cerebral hemisphere which is affected therefore influences the rehabilitation process and/or outcome.

## **SECTION D:**

### **REFERRAL PROCESS**

As patients are referred to the Rehabilitation Centre from various sources

and by different professionals, data relating to the referral agency, referring person and the date of referral were collected. The distribution of referrals from primary, secondary or tertiary institutions could then be determined.

## **SECTION E: TREATMENT INTERVENTIONS**

### **(i) Treatment Received**

A full complement of staff i.e physiotherapist, occupational therapist, speech therapist (part- time student intervention), social worker, medical officer and dietician provide services at the Bishop Lavis Community Health Centre. By recording which professional the stroke client consulted, the extent of team management of stroke clients at the Bishop Lavis Community Health Centre could be determined.

### **(ii) Date of first assessment at Rehabilitation Centre:**

It is commonly agreed that functional recovery following stroke occurs within the first 3 months (Mayo 1999). For rehabilitation to be most effective, rehabilitation needs to start as soon as possible following a stroke. The researcher therefore needed to know how soon following their stroke, clients were seen at the Centre.

### **(iii) Duration of the rehabilitation programme**

The duration of rehabilitation for each patient was recorded to see whether the duration of rehabilitation at the Bishop Lavis Rehabilitation Centre

exceeded or was less than what has generally reported in the literature.

**(iv) Home visits.**

Home visits are a common component of the rehabilitation process at the Bishop Lavis Community Health Centre, to either train carers of the clients, to assist with the re-integration of the clients into their homes or to follow-up clients referred from other institutions. The number of clients who were visited at home was therefore recorded.

**(v) Stroke Groups.**

Stroke support and activity groups were developed at the Centre to provide social support as well as skills development for stroke survivors. The number of clients attending these groups was recorded to determine how many were actually attending these groups.

**(vi) Total number of treatment sessions.**

The total number of physiotherapy as well as occupational therapy treatment sessions per individual was recorded to determine whether stroke clients at primary level use the services of the physio-or occupational therapist more often. Individual statistics were not available for those clients who received speech therapy and could therefore not be included in this study.

**SECTION F: FUNCTIONAL STATUS**

**(i) Functional status at the time of admission and at last attendance.**

Most of the client's records contained assessment forms, indicating the functional status at admission, which had been completed by the Occupational

Therapist (Addebdom 2). These forms were adapted from the Barthel Index, a validated outcome scale frequently used in the rehabilitation of stroke clients.

In cases where these forms had not been completed, the researcher coded the information recorded in the folders according to the scales used on the forms.

The activities were scored 0, 1 or 2. A score of 0 indicated that the client could perform the activity independently, a score of 1 indicated that the client needed some assistance when performing the activity and a score of 2 indicated that the client was totally dependant on a caregiver to perform the task.

As data was collected retrospectively, no standardized measures could be used. However, the researcher could make informed decisions from the files regarding the patient's functional abilities both at admission and at time of last attendance.

### **3.8 PILOT STUDY**

A pilot study was conducted prior to embarking on the main study, to clarify whether the information the researcher wanted to capture was available in the files of the clients, as well as to ensure that all the relevant data was captured to fulfill the aims of the study.

The records of twenty-seven (27) clients who were referred for rehabilitation between 1/1/1994 to the 31/12/94 were reviewed in the pilot study. Following the pilot study it was necessary to delete certain questions from the data capture sheet, as this information was not readily available in the folders, (the type of

stroke, transport used by clients to access the Rehabilitation Centre, primary care-giver, the referral of clients from the Rehabilitation Centre to other institutions, the statistics of the speech therapist as well as the visual status).

### **3.9 PROCEDURE**

All data was collected by the researcher. Stroke clients were identified by reviewing the statistics books of the physiotherapist and the occupational therapist. Each client was allocated a research identification number to ensure confidentiality. The data collected was recorded on the data capture sheet.

The primary sources of data was the patients' files kept at the Rehabilitation Centre. These files contained the Physio-, Occupational- and Speech therapy records. Similar information was recorded by all three professions, and for completeness and reliability of the data, all the available notes were consulted and compared. In cases where the relevant medical information was missing from these files, the medical files kept at the Bishop Lavis Community Health Centre were also reviewed. In a few cases, the patients' medical files at Conradie Hospital needed to be consulted to complete the data capture sheet.

As data was collected retrospectively for the study, documentation might have been incomplete or missing. To limit missing clinical data bias the researcher consulted all sources of documentation, i.e. physiotherapy, occupational therapy, speech therapy and medical folders.

### **3.10 DATA ANALYSIS**

The data was coded and captured on a spread sheet using the Word Excel computer programme. The data was analysed using the Statistical Package of Social Sciences (SPSS) as well as the Statistical Analysis System(SAS) Descriptive statistics were used to obtain information on frequency tables prepared for each variable. The statistician ensured correctness of the data (cleaning of data) before analysis. The analysis of the data was done by the Statistics Department, University of the Western Cape.

### **3.11.ETHICAL CONSIDERATIONS**

The study was non-invasive. Permission to review the clients' records was obtained from the Medical Superintendent Community Health Services Organization as well as from the Medical Superintendents of the referral institutions where necessary. The Research Committee C of the Faculty of Health Sciences of the University of Stellenbosch accepted the protocol for the proposed study. All information was handled with strict confidentiality. No personal identification appeared on the data capture sheet or during the processing of data.



## **CHAPTER 4.0**

### **RESULTS AND DISCUSSION**

The results will be discussed under the following main headings:

- 4.1 Introduction
- 4.2 Demographic profile
- 4.3 Medical status
- 4.4 Referral Process
- 4.5 Rehabilitation process
- 4.6 Summary of results

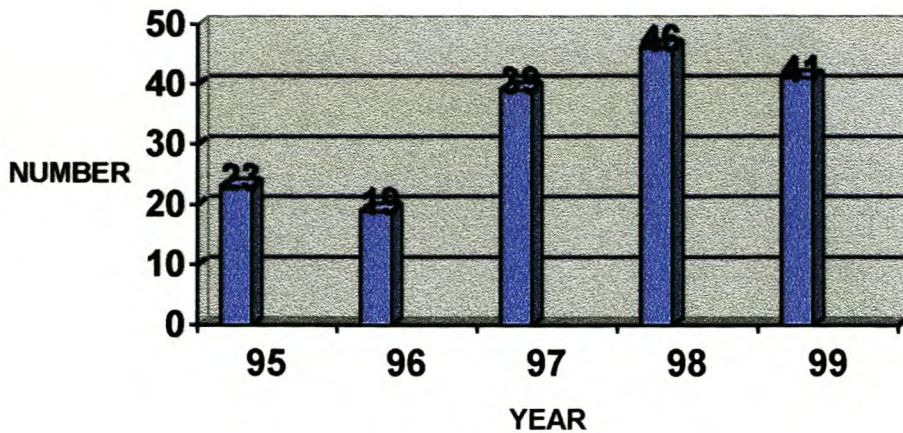
The results will be presented for each section followed immediately by the relevant comparisons to the literature. Percentages are expressed, and numbers are rounded off to one decimal point.

#### 4.1 INTRODUCTION

One hundred and ninety-four stroke patients were treated at the Bishop Lavis Rehabilitation Centre between 1/1/95 to 31/12/99. However, only the records of 173 patients were available at the Rehabilitation Centre. Of these, five were excluded due to insufficient data leaving the records of 168 patients for analysis. Certain variables were missing from the available records, and this was taken into account in the presentation of the results.

Figure 1 illustrates the number of stroke clients referred during each of the different years.

**Figure 4.1 NUMBER OF CLIENTS REFERRED EACH YEAR**



From the above graph it appears that the number of referrals of persons following stroke appeared to show an upward trend over the five year period. The Rehabilitation Centre opened its doors in 1994. Therefore, as time passed, it became more known both to medical personnel as well as the community.

More people were therefore referring clients to the Centre. The low number of clients referred in 1996 is staff-related. The occupational therapist resigned in June 1996 and the physiotherapist was on maternity leave from the middle of September 1996. The service was mainly provided by students during the times that there were no therapists. The centre was closed from middle October 1996 for students' examinations and recess.

The service was resumed in February 1997 when the physiotherapist returned from maternity leave, an occupational therapist was appointed and the students started their clinical blocks for the new year.

The figures do however indicate that the number of clients being referred for rehabilitation each year is not decreasing markedly, despite the slight drop from 1999 to 1998. If one relates the above information to the incidence of stroke it is apparent that the incidence in this population is on average remaining constant. This is in line with global statistics which indicates that although mortality post stroke is decreasing there is no drop in the incidence rate (Gresham et al 1997).

## **4.2 DEMOGRAPHIC PROFILE**

The following factors will be discussed under the demographic profile.

4.1.1 Gender

4.1.2 Age

4.1.3 Marital status

4.1.4 Area of residence

4.1.5 Employment status

#### 4.2.1 GENDER

The population consisted of 54% (91/168) females and 46% (77/168) males. The results are similar to the results found by Hoffman (2000), who found the male to female ratio to be equal in a group of young stroke clients. The above results for this study in South African, differ from international studies which generally reflect a slightly higher incidence in males than in females (Bruno & Engin 2000; Bonita *et al* 1997; Thorvaldsen *et al* 1995).

#### 4.2.2 AGE

Table 4.1 illustrates the age distribution of the study population. The mean age of the group was 59 years, with ages ranging from 33 years to as old as 83 years. The standard deviation for the group was 11.0.

**Table 4.1 AGE DISTRIBUTION OF THE CLIENTS (N=168)**

Variable	Mean	Median	Mode	Standard deviation	Range	N	%
<b>AGE(yrs)</b>							
Total sample	59	60	65	11.0	33 – 83	168	100
31-40						16	10
41-50						19	11
51-60						49	29
61-70						59	35
71-80+						25	15

It was astonishing to note that 50% of the population were 60 years old or younger, i.e. people who fall into the economically active group of the population. This is in contrast to the findings of other studies. For example in the study by Bonita et al 1997, out of a total population of 1518 subjects only 20% were 64 years and younger. Rosmand (1986) also found higher incidence rates among those whose who were 65 years and older. In many other countries stroke is said to be generally uncommon in those 50 years and younger (Bonita 1992). However, this did not appear to be the case in the present study.

Stroke in the young is particularly tragic, resulting, in most instances, in a long-term burden for the victims, their families and the community (Walker et al. 1981).

Table 4.2 compares relevant different age variables of the males and females.

**Table 4.2 AGE VERSUS GENDER**

<b>Gender</b>	<b>Mean</b>	<b>Median</b>	<b>Mode</b>	<b>Standard Deviation</b>	<b>Total</b>
Females	60	63	64	10.8	91
Males	58	58	58	11.2	77

The age distribution of females in the present study revealed that the female subjects were generally older than the men. This correlates with the literature that states that the mean age of onset of stroke is higher in females than in

males with the risk of men therefore having a stroke being higher in the earlier decades of life (Stewart 1999; Bonita 1992).

#### **4.2.3 MARITAL STATUS**

The total number of subjects analysed for this variable was 166. Table 4.3 illustrates the marital status of the group. Fifty six percent (56% or 93/166) were living with a partner, the majority of these cohabiting in a formal traditional marital relationship. The remaining 44% were single. Of those who were single 64%(47/73) were widowed, a factor which could be expected as the age range of the population extended beyond eighty years of age.

The majority of the younger stroke clients in the study were married. This was in agreement with the finding of Teasall *et al* (2000). Although information regarding the primary caregiver was not available in this study, spouses often serve as caregivers (Teasall *et al* 2000; Dennis *et al* 1997; Anderson *et al.* 1995). Marital separation as a result of caregiver stress is reported to be high amongst younger stroke clients (Teasall *et al* 2000). The chances of divorce or marital separation is therefore high in about 50% of the clients in the present study.

**TABLE 4.3 MARITAL STATUS OF CLIENTS (N=166)**

	N	%
<b>MARITAL STATUS</b>		
Married	90	54
Widowed	47	28
Single	18	11
Divorced	8	5
Living Together	3	2

There was a difference between the marital status of the females compared to the males. Table 4.4 is an illustration of this.

**TABLE 4.4 MARITAL STATUS VERSUS GENDER (N=90 females) (N=76 males)**

	Males		Females	
	N	%	N	%
Married	52	68.4	38	42
Widowed	11	14.5	36	40
Single	9	11.2	9	10
Divorced	2	0.03	6	7
Living together	2	0.03	1	1

It was notable that 40% of the females compared to 14.5% of males were widowed. This could be linked to previous results indicating that the females in

the study were generally older than the males. Considering the fact that females are known to live longer than males, (Bonita 1992), this finding is to be expected.

#### 4.2.4 RESIDENTIAL AREA

Table 4.5 also illustrates the residential areas in which the population (N=168) resided.

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**TABLE 4.5 RESIDENTIAL AREAS IN WHICH CLIENTS RESIDED (N=168)**

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RESIDENTIAL AREAS	N	%
* Bishop Lavis	64	38
* Bonteheuwel	33	20
Elsies River	20	12
* Valhalla Park	17	10
* Nooitgedacht	8	5
* Kalksteenfontein	7	4
* Clarkes Estate	1	0.6
Delft	1	0.6
Other	17	10

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\* Areas serviced by Bishop Lavis Community Health Centre

Over 75% of the clients (130/168) lived in areas that are serviced by the Bishop Lavis Community Health Centre. These areas include Bishop Lavis, Bonteheuwel, Valhalla Park, Nooitgedacht, Kalksteenfontein and parts of Clarkes Estate. The rest of the group came from areas that did not have physiotherapy services at their local Community Health Centres. Bishop Lavis Rehabilitation Centre provided the closest rehabilitation service. A limitation of the present study is that information regarding the mode of transport used to



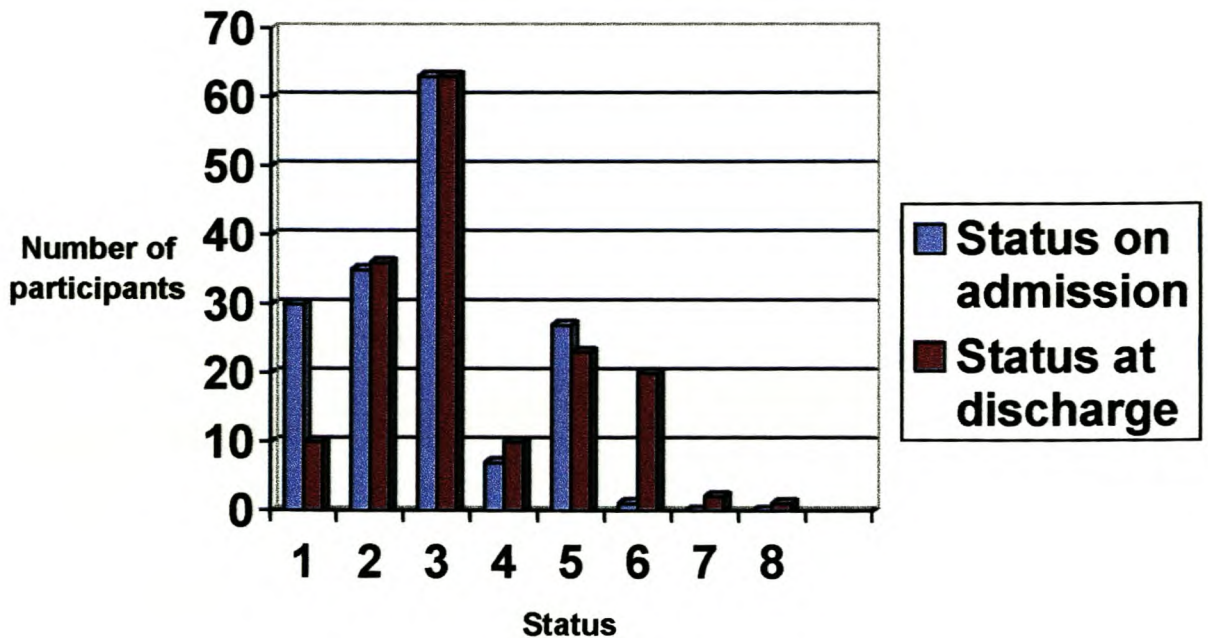
access rehabilitation was not available. Although the majority of the clients came from areas that are serviced by the Bishop Lavis Community Health Centre, there were however, those who had to travel between 5-15 kilometers to receive rehabilitation. For primary health care to be successful, it is recommended that health services be geographically accessible (Denhill 1995). It is suggested by the World Health Organisation (1980), that the services be within a 5-10 kilometre reach, and that transport should be available to access these services. Hospital transport to get to the Rehabilitation Centre was however only available to those clients living in the Bishop Lavis, Bonteheuwel, Valhalla park and Nooitgedaght areas which are directly serviced by the Bishop Lavis Community Health Centre. Clients often had to wait long hours after they had completed their rehabilitation session for the transport to take them home. This frustrated many clients and they were therefore not eager to attend rehabilitation if they had to rely on the hospital transport. The use of private transport was very expensive and could not always be afforded by the clients. The problems relating to transport therefore could have affected the client's compliance to rehabilitation. The Integrated National Disability Strategy (1997) mentions the need to develop a public transport system that is both flexible and accessible. This would increase the ability of people with disabilities to access services, including rehabilitation services. Accessible and affordable transport services would therefore facilitate the attendance of stroke clients at rehabilitation. Clients who utilised their transport would however not have been limited by these factors.

#### **4.2.5 EMPLOYMENT STATUS:**

Figure 4.2 illustrates the employment status of the population (N=163) at the time of admission to the Bishop Lavis Rehabilitation Centre as well as at the time of discharge from rehabilitation. A disconcerting finding was that of the 30 subjects who were employed at the time of assessment, only 10 had returned to work by the time they were discharged. Of those clients who received a pension, most of them received a government pension (60 persons) while only seven were receiving a private pension. Fewer clients were listed as being unemployed at the time of discharge compared to the time of admission. An explanation for this could be that at discharge more clients were waiting for their disability grants to be processed. Of those stroke clients who were 60 years and younger that were employed at the time of their stroke (31%), only 7% could return to work. Teasall (2000) and Flick *et al* (1999) mentioned the discrepancies about the return to work rate post-stroke recorded in the literature. Rates published range between 17% and 51%. The reasons for this may be due to the differences in the severity of the stroke among the persons studied and differing definitions used for return to work (Teasall 2000; Flick *et al*. 1999). The majority of studies however, record very low return to work rates. Stroke clients experience high levels of anxiety about whether they will be able to return to work post-stroke (Teasall 2000). Most of the clients in the present study who could not return to work, had applied for disability grant. Applications had been processed but grants had not yet been received by the time they were last treated at the centre.

The families of stroke clients who contributed to the family income or were the breadwinners therefore could be left for quite a while with a decrease in their finances or even without any income. This could place a large financial strain on both the client and the family. In families where the R570 disability grant is less than what the stroke client had been previously earning the strain could even be greater.

**Figure 4.2 Employment Status of Clients (N=163)**



**KEY:**

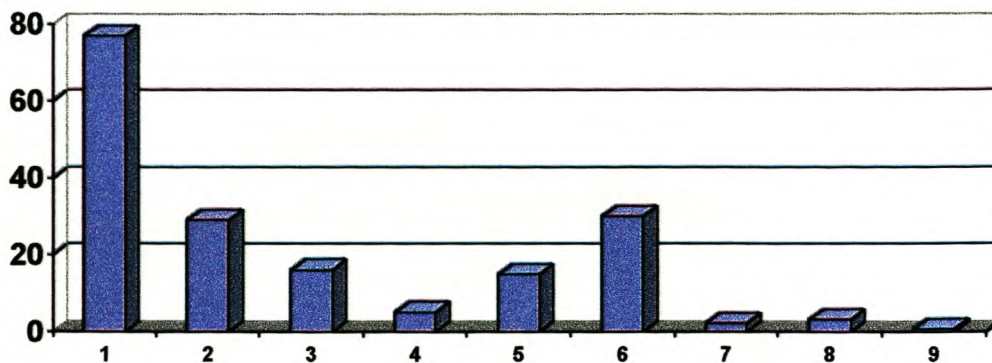
- |                           |   |
|---------------------------|---|
| 1. Employed               | 5. Unemployed                           |
| 2. State disability grant | 6. Unemployed awaiting disability grant |
| 3. State old age pension  | 7. Unemployed awaiting other pay-out    |
| 4. Private pension        | 8. Work rehabilitation                  |

### 4.3 MEDICAL STATUS

#### 4.3.1 RISK FACTORS AS DOCUMENTED FOR THE STUDY POPULATION:

The presence of risk factors for stroke is illustrated in Figure 4.3. Hypertension was the most prevalent documented risk factor of the population 73% (123/168) followed by smoking 29% (48/168) and then diabetes 27% (46/168). Hypertension also constituted 30% of the total number of risk factors present in the population.

**Figure 4.3 Documented Risk Factors For Stroke In The Study Population (N=168)**

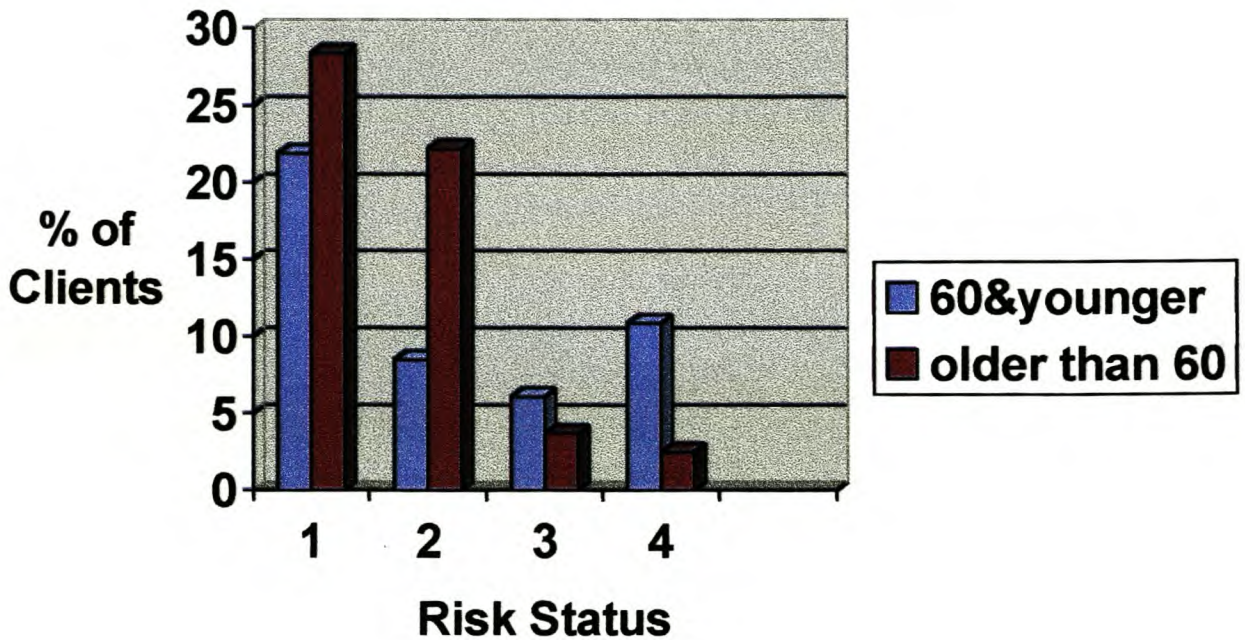


**KEY**

1. Hypertension
2. Diabetes
3. Ischaemic heart disease
4. Obesity
5. Alcoholism
6. Smoking
7. Elevated blood lipid levels
8. Peripheral vascular disease
9. Carotid artery stenosis

A combination of risk factors were present in the majority of the population. The mean risk factor per person was 2.4. Hypertension and diabetes was the most common combination, 21%(35/168) recorded. The combinations of risk factors were slightly different between those 60 years and younger and those older than 60 years. Figure 4.4 illustrates the different risk factors in the two groups of clients.

**Figure 4.4 Risk Factors Versus Age (N= 168)**



**KEY**

1. Hypertension only
2. Hypertension and Diabetes
3. Smoking only
4. Hypertension, Alcohol use and Smoking

The above results revealed that the hypertension was slightly more common in the older stroke clients than the younger stroke clients. Alternatively though, the more common combination of risk factors found in the older stroke clients were hypertension and diabetes, whereas the combinations more common in the younger group was hypertension combined with smoking and alcohol.

The risk of stroke increases substantially with the increase in the number of risk factors present. These risk factors are said to interact to increase the probability of a stroke (Tanne *et al.* 1998).

The results in the present study, which identified hypertension followed by diabetes to be the most prevalent documented risk factors recorded, is in agreement with the household survey on self-reported illness by DeVilliers, Dreyer, Koornhof, Howes, Mentoor, Rhoda, Statham (2000) in Bishop Lavis. These results correspond with global statistics which report hypertension as being the most prevalent modifiable risk factor for stroke, which, when treated, substantially reduces the risk of stroke (Tegos *et al.* 2000; Gorelick *et al.* 1999; Warlow 1998; Helgason *et al.* 1997). Despite this fact, knowledge of the relationship between hypertension and stroke is however low amongst communities both internationally and nationally. Hale *et al.* (1998) reported that among a group of stroke patients from Soweto, all the patients interviewed were unaware that their stroke was related to their hypertension. Kothari, Suaerbeck, Jauch, Broderick, Brott, Khoury, Liu (1997), in the United States investigated the awareness of patients of the signs, symptoms and knowledge of risk factors. Their results indicated that only 31% of those who had hypertension identified it

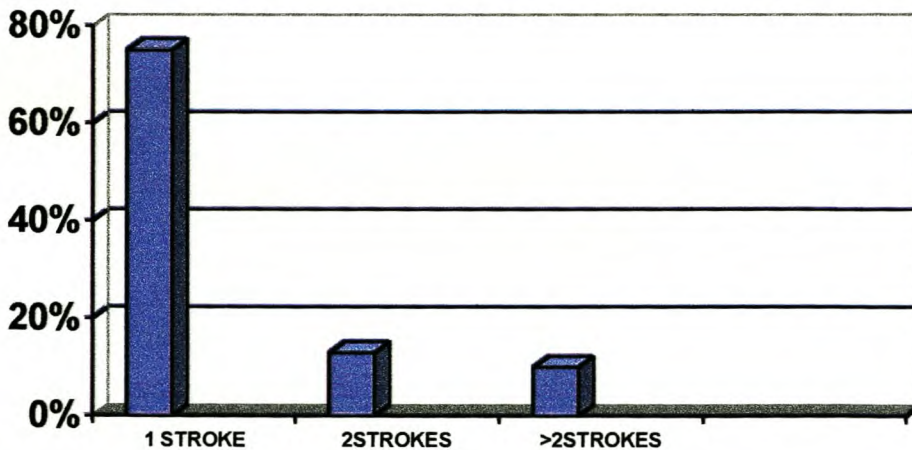
as a risk factor. Educational programmes that inform communities about the risk factors as well as the signs and symptoms of stroke are therefore strongly recommended (Hale *et al.* 1998, Kothari *et al.* 1997; Helgason *et al.* 1997; Steyn 1995;). The other risk factors mentioned in the article by Kalache *et al.* (1999) i.e diabetes, elevated blood lipids, smoking and alcohol consumption were all related to lifestyles (Kalache *et al.* 1995). Smoking, high cholesterol and alcohol consumption were the risk factors more commonly found in the younger stroke patients (Hale *et al.* 1998; Pohjasvaara 1997; You *et al.* 1997). Health promotion programmes should therefore specifically target the population 60 years and younger. In addition to their stroke, some of the clients in the present study also had other illnesses. The following documented additional illnesses were found to be the most prevalent in the study population: 13% (22/168) had osteoarthritis, 8% (13/168) had respiratory illnesses and 8% (13/168) suffered from epilepsy. The other additional illnesses recorded were rheumatoid arthritis (3.8% or 6/168), gout (2.5% or 4/168), visceral illness (3.8% or 6/168), psychiatric illness (3.2% or 5/168), cancer (1.3% or 2/168) and other (7.5% or 13/168).

#### **4.3.2 EPISODE OF STROKE.**

Figure 4. 4 illustrates the number of episodes of stroke each client had experienced. Data, concerning this specific variable was missing for 5 persons. Of those individuals referred in the period under review, the majority 75% (126/163) had experienced only one stroke. However, it was alarming to note that 13% (21/163) had experienced a second stroke and 10% (16/163) had had more than two episodes. This finding is in keeping with international figures.

According to Rosenberg & Popelka (2000), 14% of stroke survivors will experience a second stroke in the first year following the initial event. In the sample of the population who had suffered two or more strokes 86.5% had hypertension as one of their risk factors while 13.5% had other risk factors. This may be related to hypertension being the most common risk factor as hypertension was not a significant risk factor predisposing individuals to sustain more than one stroke (RR;0.937; 95%CI: 0.4-2.0). A previous stroke is said to be an indicator for poor functional outcome following stroke (Kwakkel *et al.* 1999; Reddy & Reddy 1997; Joungbloed 1986).

**Figure 4.5 Number of Episodes of Stroke per Subject (N=163)**



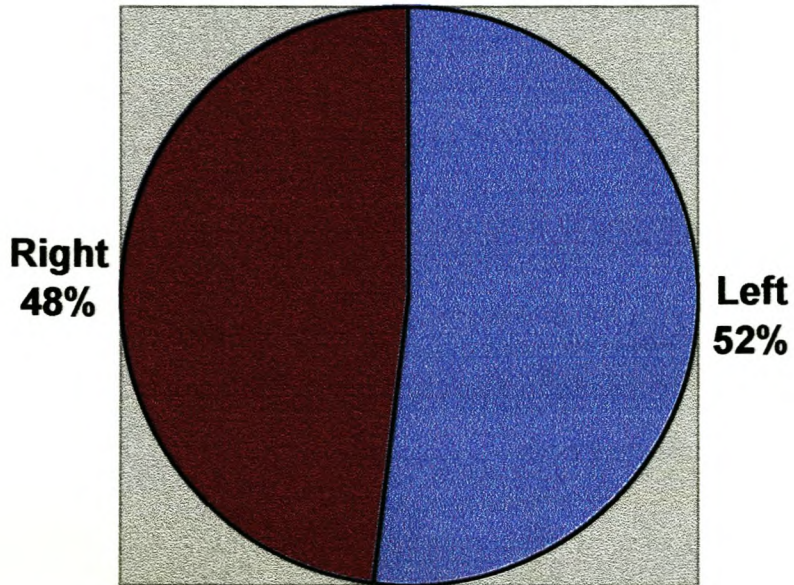
**4.3.3 SIDE OF STROKE (N=157)**

There were 11 missing records for this variable. There was no significant difference between the number of clients who had suffered a right cerebrovascular accident (CVA), (48%,75/157) compared to those who had



cerebrovascular accident (CVA), (48%,75/157) compared to those who had suffered a left cerebrovascular accident (52%,82/157), see figure 4.5. Although perceptual impairments, which occur more frequently in right CVA than in left CVA could have an effect on the outcome post-stroke, the hemisphere of the lesion does not seem to strongly influence the outcome post-stroke (Reddy & Reddy 1997; Joungbloed 1986). Clients with a left CVA are those who are most likely to have a speech impairment and would therefore need the services of a speech therapist. The results in the present study are an indication that the services of a speech therapist are definitely needed at primary level, as almost half of the population could have benefited from speech therapy. At present, in the Western Cape, speech therapists are only employed at the tertiary and secondary hospitals and not at community health centres.

**Figure 4.6 Side of Stroke**



## 4.4 REFERRAL PROCESS

The following section of the results illustrates and discusses the referral process, providing information on the referral agency and source as well as the length of time between the actual stroke and referral to the Rehabilitation Center.

### 4.4.1 REFERRAL AGENCY:

A total number of 165 records out of the 168 records were analysed. Table 4.4 illustrates the agencies from which the patients were referred.

**TABLE 4.6 REFERRAL AGENCY**

<b>Referral Agency</b>	<b>Number Referred</b>	<b>%</b>
Tygerberg	35	20.8
Karl Bremer	7	4.2
Groote Schuur	4	2.4
Conradie	28	16.7
Bishop Lavis Community Health Centre	37	22.0
General Practitioners	15	8.9
Non-Governmental Organisation	1	0.6
Other Community Health Centres	23	13.7
Other Agencies	15	8.9
Not recorded	3	1.8

When classifying the referrals into primary, secondary and tertiary referrals, thirty nine persons were referred from tertiary institutions which included Groote Schuur and Tygerberg hospitals, thirty five persons were referred from secondary institutions which included Conradie and Karl Bremer hospitals, while the majority (ninety one) of the clients were referred from primary sources. The clients listed under "other agencies" (8.9% or 15/165) were mainly referred from family and community members

#### 4.4.2 REFERRAL SOURCE

Table 4.7 is an illustration of the referral sources. Most of the subjects (56% or 93/168) were referred by medical officers. A total of 59 persons (36%) were referred by either Physiotherapists or Occupational Therapists.

**TABLE 4.7 REFERRAL SOURCE (N=168)**

REFERRAL PERSON	NUMBER	%
Medical Officer	93	56
Physiotherapist	33	20
Occupational Therapist	26	16
Nursing Sister	4	2
Self/Family	7	4.2
Social Worker	1	0.6
Community Source	1	0.6
Not recorded	3	1.8

#### 4.4.3 REFERRAL PERIODS

Clients were referred after varying periods of delay following their stroke.

Table 4.8 illustrates the periods in days, weeks and months.

**TABLE 4.8 TIME PERIOD BETWEEN DATE OF REFERRAL AND DATE OF STROKE (N=123)**

PERIOD	NUMBER OF CLIENTS
0-7days	56
8-14 days	4
>2-12 weeks	37
>3-12 months	23
>1 year	3

For those persons referred within the first two weeks following their stroke one can assume that they were referred directly post-stroke. However, some of the clients were only referred by medical staff years after their stroke. There were three (3) clients who had previously been rehabilitated where the referring medical officer felt they could either do with a follow-up assessment for inclusion in a group, or they needed a change to an assistive device.

#### **4.4.4 Discussion on results related to referral of clients:**

Stroke clients were referred by different health care staff and not only by therapists. This indicates that most health professionals are knowledgeable about the benefits of rehabilitation post-stroke. The referral of stroke clients by members of the community was also positive.

The results present some indication that about half of the clients were not hospitalized post-stroke (56% or 91/165). These are all the clients referred by primary level sources. However, this cannot be taken as a true reflection of those not being hospitalized post-stroke, as some of them could have been admitted at the time of their stroke and not referred for follow up treatment in the community. These figures are similar to those found by Lincoln et al, in the United Kingdom, where only 49% of the patients in their study were admitted to hospital (Lincoln, Gladman, Bermans, Luther, Challen 1998). In another study conducted in Denmark however 88% of stroke patients were referred to hospital (Jorgensen *et al.* 1995).

In the present study, only those stroke clients who were regarded as having a medical emergency, which included uncontrollable blood pressure, loss of consciousness and inability to swallow, were referred to hospital for treatment. The hospitalisation of stroke clients is therefore not dependent on the severity of the disability of the client, which means that the clients that were seen at the Rehabilitation Centre could have been severely disabled. Of those clients who were hospitalised (44% or 74/165), (see Table 4.6), some may have received a

degree of in-patient rehabilitation. The intensity and length of in-patient rehabilitation would differ depending on the institution. Clients treated at the tertiary institutions would be discharged once they were medically stable, with the admission period usually being of short duration. On the other hand, those who received rehabilitation at secondary rehabilitation centres, may have been admitted for an average of three months. The rest of the clients who were not admitted would therefore only receive rehabilitation at the primary out-patient centre. This means that the clients referred to the Bishop Lavis Centre would have different rehabilitation needs: some would require acute rehabilitation whereas other would only need input regarding re-integration into their homes and the community.

## **4.5 REHABILITATION PROCESS**

The following section of the results reports on the rehabilitation process.

### **4.5.1 Assessment Times Post-Stroke:**

As stroke clients were referred by different sources they were assessed at different times post-stroke. Table 4.9 illustrates the time lapses between the date of referral and date of assessment.

**TABLE 4.9 TIME PERIOD BETWEEN OCCURRENCE OF STROKE AND DATE OF ASSESSMENT AT BISHOP LAVIS COMMUNITY HEALTH CENTRE (N= 152)**

<b>PERIOD</b>	<b>NUMBER OF CLIENTS</b>
0-7 days	24
8-14 days	26
>2 weeks-12 weeks	65
>3 months-12 months	29
>1 year	8

It was pleasing to note that the majority of the clients were assessed within the first three months post-stroke (76% or 115/152). It is in this period of time, according to the literature, that rehabilitation is most effective. The stroke clients referred to the centre therefore had the potential to improve with rehabilitation.

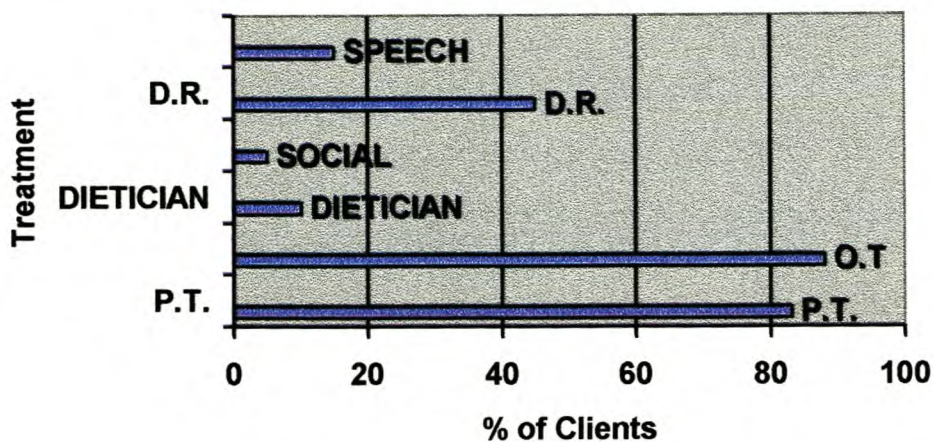
#### **4.5.2 Rehabilitation Interventions:**

Figure 4.7 is an illustration of the treatment interventions each patient received at the Bishop Lavis Community Health Centre. The majority of the clients were treated by both a physiotherapist (P.T.) and occupational therapist (O.T.). Following a stroke, a patient will be initially assessed by a medical officer (DR). However, out of the total group only 45% (76/168) were seen by the medical officer at the Bishop Lavis Community Health Centre. The rest of the clients referred by a medical officer (17/93), would either have been referred by a



medical officer at a secondary or tertiary institution or by a doctor working at another community health center or by a general practitioner.

**Figure 4.7 Treatment Received (N=168)**



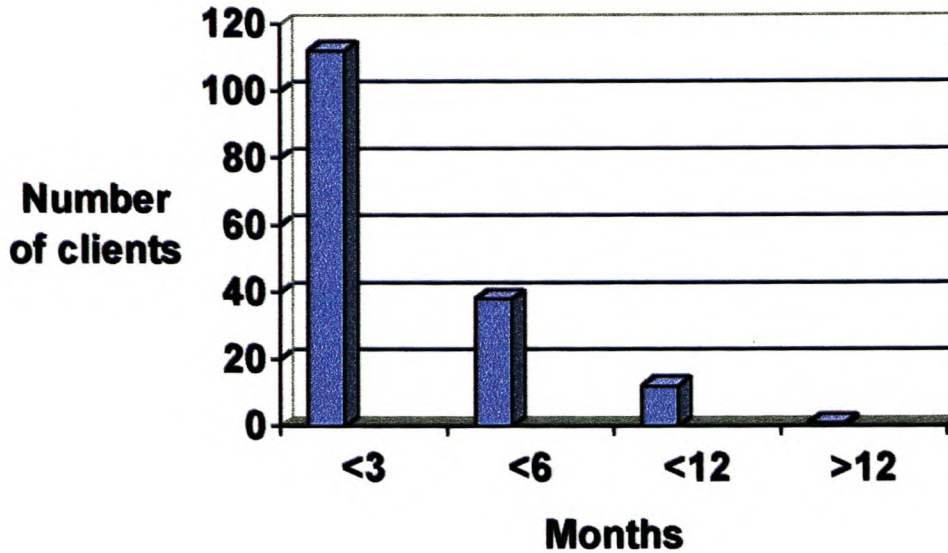
Although a team of professionals namely physiotherapist, occupational therapist, dietician, medical officer, social worker and nursing staff, are employed at the Bishop Lavis Community Health Centre, they were not all actively involved in the management of stroke clients. Most of the clients received Physiotherapy and Occupational Therapy. As some of clients had diseases that needed medical follow up, they were treated by the doctor. Although this number is small if one compares it to the number of clients who have hypertension, stroke clients are often followed by their general practioner and not necessarily by the doctor at the community health centre. The services of the dietician and the social worker appeared to be under utilized. The number of clients that received speech therapy was in the minority compared to the other allied health professions. This could be due to the fact that the speech therapy services were only offered on a

limited basis. In the randomized control study performed by Rudd *et al.* (1997), 71% of the clients in the community group were treated by a speech therapist. The success of rehabilitation of stroke clients, whether in an acute hospital setting or in the community lies in the organization and or structure of the rehabilitation service by a multi-or interdisciplinary team (Helgason *et al.* 1997; Reddy & Reddy 1997). Although the necessary services needed for successful rehabilitation of stroke clients were available at the Community Health Centre, no team meetings were held to jointly plan and discuss the goals of management of the stroke clients in an interdisciplinary manner. A disintegrated approach was therefore used which could have negatively affected the outcome of stroke clients post-rehabilitation.

#### **4.5.3 DURATION OF REHABILITATION**

Figure 4.8 is an illustration of the duration of rehabilitation for the study population. Data for 6 of the subjects were missing for this variable. The majority of the clients (69% or 112/162) received rehabilitation for less than three months. There was however one client who received rehabilitation for more than a year.

**Figure 4.8 Duration Of Rehabilitation (N=162)**



**4.5.4 FREQUENCY OF PHYSIOTHERAPY AND OCCUPATIONAL THERAPY TREATMENT SESSIONS.**

Table 4.10 illustrates the number of occupational- as well as physiotherapy sessions received by the clients.

The majority of the clients received an average of one to ten treatment sessions. If one compares this with the total time spent receiving rehabilitation, which was 0-3 months, one can deduce that the majority of the clients were seen only once a week. Almost an equal number of clients received both physiotherapy and occupational therapy.

**TABLE 4.10 NUMBER OF PHYSIOTHERAPY (P.T.) AND OCCUPATIONAL THERAPY(O.T.) TREATMENT SESSIONS RECEIVED. (N= 168)**

	<b>P.T.</b>	<b>O.T.</b>
Treatment Sessions	Number of patients	Number of patients
1 – 10	138	130
11 – 20	14	23
21 – 30	5	6
31 – 40	0	0
41 – 50	1	0
No treatment sessions	10	9

As maximum functional recovery is reached within the first three months post-stroke (Jorgenson *et al.* 1995), the time spent rehabilitating clients was reasonable and no unnecessary time appeared to have been spent rehabilitating patients.

When analyzing the number of therapy sessions each patient had in the three months, it would average one session of both Occupational Therapy and Physiotherapy per week as the majority of the patients received between a total of one to ten treatment sessions. This amount of treatment is much less than what is provided in other countries. In the United States, single or multiple therapies between 2-5 times a week is recommended (Flick 1999).

The number of treatment sessions per week needed by stroke clients is open for discussion as there is no strong evidence in the literature to date indicating that an increase in the intensity of rehabilitation results in an increased functional outcome (Cifu 1999). Treatment sessions of only once a week do however, seem very little, especially for those patients who are in the acute stage.

#### **4.5.5 HOME VISITS:**

Visiting the patients at their home is part of the management of clients treated at the Bishop Lavis Rehabilitation Centre. Home visits were done for various reasons, either to train carers of stroke clients, to follow-up clients referred from other institutions who did not contact the Rehabilitation Centre for an appointment, or to assist re-integration of the client into their homes.

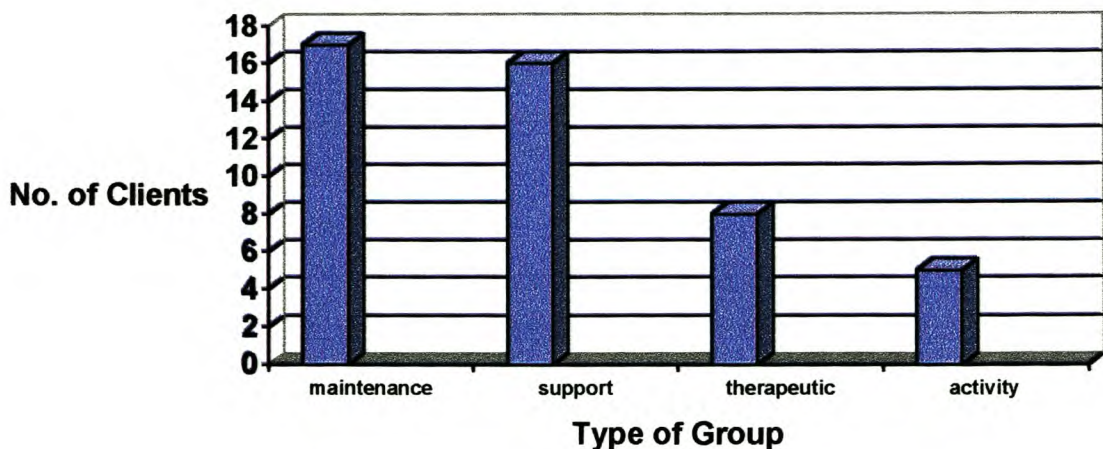
Out of the total sample, 60% (101/166) of the subjects were visited at least once at home either by the physiotherapist or the occupational therapist or both. The number of visits each subject received was not recorded. The fact that more than half of the subjects were visited at home is a positive finding, indicating the viability and feasibility of the inclusion of this type of service as part the rehabilitation offered at the Rehabilitation Centre, despite the opinions to the contrary of other researchers (Hale & Walker 1996).

#### **4.5.6 GROUP ATTENDANCE**

The management of stroke clients at the Bishop Lavis Rehabilitation Centre included rehabilitation on an individual basis, home visits and group therapy, with

the development of different groups is seen as an integral part of the rehabilitation process.

**FIGURE 4.9 Groups Attended**



Only 23% of clients (38/168) attended groups. Figure 4.9 illustrates the number of subjects attending each group. The objective of the maintenance group was to assist clients in maintaining their level of function. Clients attending these groups engaged in maintenance exercises. The support group members came together on a weekly basis and engaged in activities which facilitated social support.

Clients were taught activities such as cane-work and leather-work in the activity group. The goal of this group was skills training with the aim of facilitating income generation. Clients who still needed therapeutic input and were at the same functional level, were seen in a group which was called the therapeutic group. Including stroke groups as part of the management of stroke clients in the community has been recommended, as they provide the social support needed by stroke survivors (Flick 1999). However, there is no substantial evidence in the

literature of the benefits of either home visits or group therapy. In the present study, the number of clients out of the total group that attended these groups was low. Further investigation is needed to ascertain why so few people attended these groups. The stroke support group had transport available, so one would have thought that more clients would have attended.

#### 4.5.7 FUNCTIONAL STATUS.

Functional activities were captured and scored as indicated in the methodology section of the present thesis. Table 4.11 is an illustration of these results.

**TABLE 4.11 FUNCTIONAL STATUS ON ASSESSMENT:**

**(n= 155)** Admission (adm), Last Treatment (last)

VARIABLE	INDEPENDENT		WITH ASSISSTANCE		DEPENDENT	
	adm	last	adm	last	adm	last
Eating	130	146	21	6	4	5
Dressing	58	104	67	40	30	11
Washing	59	96	66	46	30	13
Toileting	77	104	52	37	26	14
Bed mobility	101	127	37	18	17	10
Transfers	89	106	38	27	28	22
Walking	81	107	37	26	37	22

When comparing the results of the functional levels of the clients on admission and discharge, there was a definite improvement in the status. On admission, clients needed more assistance with activities of daily living such as dressing, washing and toileting than with activities such as bed mobility and transfers.

This however, differed from the situation at discharge, where more clients were totally dependent on a caregiver for activities such as walking and transfers than for activities such as dressing and washing. These findings were similar to those found by Mayo *et al.* (1999) in their study, the clients also made greater gains in activities of daily living than in gait. At one year 73% of their sample were functionally independent in activities of daily living while although they could walk independently, they experienced problems with endurance while walking.

Although specific outcome measures were not used at the Rehabilitation Centre in Bishop Lavis, a good indication of functional status at assessment and at the time the clients were last treated at the centre could be gained. An improvement in functional status in the majority of the clients indicated a positive response to the rehabilitation received at the centre. As the main aim of rehabilitation in stroke patients is improvement of functional independence, the rehabilitation at the centre could be seen to be successful. Alternatively, a positive outcome post-stroke could also be partly attributed to the natural recovery process, as the results in the present study indicate that the majority of the clients were rehabilitated within the first three months post-stroke, the time frame within which, according to the literature, post-stroke recovery occurs naturally. (Cifu 1999).

#### **4.6 SUMMARY OF RESULTS**

A total of 194 stroke clients were treated at the Bishop Lavis Rehabilitation Centre between 1995 and 1999. The final study sample however, only consisted of 168 subjects as 26 were excluded due to missing and incomplete clinical data.



Although some of the records used in the analysis of the data were incomplete, the present study produced important information regarding stroke clients that had been rehabilitated at a primary health care centre. This is the first study that provides information regarding such a profile.

The results revealed that 50% (84/168) of the study population was 60 years or younger with an average age markedly younger than that reported in other studies. The most prevalent risk factors found in the present study, i.e. hypertension, diabetes and smoking, are well-established for stroke.

There is some indication from the results, that the majority of stroke clients were managed at primary level and not referred to secondary or tertiary institutions for hospitalisation. The clients were not only referred by therapists, but also by other members of the medical team and even by members of the community. Rehabilitation could however, still assist with functional recovery of the majority of the clients as they were referred within 12 weeks post-stroke.

The physio- and occupational therapist were the two allied health professions most utilized by the stroke clients. Groups were run to specifically address additional needs of post-stroke clients. These groups were, however, only attended by a small minority of the study sample.

A definite improvement in the functional status of the clients is noted at the time of last attendance when compared with that of initial assessment.

## **CHAPTER 5.0**

### **CONCLUSION**

#### **5.1 PRACTICAL IMPLICATIONS**

The objective of this descriptive survey in compiling a profile of the stroke clients treated at the Bishop Lavis Rehabilitation Centre between 1995 and 1999, was successfully achieved.

As the mean age of the sample was younger than is found internationally, one could expect the impact and burden of stroke to be greater in this community, due to the potential for a lifetime of disablement in younger stroke clients.

The vast occurrence of modifiable risk factors in the present sample is concerning as it reveals that the lifestyles of this community could lead to a variety of chronic diseases.

The rehabilitation of this specific sample needs to include services which cater for the needs of a group of clients that might have had active lifestyles or even be employed at the time of their stroke, as opposed to an older population that might have been less active. A greater focus should be placed on factors that could reduce participation restrictions.

## **5.2 LIMITATIONS OF THE STUDY**

As the present study was only a descriptive survey, information gained should be regarded as a basis upon which future analytical studies could be based.

Incomplete records, which could result in missing clinical data bias, were a major limitation of the present study. Some of the information gained e.g. length of rehabilitation, was based on the last time the client was treated at the center as no definite indication of discharge date was recorded. The conclusions drawn from this should therefore be accepted cautiously as the actual situation might be different.

Although the Occupational Therapist completed an assessment form for the majority of clients on admission, there was no indication in the records that a specific format of assessment or treatment was used. This influenced the ability to record information about the functional outcomes. Collateral information, such as the identity of the primary caregiver, was not documented and could therefore not be commented on in the present study. This was a shortcoming, as the role of the caregiver is a major considering factor in the rehabilitation of stroke clients.

A major limitation of the present study is that information regarding the participation restrictions and quality of life experiences of the clients was not obtained.

### 5.3 RECOMMENDATIONS

Based on the findings of the current study the following recommendations are made:

1. Health prevention and promotion strategies relating to stroke should be urgently implemented. The programmes should specifically target the younger males in the community.
2. The staff of the Rehabilitation Center should use a specific standardized outcome measure when assessing stroke clients as this would provide more objective indicators of the effects of rehabilitation.
3. An interdisciplinary team approach should be implemented where all members of the team decide at regular team meetings about the goals and rehabilitation plan of the individual stroke clients.
4. Good record keeping is essential for planning of health care services. It is important that the staff at the rehabilitation center keep correct, complete records relating to all aspects of the assessment, both subjective and objective. It is also important to record whether the clients were discharged or whether they died or discontinued their treatment. This information is not only useful when implementing research, but also when assessing the cost-efficiency of a service.
5. The need for the employment of a speech therapist at primary level is strongly urged. This staff member might not only be needed for stroke survivors but for clients with speech or swallowing problems resulting from other conditions.

6. As the majority of stroke clients are managed at primary level, prospective analytical studies should be done to evaluate the management of these clients at Community Health Centres.
7. Clinical guidelines for the rehabilitation of stroke clients at primary health care centres should be developed. Post-stroke clients need to be consulted as information regarding the impact of the stroke on their quality of life is vital when developing these guidelines.

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## DATA CAPTURE SHEET

## A. GENERAL DEMOGRAPHIC DATA

COMPLETE THIS INFORMATION SHEET BY WRITING THE CORRESPONDING NUMBER INTO THE BLANKS PROVIDED FOR EACH QUESTION

1. Patient identification number:

--	--	--

2. Gender:

--

1	Female	2	Male
---	--------	---	------

3. Date of Birth:

Y	Y	M	M	D	D
---	---	---	---	---	---

4. Residence:

--

1. Bishop Lavis
2. Bonteheuwel
3. Clarkes Estate
4. Elsies River
5. Nooitgedacht
6. Kalksteenfontein
7. Delft
8. Valhalla Park
9. Other

Specify Other .....

5. Indicate employment status as follows at time of:

* last stroke	
* discharge from Bishop Lavis	

1. Employed
2. State Disability Grant
3. State Old Age Pension
4. Private Pension
5. Unemployed
6. Unemployed awaiting Disability Grant
7. Unemployed awaiting other pay-out
8. Work assessment
9. Work rehabilitation

6. MARITAL STATUS

1. Married
2. Single
3. Divorced
4. Widowed
5. Living together

<b>B. MEDICAL DATA / HISTORY</b>
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1. FUNCTIONAL VISUAL STATUS

1	Functional	2	Partially Sighted	3	Blind
---	------------	---	-------------------	---	-------

FOR QUESTIONS 2 – 3 INDICATE - 1 for YES or 2 for NO

1	YES	2	NO
---	-----	---	----

2. PRESENCE OF FOLLOWING RISK FACTORS:

- \* Hypertension
- \* Diabetes
- \* Ischaemic heart disease
- \* Obesity
- \* Alcoholism
- \* Smoking
- \* Elevated blood lipid levels
- \* Peripheral vascular disease
- \* Carotid artery stenosis

3. PRESENCE OF ASSOCIATED ILLNESSES:

- \* Rheumatoid arthritis
- \* Osteoarthritis
- \* Gout
- \* Respiratory illness
- \* Visceral illness
- \* Psychiatric illness
- \* Other


Specify other .....

**C. FACTORS RELATING TO THE LAST STROKE:**

1. DATE OF STROKE

Y	Y	M	M	D	D

2. FREQUENCY OF STROKE

1	First Stroke	2	Second Stroke	3	Greater Than 2
---	--------------	---	---------------	---	----------------

3. TYPE OF STROKE:

1	INFARCT	2	HAEMORRHAGE	3	OTHER
---	---------	---	-------------	---	-------

4. HEMISPHERE OF LESION:

1	RIGHT	2	LEFT
---	-------	---	------

**D. THE FOLLOWING QUESTIONS ARE RELATED TO THE REFERRAL:**

1. REFERRAL AGENCY:

1	TBH	4	Conradie	7	General Practice
2	KBH	5	Bishop Lavis CHC	8	NGO
3	GSH	6	Other CHC	9	Other

2. PERSON REFERRED:

1	O.T.	5	Physio	9.	Other
2	Nursing Sister	6	Community Source		
3	Speech Therapist	7	Dr		
4	Social Worker	8	Self or Family		

3. Date of referral to Bishop Lavis Rehabilitation Centre

Y	Y	M	M	D	D

4. Referral of patient from Bishop Lavis Rehabilitation Centre To Secondary or Tertiary Institution:

1	TBH	3	CONRADIE
2	KBH	4	OTHER

Specify reason for referral: .....

.....

E. THE FOLLOWING QUESTION RELATES TO TRANSPORTATION USED TO ACCESS THE BISHOP LAVIS REHABILITATION CENTRE:

1. Which method of transport was used ?

1	Walk	4	Hospital Transport	7	Hospital Wheelchair
2	Own Vehicle	5	Hired Vehicle	8	Bus
3	Own Wheelchair	6	Hired Wheelchair	9	Taxi

F. INTERVENTIONS:

1. TREATMENT RECEIVED

1	YES	2	NO
---	-----	---	----

a.	Physiotherapy	
b.	Occupational Therapy	
c.	Speech Therapy	
d.	Social Work	
e.	Medical Officer	
f.	Dietician	

2. Date of first assessment at Rehabilitation Centre

Y	Y	M	M	D	D

3. Time lapse between initial referral and start of rehabilitation programme in weeks

1	< 1
2	< 2
3	< 3
4	< 4
5	4 weeks or longer

4. Duration of Rehabilitation Programme in months

1	< 3
2	> 3
3	< 6
4	> 6
5	<12
6	>12

5. Was the Patient visited at home:

1	YES	2	NO
---	-----	---	----

6. How many home visits were done:

7. Did patient attend Stroke Groups at Centre

1	YES	2	NO
---	-----	---	----

8. Which group did the patient attend

1	YES	2	NO
---	-----	---	----

a	Support Group	<input type="text"/>
b	Maintenance Group	<input type="text"/>
c	Activity Group	<input type="text"/>
D	Therapeutic Group	<input type="text"/>

9. Were there any interruptions in the Rehabilitation Programme

1	YES	2	NO
---	-----	---	----

Reasons for Interruptions .....

10. What was the total number of treatment sessions?

Physiotherapy	<input type="text"/>
Occupational Therapy	<input type="text"/>
Speech Therapy	<input type="text"/>



**G: PHYSICAL STATUS:**

The following functional activities will be scored as follows:

- O - Patients performs independently
- 1 - Patient needs assistance with tasks
- 2 - Patient totally dependent

1. ADMISSION SCORES:

a	Eating	
b	Dressing	
c	Washing	
d	Toilet use	
e	Bed mobility	
f	Transfers	
g	Walking	

2. DISCHARGE SCORES:

a	Eating	
b	Dressing	
c	Washing	
d	Toilet use	
e	Bed mobility	
f	Transfers	
g	Walking	

**DEPARTEMENT ARBEIDSTERAPIE  
FUNKSIONELE AKTIWITEITE SIFTINGVORM**

PASIËNT PLAKKER
-----------------

NAMME: \_\_\_\_\_

TERAPEUT: \_\_\_\_\_

**INSTRUKSIES**

- Item I : Kan pasiënt aktiwiteit onafhanklik doen?  
 0 = Geen probleem - pasiënt doen aktiwiteit onafhanklik  
 1 = Wel probleem - nie totaal onafhanklik nie  
 2 = Groot probleem - totaal afhanklik
- Item II : Wat is die bron van die probleem; kennis; gesindheid of vaardigheid?  
 0 = Nie K, G of V probleem nie  
 1 = Wel K, G of V probleem
- Item III : Enige hulpmiddels?  
 0 = Nee  
 1 = Ja
- Item IV : Is verdere bepaling nodig?  
 0 = Nee  
 1 = Ja

N.T. : Waar toepaslik.

W. As probleem opgelos word = 0, met ander woord 0 word bo-oor 1 gemaak.

SELFHANDAWING	I			II			III	IV	OPLOSSING	OPMERKING
	K	G	V	K	G	V				
<b>SELSORG</b>										
1. Eet										
2. Drink										
3. Aantrek van klere en kunsledemate										
4. Was/Bad										
5. Higiëne bv. tandeborsel, skeer										
6. Toiletgebruik										
<b>MOBILITEIT</b>										
1. Bedbewegings										
2. Oorplasings										
3. Rystoelgebruik										
4. Loop										
5. Vervoer										
6. Mobiliteit en oriëntering vir Oogheekunde pasiënte										