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Expert Opinions on Best Practice for the Occupational Therapy Management of Visual Perceptual Deficits in Adults post Stroke

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Occupational Therapy

Johannesburg

May 2013

DECLARATION

I, Bronwyn Joy Reed (nee Swanepoel) declare that this research report is my own work. It is being submitted for the degree of Master of Science in Occupational Therapy by coursework and research report in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

…….

……day of ……., 2013

To my husband, for unending support and encouragement, and for many dinners cooked

To my parents for their unfailing confidence in my ability

Abstract

Visual perceptual impairment is a common consequence of stroke which may affect all areas of occupational performance. The evidence for the management of these deficits in occupational therapy is not clear. The purpose of this qualitative study was therefore to determine the expert opinion for best practice in the management of visual perceptual deficits in adults post stroke in the South African context.

Interviews with eight expert occupational therapists indicated that a lack of clarity exists in this area of clinical practice. Findings indicate this is a complex area of practice where management needs to be focussed on occupation based therapy for the individual patient in their context. The use of standardised and non-standardised assessments and compensation verses remediation in intervention must be individually determined, and the use of a "top down" approach was considered preferable. This study presents the first step in the development of clinical guidelines for management of this deficit in occupational therapy in South Africa.

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Definition of Terms

Evidence based practice - "Practice based on empirical evidence of efficacy. It is a process which involves searching for, appraising, and then using research findings to guide clinical practice" (Tse et al., 2004) p. 269.

Occupation-based therapy – refers to therapy that carefully considers a client's needs in selecting activities that have particular relevance or meaning to the individual for use in treatment (Schindler, 2010)

Occupational performance – "the ability to perform those tasks associated with individual life roles (such as parent, worker, student, etc.) in a satisfying manner appropriate for the individual's developmental stage, culture and environment." (Pedretti and Early, 2001) p 5

Skill based training – refers to therapy that uses tasks which demand the use of isolated skills with the assumption that practice of the skill will lead to better performance in related tasks. (Hinckley et al., 2001)

PEDro scoring system – A scoring system developed to assess the methodological quality of research articles. It consists of ten criteria, each scoring one potential point to give articles a score out of ten. The scale is useful to compare or determine the quality of published research (Jutai et al., 2003).

Visual perception - the process, by which visual information is received, integrated and used to adapt to the environment. The impressions generated from visual information received are manipulated and then are used for decision making and adaptation of tasks in the performance of activities of daily living (Pedretti and Early 2001).

Abbreviations

Activities of Daily Living (ADL)

Barthel Index (BI)

Berry Developmental Test of Visual Motor Integration (VMI)

Chessington Occupational Therapy Neurological Assessment Battery (COTNAB)

Cerebro-Vascular Accident (CVA)

Developmental Visual Perceptual Test- Adults (DVPT- A)

Functional Electrical Stimulation (FES)

Functional Independence Measure (FIM)

Lowenstein Occupational Therapy Cognitive Assessment (LOTCA)

Lowenstein Occupational Therapy Cognitive Assessment for Geriatric use (LOTCA-G)

Motor-Free Visual Perception Test (MVPT).

Occupational Therapy Adult Perceptual Screening Test (OT-APST)

Randomised Controlled Trials (RCTs)

Rivermead Perceptual Assessment Battery (RPAB)

South Africa (SA)

Test of Visual Perceptual Skills 3 (TVPS 3)

Transcutaneous Electrical Nerve Stimulation (TENS)

Unilateral Spatial Neglect (USN)

United States of America (USA)

University of the Witwatersrand (Wits)

University of Pretoria (UP)

Vocational Rehabilitation (Voc rehab)

CHAPTER 1
INTRODUCTION

1.1 Introduction

Cerebro-Vascular Accident (CVA) or stroke is one of the leading causes of disability worldwide (Menon and Korner-Bitensky, 2004). The crude prevalence for CVA is estimated at 300/100 000 in South Africa and, while this is lower than that for some developing countries, it places an added economic burden on the country as the severity and subsequent loss of function has been indicated as being higher in the South African population (Connor and Bryerb, 2011).

Rowe (2009) reported that 64.4% of all patients with stroke were found to have one or more problems with visual perception and praxis (Rowe 2009), and Khan, Leung and Jay (2008) found that up to 85% of patients report some degree of visual deficit post stroke (Khan, Leung and Jay 2008). Visual perception has been defined as the process which takes basic visual information and integrates it with other incoming information and prior knowledge of the environment as well as concepts of space and objects. This information can then be used to adapt to the environment which aids decision making and adaptation of tasks in the performance of activities of daily living (ADL) in all occupational performance areas (Pedretti and Early 2001). Since the literature continually emphasises the link between the ability to perform functional tasks and an intact visual perceptual system (Pedretti and Early 2001), it is feasible that visual perceptual fallout may have a devastating impact on occupational performance.

Occupational therapists are the leading professionals in the treatment of visual perceptual deficits related to the performance of functional everyday activities in adult stroke patients (Brown and Elliot, 2011). The effective intervention of any deficits in visual perception should thus be the concern of all occupational therapists working with stroke patients. It is recognised that neuropsychologists may also be involved in the management of visual

perceptual deficits with a particular focus on assessment and less on the impact of the visual perceptual fallout on the patient's ability to perform everyday tasks.

In order for intervention to be effective however, it should be based on best practice. This is a term that is widely used, not only within the medical field but also throughout the domains of business, commerce and science. It is exercised when the actions and decisions made by a professional are based on the most up to date research evidence and current knowledge in their specific field. In order to implement best practice within a health setting one has to employ evidence based practice (Dunn, 2000).

Evidence based practice (EBP) was initially introduced as a concept linked to the practice of "evidence based medicine" at McMaster University in the 1980s, but its principles are highly relevant for healthcare professionals in all fields (Bennett and Bennett, 2000). In occupational therapy it can be understood as the process of integrating several factors such as the analysis of good quality evidence, clinician experience as well as patient values and needs and available resources in order to provide the best possible treatment (Kielhofner 2006). The importance of evidence based practice in occupational therapy cannot be ignored and it is within this framework that the optimal quality of intervention may be attained.

In order to provide effective management of any deficits after stroke, including visual perceptual deficits, occupational therapists need to have a good grasp of this current evidence provided by research in the literature. Other critical components in effective treatment are the knowledge of the individual patient's needs and of the specific internal components and performance skills leading to dysfunction, as well as an understanding of how to manage the problem based on clinical experience.

1.2 Statement of the Problem

In terms of research evidence, the several systematic reviews of visual perceptual rehabilitation in patients with stroke that have been published present several methods of assessment and rehabilitation of visual perceptual deficits. The research reviewed has been criticised in terms of both research methodology and rigour. The recognised need for larger samples, clearer and more detailed specification of treatment effects and increased research rigour, indicate that further research is needed to support the conclusions presented (Cicerone et al., 2005). These results, although identified in 2005, remain consistent in current literature with very little good quality recent literature published since then to refute this.

There are a plethora of assessment tools, both standardised and non-standardised, to evaluate visual perceptual deficits in adult stroke patients, with as many suggestions on how best to approach the intervention of these problems. Unfortunately, published evidence designed to guide therapists in the most effective management of visual perceptual deficits remains inconclusive. The many subjective, non-standardised assessment techniques used to evaluate visual perceptual deficits, as well as the effectiveness of related therapies, lack validity and reliability and give little guidance as to whether intervention should remediate or assist the individual to compensate for their deficits.

Another major problem that faces occupational therapists in this field of practice is the apparent lack of consistency in the definitions of specific terms related to visual perception, as well as in the components that are included in the broader visual perception category. This lack of consensus about definitions and best practice makes judging the outcomes of treatment for visual perceptual deficits difficult particularly within the South African context. This is because most research in this field has been done in first world countries, so their results need to be interpreted with caution when applied to the South African population. As an occupational therapist currently working in the field of adult neurology, I became aware of the significant functional implications of visual perceptual

dysfunction as well as the lack of consistency in how it was being managed by my colleagues. This present work is a result of that observation.

1.3 Purpose of the Study

On investigating the available research on the occupational therapy management of visual perception post stroke, it was noted that there is limited evidence to support or refute the use of various occupational therapy assessment techniques and interventions, with a paucity of information for the South African context. The purpose of this study was therefore to research the opinions of experienced occupational therapists, in order to establish how they identified best evidence in this field of practice and what factors they felt affected the management of visual perceptual deficits post stroke, particularly in the South African context.

1.4 Aim of the Study

The aim of this study was to determine the expert opinion on best practice for the management of visual perceptual disorders in adult patients post stroke with specific reference to the South African context

1.4.1 Objectives of the Study

The objectives of this study were:

- To gain expert opinion on the definitions of visual perception and visual perceptual deficits and the various associated terms.
- To gain expert opinion on the methods that should be used to assess visual perceptual deficits in adults post stroke in a clinical context.
- To gain expert opinion on the methods that should be used to treat visual perceptual deficits in adults post stroke in a clinical context.
- To gain expert opinion on the how management of visual perceptual deficits post stroke should be adapted for the South African context

1.5 Justification for the Study

In the absence of consistent findings in the published research evidence, the clinical experiences of medical experts, as well as the context in which they gained this experience, together with their understanding of individual patient's needs, are important aspects for best evidence for practice within the framework of evidence-based practice (Kielhofner 2006). This study is potentially the first step in establishing best practice guidelines for the management of visual perceptual deficits post stroke by collating and publishing this information. Once guidelines based on clinical experience are available for the South African context, it may be possible to set up research to confirm results which may lead to better outcomes in this field of practice.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This literature review will consider CVA and the visual perceptual deficits associated with the condition. The assessment of visual perceptual deficits as well as the occupational therapy intervention will be considered in terms of various frameworks and models and specific techniques that can be used in occupational therapy.

2.2 Cerebrovascular Accident

Cerebrovascular accident (CVA), or stroke, is the leading cause of serious, long-term disability for adults in the United States of America (USA) (Menon and Korner-Bitensky, 2004). Although it is difficult to apply data from the USA directly to the situation in South Africa (SA), these data are indications of the significant role that CVA has to play in the overall disability status of people in first world countries. The burden of CVA is likely to be higher in South Africa (SA) due to the reduced access of the general population to adequate medical and rehabilitative services. Stroke incidence in SA is difficult to report accurately due to the lack of good quality studies as well as poor record keeping of patients in more rural populations, but it has been estimated at between 101 and 300 per 100 000 people per year (Connor et al., 2007, Connor and Bryerb, 2011). These proposed figures highlight the importance of CVA as a source of permanent disability in our country. The literature and clinical practice provide evidence that visual, visual perceptual and cognitive disorders are prevalent after stroke and are present from the acute phase. Visual perceptual disorders affect rehabilitation and quality of life after stroke (Granger et al., 1993).

Rowe (2009) reported that 64.4% of all stroke sufferers were found to have one or more problem with visual perception and praxis (Rowe and UK, 2009), and Khan, Leung and Jay (2008) found that up to 85% of patients report some degree of visual deficit post stroke

(Khan et al., 2008). A significant decrease in the performance of everyday activities in the occupational performance areas has been shown to be related to visual and visual perceptual disorders (West et al., 2002).

2.3 Visual Perception

Intact visual perception is a performance skill that is necessary for the efficient and accurate performance of functional tasks (Cooke et al., 2005, Cate and Richards, 2000). There are many definitions of visual perception in the literature. All of them cover the concept of reception and processing of visual information in order to make sense of and perform effectively in one's environment. It is described well by Cooke, Mckenna and Flemming (2005) in stating that

> "Visual perception is the dynamic process of receiving (perceiving) the environment through sensory impulses and translating these impulses into meaning, based on a previously developed view of the environment." (Cooke et al., 2005) pg. 59

Although the concept of visual perception is consistently defined in most texts, there are some discrepancies when it comes to the components that are included as disorders of visual perception. Certain visual perceptual components are traditionally recognised by various authors. These components are seen as those which may influence the way that an individual interacts with their environment and which are needed to engage in everyday activities. These components include visual form perception (visual closure, figure-ground and visual organisation); spatial relations (spatial reasoning, visual imagery, spatial perception); spatial orientation (laterality, directionality, topographic orientation); visual cognition (visual thinking, visual manipulation); visual-motor integration (visual stimulus followed by motor response); visual memory (visual-spatial memory, visual sequential memory); visual discrimination and visual recognition and awareness (Suter and Harvey, 2011, Pedretti and Early, 2001, Gillen, 2009). The complexity of the definition of visual perception is illustrated by the fact that this list of components could not be consistently gained from one source but had to be pieced together from several sources.

2.3.1 Visual Perceptual Disorders

Central nervous system injury, such as CVA, has the potential to influence visual function (Cate and Richards, 2000). Statistics vary but as many as 85% of patients have been found to experience some type of visual dysfunction post stroke (Khan et al., 2008), and up to 20% of these visual deficits were found to be in the specific area of visual perception (Parkinson, 2011). Disorders of visual perception occur as a result of dysfunction within the association areas of the brain and/or their complementary nerve tracts (Brown et al., 2011)

Visual perceptual disorders may lead to problems with organising, processing and interpreting visual information correctly. These problems make it difficult for individuals to respond appropriately to this visual information (Cooke et al., 2005). Impairments in visual perception have been linked to difficulty with performance of activities of daily living (ADLs), as well as to reduced safety and increased risk of falling (Cooke et al., 2005, Cate and Richards, 2000, Brown and Elliot, 2011).

In a large, prospective, multicentre, observation cohort study conducted by Strabismus (2009), the distribution of various visual perceptual impairments in individuals post stroke was investigated (Parkinson, 2011). Visual inattention or USN constituted the largest portion of the visual perceptual problems (70%) with other skills such as depth impairment and agnosia accounting for four and 14% respectively (Parkinson, 2011). There are few other studies that have documented specific occurrence statistics of visual perceptual deficits except in the area of neglect. In other studies, USN has been found to occur in up to 82% of right hemisphere strokes and up to 65% of left hemisphere strokes (Proto et al., 2009). There is no significant, updated literature to give an accurate indication of the occurrence statistics of other visual perceptual impairments in patients post CVA. However there is information available in certain sources about other visual perceptual impairments that may occur in CVA patients and how these influence functional performance.

2.3.1.1. Unilateral Spatial Neglect/Inattention

Unilateral Spatial Neglect (USN)/Inattention is defined by Menon and Korner-Bitensky as "a failure to report, respond, or orient to stimuli presented to the side opposite a brain lesion" (Menon and Korner-Bitensky, 2004) pg. 41. This failure to respond to the stimuli on the particular side occurs in spite of the patient having the ability to do so in terms of motor and sensory function (Cherney et al., 2003, Shinsha and Ishigami, 1999). USN has been associated with poorer performance of ADL's and well as increased falling risk in patients post CVA (Menon and Korner-Bitensky, 2004). It is important to differentiate it from deficits in visual fields such as homonymous hemianopia and to recognise that, although the two impairments may be present at the same time after stroke, they may also exist in isolation and the two terms cannot be used interchangeably (Khan et al., 2008, Gillen, 2009, Parkinson, 2011). This is an area which receives significantly more attention in the available literature than any other visual perceptual impairment researched. Perhaps this is due to the revealed debilitating nature of this impairment or due to its relative ease of identification in certain patients. It is for this reason that much of the information in this literature review is specific to USN.

2.3.1.2 Agnosias

Agnosias are disorders of recognition specific to one sensory channel that affect either the perceptual analysis of the stimulus or the recognition of its meaning (Parkinson, 2011). Visual agnosias occur when the individual is unable to recognise visual stimuli despite adequate primary visual function (Parkinson, 2011). Agnosias have been documented to cause confusion and reduced problem solving ability by some authors (Gillen, 2009) due to the inability for patients to recognise specific aspects in their environments, thereby impacting significantly on performance in daily tasks. There are several specified sub-types, each with non-recognition of certain specific stimuli and these sub-types may occur in isolation or simultaneously (Gillen, 2009). Each source of information on this topic produced a slightly different list of sub-types which is another example of discrepancies within the definition of visual perception. Alexia, which is described as the inability to recognise words presented in a visual format, results in patients being unable to read. Letters may be recognised but words not, so that patients may attempt to read letter by

letter (Pedretti and Early, 2001). It is recognised as an agnosia in certain texts such as Gillen, 2009 and not in others (Gillen, 2009)

2.3.1.3 Visuospatial Impairments

These deficits occur in up to 38% of patients post stroke and are seen as being common impairments in this group of patients (Gillen, 2009). They can be defined as impairments in the ability of the brain to organise visual information into meaningful spatial representations (Pedretti and Early, 2001) and present as deficits in several skill areas. As with many of the other visual perceptual disorders, the specific parameters mentioned in literature is not consistent between authors. Skill areas mentioned by both Pedretti and Early, 2001 as well as by Suter and Harvey, 2011 are form constancy, figure-ground perception and Spatial orientation (including position in space) (Pedretti and Early, 2001, Suter and Harvey, 2011). Suter and Harvey, 2011 further include visual closure and spatial visualisation (Suter and Harvey, 2011), while Pedretti and Early, 2001 include spatial relations (Pedretti and Early, 2001) and depth perception is an aspect mentioned by Gillen, 2009 (Suter and Harvey, 2011).

2.3.1.4. Other Disorders

There are some other disorders that do not receive as much attention in the literature and are not mentioned as consistently. These include body scheme disorders such as impaired right-left discrimination (Parkinson, 2011). Then there are a group of agnosias related to body scheme, namely, anosagnosia (denial of deficit (Proto et al., 2009)), asomatagnosia (denial of ownership of the affected limbs) and finger agnosia (reduced recognition of individual fingers) (Parkinson, 2011). These are classified here as primarily body scheme disorders with a component of agnosia but not classified as primary agnosias by these authors and others (Pedretti and Early, 2001). This further emphasizes the complexity and potential for confusion in the area of definitions of visual perceptual impairment components. Visual hallucinations have also been described as a disorder of visual perception by some authors as has dyschromatopsia (color blindness) (Parkinson, 2011) but neither of these impairments feature strongly and consistently throughout the literature.

2.3.2 Discriminating between Visual Perceptual and other Disorders

Because much of the crude interaction that occurs between an individual and the environment occurs via the motor system, a patient with a disorder in visual perception may seem to be unable to perform certain learned or observed movements to the same degree as before. This is especially true for the ability of an individual to handle tools and mimic actions. This could lead to clinicians mistakenly diagnosing apraxia in the presence of simple visual perceptual fallout, as apraxia is defined in the literature as

> "A disorder of the execution of learned movements that cannot be accounted for by weakness, incoordination, sensory loss or incomprehension of or inattention to commands." (York and Cermak, 1995) pg. 543

In a study by York and Cermak (1995) the relationship between visual perceptual impairment and apraxia is explored. They propose a link between visual perception and praxis and show that patients with visual perceptual impairment perform poorly on tests of gesture discrimination (praxis) (York and Cermak, 1995). Their argument as well as the findings of their study illustrates the link between visual perceptual ability and praxic ability and although the study is relatively old and the sample sizes used were small, the results highlight the possible confusion in the assessment of these two areas.

Similarly, problems with praxis could impact on a patient's ability to perform well on certain tests of visual perception such as with written assessments and constructional tasks. In this area, certain authors make the distinction that problems with construction skills, as sometimes assessed in visual perceptual assessment batteries, should be classed as apraxia and not as visual perceptual disorders (Cooke et al., 2005). The fact that tests for visual perception often include praxis elements further adds to the apparent discrepancy in this area although some authors of visual perceptual tests have implied that this inclusion is there in order to assist in the differentiation between the two disorders (Cooke et al., 2005).

Another area of discrepancy in relation to identifying visual perceptual problems lies in the area of primary visual skills. Visual dysfunction is a common problem facing many stroke

patients (Warren, 1993b). Visual field loss, for example, is often seen in patients post CVA and is seen to have an impact on their ability to perform daily tasks (Warren, 1993a). Warren suggests that visual skills in three primary areas underpin an individual's ability to process and integrate any visual information. These areas are intact visual fields, visual acuity and oculomotor ability (Warren, 1993a). These three areas can be used to classify some of the common visual deficits observable in adults post stroke. Similarly to the visual perceptual impairments, details of specific visual deficits are inconsistent in the literature and very little details are available to justify this discrepancy. Specific impairments mentioned include visual field deficit (Cate and Richards, 2000, Warren, 1993a); contrast sensitivity function which is the ability to distinguish the borders of an object as the contrast between the object and the background diminishes (Cate and Richards, 2000); visual acuity (Gillen, 2009) and oculomotor ability consisting of pursuits or scanning, saccades, accommodation and convergence (Gillen, 2009, Cate and Richards, 2000).

Accurate visual information needs to be received for visual perception to occur efficiently. The receipt of accurate visual information is separate from the process of interpreting it, which is visual perception. Visual perception cannot occur without vision, but vision is a primary sense and not a perceptual skill (Warren, 1993a). This concept was supported by Cooke, Mckenna and Flemming (2005) who reiterated the importance of accurately assessing primary visual skill before attempting to assess visual perceptual functioning in the adult (Cooke et al., 2005). This enables us to differentiate between primary visual skills and perceptual skills but the close relationship of the two also highlights the potential for confusion.

It is important for occupational therapists to reach consensus about the parameters of visual perception as this has a direct impact on how visual perception is assessed. Clear parameters would lend clarity to and provide standards for the assessment of this common area of dysfunction.

2.4 Assessment of Visual Perception

The two basic approaches to the assessment of visual perception are function based, and component or skill based. The choice of approach is often made depending on whether we view assessment in a "top-down" or "bottom-up" way (Cooke et al., 2005). A "top-down" frame of reference focuses on the impact of perceptual difficulties on functional tasks. This type of assessment seeks to evaluate the visual perceptual skill in the context of a functional task. A "bottom-up" frame of reference focuses on the individual impairments and the individual functioning of each element in contrived tasks specifically designed to evaluate those elements (Cooke et al., 2005). If a thorough assessment is not done, this will impact on the ability of the clinician to identify accurate barriers to optimal functioning, and will thus hinder clear understanding of performance as well as accurate treatment planning.

2.4.1 Assessment of Function

Since the early 1900s, occupational therapists have used non-standardised observations of functional performance in tasks to assess visual perception in adults. This method of assessment has been criticised for many reasons (Cooke et al., 2005). Although there are certain visual perceptual deficits that are easily observable in functional tasks, such as severe unilateral neglect (Menon and Korner-Bitensky, 2004), it is very difficult to determine the severity of these deficits and to isolate visual perceptual deficits from other primary visual deficits or problems with praxis or cognition when a patient is performing poorly (Cooke et al., 2005). Furthermore, if the task is not standardised, the performance measure is often subjective and cannot be accurately and objectively re-evaluated at a later stage. Interpretation of the assessment may then be dependent on the level of experience and clinical reasoning of the clinician (Cooke et al., 2005).

However, one advantage of this approach is that it allows the clinician to observe the actual impact of the deficit on the functional performance of the patient (Cooke et al., 2005), which is often the main focus of occupational therapy. Unfortunately, this approach makes it extremely difficult to evaluate the effectiveness of therapy and to use the data for

research purposes (Cooke et al., 2005), both of which are essential, especially in the South African context, to justify the role of occupational therapy in the rehabilitation team.

Occupational therapists can make use of standardised functional assessments such as the Functional Independence Measure (FIM) or the Barthel Index (BI). These tests give standard scores based on the performance of ADL personal management tasks. This allows the therapist to determine an objective score for each patient that can be compared against norms or other patient's scores, as well allowing for clear documentation of the progress in functional performance related to a specific therapy intervention. Although these measures give more objective measurable assessments, it is still difficult to use them to isolate specific perceptual problems and they will not be effective as stand-alone visual perceptual assessments.

2.4.2 Assessment of Performance Components

When assessing visual perception using a "bottom-up" frame of reference there are many tasks that can be used to assess deficits in individual skills, both standardised and non-standardised (Cooke et al., 2005).

Several standardised tests are available in order to assess individual visual perception impairments. These include several tests developed for use with the paediatric population, such as the Berry Developmental Test of Visual Motor Integration (VMI), the Developmental Visual Perceptual Test- Adults (DVPT- A) and the Test of Visual Perceptual Skills 3 (TVPS 3). All three of these tests have undergone processes to develop norms for the adult population (conducted between 1980 and 1995) but there has not been exhaustive, peer-reviewed testing of the reliability and validity of any of them with adults (Cooke et al., 2005). This makes it difficult to use them as stand-alone measures of the visual perceptual ability of a patient (Cooke et al., 2005). The test most often used in published research is the Motor-Free Visual Perception Test (MVPT). Its main advantage is that it does not require the patient to use any motor skills, which is beneficial when there are movement deficits as in hemiplegia or apraxia. It has, however, been shown to have

borderline measures of predictive validity and may not be appropriate to predict real-world functioning (Gillen, 2009). In a 2004 review of perceptual testing measures, no evidence could be found to support the reliability of the test (Menon and Korner-Bitensky, 2004). A newly developed (2003) MVPT-3 was recently reviewed by Brown (2011). Unfortunately, the findings do not support its use to gain an accurate picture of the spectrum of visual perceptual problems in adults post stroke (Brown and Elliot, 2011), due to it exhibiting multidimensionality instead of the desired uni-dimensionality (Brown and Elliot, 2011). Findings also cast doubt on the internal validity of the test for use with adult stroke patients (Brown and Elliot, 2011).

Other tests have been developed specifically for use with the adult population. They include The Rivermead Perceptual Assessment Battery (RPAB), The Chessington Occupational Therapy Neurological Assessment Battery (COTNAB), the Loewenstein Occupational Therapy Cognitive Assessment (LOTCA) and the LOTCA developed for the geriatric population (LOTCA-G). The RPAB has published evidence of both reliability and validity for use with adult patients and consists of 16 subtests of visual perception (Menon and Korner-Bitensky, 2004). It also has a shortened version with three different presentation options, but this version has less convincing reliability and validity and it has been shown to be less responsive to clinical change than the full test (Menon and Korner-Bitensky, 2004). The LOTCA was seen to be useful for predicting functional change after stroke rehabilitation (Zwecker et al., 2002). The geriatric adaptation (LOTCA-G) was shown to have good construct validity as well as to be reliable and valid for elderly patients who may require more time to complete certain tasks (Katz et al., 1995). The LOTCA is, according to its name, primarily a cognitive assessment and the ability of it to comprehensively assess perceptual impairments is queried by the researcher.

More recently, a screening tool for visual perceptual deficits post stroke called the Occupational Therapy Adult Perception Screening Test (OT-APST) was developed in Australia by Cooke, Mckenna and Flemming (Cooke et al., 2005). This test includes isolated perceptual skills and has published data detailing its established reliability and validity (Cooke et al., 2005). The tool can be administered in a short time (30 minutes) but since it is a screening tool the authors recommend further perceptual testing if specific

problems are identified. This assessment must be viewed as a short duration initial screening designed to save time, and should be supplemented by a more in-depth assessment for visual perception when time is not a problem. It is also not sensitive enough to pick up high level, subtle problems (Cooke et al., 2005).

For some visual perception impairments, usually those that are most prevalent, specific tests which assess only that one component are recommended. It has, for example, been recommended as part of published clinical guidelines for stroke rehabilitation that all patients be screened for the presence of unilateral spatial neglect (USN). This may be due to the fact that the presence of USN has been associated with poor functional outcome and increased injury/falling risk in individuals post stroke (Menon and Korner-Bitensky, 2004).

2.4.3 Assessment of Specific Components of Visual Perception

The assessment of USN has received much attention in the literature and it is the only aspect of visual perception that has this volume of assessment scales available for it. It is also the most common visual perceptual impairments post CVA and for these reasons, it has been suggested that patients with right hemisphere damage are more prone to neglect, but recent studies have shown that neglect may be present in patients with both left and right sided damage (Menon and Korner-Bitensky, 2004). It has been recommended that therapists ensure that they determine whether the neglect exists with or without the presence of homonymous hemi-anopia, or if the presenting symptoms might indicate a hemi-anopia rather than USN (Suter and Harvey, 2011, Pedretti and Early, 2001). This can be done by specific awareness of the distinction between the two deficits during screening for and assessment of USN (Suter and Harvey, 2011). One way to accomplish this is to observe the optical "search pattern" used by the patients while engaged in the screening tasks (Pedretti and Early, 2001). Menon and Korner-Bitensky (2004) reviewed and evaluated the effectiveness of 62 standardised and non-standardised assessments for neglect (Menon and Korner-Bitensky, 2004). They were able to recommend certain screening tests as accurate evaluators of USN, including the Line Bisection Test which has the strongest psychometric properties of all the pen and paper tests evaluated. The Line

Bisection Test also does not require the patient to be literate and can be administered easily using only paper and a pen or pencil. One disadvantage is that it requires a patient to be able to hold a pen and follow instructions (Menon and Korner-Bitensky, 2004). Other pen and paper tests for USN include the Draw-A-Man Test and the Rey Complex Figure Test. These tests should however be used with caution, as the presence of other cognitive and perceptual deficits could skew the results and limit accurate interpretation of the presence of neglect. The same concerns apply to the Clock Drawing Test which is the least sensitive of the tests listed above, in detecting neglect (Menon and Korner-Bitensky, 2004).

In the assessment of USN it is necessary to determine in which spheres the neglect is present (Gillen, 2009), and how it will impact on the safety and occupational performance of the patient (Menon and Korner-Bitensky, 2004). A related concern with the use of pen and paper type tests is that they only screen and assess for the presence of neglect in the personal space, and do not assess the two other types of neglect (neglect in the near and far extra-personal spaces) which could have significant impacts on the occupational performance of the patient (Gillen, 2009). One of the better tools for assessing what type of neglect is present, is the Rivermead Behavioural Inattention Test which evaluates near and far extra-personal neglect on an impairment level as well as using functional tasks to evaluate the impact of USN on function. The test has been shown to have excellent reliability and validity evidence (Gillen, 2009, Menon and Korner-Bitensky, 2004), as well as predictive validity for functional outcome. However, it does contain several reading tasks and many other perceptual skills are needed to complete it. Patients may therefore be compromised if they are illiterate, do not speak English (a particular concern for its use with the South African population), or have other visual perceptual deficits (Menon and Korner-Bitensky, 2004).

It can be seen that there is value in performing assessments of isolated visual perceptual skills in stroke patients, but if these are the only assessments done there is a danger of not having a full understanding of the impact of the discovered deficits on the ability of the individual to function in his or her environment (Gillen, 2009). One study investigating the effectiveness of several neglect assessment tasks indicated that the functional

assessment of neglect in daily tasks was seen to be more sensitive in identifying neglect that any of the paper and pen tasks used (Gillen, 2009). The Catherine Bergego Scale is one such assessment that uses observation of the patient in ten functional tasks to derive a standardised score to test for the existence of neglect in all three hemi-spaces (Gillen, 2009, Menon and Korner-Bitensky, 2004). It has also been shown to correlate well with several pen and paper USN tests, as well as with functional measures such as the Barthel Index (BI). It can also be administered as a questionnaire to patients for them to evaluate their own performance and thereby assess for anosagnosia (Menon and Korner-Bitensky, 2004). Unfortunately, there is little published evidence to substantiate the test-retest reliability of this test in use with stroke patients (Cooke et al., 2005).

In general, literature suggests that an optimum assessment will combine the two types (both "bottom up" and "top down") in order to understand not only the particular underlying impairments, but also how these problems are influencing the patient's ability to perform functional daily tasks (Gillen, 2009, Cooke et al., 2005, Warren, 1993b).

2.4.4 The Use of Tests for Visual Perception in South Africa

The problem with reading and with interpreting English instructions is a common concern with most of the above-mentioned, internationally produced standardised tests. Even if patients do have a basic grasp of English as a second, third or fourth language, their comprehension of test instructions may not be adequate and would influence performance and skew results. Other tests may produce skewed results in the South African population due to the use of unfamiliar items in sub tests. For example, some items of the OT-APST that involve the use of a stapler (Cooke et al., 2005) are evaluated based on the assumption that the patient has used a stapler previously. Many patients from a rural background may never have seen or used a stapler before and so negative responses cannot be construed as poor performance of the skills. This is equally true for many of the block building and puzzle tasks, as many patients in the South African population may lack familiarity with these types of materials. This assumption has not been investigated in any literature searched for this review and it is an area that requires further investigation with the South African population to evaluate its credibility. These aspects may affect both the

interpretations of these assessments as well the ability to use them as outcome measures to determine the effectiveness of treatment in a South African population.

2.4.5 Factors affecting the Assessment of Visual Perceptual Deficits

There are several factors that have the potential to influence the performance of patients on visual perceptual assessments. Primary visual skills, praxis and cognition are three that have received attention in the literature.

Up to 85% of patients have been seen to have some degree of visual fallout post CVA (Khan et al., 2008). If a patient is unable to accurately receive visual information it will be very difficult for him or her to perform optimally on a test of visual perception (Warren, 1993a, Pedretti and Early, 2001, Cooke et al., 2005). This has the ability to complicate assessment of visual perception with stroke patients, especially if the therapist is not fully aware of the extent of the visual impairments and it may lead to the diagnosis of visual perceptual impairment in the case of more fundamental impairment in certain visual skills. It will also have a significant impact on the treatment of these patients. Therefore, a comprehensive screening of a patient's visual skills needs to be conducted, either by the occupational therapist or by another professional such as a functional optometrist who has the specialised tools and equipment to do a thorough evaluation (Warren, 1993b).

Impairment in the internal performance component of cognition may influence a patient's ability to perform optimally on assessments of visual perception (Pedretti and Early, 2001). A patient's ability to attend to and manipulate the various components of several perceptual tests relies heavily on cognitive skills. It is thus important to rule out or at least understand the effect of these cognitive skills on the performance of a visual perceptual assessment task. Similarly, the ability of a patient to plan and execute movements can impact on performance in certain tasks such as construction and written aspects of standardised tests (Cooke et al., 2005). Apraxia can also lead patients to perform poorly in functional tasks which, to an inexperienced clinician, may be mistakenly perceived as visual perceptual fallout.

These factors are indicative of the complexity of the assessment of visual perception in patients post CVA. Clinicians have to be aware of some or all of them during assessment in order to accurately identify the specific visual perceptual impairment and isolate it from impairments in any of these other areas

2.4.5.1 Site of the Cerebrovascular Accident

Even before assessment begins, it is assumed that a therapist can often have an idea about what to expect in a patient based on the side and site of the lesion (Gillen, 2009). Strokes involving certain sites in the brain display the prevalence of different types of visual and visual perceptual disorders. The parietal and temporal lobes are seen to be the common sites for damage to induce visual perceptual dysfunction. Typically, damage to the temporal lobe leads to impairments in visual memory and to agnosias and damage to the parietal lobs results in impaired visuospatial functions and apraxia. Damage to the occipital lobes typically leads to problems with visual recognition and frontal lobe damage traditionally results in problems with movement, speech and cognition (Pedretti and Early, 2001). The side of the lesion is also often indicative of certain impairments. Damage to the right cerebral hemisphere usually results in attention deficits, USN, visuospatial impairments, left visual field loss, left sided motor apraxia, reduced insight, impaired left-right discrimination and impaired constructional skill. Damage to the left cerebral hemisphere usually results in bilateral ideational motor apraxia, right visual field loss, body scheme disorders and alexia (Gillen, 2009, Parkinson, 2011). These assumptions are supported by much of the available literature, specifically in the indication that visual perceptual fallout can be expected in patients after left CVA (Cooke et al., 2005).

Although lateralisation does occur in the brain for certain tasks, this is not the case in every patient. In their study on 45 subjects on various praxic and visual perceptual tasks, York and Cermak found evidence of visual perceptual fallout in patients with both left and right CVA (York and Cermak, 1995). When compared to a control group (with no history of CVA) there were statistically significant differences between the scores of patients with both left and right CVA on the performance of four different visual perceptual tests (York and Cermak, 1995). These results need to be interpreted with caution as the cognitive

status of the patients in each group was not reported, and there was also no evidence of blinding of the tester so scoring may have been slightly biased in order to prove this hypothesis. These results do, however, give an indication of the complexity of presentation of impairments in patients post CVA and indicate that it is not reasonable to only expect visual perceptual fallout if the lesion location is traditionally consistent with this.

The assessment process is essential in order to identify areas of focus and goals for treatment. In the same way as assessment can be viewed as "top-down" or "bottom-up", many decisions regarding treatment are based on which frame of reference is being used by the treating therapist, as discussed below.

2.5 Intervention for Visual Perception

The treatment of visual perception in relation to improving functioning in everyday activities is almost exclusively managed by occupational therapists (Brown and Elliot, 2011). Thus occupational therapists need to have a good understanding of all aspects of visual perceptual rehabilitation, especially regarding the effect that visual perceptual deficits have on performance in functional tasks (occupational performance) (Jutai et al., 2003, Neistadt, 1988, Cherney et al., 2003). The problem in this regard is that there exists little empirical evidence to overwhelmingly support any specific method of treatment in the attempt to improve occupational performance (Gillen, 2009).

Intervention using the "top-down" or adaptive functional occupational performance approach traditionally refers to the retraining of ADL tasks. It often takes a compensatory approach and focuses on improving the performance of the individual in ADL tasks by compensating for the visual perceptual deficits present and/or by adapting the environment. The outcome measures for this type of therapy will be functional performance. Treatment includes practising functional tasks in the occupational performance areas. The "bottom-up" remedial treatment approach focuses on addressing deficits in specific areas of visual perception using frames of reference related to sensory-perceptual performance skills. This

approach seeks to reorganise cerebral function. Much of the research investigating treatment of visual perceptual dysfunction in occupational therapy refers to a "bottom-up" view. In this approach, the focus of treatment is on remediation of performance skills with the assumption that the remediation of these will carry over into improvement of functional tasks (Jutai et al., 2003).

Neistadt (1990), in her critical analysis of occupational therapy for these deficits, mentioned both the adaptive and remedial approaches used for the treatment of perceptual deficits in adults with brain injury (Neistadt, 1990). These approaches were still advocated for use with stroke patients by Zoltan (2007) and Gillen (2009) (Gillen, 2009, Zoltan, 2007).

2.5.1 Rehabilitative Treatment Approach

The rehabilitative approach to treatment for visual perceptual problems is based on the assumption that the adult brain has limited ability to repair itself, and that intact abilities can be used to substitute for those that have been lost and hence compensate for whatever perceptual deficits exist. Patients are taught to change the way they perform their functional tasks, with the goal of making use of intact perceptual skills, and the approach thus includes techniques such as backward chaining for specific functional activities. These functional tasks are practised in therapy to improve occupational performance by using repetition to improve performance on isolated tasks (Edmans and Webster, 2000). Therapy should focus on the retraining of essential, specific activities of daily living, as adults with brain injury cannot easily generalise their learning from one activity to the next (Neistadt, 1990).

2.5.2 Remedial or Therapeutic Treatment Approach

In line with more recent theories related to plasticity of the central nervous system, the remedial "bottom-up" therapeutic approach assumes that the adult brain can repair and reorganise itself and that this process is influenced by stimulation from the environment. Thus sensory-perceptual input can promote recovery which may generalise to other

activities including functional occupational performance. Neistadt (1990) described a number of different approaches that subscribe to remediation of visual perceptual deficits (Neistadt, 1990).

2.5.2.1 Transfer of Training

Techniques for remediation of visual perceptual deficits include the transfer of training approach, initially described by Siev et al. (1986). They recommended that individuals with deficits in constructional skills should practise isolated skills such as simple copying and construction skills. Based on their earlier work, they assumed that improvement in these skills would transfer automatically to other performance skills and functions (Siev et al., 1986). These assumptions are also indirectly made by Groffmann (2011) in Suter and Harvey (2011) when he recommends several isolated impairment based interventions for remediation of visual perceptual dysfunction (Suter and Harvey, 2011). Siev, Frieshtat and Zoltan (1986) further recommended the use of assessment materials in therapy, but this approach was criticised as the patient's exposure to the assessment items compromises the ability to use these respective tools to evaluate patient progress (Siev et al., 1986). The same authors also recommend that training tools used on the paediatric population are appropriate for use with adults for remediation purposes (Neistadt, 1990). This assumption is based on the theory that recovery from neurological injury occurs in a developmental sequence, and therefore treatment tasks should be presented in a way which follows the developmental sequence (Neistadt, 1990).

The main disadvantage of a transfer of training approach is that patients may see the remedial activities as meaningless and too simple, and hence the therapist needs to continue with other activities of daily living as well. Research differs on the effectiveness of this method with approximately half the studies reporting positive results (Edmans and Webster, 2000). Although many of the original assumptions of Siev et al. (1986) are disputed by newer neurological theory, the transfer of training approach is still widely used in clinical practice today and several studies place more emphasis on the measurement and treatment of isolated perceptual elements than on the functional implications of these

impairments (Edmans and Webster, 2000, Siev et al., 1986). This is indicative of the confusion and inconsistency in this area in the international research community.

2.5.2.2 Cognitive Rehabilitation Model

Abreu and Toglia (1987) presented a cognitive rehabilitation model that used an information processing perspective to explain perceptual dysfunction. These authors disputed the application of paediatric theories and techniques to the adult population, explaining that "the neurological organisation, activation and inhibition of the brain varies according to age" (Abreu and Toglia, 1987) p 445. The perceptual process is described as involving sensory detection, analysis of the information, comparing the analysis with prior experiences, relating it to the goal of the activity, and providing the correct response. The cognitive rehabilitation model intervenes by using cognitive strategies needed to perform a variety of tasks, to stimulate the central nervous system's perceptual processing capabilities. Related techniques include making patients cognitively aware of the goal of an action or movement and encouraging planning, control of the speed of response, checking the work, and scanning from left to right (Abreu and Toglia, 1987).

Toglia (1991) described learning as "knowledge acquisition through an interaction of internal and external factors that influence the ability to process information" (Toglia, 1991) p 506. Internal factors have been identified as those features and abilities unique to each learner, and include metacognition (a learner's insight into his or her own abilities and the ability to monitor his or her performance), processing strategies and learner's characteristics (Toglia, 1991). One or more of these factors can be impaired in patients with perceptual fallout post stroke, with the consequence that the ability for patients to learn effectively is significantly compromised. Therapists need to pay close attention to the process of learning occurring in patients and ensure that they promote transfer of learning as much as possible if there is to be transfer and resulting gains in functional occupational performance (Toglia, 1991). Toglia (1991) proposed a multi-context approach to facilitate learning (and skill transfer) in adult patients post brain injury. This approach includes five components: the use of multiple environments, task analysis and establishment of criteria for transfer, metacognitive training, processing strategies and the relation of new information to previously learned skill (Toglia, 1991).

A further related aspect which is mentioned by Toglia and reinforced by other authors, is that of assisting the patient to become aware of his or her perceptual impairments (Pedretti and Early, 2001, Gillen, 2009). Through these methods, feedback is given to the patients about their deficits in visual perception by confronting them with their poor performance on specific assessment-type tools (Gillen, 2009). Improved personal awareness of perceptual deficits is mentioned as a component of both therapeutic and compensatory therapies (Pedretti and Early, 2001, Toglia, 1991).

2.5.2.3 Occupation Based Therapy

Another more recently developed approach suggests that it is beneficial to perform isolated perceptual skill training (i.e. bottom-up) but to do this in functional activity (Gillen, 2009). It differs from the traditional functional approach in that it does not seek to compensate for the deficits by teaching the patients various strategies to overcome deficits. Rather, it involves skilled activity analysis on the part of the therapist, in order to provide the appropriate challenge (based on assessment) to specific perceptual skills, but to provide this challenge in daily tasks such as folding clothing, playing familiar and appropriate board games and setting a table (Gillen, 2009). This approach, if done using tasks that are relevant to the patient, can promote generalisation of skills as mentioned by Toglia (Toglia, 1991).

2.5.3 Effectiveness of Remedial Treatment Approach on Occupational Performance

Up until 1988, literature in perceptual and cognitive therapy had been able to show improvement in isolated skills post intervention but had failed to showed proof of transfer of these skills to daily tasks such as dressing and washing (Neistadt, 1988). More recent academics have proposed that brain plasticity is not sufficiently induced by experience (Bayona, Bitensky, Salter and Teasell, 2005). Research with animals has indicated that stimuli entering the central nervous system need to have an impact on limbic and paralimbic structures in order to induce functional reorganisation in the brain (Bayona et al., 2005). This means that in order for plasticity to occur the individual needs to be engaged in tasks that are meaningful to him or her. However, these conclusions have been

made from detailed observation of the motor cortex in animals and it is not clear whether or not they can be directly applied to the process of visual perceptual retraining in humans.

There is evidence to suggest that specific perceptual retraining has the capacity to improve isolated perceptual functioning, but to date there is little unequivocal evidence to confirm that specific retraining has a significant effect on functional abilities. On the basis of available evidence, authors have concluded that functional reorganisation of the perceptual cortex may be influenced by experience and relevance of the task, just as the motor cortex has been shown to be (Bayona et al., 2005). In addition, brain injured patients have been shown to be unable to spontaneously transfer skills from one learning situation to another (Warren, 1993b).

An extensive review of the treatment of visual perceptual disorders post stroke conducted by Jutai et al. (2003) showed that there is a varying level of rigour in the methodologies used to study these visual perceptual treatment interventions. Of the nine studies considered, four had PEDro scores of 5 or 6, indicating the use of rigorous methodology as well as results that accurately reflect the set hypotheses, two used standardised tests and six were conducted before 1997. Results of the review provided moderate evidence that involvement in perceptual skill training does improve performance in perceptual tasks (Jutai et al., 2003).

However, in the same review by Jutai et al. (2003), there was mixed evidence for the correlation of improvement in perceptual test scores with increased ability to perform function tasks in occupational performance areas. Only two of the studies included a functional measure, and the first study found no correlation when they compared the performance of two groups on the Rivermead ADL Scale and the RPAB after one group received unspecified “perceptual retraining” and the other “conventional therapy” (Jutai et al., 2003). Results showed no statistically significant difference between the two groups after four weeks, and suggested that there is little transfer of skill from isolated perceptual training to functional tasks (Edmans, Towle and Lincoln, 1991). Another study, by Edmans and Webster, 2000, which measured the difference in functional and perceptual performance between a transfer of training group and a functional treatment group, did

support the transfer of training in both groups. In this case, the functional treatment was purely compensatory and did not have a focus on specific perceptual skill training. The results showed no significant difference between the two groups after six weeks, with both groups showing significant improvement in perception and function (Edmans and Webster, 2000). This appears to indicate that both methods are equally effective in achieving improvement in isolated perceptual skills as well as in functional tasks (Edmans and Webster, 2000). It is interesting to note here that the group receiving "functional" therapy improved just as much on isolated perceptual tasks as did the group receiving specific perceptual retraining. This may indicate that involvement in occupational performance tasks may have an effect on perceptual ability. More investigation is needed to establish the benefits of involvement in function-based specific perceptual retraining, in comparison to isolated skill training using non-functional tasks such as block building.

It can be seen that there is a lack of good quality literature documenting the effect of visual perceptual treatment on occupational performance. The few studies that have attempted to link skill based treatment to function are either methodologically flawed or have used unreliable or subjective tools to measure "function". The question that needs to be asked by occupational therapists is whether or not brain injured patients have the ability to transfer skills learnt in one context to other contexts and thereby improve engagement in occupational performance tasks.

2.5.3.1 Transfer of Learning

It is imperative for the therapist to monitor the level of transfer attained by the patient, as the capacity for transfer may differ from patient to patient (Toglia, 1991). According to Toglia (1991), the principle of transfer of learning is an important theoretical factor to be considered in the use of any task in treatment of visual perception, and information is better retained when it is related to a previously learned skill (Toglia, 1991).

This transfer of learning does not occur automatically and theorists have argued that transfer occurs during the learning process and not after learning has occurred. Toglia (1991) presented a framework of near or within task, intermediate or across task, far to a

new task and very far to another environment transfer. Each level is characterised by the ability of the patient to transfer skills from one task to another one, each with less similarity to the original task taught in therapy (Toglia, 1991). Patients, depending on the severity of their dysfunction, will be able to manage different levels of transfer and an evaluation of this can be used to make an important distinction in therapy – whether to use an adaptive/compensatory approach or a remedial approach (Toglia, 1991).

A compensatory approach needs to be taken specifically with patients with poor ability for abstract thought. They are only able to achieve transfer at a near transfer level and specific functional skills are trained repetitively. This requires very little transfer of skill and generalisation (Neistadt, 1988). This means that therapy needs to emphasise the re-training of specific tasks in the occupational performance areas in order to adapt and compensate for overall functional performance (Toglia, 1991). The way that patients do these tasks will often differ from their "normal" way of doing the task, which is why repetition and a certain element of re-learning are required. Some suggested approaches to compensate for USN, for example, in daily tasks include: using anchoring (a coloured or textured line on the left side of the page while reading) and other self-cueing tasks such as numbering lines in reading tasks and turning the page at a 90 degree angle to limit the amount of tracking required to the left while reading (Suter and Harvey, 2011). The same authors suggest working on the ability of the patient to "throw the eyes to the left and scan to the right" to improve extra-personal neglect, as well as development of body scheme to work on personal neglect (Suter and Harvey, 2011). These methods are yet to be validated by empirical research although the suggested left to right scanning pattern is also recommended by Warren (2001) in her chapter in Pedretti and Early (2001) (Pedretti and Early, 2001). Warren goes further to recommend scanning of the environment and physical interaction with objects found, as well as emphasis on attention to detail and the practice of the strategies in varying contexts to ensure carryover (Pedretti and Early, 2001).

Taking all the above into account, even some compensatory treatment methods rely on a certain level of generalisation in order to be effective. Patients can be taught strategies to adapt and compensate for poor visual perception. This might improve their ability to interact with their environments without specific improvement in isolated visual perceptual

impairments. For a compensatory approach to be used, patients need insight into their deficits of visual perception (Warren, 1993b, Toglia, 1991), and for this reason Niemeier, Cifu and Kishore (2001) suggests starting intervention by showing patients their errors on neglect screening tools (Niemeier et al., 2001). Some compensatory strategies suggested by Warren (1993b) to overcome certain errors and to aid the processing of visual information, are for patients to slow down their approach to the task (pacing), and to reduce the amount of stimuli in the environment to enable easier processing of isolated elements (Warren, 1993b).

Occupational therapists understand that in order to facilitate representational plasticity in the brain, patients need to be involved in tasks that are meaningful and familiar to them. Therapists are thus required to use their skills in activity analysis in order to involve patients in treatment sessions that challenge the relevant skills in purposeful activity (Gillen, 2009). Treatment should be done in the light of careful consideration of the cognitive level of the patient in order to achieve the most desirable outcome, whether that is with a remedial or adaptive approach (Toglia, 1991). Linked to this, it is also recommended that a high rate of patient success is maintained in the chosen therapeutic activities (Suter and Harvey, 2011). This serves to motivate the patient and to encourage participation of both patient and family.

If the patient can initiate and successfully use a learned strategy in a variety of situations in terms of intermediate and far transfer distance, then a remedial approach is used in therapy. In these patients, intervention will address specific visual perception impairments using appropriate adjunctive and ADL based techniques and activities (Gillen, 2009, Neistadt, 1990).

2.5.4 Therapeutic Strategies for Intervention for Specific Visual Perceptual Deficits

In the literature there is a definite focus in occupational therapy and neuropsychology research on the specific visual perceptual component of USN. Some reported treatment strategies for neglect include the use of transcutaneous electrical nerve stimulation

(TENS), caloric therapy and mirror therapy. These are all aimed at drawing attention to the neglected hemisphere either by providing electrical stimulation to the skin (TENS); providing cold water infusions into the ear (caloric therapy) or reflecting the neglected hemisphere back at the patient in the non-neglected hemisphere. The use of Dopaminergic drug therapy has also been documented, aimed at reducing the symptoms. Studies regarding these strategies have low levels of evidence, indicate limited lasting effect in patients with neglect, and do not include any information about carryover to functional tasks (Jutai et al., 2003, Teasell et al., 2003) and impact on occupational performance.

Visual scanning is one treatment modality applied in the case of USN, as well as other various perceptual disorders (Jutai et al., 2003, Warren, 1993b, Neistadt, 1990, Teasell et al., 2003). Jutai et al. (2003), in their review of treatment for visual perceptual disorders, reported nine studies involving visual scanning and concluded that visual scanning techniques improved visual neglect post stroke with associated improvements in function (Jutai et al., 2003). However, the methodologies of the reported studies were not always rigorous as only two were randomised control trials (RCTs) and only four included control groups. Furthermore, the functional measures used often included tasks such as reading and letter cancellation which, if improved, do not validate the claim that scanning training generalises to improvement in occupational performance as the skills of reading and letter cancellation are practised as part of scanning training (Jutai et al., 2003). This improvement, rather, reinforces the assumption that practising a particular skill will improve performance in that specific skill (limited generalisation). Positive results were obtained by Paolucci, Antonucci, Guariglia, Magnotti, Pizzamiglio and Zoccolotti (1996) using the Barthel Index as one of the measures. Their study indicated that specific treatment of neglect has value in improving functional performance (Paolucci et al., 1996). There was, however, no evidence of transfer of these skills into multiple environments and different functional situations (Paolucci et al., 1996). There is little convincing evidence of the impact of scanning training on function (occupational performance) (Gillen, 2009). It does, however, remain one of the better documented intervention strategies, although conclusions made by Gillen (2009) concur with principles of generalisation and skill transfer introduced by earlier authors such as Toglia (1991) when he states that “scanning training may not generalise automatically” (Gillen, 2009) pg. 152). To attempt to justify

the use of this potentially valuable treatment modality, he concludes that scanning should be used in functional tasks and notes that it is considered to be customary practice by the American Congress of Rehabilitation Medicine (Gillen, 2009).

A number of different visual scanning programmes have been described in the literature, and the programme used by Niemeier, Cifu and Kishore (2001) includes the use of visual imagery with scanning training (Niemeier et al., 2001). In her study an experimental group underwent three 30-minute training sessions in a visual imagery strategy called "The Lighthouse Strategy" (LHS). This involved increasing patients' awareness of the deficit (metacognitive training), teaching them a visual scanning strategy with head movement using a table-top task. The patients were encouraged to look around the room (multiple environments) and practise the same technique. Different environments were used with reinforcement of the same strategy, and training was given to nursing staff and families in order to facilitate carryover into even more environments. Patients were evaluated using the Functional Independence Measure (FIM) and the Mesulam Verbal Cancellation Task pre and post intervention, as well as on a non-standardised route finding task (Niemeier et al., 2001). Significant improvements were noted in some FIM scores as well as on the route finding task as compared to the control group who received tradition occupational therapy (Niemeier et al., 2001). This definite improvement in functional tasks was in contrast to previously researched treatment strategies for neglect. It has been suggested that introducing the LHS strategy in different contexts is one possible reason for these results. This approach, which is unique to this study, may have assisted the patients to use the skills learned in one session in several other environments, and thereby facilitated transfer of the skill to occupational performance areas.

A similar approach to treatment is used and suggested by Warren (1993) with strategies of visual scanning and attention (Warren, 1993b). The fundamental theoretical approach to the therapy was a hierarchical one, with the authors advocating the treatment of visual scanning and attention in order to correct "higher level" perceptual skills such as visual cognition and memory and pattern recognition (Warren, 1993b). Margolis (2011) in Suter and Harvey (2011) re-iterates the use of 2D scanning activities in the treatment of USN (Suter and Harvey, 2011). The differentiating characteristic of Warren's work is that

specific training guidelines are given by the authors, based on the work of Toglia (1991) and the lack of transfer of training that occurs with brain injured patients (Warren, 1993b). Recommendations therefore include the practice of the learned techniques in various functional situations (multiple environments) in order to facilitate transfer of skill and generalisation. This approach is yet to be supported by research.

One difficulty in implementing visual scanning in therapy is that there is no standardised programme or suggested technique to guide therapists, especially novices, in the selection and implementation of scanning strategies. More research is needed to guide therapists in more specific implementation strategies as this type of therapy could potentially be replicated at low cost with minimal resources, which is appropriate in the South African context.

The use of limb activation has been investigated by several authors in small intervention groups and case studies (Gillen, 2009). In many cases the activation of the affected limb in the neglected space produced an improved attention to the neglected hemi-space, and some studies even found improved performance on functional measures (Gillen, 2009). Unfortunately, the results are difficult to use to guide practice due to low levels of evidence; further research is needed in this area to enable decisions to be made about clinical practice. Links have been drawn between this kind of treatment and constraint induced movement therapy, but one significant limitation noted by Gillen (2009) is that these related methods are not feasible with the often co-existing hemiplegia on the neglected side (Gillen, 2009). It has been suggested that mental imagery is an option for these mobility impaired patients but, although investigations showed potentially encouraging results, the evidence level of the current studies is too low to lead to a definitive clinical decision (Gillen, 2009).

Other techniques that have been reported as being useful in treating visual perception deficits in patients with stroke, are computer based therapy and prisms. Prisms are typically small plastic, press on prisms that are fitted onto spectacles in order to attempt to shift the visual field towards the centre (Gillen, 2009). They were found to improve visual

perception scores, although they had little carryover into occupational performance tasks and warrant further investigation (Gillen, 2009, Jutai et al., 2003), while computer therapy was shown to have little impact on either visual perception or occupational performance (Jutai et al., 2003). Two computer-based programmes are specifically mentioned by Groffman (2011) in Suter and Harvey (2011) for the remediation of visual-perceptual skills (Suter and Harvey, 2011). One of the programmes is said to improve specific functional ability in elderly patients, but no details are given of the study used to derive this information. Other computer programmes are mentioned by Groffman (in the same chapter) with a specific focus on impairment based rehabilitation using games and tasks that bear no resemblance to everyday activities which an individual would ordinarily do on a computer (Suter and Harvey, 2011). Gillen (2009), expresses concerns regarding the generalisability of these tasks beyond near or very near transfer (Gillen, 2009). More research is clearly needed in both of these areas in order to make well informed decisions about whether or not they should be included as part of therapy programmes, especially in the South African context (with resource restraints in many areas), and whether or not they have an influence on occupational performance.

The use of monocular patching (placing a patch over one eye to partially occlude vision and encourage a shift of attention to the neglected hemisphere) was investigated by Barret and Burkholder (2006) on a very small sample with no objective functional measure, with several other key methodological problems such as no evidence of blinding of assessors (Barret and Burkholder, 2006). While other studies using this technique had more rigorous methodologies, all the research only provides a moderate level of evidence to promote the use of monocular patching (Jutai et al., 2003). Beis, Andre, Baumgarten and Challier (1999) found the most promising results in their RCT. Their findings indicated that the use of half field patches may improve functional ability, as measured on the FIM, and reduce neglect (Beis et al., 1999). This is a promising outcome, as this treatment modality requires few resources in terms of both equipment and time spent in therapy, and could therefore be extremely useful in the South African context.

In summary, treatment of these deficits is described in the literature as being either rehabilitative with a focus on ADL retraining and assuming poor generalisation and brain

plasticity or remedial with a focus on isolated perceptual skill retraining. It can be seen that even within certain studies these two approaches are used without clear distinction and this decision, although important, is a complex one. Older theories assumed that patients post CVA were able to transfer skills between environments but more recent literature tells us that this is inaccurate. However, several studies continue to seek to retrain perceptual skill and produce favourable results in functional performance in spite of the new information about skill transfer and generalisation. This reflects a lack of synthesis in the literature and makes it difficult to use it to inform practice. This complexity also makes it difficult for inexperienced therapists to make the decision as they do not have as much clinical knowledge to inform the decision and may rely solely on the evidence. The results of these studies are also mixed with some citing improvement in certain isolated perceptual skills and some not and a vast majority of the studies are not able to produce convincing and significant improvements in functional performance. Occupation based therapy has been suggested in order to facilitate representational plasticity and have an effect on functional performance but no specific research could be located that evaluated the effectiveness of this therapy on functional performance. Again, this emphasises the uncertainty in this area. The area of USN has received significantly more attention in the literature that any other specific perceptual deficit and it was for this reason that much time was dedicated to it in the review. There are few studies investigating the same modality of treatment so there is very little research to endorse the use of any of the modalities to remediate neglect. There is also very little evidence to support the use of these modalities to improve functional performance. Many of the strategies mentioned are resource and experience intensive which may limit the generalised use of them in the South African context. The only strategy to produce favourable results and seem easily reproduced in our context was the lighthouse strategy. The general discrepancy and confusion evident in literature make it difficult to use the current evidence alone to inform practice in this area.

2.6 Evidence Based Practice

Evidence-based practice is been defined as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients” (Sackett et al., 1996) p. 7 and has been described as the synthesis of clinical expertise,

good quality evidence and individual client factors (Bennett and Bennett, 2000). It is well recognised throughout the literature as an essential concept in the management of patients in all spheres of healthcare practice and the involvement of aspects of expert consensus, client input and available resources is reiterated in several sources (Kielhofner, 2006, Sackett et al., 2000). This synergy of knowledge and experience is related to clinical reasoning which is more efficient and better developed in expert clinicians than in novices (Unsworth, 2001). Fleming and Mattingly (1994) also regard clinical reasoning as largely influenced by the prior clinical experience of the therapist (Fleming and Mattingly, 1994). An expert clinician is able to draw from a much broader knowledge base, make decisions more quickly and identify what irrelevant information should be ignored (Unsworth, 2001). Due to the fact that expert clinicians are able to integrate so much information into their clinical decision-making and combine evidence with clinical experience in their specific context their input in research investigations where an accurate opinion on the current best practice in any particular field is being investigated, is essential (Kielhofner, 2006) especially if they have experience in the particular field being researched.

EBP is described by Bennett and Bennett, 2000 as a process that starts with the generation of a question (Bennett and Bennett, 2000). They go on to describe how the literature is then searched and evidence gained is evaluated for methodological rigour and applicability to the setting. Throughout the description of this process, reflection on several factors is described as being essential. Factors include the appropriateness of the intervention to the client in terms of age, gender, personality, frame of reference, etc.; the resources available and the clinical expertise of the therapist (Bennett and Bennett, 2000). This process of matching the evidence from the literature to the individual patient and unique setting is described as a vital component of EBP and is said to rely on clinical reasoning (Bennett and Bennett, 2000), which we know to be better developed in expert clinicians.

Several studies have been done on the actual implementation of EBP by occupational therapists as well as their opinions of it, mainly in Australia and the United Kingdom. The findings in this area are relatively consistent in the expression of barriers to EBP. The most frequently mentioned barriers are lack of time, both to look for and implement new theories and lack of skill to search for and evaluate literature (Bennett and Bennett, 2000,

Bennett et al., 2003, Mc Cluskey, 2003). No studies of this nature probing the South African population of occupational therapists could be located but it is assumed, due to the frequency and consistency of these results that many of the same factors may prevent South African therapists from engaging with the published literature. One study, done in Australia found that therapists were guided more by clinical experience than by published literature (Bennett et al., 2003), potentially due to the above-mentioned factors. This is clearly much more valuable if the clinicians in question either have significant expertise or are working with mentors who can guide and advise their practice.

There is very little evidence to strongly direct practice in the area of visual perception and so the experience of clinicians in this area is an important source of evidence for practice, particularly in South Africa where there is almost no local literature on visual perception. Since there is little evidence in the literature for best practice in dealing with visual perceptual deficits after stroke, clinical experience and the opinion of experts needs to be considered.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Research Design

The research design was qualitative in nature using phenomenological methods. Qualitative research enables researchers to explore and probe the experiences of individuals and to acquire details of how those experiences have shaped their opinions (Kielhofner, 2006), and these aims are supported by phenomenological methods (Lester, 1999). This design has been used in the present study in order to gather in-depth information about the specific recommendations of expert therapists practising in the South African context. It was felt that this design would generate data with a focus on the specific influence that the South African context has had on the development of the intervention strategies of these professionals, and that these findings would be valuable as there exists very little literature in this area that has been generated within South Africa to guide therapists. The study used inductive methods as there was seen to be limited existing research evidence available to guide practice in this area, and themes and codes would be allowed to emerge from the data instead of being pre-decided (Hsieh and Shannon, 2005). Inductive methods are required by the phenomenological design as it recognises that information given by respondents is unique and should have no pre-conceived structure imposed upon it (Kielhofner, 2006). Conventional content analysis was used, as this is closely related to the inductive approach of the study (Hsieh and Shannon, 2005).

Data was gathered using individual, semi-structured interviews. This type of data collection is used in order to attain quality data from individuals who are well informed in the area of research (Kielhofner, 2006).

In this study, the underlying concepts of visual perception in the view of South African expert clinicians was established, and their opinions on the best methods to assess and treat these problems in adult patients post stroke were investigated. The study started with

gaining a specific understanding of the definition of visual perceptual problems, and sought to establish generalised guidelines for the effective management of visual perception post stroke.

3.2 Participants

In order to understand the management of visual perception in stroke in the South African context, evidence for the best practice must be sought. While evidence based practice must clearly include treatment based on scientific evidence, the individual therapist must not only read and apply the research evidence, but also be able to judge the quality of the evidence and use their experience to generalise the findings to their own particular context and situation.

The participants in this study were occupational therapists who are considered to be experts in the field of adult neurology. In light of the aim to use this research to develop best practice clinical guidelines for the management of visual perception post stroke, it was important that the participants had a good grasp of best practice and that their comments and opinions were underpinned by evidence based practice.

This synergy of knowledge and experience is related to clinical reasoning which is more efficient and better developed in expert clinicians than in novices (Unsworth, 2001). An expert clinician is able to draw from a much broader knowledge base, make decisions more quickly and identify what irrelevant information should be ignored (Unsworth, 2001). Expert clinicians are said to interpret clinical cues and information as well as topic specific evidence with significantly more insight than the novice (Schell and Schell, 2008). They also have a frame of reference which embraces many different approaches to both assessment and treatment, and are much better able to select specific interventions that they know, from experience, will improve the overall outcome of the patient (Schell and Schell, 2008).

As expert clinicians are able to integrate so much information into their clinical decision-making and combine evidence with clinical experience in their specific context, it is essential to obtain their input in research investigations where an accurate opinion on the current best practice in a particular field is being investigated (Kielhofner, 2006). Hence, the participants in this study needed to be experts in the field of adult neurology.

Literature asserts that the label of expert cannot be based solely on years of experience (Jensen et al., 2000). The identification of an expert must take into account the information available to the clinician, and how that practitioner combines this with clinical reasoning based on experience in order to apply the knowledge to the best of his or her ability. Thus for the purpose of this study, an expert is classified as an occupational therapist who has worked in the field of adult neurology for five to ten years and who has a post graduate qualification (degree or diploma) in the field of neurology or other relevant fields. Expert opinions were in this way obtained, in order to assist in the eventual development of evidence-based, best practice guidelines (Kielhofner, 2006).

3.3 Participant Selection

The participants were selected using purposive sampling that was criteria based, with the level of expertise of the therapists being the main criteria. For this study, level of expertise was defined as a combination of years' experience in the field as well as evidence of further study and enquiry.

Inclusion criteria:

- At least five and preferably ten years of experience as an occupational therapist
- A postgraduate qualification
- Clinical experience in neurology for at least five years

Convenience sampling was used and therapists from Gauteng were invited to participate. Names were obtained from colleagues and university supervisors for those occupational therapists who met the inclusion criteria, and emails were sent out (either to business addresses or personal addresses, depending on the available information) with information

sheets and invitations to participate in the study. Emails were also sent out to all Occupational Therapy Departments in universities and major teaching hospitals in Gauteng to invite participation. Nine occupational therapists responded positively. Eight therapists in Gauteng were selected to participate, based on their willingness to do so and their meeting the set criteria. The ninth therapist had extensive experience but lacked the post graduate qualification, so a pilot interview was conducted with her in order to refine the interview process and to develop the interviewing skills needed for the later interviews.

Although much of the current practice amongst the participants lies in the area of private healthcare, many of the practitioners have had extensive experience in both private and government settings.

3.4 Measurement Techniques

Information was gained using individual, semi-structured interviews using an interview schedule (Appendix A). Specific, open ended questions were posed to the selected experts. The questions were developed by the researcher after a review of the literature, and are listed in Appendix A. The lack of specific trends in the literature further inspired the open-ended nature of the questions as well as the specific prompts about USN due to the trends in literature towards this aspect. These questions broadly covered a definition of visual perception and related terminology, assessment of visual perception in patients with stroke, and treatment of visual perceptual deficits in patients with stroke. Questions were intentionally open-ended and non-specific in order to allow experts to give an undirected opinion, in order to be true to the inductive nature of the study and not to place the answers in predetermined categories (Hsieh and Shannon, 2005). The experts were allowed to share as much relevant information as they wished.

3.5 Research Procedure

Before the interviews were held, a pilot interview was conducted with an experienced clinician who did not have a postgraduate qualification. This was done in order for the

interviewer to gain experience in the skill of interviewing, particularly in avoiding bias and leading the participant.

3.5.1 Pilot Interview

The clinician who was used for the pilot interview was approached personally and asked whether or not she would consent to participate as the subject for the pilot interview. She was made aware of the objectives of the study as well as the fact that her interview was the pilot. She was asked the same questions as the later participants and, in addition, was asked at the end to comment on the interview technique of the researcher and the appropriateness or relevance of the questions. She did not have any questions to add, nor did she have any comments on the interview style, but upon personal reflection on the interview the researcher did implement some changes. After the pilot interview, the questions were not changed in any way, but the emphasis of the interview and the questioning process was adapted. It was decided that the interview questions would be phrased so as to guide participants to consider what they believed to be best practice in the relevant areas, rather than to describe what they were personally doing or what they thought were current practice trends. The questions were also set up with possible prompts to be used by the researcher during the interview in order to extract more detail or specific examples of techniques or concepts mentioned (Appendix A).

It was also decided that clarity would be improved if the interviewer presented a brief summary of what had been said, in order to determine if she had correctly understood the participant responses. The interviewer also became aware of the need to bracket and clear personal biases before each interview, as well as to remain neutral and not to strongly agree or disagree with the participants at any point, to avoid influencing the participants in their opinions.

3.5.2 Ethical Considerations

Ethical clearance certificate M 101103 (Appendix B) was obtained from the Human Research Ethics Committee at the University of the Witwatersrand.

Each participant was given information sheets (Appendix C) via email and was asked at the interview to sign written consent to participate as well as for the interview to be recorded (Appendix D).

Participants' responses were confidential and only the researcher and supervisor would have access to their information. Participants were each given a number and no names were mentioned in the analysis and reporting of the data. The participant's names were not recorded and they were informed that they may withdraw at any time from the research without consequence. Feedback on the results was offered on request.

All data and audio recordings will be stored in a secure location for six years or until the study is published according to HPCSA regulations before being destroyed.

3.5.3 Interviews

Selected therapists were contacted via email and invited to take part in the study. If they chose to participate they were contacted telephonically to make their appointment for the interview.

The semi-structured interviews were held at times and venues convenient for both the interviewer and the particular expert therapist and lasted between 25 and 45 minutes. Interviews were mainly conducted in the rooms or offices of participants to ensure privacy and limit interruptions. One interview was conducted in a coffee shop due to logistical ease for the respondent and privacy was ensured here by strategic location of the table. The interviewer sat opposite the interviewee in all cases with open posturing to encourage unhindered disclosure of opinions, and every effort was made to ensure the ease of the respondents and to facilitate full disclosure. During the interviews, subjects were asked to discuss each question in relation to their own practice and to consider the South African context if not already mentioned. The interview was introduced in the broader context of the possibility of developing clinical guidelines, and it was explained that this study could potentially form part of a bigger project.

Standard prompts were included as part of the questions and they were used if necessary, although many participants mentioned the aspects spontaneously with no need for prompts. The interviews were recorded using a voice recorder. The audio data was then converted to electronic format for transcription and analysis.

3.6 Trustworthiness

The following steps were implemented in order to ensure that the data gathered as well as the interpretation is trustworthy and not subjectively interpreted.

3.6.1 Member Checks

Stakeholder checks were performed once the initial interview information was analysed. The participants were contacted via email with a document that reflected a summary of the results gained from the interviews. Participants were asked to comment on whether or not they felt that it was an accurate reflection of their feelings and opinions on the topic, or if they had any strong opposition to any of the findings presented (Kielhofner, 2006). This process reduced the chance that misrepresentation had occurred (Krefting, 1991).

3.6.2 Audit Trail

An audit trail (in the form of field notes) was kept by the primary researcher, which included all the accumulated raw data, the rationale for the use of specific gathering and collection methods, notes about specific decisions that were made throughout the study and the reasons for these, as well as personal reflections of the researcher throughout the process. The personal reflections were useful so that the process of reflexivity could be followed in order to uncover any biased opinions or beliefs that may have developed and clouded the process of data analysis, specifically in the way that subjects may have been probed during interviews and later follow-up emails, as well as in the way that the coding process was done (Krefting, 1991).

3.6.3 Bracketing

The researcher was aware of her own preconceived ideas and had to deliberately suspend or at least control these in order to approach the study with an open mind (Fischer, 2009). Techniques for doing so included documenting any bias detected upon reflection of the pilot interview process as well as during reading other literature and during participant interviews. It also included paying attention to how these biases may influence interviewer responses or encouragements given to participants during the interviews. These may have unintentionally led participants in a specific way during interviews and analysis.

3.6.4 Peer Scrutiny of the Coding

Another occupational therapist was recruited to overlook the codes extracted and to check how the codes matched with the quotes supplied. This particular therapist was recruited due to her having 3 - 4 years' experience working in adult neurological rehabilitation as well as further training in visual rehabilitation and a particular interest in visual perceptual rehabilitation. It was important for her to have access to the original quotes so that she could scrutinise the development of the codes and hence to ensure that researcher bias did not influence the interpretation of the data (Krefting, 1991). Her opinions and views on each code were discussed until a 75% agreement was reached. In this way, the truth value of the study is reinforced as the therapist involved has experience in this area and in working with this specific aspect of stroke rehabilitation (Krefting, 1991).

3.6.5 Rich Thick Data

The fact that experts were used for interviews ensured that data gathered were of a high quality (as opposed to data that could have been gathered from novice occupational therapists), and that the data were rich and full of information rather than being superficial.

3.6.6 Data Saturation

After the eight scheduled interviews, data saturation had been reached on all the questions so there was no need to conduct further interviews. No new information was being given by the end of the eighth interview.

3.7 Data Analysis

As there has not been any previous research looking specifically at the opinions of Gauteng expert occupational therapists in this area, conventional content analysis was used to analyse the data gained from interviews as described by Hsieh and Shannon (Hsieh and Shannon, 2005). The interviews were initially recorded using an electronic recording device. Each interview was stored as an electronic audio file labelled with the participant number (without names). The audio files were transcribed.

The researcher started the analysis process by listening to each interview recording while reading the transcript and noting the main points mentioned by each participant, as well as noting any pauses or voice intonations that may indicate feelings around certain topics, which might not be evident in a written transcript. The interviews were listened to again and the occurrence of similar information in different interviews was noted. The process of inductive coding began, with the researcher identifying numerous basic codes and noting these, along with which participant mentioned them, in an Excel spreadsheet. Thus, the initial codes were developed inductively (Hsieh and Shannon, 2005).

The transcriptions were analysed. The researcher first read through each transcribed interview several times in order to gain a general idea of the concepts discussed and become "immersed" in the data (Hsieh and Shannon, 2005). Any errors made in transcription were corrected by listening again to unclear sections in the audio files. The margins of the transcriptions were used to write notes about possible common concepts that arose in response to each question, and in this way initial codes were further developed. As this process was occurring, the codes were being added to those already

entered in the existing Excel spreadsheet. Similar wording was used to describe the codes that arose in order to allow for comparison of data, and the occurrence of codes in each interview was noted by participant number as part of the spreadsheet.

The basic codes were analysed and common themes were identified. The initial codes were grouped into 15 sub-categories. The coding was checked by re-reading the data, and during this process relevant quotes were extracted to support various codes noted in each specific cluster. The data were re-read to investigate whether or not any codes were repeated by any participants and if so, how many times. The 15 sub-categories were grouped into seven categories and these formed the four main themes of the data. The categories were not narrowed down any further to prevent loss of important categories that could not be grouped together efficiently.

Throughout the process of analysis, data were compared between the individual interviews to attempt to gain an idea of the overall expert opinion and to identify areas of conflicting opinion for later discussion.

CHAPTER 4

FINDINGS

4.1 Introduction

Data for this study took the form of transcribed audio recordings of interviews done with expert occupational therapists, collected using a voice recorder during individual semi-structured interviews. The findings reflect the views of eight respondents who fitted the inclusion criteria and who were willing to take part in the study.

4.2 Profile of Respondents

The respondents selected for this study were all considered experts in the field of neurology, with the majority having qualified as occupational therapists at the University of the Witwatersrand over a period of 43 years. Their postgraduate training involved both postgraduate degrees and postgraduate diplomas in neurology and related fields in adult rehabilitation.

The respondents are female, ranging in age from 28 to 67. With the exception of one retired respondent, they are presently employed either in private practice or in academic positions. Their years of experience range from 40 years to six years.

Table 4.1: Profile of Respondents

Respondent number	Undergraduate Studies	Postgraduate Studies	Years' Experience	Current Field of Practice
1	Wits (2002)	MSc Wits (2011)	10	Academic
2	Wits (1990)	Postgraduate Diploma in Neurology Wits (1993) Diploma in Voc Rehab University of Pretoria (UP) (2000) Dip Hands UP (2008)	22	Private Practice (Outpatients)
3	Wits (1984)	Postgraduate Diploma in Neurology Wits (1999) Diploma Hands UP (2008)	28	Private Practice (Outpatients)
4	Wits (1999)	Postgraduate Diploma in Neurology Wits 2002 Diploma Voc Rehab UP (2006)	13	Private Practice (OP and IP)
5	UCT (2000)	MSc Brunel, UK (2007)	12	Private Practice (Outpatients)
6	Wits (1999)	MPH Wits (2006)	13	Academic/ Management
7	Wits (2006)	Postgraduate Diploma in Neurology Wits (2010)	6	Private Practice (Outpatients)
8	Wits Dip (1963)	PhD Wits 1991	40	Retired
(pilot)	Wits	N/A		Private Practice (Outpatients)

4.3 Coding of Data – Themes, Categories, Sub-categories and Codes

Data was transcribed and inductive coding was performed, with the result that the following four themes were identified:

Theme 1: Lack of clarity

Theme 2: Strategies for management

Theme 3: Dichotomies in assessment and treatment

Theme 4: Adaptation for the South African context

Table 4.2: Themes, Categories, and Subcategories

Theme	Category	Sub-Categories
Lack of clarity	Visual perceptual deficits are complex	therapists unsure
		patients often have multiple deficits
		definition parameters
	No clear evidence for practice	need evidence from research and experience
Strategies for management	Competent management depends on experience	not for inexperienced therapists need experience in the field
	Suggested intervention	should be individualised according to each patient
		focus on occupational performance
		principles must guide treatment
Dichotomies in assessment and treatment	Assessment tools and procedures	standardised vs. non-standardised tests
		assessment of occupational performance vs. skill based assessment
	Treatment approaches and procedures	remedial vs. compensatory
		occupational performance vs. performance skill tasks
Adaptation for the South African context	Factors specific to South Africa	factors influencing management
		recommendations for occupational therapist

4.4 Theme 1: No Clarity

Table 4.3: Theme 1 - Categories, Subcategories and Codes

Theme 1	Category	Sub-Categories	Codes
Lack of clarity	Visual perceptual deficits are complex	therapists unsure	therapists not sure of the definition of visual perception therapists unsure and lack confidence in this area of practice
		patients often have multiple deficits	• seldom seen in isolation and are complicated by other deficits • patients can compensate
		definition parameters	• can be confused with praxis and visual deficits • reduces management efficiency • lack of clarity of definition in literature
	No clear evidence for practice	need evidence from research and experience	• evidence based practice is important • no clear evidence or guidelines in the literature • need experience for evidence based practice

4.4.1 Visual Perceptual Deficits are Complex

4.4.1.1 Visual Perception is a Complex Area

Many respondents mentioned more than once the complex nature of visual perception when talking about both assessment and treatment. Many of them also suggested that there is reduced clarity in the wider occupational therapy community in South Africa regarding the definition of visual perception.

The respondents themselves admitted to being **unsure of some definitions** and struggled to remember all aspects of visual perception, expressing the need to look up information in notes or textbooks. The complex nature of visual perception is presented as a real challenge for occupational therapists, especially since the respondents view occupational therapists as the current experts in this field. The respondents are of the opinion that **occupational therapists are generally unsure and lack confidence** in this area and that it is often an area that is neglected as a result:

> *"I think that's an area that everyone wants to run a mile from because it's just an area where you feel quite inadequate. It's a lot harder than treating a tendon injury."*

Certain patterns of contradicting responses highlight how the complexity of this area interferes with clinical reasoning. For example, one respondent suggested that visual perception is often not a great priority in the acute phase of rehabilitation and that there are many other skills that need attention before we arrive at visual perceptual treatment. This statement is refuted by another respondent in saying that it is important for occupational therapists to realise the importance of early identification and treatment of visual perception deficit in patients with stroke.

4.4.1.2 Patients often have Multiple Deficits

The respondents also believed that visual perception is something that is **seldom seen in isolation** and this also contributes to the complexity of the condition, as described succinctly by one respondent:

"*You know in my experience it's very seldom that you have a pure visual perception problem."*

This identified characteristic is seen to complicate the assessment of visual perception as it may be difficult to isolate the visual perceptual deficits from the co-morbid deficits in a patient at any one time:

"*…when you have visual perceptual deficits it's often co-morbid with a lot of other brain dysfunction and it's really difficult to tease out of what you actually seeing and if you're seeing it because it is related to visual perception or it is related to cognition or it's related to another element…"*

Visual perceptual deficits are suggested to be **complicated specifically by the presence of reduced endurance, apraxia, cognitive deficits and visual deficits**. Cognitive impairment is highlighted as the most concerning concurrent problem and one that is often closely related to visual perception. This phenomenon is justified by one of the respondents:

"Ultimately one has to understand that visual perception is very closely associated with cognition and interpretation because part of visual perception is an interpretation analysis of what the individual is receiving and processing."

Another aspect that makes assessment even more challenging is that respondents have noted that patients can **often compensate for visual perceptual deficits** from very early on post stroke, making it even more difficult to identify isolated visual perceptual deficits in functional tasks.

4.4.1.3 Definition Parameters

Impaired cognition, apraxia and visual deficits are seen by the respondents to have an influence on or to be influenced by the presence of visual perceptual deficits. All three of these aspects were, however, identified as being separate entities and were not considered to fall within the definition of visual perceptual deficits. The least well defined area was that of apraxia, with some respondents expressing uncertainty at the prospect of excluding it totally from the definition of visual perceptual deficits and also indicating that it is a very

complex area, one that may not be fully understood. Many respondents expressed reluctance to make any definitive statements about apraxia due to lack of clarity in their own clinical reasoning, as one respondent expressed:

"It (apraxia) is a difficult thing and I don't understand it very well."

Unilateral spatial neglect in all but one respondent was considered to be a deficit of the visual perceptual system and one that many of the respondents would include in the evaluation of most individuals post stroke. It was suggested by a small number of respondents that cognition may also play a role in USN. Specific visual perceptual skills mentioned by respondents are provided in Table 4.4.

Table 4.4: Specific Visual Perceptual Skills Mentioned by Each Respondent

Visual perceptual component	**Respondent number**							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Position in space	x	x	x	x				
Spatial relations	x	x	x	x				x
Visual closure	x	x						
Figure ground perception	x	x						
Visuo-motor integration	x							
Visual discrimination	x							
Visual hallucinations	x							
Agnosias				x				
Constructional ability				x				
Body scheme		x						
Colour/form perception	x			x	x		x	x
General spatial perception					x			x
Visual memory					x			

The complex nature of visual perception was further highlighted as a potential problem that may **influence the efficacy of our management of these deficits**:

"*...people are not very clear on what visual perception is, so if you ask them, assess it, they wouldn't even know what test to take out their cupboard, they wouldn't know what activity to do, and they wouldn't know how it affects people."*

Another problem identified by some respondents is the **lack of clarity on the definition in the literature,** with many respondents having read differing definitions in different literature sources. Their comments on the literature around management of these deficits are investigated further below.

4.4.2 No Clear Evidence for Practice

4.4.2.1 Need Evidence from Research and Experience

Three quarters of respondents felt that literature provides **no clear direction for the management of patients with stroke in the area of visual perception**. Some respondents admitted to minimal current reading but commented on the literature that they had previously come into contact with and came to the same conclusions, as described by one:

> *"I think the problem is that there aren't clear guidelines as to what does work and what doesn't work."*

This need for guidelines that is expressed by this respondent is reiterated by others. They feel that there is a **need for best practice evidence and guidelines** for clinical practice in this area as part of their recommendations. They highlighted the fact that occupational therapists should try to keep up to date with current literature and alter their practice accordingly and the **evidence that comes from experience** is essential in treating these deficits. As one respondent explained:

> *"…as much as we can at university provide baseline knowledge of perceptual elements, I think that the cognitive understanding of those components and how they manifest in behaviour can only begin through some kind of experimental learning of it, that being, you know, practical exposure to it and interpretation of that practical exposure."*

The perceived lack of clear direction in this area may impact the ability of therapists to use evidence based practice in order to manage these patients optimally.

4.5 Theme 2: Strategies for Management

Table 4.5: Theme 2 - Categories, Subcategories and Codes

Theme 2	Category	Sub-Categories	Codes
Strategies for management	Competent management depends on experience	not for inexperienced therapists need experience in the field	• too complex to be understood at an undergraduate level • inexperienced therapists need a bottom up approach with standardised tests initially • need postgraduate courses • experience needed to analyse and use functional activities
	Suggested intervention	should be individualised according to each patient	• assessment should be based on premorbid occupational performance abilities • standardised tests to compare the patient to norms • premorbid characteristics important determiners of treatment • treatment is dependent on level of functioning • treatment guided by individual goals
		focus on occupational performance	• function is the core of occupational therapy • understand impact of visual perceptual deficit on the occupational performance • means using a functional assessment rather than a standardised test • what if visual perception deficits don't impact on function • approach based on outcomes expected for the patient • skill based tasks should be carried over to functional tasks (must have functional implication) • limited spontaneous skill transfer in patients with stroke
		principles must guide treatment	• principles need to be consistent • treatment should be one-on-one • awareness training is important • grading is important • treatment is long term - results not quick • TENS, FES, prisms, kinaesthetic input and visual scanning for neglect • general principles for neglect treatment

4.5.1 Competent Management Depends on Experience

4.5.1.1 Not for Inexperienced Therapists

Some respondents believe that this area is too complex **to be understood at an undergraduate level**, as explained by this respondent:

"I think that as much as we can at university provide baseline knowledge of perceptual elements or what do they call it, components. I think that the cognitive understanding of that component and how it manifests in behaviour can only begin through some kind of experimental learning of it, that being you know practical exposure to it and interpretation of that practical exposure."

It is for this reason that the respondents suggest more of a **bottom-up assessment approach** for new graduates and inexperienced therapists, encouraging these individuals to use standardised measures in managing these patients. One method of bottom-up assessment, specifically suggested to give direction in these complex cases as well as to guide new graduates is the use of **specific standardised tests.** Such tests have, however, been criticised by the respondents as being flawed in many aspects which may compromise accuracy of assessment, providing yet a further complication. Another perceived need is for more **good quality postgraduate courses** on this topic to be run for qualified therapists, in order to assist in optimal management of these cases.

4.5.1.2 Need Experience in the Field

Throughout the interviews, respondents consistently highlighted the critical role of experience in the effective management of visual perceptual deficits in patients with stroke. This applies especially to assessment of patients and the ability to identify specific visual perceptual deficits impacting on occupational performance, particularly with the use of top-down functional assessments as explained here:

"I think you need to be competent and you need to be accurate with what you're observing and your clinical reasoning needs to be really good because, just seeing someone in function, if they can't do something, it could be for a whole host of reasons."

Another area that is seen to be dependent on experience is the ability to **analyse and use functional activities** in occupation based therapy to effectively treat visual perception. The skill of being able to transfer skills into functional activity is seen by this respondent to be dependent on experience and clinical skill:

"I think that is what makes someone a really good occupational therapist is when they're able to you know to make those impairment based tasks you know bring

them into the real world. So, I think that you know for good occupational therapists that have a lot of experience or skill with activity, I think that you know that they are able to do that, but I don't think that every occupational therapist is able to do it. And I think that's really skill that is developed."

The ability to implement this kind of treatment as well as to assess effectively has been linked, by the respondents, to a good, clear knowledge of the parameters of visual perception.

4.5.2 Suggested Intervention

4.5.2.1 Management Should be Individualised According to each Patient

A belief that is reiterated on several occasions by our respondents is that the management of these patients should be strongly **directed by individual patient characteristics.** According to the respondents, the premorbid characteristics of each patient should guide several aspects of management. The choice of what type of assessment to conduct should be made with particular sensitivity, taking into account the frame of reference, level of education and occupational performance demands of each patient, as mentioned by one of the respondents:

"…depending on their premorbid skills, or their pre-morbid jobs and things like that, I think the components I look at are different."

This is a concept that was repeated several times and commented on in one way or another by almost all respondents interviewed. Respondents also commented on the use of standardised tests, stating similarly that the use of these may depend on the patient and the demands that they may place on the patient, which should take their premorbid occupational performance into account. The use of standardised tests was seen as being important as they enable patients to be compared to norms that are related to their specific age and in this way, patients are not all expected to be performing at the same level.

Closely related to this is the idea that treatment given should be tailored and **made relevant to patients**. This was one of the few ideas that was re-iterated more than once by

a majority of the respondents and recommended by everyone, here justified by one of the respondents:

> *"You have to tailor what you want to achieve and they (patients) would respond very differently to each activity. And they do things differently – people wash differently, dress differently, leisure differently, and each person does their job differently"*

Premorbid characteristics were highlighted as extremely **important determiners of treatment** in all spheres and were considered to be an important aspect to bear in mind when planning treatment activities. In particular, the choice to either remediate or compensate for visual perceptual deficits is said to be based, in part, on the premorbid levels of function and education of the individual patient (i.e. the capacity of the patient to engage in remedial therapy). However, the premorbid state of the patient is not the sole factor to consider in treatment; our respondents feel that the level of **functioning of the patient at the time of treatment** is also an aspect that will guide the type of treatment given, as explained by one:

> *"I think you would have to pitch your activities, impairment activities and functional activities, at the right level at which they can cope, and maybe break down a big activity into component parts…"*

This focus on the individuality of each patient is taken further by the respondents in their expressed belief that each patient will have different goals for therapy. Half the respondents suggest that **treatment should be guided by these individual goals**, which are likely to be based on the anticipated occupational performance outcomes.

4.5.2.2 Focus on Occupational Performance

Occupational therapy is seen by the respondents to have, **at its core, a focus on function**. Several of them mention that they believe occupational therapists to be the functional experts over other professionals, as stated by one of the respondents:

> *"Occupational therapists really have an indication of where the patient is functionally and what the impact is on their lives…"*

One respondent includes the focus on function as a specific recommendation:

> *"I think people just need to not get stuck on the individual skills but see the functional impact and rather treat that than the individual skills."*

The word "function" and occupational performance can be used interchangeably here and the respondents mentioned it several times in response to several different questions. In terms of assessment, it was suggested that the assessment process should begin with a screening of patients' occupational performance in basic tasks. For the respondents it is extremely important that an occupational therapist has a good understanding of the **impact that any visual perceptual deficit has on the occupational performance** of the patient as emphasised by one respondent:

> *"I mean obviously that foundation is essential so they (occupational therapists) need to have knowledge of – you need an understanding of what it (visual perception) is and that is key and I think with visual perception there are so many different definitions. So I think one really needs to understand not what just the definition is, but how it affects someone in a functional way."*

This forms the basis of a common criticism of standardised tests use for assessment. When used in isolation it is felt that they tell us little about the impact of the visual perceptual deficit on the occupational performance of the patient. Many respondents implied and one actually stated that they would **rather use a functional assessment task than a standardised test** to assess visual perception.

Further, the use of standardised tests is not encouraged in patients in whom the visual perceptual deficit has no functional implication (impact on occupational performance). It is recognised by the respondents that **not all visual perceptual deficits will have an impact on occupational performance** for all patients, as described:

> *"So if somebody can't stack a block, it doesn't mean they can't live. But it gives you a clue that there is a problem – I might have to just look at functionally, whether it has a massive effect."*

"…I wouldn't assess perception unless I feel that the perception skills are important for their work or pre-morbid function, in a sense."

Similarly, respondents do not recommend treatment of visual perception as a priority if the visual perceptual skills that are deficient do not have an impact on the occupational performance of that individual:

"…if someone is functioning fine, but they've got perceptual deficits, then there's no point in treating perception if it's not actually a functional problem."

They also felt that the use of a **remedial vs. a compensatory approach** would be determined, in part, by outcomes expected for the patient. Some went so far as to say that skill based tasks should only be used if the patient has an occupational performance demand for that specific skill, as in this example:

"I very rarely treat construction activities again unless it is something that is related to the person's job, what they're going back to."

Three quarters of respondents interviewed stated explicitly that visual perception should be treated using performance skill based tasks (related to the premorbid occupational performance of the patient) that, through activity analysis, can be used to provide treatment for visual perception.

When the respondents talk about skill based tasks they are referring to remedial, therapeutic use of the tasks to improve visual perceptual skills, rather than the retraining of occupational performance to compensate for visual perceptual deficits. Respondents strongly advise that these skills based tasks be carried over or related to functional occupational performance activities. This recommendation supports certain underlying theories about the spontaneous transfer of skill in patients with stroke.

Five of the eight respondents interviewed are of the opinion that there is **limited spontaneous skill transfer in patients with stroke**. Two of the respondents did not expressly say this, but identified the need to treat visual perception within appropriate

functional occupational performance tasks and the need to not use impairment skill based treatment in isolation.

The respondents go on to say that it is possible for patients with stroke to transfer a skill from one task to another, but this process needs to be actively and intentionally facilitated by the therapist as described by one of the respondents:

> *"I don't think placing a patient at a peg board activity for half an hour is going to have any specific carry-over into their functional abilities – in terms of manoeuvring around their space. If they are having spatial orientation deficits, I would rather physically make them manoeuvre their wheelchair in their space and make them aware of their environment and relate it to them and understand how it fits in relation to them…"*

The process of treatment, as well as assessment of these deficits, was also seen to have very specific parameters, as defined by the respondents as the following principles that must guide treatment.

4.5.2.3 Principles must Guide Treatment

Several respondents mentioned that in order to effectively manage these patients, **treatment principles should be consistent** in all dealings with the patient and in every task such as approaching the patient from the neglected side in the presence of USN. Half of the respondents advocated the use of these types of **general principles for neglect** such as structuring of the room to include stimuli in the neglected hemisphere and always approaching on the neglected side. It is felt by the respondents that use of these principles will assist in the transfer of skill from one task to the next.

Treatment is said to be more effective if done **one-on-one** rather than in groups, and it is also seen to be important that the chosen activity is pitched at the correct level, according to the current level of functioning of the patient and **then graded accordingly.** One of the first and essential elements raised by one respondent is the importance of **awareness training** for these patients, as she explains:

"...you have to make them aware of it (the visual perceptual impairment) – if they're not aware as to what you're trying to work on and what their deficits are, then I don't think you're going to have much joy."

Other specific treatment modalities recommended for use with neglect include **visual scanning**, the use of **transcutaneous electrical nerve stimulation (TENS)**, **functional electrical stimulation (FES), prism lenses** in glasses and **kinaesthetic input**. These modalities were mentioned by isolated experts and the only one to be mentioned by more than one was the use of **visual scanning** (mentioned by two respondents).

Treatment of this problem is described as a **long-term situation**, with respondents highlighting the chronicity and time taken for results to be seen.

4.6 Theme 3: Dichotomies in Assessment and Treatment

Table 4.6: Theme 3 - Categories, Subcategories and Codes

Theme 3	Category	Sub-Categories	Codes
Dichotomies in assessment and treatment	Assessment tools and procedures	standardised vs. non-standardised tests	• screening tools • self-developed non- standardised tests mostly used • can't separate cognition in the tests • split opinion over use of standardised tests for assessment • no consensus on value of standardised tests • standardised tests useful in specific cases –complex, outpatient, medico-legal and return to work • standardised tests are flawed
		assessment of occupational performance vs. skill based assessment	• can use in place of standardised tests • observe both advanced and basic tasks • it is a priority in acute phase of rehab • difficult to keep this assessment objective • specific to occupational therapy • best if work with other team members - optometrist
	Treatment approaches and procedures	remedial vs. compensatory	• be clear which approach is used • compensatory approach – two frames of reference • functional retraining vs. use of remedial occupational performance to treat visual perception
		occupational performance vs. performance skill tasks	occupational performance tasks • motivate patients more • more difficult to implement • activity analysis essential to implement this but is complex and skill is lacking worldwide performance skill tasks • may improve isolated perceptual skills but need to be carried over to functional tasks • good for preparatory tasks • good for home programmes • resource dependent

4.6.1 Specific Assessment Tools and Procedures

4.6.1.1 Standardised Tests vs. Non-standardised Tests

The process of assessment is seen by five of the eight respondents as a vital step in ensuring that treatment given is accurate and effective:

> *"Obviously you just need to make a thorough assessment so we know exactly what we're treating…"*

The process of assessment is seen to be constant and on-going, and respondents suggest that patients may need constant re-evaluation at different stages in the rehabilitation process. This assessment often starts with **some kind of screening** task whether it is a screen of basic **functional occupational performance abilities, or some sort of paper based task (either standardised or non-standardised**). The use of tests is seen to be useful to assist in the identification and isolation of deficits for new occupational therapists as well as in complex cases for experienced therapists.

Only one respondent recommended the use of a standardised screening task and the task mentioned was, in fact, an extract from a neuropsychological test. Other respondents suggested non-standardised screening tests, both paper based and 3D construction based, in order to screen for the presence of visual perceptual dysfunction. These tasks are isolated impairment based tasks that are **often self-developed** and which are frequently used by the respondents. However, one respondent felt that the use of these types of tasks is a *"waste of time"* due to the fact that the same information can be gained with the use of a standardised assessment scale.

According to the respondents, the use of these non-standardised paper and construction-based screening tasks can be carried over into the assessment. However, a criticism of these types of tests, specifically paper based ones, is that they **may have cognitive demands** which could lead to inaccurate results in cognitively impaired patients:

> *"I think that they (non-standardised assessments) are largely questioned from a cognitive perspective and not from visual perception so it's laden with trying to understand what it is and to understand one applies cognition."*

The same concerns exist when the respondents discussed standardised testing, although half of the study respondents directly said that they felt that it was **important to have standardised assessment** of this area. Standardised tests were said to give a good idea of the baseline level of perceptual functioning, and respondents believe that there are some good tests that can be used and that they definitely have a place in assessment.

The understanding of specific visual perceptual impairments and the accurate assessment is often gained, according to respondents, if occupational therapists choose one test and use it continuously for assessment in order to familiarise themselves with it and to become proficient in its administration.

There were some **split opinions about the cost and time effectiveness** of using these tests. Two of the eight respondents believe that standardised tests are both cost and time effective, if the correct tests are chosen and used. One comment was that if the wrong test, or several "*useless*" non-standardised elements were used, then a standardised test could rather have been done, giving a clearer picture of the patient's impairment and taking less time.

The majority of respondents, however, do not believe that the current available standardised tests for adults are cost or time effective. The standardised tests are seen by the respondents to be more useful in **outpatient settings** and in order to give clarity to the visual perceptual assessment in **complex cases**. The tests are also seen to be useful in **medico-legal and return to work cases**, where assessment and reporting of specific visual perceptual skills is necessary.

Although the respondents can see value in the use of standardised tests in assessment, the tests are recognised as being **flawed in many respects**. A large concern exists among the respondents about the ability to generalise the results of these tests to members of the South African population as none of them were standardised on our population. Respondents also express concern regarding the construct validity of the tests in that so many of them have significant **cognitive demands**, and the results achieved may not accurately report on the visual perceptual system in isolation. This was expressed as a specific concern, as respondents felt that perceptual and cognitive fallout are often seen concurrently. This can be related to the complexity of management of this area.

As a result of these flaws, respondents conclude that standardised assessments alone cannot be used to gain a full understanding of a patient's performance. Many of the respondents suggest that more than one method of assessment should be used, as described by this respondent:

> *"So in essence I think it's two components, I think it's understanding the processing of ADL basic and advanced and it needs understanding according to measure of the level of dysfunction from a standardised scale perspective."*

The test most commonly recommended by respondents is the Rivermead Perceptual Assessment Battery (RPAB). The Lowenstein Occupational Therapy Cognitive Assessment (LOTCA) and the Chessington Occupational Therapy Neurological Assessment Battery (COTNAB) are also mentioned by more than one respondent but not as frequently as the RPAB. (See Table 4.7)

Table 4.7: Frequency of use of Standardised Tests to assess Visual Perceptual Deficits as Reported by Respondents

Perceptual Test	Respondent							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
RPAB	x	x	x			x		x
COTNAB	x			x	x			
LOTCA	x		x	x	x			
WASP			x					
T-PAL	x							
VALPAR	x							
VMI							x	
Visual Inattention Test		x						
Visual Object Spatial Perception Test		x						
Complex Figure of Ray		x						
Cognitive Assessment of Minnesota		x						
AMPS				x				

4.6.1.2 Assessment of Occupational Performance

The other facet of assessment that is recommended, sometimes above the use of standardised testing, is **the use of functional occupational performance tasks**. This does depend on the particular setting and is recommended more in the acute setting.

Respondents recommend observation of the patient in both **basic and advanced occupational performance (or ADLs)** as a first step in the assessment process. The importance of assessment in advanced occupational performance task was justified by one respondent who pointed out that we need to know how the patient will react to a novel or complex task as opposed to routine tasks. Assessment in functional occupational performance tasks is identified by some to be a **priority in acute rehabilitation**. The downfall, as identified by one respondent is that it is **difficult to keep this sort of assessment objective.** Another respondent does not see this as a problem and insists that it is imperative to have some sort of idea of the baseline functional ability for comparison at a later stage, even if it is non-standardised, as long as both evaluations are performed by the same occupational therapist.

The evaluation process is seen by respondents to be one that is **confined to the occupational therapy profession**, and respondents would not refer out to other professionals to gain specific visual perceptual information. Functional optometrists are used by several respondents to gain in-depth information to supplement their assessments. These professionals often work alongside the respondents to assist with the visual aspect of treatment, allowing the occupational therapist to focus purely on visual perceptual elements.

4.6.2 Treatment Approaches and Procedures

4.6.2.1 Remedial vs. Compensatory

Another important area mentioned by respondents is that each occupational therapist **must be clear about whether or not their treatment approach is primarily compensatory or rehabilitative**.

In the management of these patients it has been described as difficult to tell the difference between remediation and compensation and the use of either mechanism by patients is seen to be difficult to control. One of the respondents describes it like this:

"I think however the threat to visual perceptual deficits is the way you remediate is

also the way you compensate."

"So we don't really have control of whether we're treating or compensating"

Respondents go on to discuss the implications of compensation, and how therapists need to have an understanding of these in order to make an informed decision about which approach to use. It is an extremely complex aspect of treatment, as noted by the respondents.

Two **methods of compensation** that can be used actively by therapists are suggested by respondents. The first is the use of a cognitive frame of reference, while the other is the use of occupational performance frame of reference which involves functional retraining, as in teaching patients functional occupational performance tasks in a repetitive manner in order to improve occupational performance. The use of functional retraining is seen to be important in settings where time or funding may be limited.

One also needs to differentiate between **functional retraining** and the remedial use of functional **occupational based tasks to treat visual perceptual deficits**. The latter method is mentioned and supported by almost every respondent interviewed.

The respondents emphasise that this kind of treatment needs to be done in the appropriate context, matched to the task being done, as described:

"…I think the more real the situation, the better, for perception…"

"I think the functional stuff is best done in the right context."

4.6.2.2. Occupational Performance vs. Performance Skill Tasks

An advantage of using occupational performance activities to remediate visual perceptual deficits was suggested by one respondent who stated that patients often seem more concerned about occupational performance tasks than about specific visual perceptual deficits, so they may be **more willing and motivated to engage in treatment** which is relevant to their needs.

Respondents point out that the use of occupational performance functional tasks requires more effort and time on the part of the occupational therapist. The **activity analysis required to implement this kind of therapy** is seen to be essential in the treatment of visual perception, but it is seen to be a complex and time consuming process and respondents see this **skill to be lacking** in the general occupational therapist population **around the world**.

The implementation of impairment based performance skill tasks in treatment is perceived to require less effort from the occupational therapist. Most respondents concede that there is value in this type of treatment, particularly as it may lead to **improvement in isolated perceptual skills**, but that these kinds of tasks ultimately need to be **carried over to functional tasks** and are not sufficient to comprise an entire treatment programme. These tasks have been **suggested as preparatory tasks** before engagement in function, as noted by one of the respondents:

> *"I think a combination of doing both impairment-based training, using activities but that are, whether it be peg boards, or, um, drawing or scanning or whatever, kind of impairment-based re-training and linking that to the functional tasks in which they need to perform every day. So I think, again, a two prong approach is important – not only to look at the impairments because you have to carry it over into the functional tasks…"*

A few respondents have suggested that impairment based tasks may be useful in cases where specific skills need to be trained, which could not be optimally trained in occupational performance areas due to their specificity.

Others have earmarked their use in acute rehabilitation and as "take home" activities as part of **home programmes**. One weakness of these tasks, according to some respondents, is that they may be more **dependent on resources** than function-based tasks, which may affect their usefulness in the South African context.

4.7 Theme 4: Adaptation for the South African Context

Table 4.8: Theme 4 - Categories, Subcategories and Codes

Theme 4	Category	Sub-Categories	Codes
Adaptation for the South African context	Factors specific to South Africa	factors influencing management	• limited resources • appropriateness of standardised tests • occupational performance based assessment and treatment appropriate • time constraints- functional retraining more important • home programmes can offer remediation approach
		recommendations for occupational therapist	• occupational therapists need good knowledge of visual perception skills in South African patients • evidence for best practice • inexperienced occupational therapists need mentors/role models • prioritise visual perception in adults • create a speciality in South Africa • up skill in activity analysis • visual perception assessment for South Africa • more collaboration with other specialised team members

4.7.1 Factors specific to South Africa

4.7.1.1 Factors Influencing Management

The South African context is a diverse one. As one respondent stated:

> *"I think there's context within context…"*

Therapists are working in diverse conditions, but many of the comments made in this section are with reference to contexts of **limited resources** in terms of time and materials. The use of standardised tests in the South African context was discussed and the **appropriateness of these tests** was questioned due to issues of poor standardisation and lack of premorbid exposure of the general population to specific test elements. It is the feeling of respondents that occupational therapists in South Africa are reluctant to use standardised tests. This might be linked to the availability of these tests in provincial hospitals, but one respondent does not agree with this as evidenced by her statement:

> *"…there are tests in cupboards in departments that they don't even know is there. So I don't think it's a question that there aren't tests and they're too expensive. People are just not using it."*

Another concern that is widespread among the respondents is the fact that the tests were not designed with our population in mind, and hence many of the elements of the tests are completely foreign to much of the South African population. As a result, patients might perform poorly on them, not due to visual perceptual deficits but possibly from lack of familiarity with the language or other elements, or from a low level of premorbid education leading to poor understanding of elements. These types of difficulties are expressed by one of the respondents:

> *"…clearly some things are experientially bound. And I think there are people particularly rural people who don't have that experience with constructional, three dimensional paper and pencil kind of tasks and who would do poorly on those kinds of assessments."*

Use of **functional occupational performance assessment is seen as being more cost effective and appropriate** in the South African context. Similarly, the use of **functional tasks for treatment** is strongly recommended by half the respondents as this type of treatment is seen as not being resource dependent and as being applicable in any context with any patient:

> *"…we have our deficits, with lack of resources and that but if you're doing what a patient is doing anyway, you have those resources – you don't need a fancy plinth and fancy worksheets - if it's what they're doing anyway at home…"*

One concern in our context is that there may be **limited time available to treat patients** individually due to short hospital stays and reduced outpatient capacity. This prospect of the patient returning home after a short acute stay is re-iterated by several respondents. It is suggested that in these cases **functional retraining** may be important, and the occupational therapist may be forced to c**ompensate for the visual perceptual deficit due to lack of time** available. When discussing time pressure and limited acute hospital stay one respondent commented:

> *"So for me that's getting back to try to live independently rather than focusing on – Oh it's compensation more than anything else."*

Another suggested appropriate treatment method in our context is the use of **home programmes**. Here the emphasis is placed on doing caregiver/family/patient **training in specific visual perceptual areas** and on implementing management strategies at home via a home programme. It is seen as likely that this method will improve the chance of transfer of skill into the home environment of each patient.

Time and resource constraints are just two of the challenges that occupational therapists face in South Africa. The respondents were also asked what recommendations they would make to occupational therapists working in our context, in order to improve our overall management of this complex area, and these are provided below.

4.7.1.2 Recommendations for Occupational Therapists

Respondents made various recommendations around key theoretical and practice areas of effective patient management in the South African context. It is recommended that occupational therapists gain **good baseline knowledge of what visual perceptual skills patients in South Africa** have, together with why they are required by patients for everyday function in occupational performance. They should learn to prioritise visual perceptual assessment and treatment when evaluating patients.

The respondents recommend that occupational therapists need to acquire more knowledge on this subject, starting at undergraduate level. It is recommended that more time is dedicated to the teaching of both assessment and treatment aspects of visual perception at both undergraduate and postgraduate level. The respondents also see the need for more courses to be run in this area to inform the profession.

The importance of **evidence based practice should be emphasised** at an undergraduate level and qualified therapists should spend more time reading the literature and engaging in evidence based practice themselves. Some respondents encourage collaboration between universities and clinical practitioners, and many respondents encourage inexperienced

therapists to be **mentored or find role models** who are older and more experienced in this area to give guidance and support, as highlighted by one of the respondents:

> *"I think with a new graduate, I would say, do your best to work alongside, or to be supervised by, or to have a mentor of a therapist who has more experience to actually talk things through…"*

Some respondents also see the need for therapists to focus on one area of **practice for the development of specialists** in this area. It is believed that the development of a specialist group would lead to research and the development of best practice guidelines. Development of these guidelines is seen as an important step in informing the profession as a whole and in providing direction for all forms of patient management in this complex area.

The problems with standardised testing also led the respondents to recommend the **development of a standardised scale for use in the South African population**. The expressed need is for a test standardised on our population, one that is not laden with cognitive demands and one that has appropriate items that are easily understood by our population, as described by a respondent:

> *"…in South Africa, I think we need one (a test) that has proper visual perception components in it. It needs to be well researched. And then it needs to have things that are appropriate to our population."*

> *"…so proper elements and things our people would understand, and pictures they would recognise if we are going to do paper-based stuff and building blocks and that. It must be stuff that they've seen before."*

In terms of specific recommendations for the treatment of these deficits, two of the respondents suggest that occupational therapists need to **up-skill in activity analysis** to ensure therapeutic use of activities in which the context is appropriate and carryover is facilitated.

It is further recommended that more **collaboration is needed between different team members** with diverse areas of specialisation, so that therapists can share knowledge between areas (such as possible use of vocational rehabilitation tests for visual perceptual testing). Collaboration and consultation within an area of specialisation is also encouraged to provide support and share information, especially in complex cases.

CHAPTER 5
DISCUSSION

This chapter will discuss the findings related to the perceptions of respondent expert occupational therapists, with experience in the neurology field of practice, regarding the management of visual perception deficits in patients with stroke. This discussion will reflect the themes presented in Chapter 4.

5.1 Demographics of Respondents

All respondents met the inclusion criteria set by the researcher. The group was homogenous in terms of the area of residence as well as in the fact that many of them completed their undergraduate training at the university at which the present study was conducted. All respondents were also part of the same cultural group which may limit the generalisability of some results, but the majority has worked with a wide range of cultural groups which may provide them with a broader perspective. This diversity in previous fields of practice and clinical experience is one factor which contributes to the heterogeneity of the respondents. The differing focus areas of postgraduate qualifications also enhance the heterogeneity of the group, and will assist in the attainment of diverse responses and the resulting generalisability of the results. There was also a gender bias noted in the group with it being 100% female. This may be due to the predominantly female representation in occupational therapy in South Africa and it is not believed to limit the generalisability of the results.

5.2 Lack of Clarity in the Definition and Management of Visual Perceptual Deficits

Visual perception has been described by the respondents in this study to be a very complex area of stroke rehabilitation. This statement is evidenced in some of the conflicting ideas

presented by the respondents, their ideas about the general management of this area as well as by the fact that, in certain aspects, the respondents themselves are not sure of underlying/related definitions.

The literature indicates that visual perceptual fallout is one of the common sequelae of stroke, with statistics ranging from 64.6 to 85% of all stroke sufferers having some sort of visual disturbance after stroke (Rowe and UK, 2009, Khan et al., 2008). Numerous sources indicate that the presence of visual perceptual disorders often coincides with significant limitations in ability to perform in all occupational performance areas, as well as with reduced safety (Cooke et al., 2005, Cate and Richards, 2000, Brown and Elliot, 2011). Occupational therapists are recognised by the respondents and in the literature (Brown and Elliot, 2011) as being the professionals with the necessary skills for the effective management of these deficits in relation to all areas of occupational performance.

It would be expected that the management of visual perceptual dysfunction as it affects occupational performance post stroke would be seen to be a priority in occupational therapy, but our findings showed discrepancy in this area. Only one participant expressly recommended that occupational therapists prioritise visual perceptual intervention as early as possible. While other respondents did emphasise the link between visual perception and occupational performance, one respondent explicitly stated that visual perception was often not a priority in the acute phase of rehabilitation. These conflicting ideas speak to the complexity of this area of rehabilitation and they lead one to question whether or not all occupational therapists have a clear idea about the impact of visual perception on their patients.

Management of deficits in any area of neurological rehabilitation is guided by a clear understanding of the specific parameters of that particular area and visual perception is no different. Half of the respondents felt that a clear definition assists the occupational therapist to assess and treat effectively. Definition parameters in this study consisted of what respondents believed fell both within and out of the parameters. Within the parameters of visual perceptual skills, those identified by the respondents were consistent

with the components defined in the literature, although seven of the eight respondents could not name all aspects related to visual perception mentioned in the literature. Respondents often went in search of self-developed check lists to name aspects of visual perception and reflected that it was not easy to remember all of them.

One respondent mentioned the importance of distinguishing between visual perceptual skills and visual perceptual dysfunction. In the area of possible visual perceptual deficits, there was, again, a lack of confidence in the definition of the various deficits which stroke patients can present with. Most respondents did not mention alexia, body scheme disorders or colour blindness; agnosia and visual hallucinations were each only mentioned by one respondent. However, literature asserts that these elements are the amongst the main constituents of visual perceptual dysfunction, along with impairments in visuospatial skills and the presence of USN (Pedretti and Early, 2001, Gillen, 2009, Suter and Harvey, 2011, Parkinson, 2011, Proto et al., 2009). Although there were no areas of conflict in the responses, respondents have shown themselves to be unsure of the exact constituents of visual perceptual skills and impairments. This lack of uniformity in answers related to the awareness of definition parameters further highlights the complex nature of this area.

The inclusion of USN was specifically investigated in this research, and seven of the eight respondents classified USN as a perceptual deficit. One respondent felt that it was seated in the cognitive realm, and while two others mentioned that there may be cognitive aspects involved in the presentation, USN has been classified as a disorder of perception. The literature emphasises the importance of differentiating homonymous hemianopia from USN (although they can occur simultaneously) in order to provide adequate treatment (Suter and Harvey, 2011, Pedretti and Early, 2001). Definitive statements about separating differentiating homonymous hemianopia from USN were only made by two respondents but several others indicated similar theoretical understandings of the two disorders.

The other separation requiring theoretical understanding is that between visual dysfunction and visual perceptual fallout. In this study the respondents were in agreement in this area with no conflicting views. The presence of visual dysfunction has been seen in the

literature to impact the individual's ability to process and understand and perceive visual information, and hence to influence visual perception (Warren, 1993a). The respondents did mention visual dysfunction and its separation from visual perception, but many failed to emphasise the importance of having a good idea of the primary visual skills in order to inform the visual perceptual evaluation. Some authors advocate the assessment or at least a screening of primary visual skills in order to gain accurate insights into the function of the visual perceptual system (Cooke et al., 2005). Only one respondent mentioned the importance of screening for visual skills as part of the visual perceptual evaluation. Three respondents did speak about referring patients with stroke to functional optometrists to perform this testing in more detail if the occupational therapist feels it is required. In terms of the complex nature of visual perceptual dysfunction and the importance of accurate assessment to isolate and treat problems it is surprising that so few respondents mentioned this aspect as part of assessment. The fact that it was not posed as a specific question during interviews might explain why respondents did not talk about it as much as cognition and praxis.

The presence of apraxia and the differentiation between apraxia and visual perceptual deficits was a topic that reflected much complexity in the interviews. Respondents agreed that apraxia is not classified as a visual perceptual deficit, but many of them were reluctant to separate it completely from visual perception as it was felt that apraxia and visual perception influence each other greatly. This was supported by the York and Cermak (1995) study which suggested that patients with visual perceptual deficits may struggle to accurately perceive gestures; this would influence their ability to replicate them and thus have an influence on their praxis ability (York and Cermak, 1995). This assumption suggested that disorders of body scheme (visual perception) could cause apraxia (York and Cermak, 1995). Although the respondents in this study did give much attention to the complex nature of apraxia and how visual perceptual fallout can influence the ability for patients to replicate movements and gestures, they did not indicate that visual perceptual fallout may lead to apraxia. They emphasised that these elements should be assessed separately. The influential nature that each has on the other is emphasised both by respondents in this study and by international literature, and is an important aspect to be considered by occupational therapists in the evaluation of this area in stroke patients.

This opinion is reinforced by the more recent writings of Cooke, Mckenna and Flemming (2005). Several tests of visual perception, including that developed by Cooke et al. (2005), include elements to evaluate apraxia (Cooke et al., 2005). This does not, however, necessarily solve the problem of how to decide what influences the apparent deficits, and how to clearly define the association between the two deficits. This could lead to further confusion in this area. The opinion of the respondents, as well as insight gained from the literature, suggests that the inclusion of tests for apraxia in standardised measures does not necessarily indicate that apraxia is perceived to be a visual perceptual impairment, but rather highlights the importance of understanding and differentiating between visual perceptual fallout and apraxia.

Cognition is another area that respondents saw as being closely related to visual perception. Six respondents commented on the interrelated nature of cognition and visual perception and the complexity that cognitive impairments add to evaluation of visual perception. Respondents felt it was very hard to separate aspects of cognition and perception. A majority of respondents commented that it is rare to encounter patients with deficits confined exclusively to the area of visual perception, and the area most frequently mentioned to occur alongside it was cognitive fallout. The potentially reduced ability of a patient with stroke to process information and attend to aspects of assessment was seen by the respondents as possibly limiting their performance in traditional assessment tasks. This was reinforced by literature which indicates that impaired cognition may influence performance on tests of visual perception (Pedretti and Early, 2001).

The lack of clarity about the different aspects which need to be assessed in relation to visual perception and the influence these aspects all have on each other, as well as the requirement to assess other aspects, all adds to the complexity of the situation. It appears that, as literature describes, experience is needed to provide the necessary insight for the correct interpretation of clinical cues and information, as well as topic-specific evidence (Schell and Schell, 2008). Thus it was expected that the expert respondents would have the ability to extract relevant information from literature in order to implement evidence based practice. However, while the importance of evidence based practice was highlighted by the respondents, they were more concerned about the lack of direction supplied by the

literature, although many respondents admitted to not having recently read any literature on the topic of visual perception in relation to stroke. The review of the literature for this study produced little reliable research evidence for many of the known therapy strategies presented in textbooks and published research (Jutai et al., 2003, Gillen, 2009).

5.3 Strategies for Management

The revised best practice model (Sackett et al., 2000) includes evidence from the practitioner's experience and the client's preferences as important sources of information to guide practice. Since there is little evidence in the literature for best practice in dealing with visual perceptual deficits after stroke, clinical experience needs to be considered. Literature dealing with the development of clinical reasoning in clinicians indicates that more experienced, expert clinicians have more efficient and better developed clinical reasoning skills (Unsworth, 2001). Fleming and Mattingly (1994) also regard clinical reasoning as largely influenced by the prior clinical experience of the therapist (Fleming and Mattingly, 1994). Clinical reasoning is thus identified by literature and by some respondents in this study, as a skill which, with experience, allows for better interpretation of assessments in general, and particularly in the complex field of visual perception. This should result in better activity analysis and the development of more efficient, specific treatment programmes and use of therapeutic activities.

Two respondents mentioned that the complex nature of this area make it extremely difficult to teach effectively at an undergraduate level. Occupational therapists need time to gain experience with patients with these problems, and to see the impact that they have on occupational performance before they are "ready" to receive more information about successful management of them. In contrast, several of the respondents felt that more focused training in this area at undergraduate level would result in better management of the deficits. One opinion was that there is greater attention on the "positive" aspects such as motor control, without the same attention being paid to the visual perceptual aspects. This focus in training may lead to therapists being conditioned to feel, as one of the respondents did, that there are more important areas of concern in an acute setting, such as

movement retraining. Thus a need for good quality courses and publications was expressed, in order to provide guidance to the profession in this complex area.

During the interviews, every respondent emphasised at least once that, particularly in the South African context, treatment needs to be tailored to individual patient needs, taking into account a patient's premorbid frame of reference, occupational performance demands and other factors such as level of education. Toglia (1991) emphasises the role that individual patients' characteristics play in the learning process and how these factors interact with external factors to enable the learning process. These are some factors, as well as the ability to attain transfer, that she sees as an important consideration when planning therapy intervention (Toglia, 1991). The respondents in this study reflect similar opinions when they state that treatment planning should be based on the level of functioning of the individual patient at the time of treatment.

Respondents also all emphasised the importance of attaining the "just right" challenge with patients. This means ensuring that grading is used optimally in order to maintain challenge while keeping tasks manageable, in order to maintain participation and "buy-in" from patients. Literature supports this maintenance of a high rate of patient success in therapy, to assist in motivating patients and family members and encouraging involvement (Suter and Harvey, 2011).

Remediation of USN is a topic that has received specific attention in the literature. Recent studies, specifically those using visual scanning for the remediation of USN, have shown potentially positive results, with treatment having an influence on occupational performance, thereby providing evidence of carry-over of therapy to functional tasks (Jutai et al., 2003, Gillen, 2009). These studies have reported some of the most successful interventions for improvement in visual perception (Jutai et al., 2003, Teasell et al., 2003, Niemeier et al., 2001), with the use of repeated scanning tasks in different environments to enhance carryover and skill transfer into functional activities (Warren, 1993b, Niemeier et al., 2001). Although the rigour of all studies in this area was not always optimal, visual scanning therapy has shown the most positive results compared with any other isolated

treatment method for USN. So much so that visual scanning training is recommended as a practice standard by the American Congress of Rehabilitation (Gillen, 2009). Interestingly, the use of visual tracking/scanning for neglect intervention was only recommended by two of our respondents, with no respondents recommending the use of visual imagery.

Other methods mentioned by respondents included the use of TENS, FES, prisms and kinaesthetic input. The literature available on these interventions indicates that although they may have an influence on the patient's immediate awareness of the neglected hemisphere, results generally do not last significantly after treatment, and there is very little carryover into functional and occupational performance tasks (Jutai et al., 2003).

One respondent touched on this aspect and recommended the use of general principles for the management of neglect with a focus on consistency of use of principles in all contexts to enhance carryover. General neglect principles or intervention specifically for neglect, such as standing on or putting all stimuli in the neglected side of the patient, was recommended by four of the eight respondents. This treatment approach was found to be successful by certain authors (Paolucci et al., 1996), but in the absence of definitive research evidence in the area of scanning and general principles for the treatment of neglect, it seems that the guidelines indicated by respondents from clinical experience must be accepted at present.

Respondents emphasised that it is important for therapists to understand the link between visual perceptual deficits and occupational performance in stroke. Literature tells us that the skills needed to gain this particular insight are unique to occupational therapists (Brown and Elliot, 2011). Respondents agree that occupational therapists are the experts in both visual perception and functional/occupational performance, and it thus follows that occupational therapy management of visual perceptual deficits would have an underlying focus on the patients' involvement in functional tasks.

The use of functional activities in occupation based therapy was repeatedly recommended by the respondents with the focus being on the use of activities that are relevant and meaningful to patients, on the basis of the theory of foundational occupational therapy (Gillen, 2009).

The literature identifies two main ways to use functional tasks in treatment. In the traditional "top-down" functional treatment, the aim is to compensate for perceptual deficits. This is done by engaging in functional retraining with the primary goal being to improve participation in occupational performance tasks, not primarily to improve visual perceptual skills (Edmans and Webster, 2000). The second way is to use a "bottom-up" approach using relevant and meaningful occupation based tasks in order to retrain and improve performance in specific perceptual skills. This approach aims to improve visual perception and then to enable the use of that improved visual perception in engagement in daily tasks (Gillen, 2009). This type of therapy was seen by the respondents as being time consuming and challenging but it was advocated by three quarters of respondents. However, there is currently very little empirical evidence to support or refute this type of therapy for visual perceptual deficits in adult stroke patients.

The use of occupation based tasks in this type of remedial therapy is suggested to enhance carryover from one situation to another. There is seen to be a lack of evidence for the ability of patients to carry improvement in visual perceptual skills (as taught in traditional skill based therapy) over into functional occupational performance tasks and other environments. Respondents thus felt that one focus of therapy should be on the facilitation of the transfer of skills from one environment to another. The respondents and the literature agreed that most patients with stroke are unable to spontaneously transfer or generalise skills learnt in one environment to another (Toglia, 1991, Gillen, 2009, Warren, 1993b). Although treatment of visual perceptual performance skills has been shown in the literature to improve isolated perceptual skills (Jutai et al., 2003), as accurately identified by one respondent, there is little evidence to indicate that this type of training has any impact on the occupational performance of patients (Edmans et al., 1991).

Respondents recognised that carryover is restricted by limited skill transfer in brain injured patients, and this led them to recommend that if skill based tasks are used, these need to be carried over into "functional tasks" in order to have significant impact on occupational performance. This recognition agrees with the work of Toglia (1991) and other authors in their promotion of the use of meaningful and relevant therapeutic tasks in order to facilitate representational plasticity in the brain (Gillen, 2009, Toglia, 1991).

Throughout the interviews, respondents expressed significant concern for occupational performance and the impact of assessment and treatment of visual perceptual deficits on this performance. Many even went so far as to say that if there was no impact of the visual perceptual deficit on occupational performance they would not address it in treatment. Given this significant focus on occupational performance and the concurrent belief that spontaneous skill transfer does not occur in stroke patients, the question arises: is there a place for the use of impairment-based perceptual skill training in the treatment of these patients? It is important to answer this question, particularly as respondents point out that these tasks are more resource dependent than "functional" tasks and this may further limit the appropriateness of their use in South Africa.

Respondents suggested that the value of skill based perceptual tasks may lie in their ability to effect improvement in isolated perceptual skills. This belief is supported by the work of authors such as Edmans and Webster (2000), as well as in the review of visual perceptual treatment post stroke done by Jutai et al., 2003 (Jutai et al., 2003, Edmans and Webster, 2000). Respondents advocated the use of specific skill-based tasks in particular situations, such as to prepare patients for perceptual activities by engaging the perceptual system, although no evidence could be identified to either refute or support this. Other appropriate situations are those in which specific skills are needed for return to work, and when the task is too specific to be treated in a functional activity. It could be argued that if specific skills need to be retrained for work or other occupational performance demands, then the treatment and practice of these skills should be done in specific contexts related to the actual performance environment. If this is the case then the treatment moves from being purely skill based and becomes occupation based or "function" as advocated by most respondents and authors (Gillen, 2009).

The implementation of occupation based therapy is seen by respondents as being more difficult than the use of skill based tasks. This could be a possible justification for their recommendation of the use of skill based tasks as part of home programmes, in order to allow the performance to be supervised efficiently by patients or family members who may not have any skills in activity analysis. These activity analysis skills are seen by respondents to develop and improve with experience and are seen as essential in order to implement this type of therapy. Gillen, 2009, supports this view by emphasising that therapists need to implement their own activity analysis skills in order to design treatment activities that correctly challenge the relevant skills (Gillen, 2009).

The fact that this type of therapy has not been extensively explained and investigated in the literature might be due to this complex nature of its implementation. Respondents have also pointed out that this type of therapy has to be carried out with emphasis on the individual patient, but this individual focus may hinder research as it does not provide a clear intervention strategy for investigation, and makes it difficult to produce rigorous and non-subjective studies with clearly defined treatment regimes.

The complex nature of this type of treatment is linked to the belief of respondents that therapists who lack experience and skill in activity analysis are likely to use these performance skill based tasks in current active treatment for visual perception. If this is indeed the case, it could potentially mean that a large majority of patients with visual perceptual deficits (particularly in under-resourced areas) are not getting treatment that would assist them to improve daily task performance post stroke.

5.4 Dichotomies in Assessment and Treatment

It is clear from many studies that "functional treatment" often refers to functional retraining in a compensatory sense (top down approach) rather than the use of functional tasks to remediate visual perceptual impairments (Edmans and Webster, 2000). Thus it is imperative that the therapist is clear about whether the treatment plan is to be remedial or compensatory. It is interesting that of the eight respondents interviewed, only three made

any reference to this aspect. However, differentiating between a remediation and compensation approach to therapy is not easy, given the complex nature of visual perceptual deficits. For example, it is extremely difficult, as mentioned by two respondents, to determine whether a patient has actual improvement in their visual perceptual deficits or if they are just learning to compensate for them. Even on an assessment level it was said that one can never be absolutely clear whether or not the patient is compensating.

The uncertain nature of this differentiation is further complicated by the lack of clarity in dealing with these in the literature. This is reflected in international literature in a study by Edmans and Webster (2000), where the purpose was to compare two methods of therapy aimed at improving perceptual skills (Edmans and Webster, 2000). One approach was said to be "functional retraining" and the other "conventional therapy". However, in both cases the authors attempted to measure the level of improvement in perceptual functioning using purely compensatory functional retraining (Edmans and Webster, 2000). This reflects a general lack of awareness of the differentiation of the two approaches in this field, both locally and internationally.

One of the few authors who spoke about the differentiation between compensatory and remedial approaches is Toglia (1991), when she suggested that the patient's capacity for transfer of skills needs to be established in order to guide the selection of a treatment approach and goal setting (Toglia, 1991). This idea was reflected by one of the respondents when she stated that her decision about whether or not to use a compensatory approach is often guided by the occupational performance demands, premorbid level of education and current level of functioning of the patient. Although this does not link directly with the recommendations of Toglia (1991), it reveals an awareness of the impact that individual patient characteristics should have on decisions about a treatment approach.

The decision about which approach to take in the treatment of visual perceptual deficits was also often said to be guided by the amount of time available for therapy. Some respondents advocated the use of a compensatory approach in situations where hospital

stay and direct therapy contact time are limited. This was linked to other comments indicating that the results of this treatment take a long time to be noticeable, as compared to other interventions such as motor retraining. Respondents suggested that the ability of a patient to perform basic functional occupational performance tasks should be a priority for both occupational therapists and patients with stroke in acute rehabilitation. In cases where visual perceptual dysfunction is present and is limiting this ability, the decision of whether to use a compensatory or remedial approach for these deficits must take the factors mentioned above into account. The literature offers very little guidance on this aspect of decision making. In this study there was a definite trend towards the "top-down" compensatory approach.

A second area where respondents felt decisions about intervention of visual perception post stroke need to be made was in the use of standardised and non-standardised assessment tools. The use of non-standardised, occupation based assessment tools depends largely on the ability of occupational therapists to understand the impact that visual perceptual fallout has on occupational performance. Respondents saw this as a very important aspect of evaluation, with similar comments being made in the literature as authors emphasised the importance of gaining information about visual perceptual deficits from assessment of occupational performance (Gillen, 2009).

Respondents in this study felt that the observation of patients during functional tasks was the most effective way to identify visual perceptual impairments and the impact of these impairments on occupational performance. However, the literature is critical of this form of evaluation as a stand-alone procedure, and reports that, other than with very obvious perceptual fallout, it is difficult to isolate specific perceptual deficits and their severity using observation alone (Cooke et al., 2005). This method is also seen as being inefficient in isolating visual perceptual deficits from other deficits in cognition or praxis which are closely associated with visual perceptual deficits (Cooke et al., 2005). The assessments are also highly subjective, an element conceded by one of the respondents. Half of the respondents, in agreement with Cooke et al. (2005), felt that the accuracy of interpretation of such assessments is largely dependent on experience (Cooke et al., 2005) .

Another flaw of functional assessment using observation is that it does not allow data to be recorded for conducting research, as the quality of evidence in a subjective evaluation is not sufficient to be relied upon to inform practice. The availability of good quality evidence to guide practice was seen as a need by respondents, but if assessment continues to be based solely on observation of functional tasks there is no potential to use this data to unequivocally inform the profession, which limits the exercise of evidence based practice in this area.

However, several standardised assessment tools for measuring occupational performance are mentioned in literature, such as the Functional Independence Measure and the Barthel Index. Both of these use observation of occupational performance tasks with a specific scoring to assess the performance of patients based on isolated elements in functional tasks. Other functional assessments such as the Catherine Bergego Scale are specifically designed to assess perceptual elements such as unilateral spatial neglect while observing the patients complete functional tasks (Gillen, 2009). The advantage of these assessments is that they are able to measure occupational performance and, more importantly, measure the impact of therapy on occupational performance from one assessment to the other, thus potentially providing more objective measures that can be used in research.

One disadvantage however is that, as with functional observation, they do not allow for detailed assessment of several isolated visual perceptual impairments. Thus, although they give an idea about functional performance, due to the co-morbidity of deficits commented on by the respondents, it makes it difficult to isolate definite factors that are influencing occupational performance. No respondent mentioned using these tests as part of the evaluation of visual perception deficits in patients with stroke, which indicates that they are either not being used by the respondents or are being used but the findings are not being linked to visual perceptual deficits.

Three respondents mentioned that more than one method of assessment was needed with patients with stroke in order to gain an accurate understanding of their visual perceptual deficits. There are many examples in published literature of the same recommendation

(Warren, 1993b, Cooke et al., 2005, Gillen, 2009) and therapists are encouraged to use both functional assessment and assessment of isolated visual perceptual performance skills in order to gain a deeper understanding of the visual perceptual impairment of the patient with stroke.

The respondents suggested that the assessment of the visual perceptual performance skills could also be done using both standardised and non-standardised table based tasks and literature concurs in many areas (Cooke et al., 2005). Respondents mentioned several standardised tests that they knew and were using or recommended should be used (Table 4.7). The three tests that were most commonly recommended were The Rivermead Perceptual Assessment Battery (RPAB), The Lowenstein Occupational Therapy Cognitive Assessment (LOTCA) and The Chessington Occupational Therapy Neurological Assessment Battery (COTNAB) in descending order of preference. The recommended use of the RPAB above other perceptual tests is aligned with literature recommendations, as the RPAB has been found to have very good published evidence of reliability and validity in use with adult stroke patients (Menon and Korner-Bitensky, 2004). Although the LOTCA has been seen as being useful in predicting functional outcomes in stroke rehabilitation, and has a geriatric version which is reliable and valid for use in the elderly (Menon and Korner-Bitensky, 2004, Katz et al., 1995), both it and the COTNAB are primarily cognitive assessments. Only one respondent expressed concern that these two tests might be primarily useful for the assessment of cognitive impairment in patients with stroke. The tests do contain some visual perceptual demands but they are not useful in providing an indication of the spectrum of visual perceptual impairments in these patients.

The tests mentioned above are all specifically designed for adults, but the literature (Brown and Elliot, 2011, Cooke et al., 2005) also mentions the use of tests for visual perception originally designed for use with the paediatric population that have now been standardised for use with adults. Of these tests only The Beery Test of Visuo-Motor Integration (VMI) was mentioned by one respondent. Thus, it appears that respondents either do not hold these tests in high regard for use with adults, perhaps as their reliability and validity when used with the adult population is questioned in the literature (Cooke et al., 2005), or they do not know that the tests have been standardised for adult use.

When considering the use of standardised tests, even tests that assess primarily visual perception, the respondents did mention the cognitive elements of these standardised tests in relation to the cognitive abilities of the patients, which might possibly limit the construct validity of the tests. Only two respondents mentioned this specifically but both mentioned it several times. It is a valid concern, especially in light of the findings about the close relationship between cognition and perception and the perception that many patients with visual impairment might have some level of cognitive fallout. This concern is reiterated in the literature, particularly in relation to paper based assessments being used to assess for the presence of USN (Menon and Korner-Bitensky, 2004). The lack of collaboration noted in South Africa between occupational therapists and neuropsychologists may further limit the validity of these tests.

The several standardised tests available to screen and to test for the presence of neglect post stroke are generally paper based, even though there is a well-documented association between the presence of neglect and poor functional outcome and risk of falling (Menon and Korner-Bitensky, 2004). The presence of USN in the near or far extra-personal space could have significant consequences for mobility and occupational performance and needs to be assessed (Gillen, 2009). Therefore, since the use of paper based tasks to test for the presence of USN only evaluate it in the personal space, great concern has been expressed about the use of these tests. (Gillen, 2009). Part of the assessment of USN should include an evaluation to determine whether the it is present in the personal, near extra-personal or far extra-personal space (Menon and Korner-Bitensky, 2004) and yet these spheres were not mentioned in any of the semi-structured interviews. In this study respondents only mentioned the paper based Clock Drawing Test and the Complex Figure of Rey assessment that evaluate for the presence of personal USN. Both these assessments, however, have other visual perceptual cognitive elements that make their construct validity questionable (Menon and Korner-Bitensky, 2004). The Draw a Clock test has also been reported as being one of the least sensitive tests for detecting the presence of USN (Menon and Korner-Bitensky, 2004).

The most recommended test for USN is the Line Bisection Test as it has the strongest documented psychometric properties of all paper based tests used to detect USN in the

personal space (Menon and Korner-Bitensky, 2004), with the Rivermead Behavioural Inattention Test also being considered as a sound instrument of evaluation in these areas. Neither of these assessments was mentioned by any of the respondents. This omission might reflect a lack of awareness of the need for specificity in the assessment of USN, and could thus indicate that in-depth assessment of it is not being considered by a large proportion of therapists, even those with expertise in this field, in Gauteng.

5.5 Adaptations for the South African Context

It is clear that there is a lack of evidence published by occupational therapists related to management of visual perceptual impairment post stroke. Within the available literature there is very little that focuses on the challenges that therapists face in contexts with limited resources – many of the studies are done in first world countries with well-resourced environments. So the lack of evidence to provide specific guidelines for South African therapists can be assumed for therapist working in third world countries and under-resourced areas internationally. Many challenges identified in South Africa related to high caseloads, limited resources and lack of experienced therapists are likely to be faced in countless occupational therapy departments globally. That said, it does not alter the fact that there is very little specific research to guide practice in the South African context. Although, while the respondents discussed differences in context between the situation in South Africa and other, more resource affluent contexts, there is no empirical evidence to support these assumptions. One respondent made an isolated comment in this regard, suggesting that certain treatment modalities like using functional tasks is in fact not resource dependent, and that the larger problem worldwide is the dearth of occupational therapists skilled in detailed assessment and activity analysis.

Respondents advocated the use of occupation based assessment and treatment, specifically in under-resourced areas where the acquisition of batteries of standardised tests as well as high level perceptual task training material may not be possible. There is no published literature to substantiate these comments but this may be due to the fact that so little research has been done from an under-resourced stand point. In situations where time is limited, such as is often the case in acute hospitals in South Africa, respondents

recommend a significant focus on occupational performance and often recommend retraining functional tasks with a compensatory approach in order to allow patients maximal functional gain in the short time they are exposed to therapy. Again, this cannot be substantiated with international literature but it does reinforce the focus, by both respondents and international literature, on the individual patient and his or her needs. Home programmes were recommended as a means to provide some opportunity for patients to engage with visual perception tasks even though individual therapy time may be limited due to reduced resources. Although, bearing in mind the discovered complexity of this area it is doubtful whether family members would be able to successfully monitor visual perception or remediate visual perception skills without direct supervision from a therapist. Home programmes would need to potentially either include details of compensatory techniques or be carefully monitored and graded based on performance.

The general reluctance of South African respondents to use standardised tests for visual perception, as observed by one participant, may be linked to the impact that patients' premorbid frame of reference have on their ability to be accurately evaluated on such tests. There was a prevalent feeling by six of the eight respondents, that without norms being standardised on the South African population, it was difficult to use them to gain an accurate picture of patient performance. They felt that aspects that interfered with optimal performance on testing included culture and, in agreement with the literature, age, premorbid level of education and gender (Cooke et al., 2005). Literature also supported the belief of the respondents that the presence of cognitive demands in standardised tests might influence their validity when used with neurologically impaired patients after stroke (Menon and Korner-Bitensky, 2004). This indicated the advanced clinical reasoning skills of the respondents in this area, as they were able to evaluate the limitations of the standardised tests and reported that they were able to use observation in order to make conclusions about patients' visual perception. This also reflected their knowledge of current literature about the flaws of standardised testing. In spite of these misgivings, the respondents did agree that the use of standardised tests could be used if interpreted carefully with awareness of the complex nature of deficits and the interrelatedness in stroke. One recommendation of therapists was the need for the development of a South African test for visual perception that would include elements more familiar to our

population of patients and would be standardised on the South African population in order to enable accurate comparison of our patients based on results. One difficulty with this suggestion is the previously mentioned diversity of patients that we see as OTs in South Africa. It would be very difficult to produce one test that could be easily used by every person in our country and standardisation processes would need to be extremely diverse in order to represent the entire population. The suggestion by the experts was that the development of a specialist group of therapists in this area is needed to begin work on projects such as this. This group could, potentially, be of benefit and also encourage evidence-based practice in this area but if the current respondents are not even conducting routine assessments that can be used for research then we may be very far from the establishment of this group in South Africa.

Other recommendations included emphasising this topic at undergraduate and postgraduate level both at universities and through other organisations with the provision of courses on the topic. The complexity of this topic is emphasised by literature as well as by responses in this study and this makes it a challenging topic to introduce at an undergraduate level. In order to allow some experience to mould the clinical reasoning process around this topic, young therapists were encouraged to work under or find mentors in order to learn from more experienced therapists while they themselves were experiencing patients with visual perception fallout. The problem with this in the South Africa context is, as identified by one of the respondents, is that many of the young and inexperienced therapists are in locations that lack older, more experienced occupational therapists.

The use of clinical experience to guide practice has been seen as an essential element of EBP (Bennett and Bennett, 2000), so much so that some studies have found this to be a factor guiding EBP more so that the investigation of published research (Bennett et al., 2003). However, if South African therapists are finding themselves inexperienced in areas with little to no mentorship or guidance (which is the perceived situation by the respondents) their ability to draw on their own experience or the experience of others is very limited. The importance of accurate review of published literature becomes extremely important in these cases. Many of the experts interviewed admitted to having had very little contact with current literature on visual perception. Although there is very little good

quality, reliable evidence on which to base practice, it is expected that the experts in the field would have read some information recently in order to substantiate their lack of faith in the material. Barriers to evidence based practice were consistently identified in the literature, with lack of time and lack of skill in searching and evaluation of information being ranked among the most common (Bennett and Bennett, 2000, Bennett et al., 2003, Mc Cluskey, 2003). Some isolated comments made by respondents touched on some of these barriers and it is assumed, due to the consistency of several different sources that these barriers may exist in South Africa as well.

More recommendations in relation to the management in the field of visual perception in stroke in South Africa are presented in Chapter 6.

5.6 Summary

Visual perception is seen to be a common consequence of stroke and occupational therapists are seen to be the experts in this particular area of intervention. It is an area that has shown to be extremely complex, producing some conflicting ideas amongst respondents as well as between the opinion of the respondents and the international literature. Many respondents reflected some level of uncertainty regarding certain aspects, but much of the information gained from them along the lines of definition parameters was reflected in international research.

Respondents identified the importance of evidence based practice but expressed an accurate opinion of the sparse literature available on this topic. However, many of them admitted to not having looked up or read any literature on the topic recently. Expert therapists are said to have advanced skills in clinical reasoning and these skills, developed with experience, are essential to manage these deficits effectively. For this reason it is seen as a difficult topic to teach at an undergraduate level; however there is still an opinion that there should be greater focus on this element at universities.

Respondents emphasised the need to focus on each individual patient's characteristics and background when intervening in any way, with an emphasis on grading the intervention tasks, as reflected in literature. Literature also recommends the use of visual scanning for USN which was the most common recommendation by respondents. The use of general principles for USN treatment was advocated more strongly by respondents and the success of these recorded in literature may have been due to their inherent focus on transference of the skill.

Literature and respondents agreed on the lack of spontaneous skill transfer in stroke patients, and that carryover of isolated perceptual skill into functional/occupational performance tasks needs to be actively facilitated by the therapist. The use of functional activities in occupation based therapy was unanimously advocated as the most effective therapeutic treatment method, but the implementation of this type of therapy was seen to be challenging, time consuming and only made easier to implement with experience.

Functional activities can also be used in therapy in a compensatory way to retrain function and improve occupational performance. This distinction between compensation and remediation was seen to be an extremely difficult one to make but it was seen as important for therapists to be aware of which approach was being used. Allied to the use of functional tasks in occupation based therapy, is a focus on occupational performance which was another strong point of agreement with respondents, possibly linked to the individual focused therapy.

One of the more controversial topics was around standardised vs. non-standardised testing. Respondents believed that observation in functional tasks is the most effective way to evaluate visual perception, but this method is widely criticised in literature for several reasons explored above. The most recommended standardised test by respondents and literature is the RPAB but the use of these types of tests has been queried from many perspectives for use in the South African population. There was no mention by respondents of any of the standardised tests to objectively measure functional performance.

The South African context is an area that received much attention by respondents, as could have been anticipated. There is seen to be a lack of research conducted in South Africa so it is difficult to substantiate much of the claims made by respondents. Certain resource-dependent assessment and treatment modalities are seen to generally not be practical or realistic, but occupation based assessment and treatment was seen to be less dependent on resources and was encouraged for this reason.

The complexity of this topic is clearly reflected in the findings; however there are several points on which respondents reached consensus in alignment with research evidence and these points can be used to guide the management of this area to a certain extent.

5.7 Limitations of the Study

The data may not have been as representative as it possibly could have been since the respondent pool lacked diversity with many respondents having been trained at the same university for undergraduate and postgraduate studies. Thus the respondents lacked heterogeneity which is recommended if the results of the study are to be more generalisable to occupational therapy in South Africa. This was due to the study being confined to one area in South Africa and the pool of "experts" being quite a small group in this area. The researcher included all therapists who responded positively to the request to participate, that met the inclusion criteria and who were available in the required time period.

Some of the participants did have previous knowledge and acquaintance with the interviewer which could have potentially affected the way in which questions were answered as the interview could have been perceived as slightly informal. This prior knowledge could have alternatively eased any potential anxiety on the part of the participant and resulted in more relaxed and honest responses.

Another possible limitation was the intentional use of non-specific open-ended questions. In an effort not to lead respondents in any way during interviews, and according to the inductive nature of the study, they were not specifically probed about any topics. This could be a limitation as there were certain topics brought up by some respondents that could have been richly commented on by others but this opportunity could not be taken unless the topic was initiated by others.

CHAPTER 6
CONCLUSION

The purpose of this study was to determine the expert opinion on best practice for the management of visual perceptual disorders in adult patients post stroke with specific reference to the South African context. The data that were collected using an exploratory, descriptive qualitative methodology revealed four central themes. The first theme indicated a lack of clarity due to the complexity of this area of practice. This is further complicated by the inconsistent definition found in the literature. In patients with visual perceptual deficits, the cases were noted to be further complicated by the presence of other impairments simultaneously. Respondents commented on the lack of research evidence in this area, and the importance of evidence based practice which demands clinical reasoning gained by experience in the field.

Recommended strategies for management of visual perceptual deficits formed theme two. Respondents were of the strong opinion that management was made more effective with experience in the field and that there should be a focus on occupational performance in treatment. This should take into account the patients' premorbid occupational performance as well as the occupational performance level at the time of treatment. A good understanding of the impact of visual perceptual deficits on occupational performance was seen to be vital. The lack of spontaneous skill transfer in stroke patients was strongly reiterated and this led to respondents advocating the active carryover of skill based tasks into occupation based tasks by therapists. Not all visual perceptual impairments will impact occupational performance in all patients, and only those that do need to be actively addressed in therapy. Therapy should also be directed towards individualised, expected outcomes for each patient.

Theme three was entitled dichotomies in assessment and treatment, in which conflicting expert opinions were discussed. One controversy regarded the use of standardised

perceptual tests, as the use of tests was seen to be dependent on the premorbid education level and frame of reference of the patients. The assessment method recommended as most effective and appropriate in the South African context was the non-standardised assessment in observation of functional performance.

The most effective treatment method was seen to be the use of functional activity in occupation based therapy. It was often not clear whether or not respondents were referring to compensation or to remediation, and some expressed the opinion that this distinction in this area of practice was extremely difficult to make. The use of skill-based tasks is seen as valuable for improving isolated perceptual skills or for use in home programmes or preparatory tasks. There was agreement, however, that these tasks need to be relevant to the patients and should be carried over into meaningful functional tasks in some way.

The ability to manage visual perception after stroke, determined by adaptations in the South African context, formed theme four. Resource limitations, time constraints and the appropriateness of standardised tests were seen as some of the most influential factors affecting the appropriateness of occupation based evaluation and treatment.

6.1 Conclusions

The management of visual perceptual deficits in adults post stroke has been shown to be an extremely complex topic. This complexity was reinforced by the uncertainty shown by respondents in areas such as the definition of visual perception, the conflicting opinions between respondents and the discrepancies noted between respondents and international literature. Evidence based practice is important and evidence can be gained from literature as well as experience in the field, but respondents in the study did not reflect an extensive awareness of recent literature in many areas. There is, however, a lack of good quality evidence to guide management in this area both internationally and locally.

The complexity of the subject makes it difficult to teach in-depth at an undergraduate level, and it was felt that competence in management of visual perception deficits after stroke is attained by reflection on literature and teaching combined with experience in the field.

Intervention needs to be planned with the individual patient in mind and this needs to be reflected in the choice of the assessment modality and treatment approach right through to the activities used in therapy. Factors such as premorbid level of education, job demands, individual interests and occupational performance demands of the discharge environment are some characteristics which need to be considered. The vast demographic variation seen in the South African population makes this an even more important aspect and makes it more difficult to prescribe specific guidelines for use with each patient.

The impact of the visual perceptual impairment on the occupational performance of each patient needs to be carefully considered and understood in order to manage patients effectively. This focus on occupational performance in occupation based therapy was seen to be at the core of occupational therapy in the management of these impairments.

In the acute phase of therapy and often with limited time resources, the focus should be on the participation of the patient in occupational performance tasks such as washing and dressing. This often necessitates the use of a compensatory approach to treatment and this should be used when the participation in occupational performance is more of a priority than the attainment of high level isolated perceptual skill. This decision should be made based on individuals and the impact of the visual perceptual deficit on their occupational performance as well as on the demands on that individual in his or her home or work setting.

Functional tasks such as occupational performance based activities should be used in a remedial way as well to treat isolated perceptual skills. Patients with brain injury are unable to transfer skills learnt in one area to performance in another, so skill based tasks need to be actively carried over into functional activities in order to facilitate improvement

in occupational performance. Specific tasks with reasonable evidence include visual scanning and general principles for the treatment of unilateral spatial neglect. It was felt that isolated skill based tasks without relevance and carryover into function have no place in treatment of these deficits.

Evaluation of visual perceptual deficits should be done using a combination of observation of the patient in functional tasks and standardised and paper based tests. Non-standardised, functional observation was regarded highly for use in South Africa but lacks credibility and objectivity and cannot be used to conduct research and inform practice. However, it does give an idea of the impact of the deficit on occupational performance and it can be used in under-resourced environments.

Standardised testing may not be reflective of a South African patient's visual perceptual ability for several reasons. The tests are not standardised on the South African population and many of the elements may be unfamiliar to patients with limited premorbid education or experience of this type of paper based task. They are also often laden with cognitive demands and, due to the frequency of cognitive and perceptual problems occurring simultaneously in these patients, the cognitive demands may impact on performance. It was felt that standardised tests often do not give an accurate reflection of the impact of the visual perceptual impairment on occupational performance which was considered essential for treatment planning.

Cost of acquiring standardised tests may also be a limiting factor for some South African therapists. The tests do however provide information which allows comparison of each individual to some set of age based norms and they are useful to isolate specific visual perceptual problems in order to plan treatment effectively. The test most recommended in this study was the Rivermead Perceptual Assessment Battery.

South African therapists face many unique challenges and these are reflected in all aspects of this study. There is very little published research to guide intervention for this specific

population group in the settings that many therapists are placed in, and the lack of evidence makes it difficult to quantify the effect of these challenges such as lack of resources on the management of these deficits in stroke patients.

The development of best practice guidelines is seen as a need for therapists in this country. Therapists in this area are encouraged to maintain a focus on occupational performance in all aspects of intervention and those with experience are encouraged to publish and run courses to enrich the profession and assist in the management of this complex area.

6.2 Recommendations

It can be seen that in order to facilitate evidence based practice in this area, the development of best practice clinical guidelines is sorely needed. This study is potentially the first step in this process and can be continued with a contextual study and systematic review of the evidence aimed at producing applicable guidelines to inform practice for both novice and expert therapists. This study has highlighted several barriers to the effective management of visual perceptual fallout post stroke.

One of those is a lack of definitive evidence to guide practice. Much published evidence is methodologically flawed which limits the ability to use the data to inform practice. Many isolated studies have been done but there is little consistency from one study to the next. Much of the literature has also been done in first world settings with good access to resources which limits the generalisability of results to therapist working in under-resourced areas or third world countries. More research is needed in these environments and specifically in the South African context in order to effectively guide practice in this area.

The development of a specialist group in this area was suggested to promote EBP and to look at the development of a South African standardised test for visual perception.

Inexperienced therapists were also encouraged to find mentors with the clinical experience to assist them in the management of this complex aspect of treatment.

Another aspect that the study has highlighted is the reluctance of therapists, even experts, to remain up to date with current published literature. This may be due to lack of time or resources but it is recommended by both the researcher and the study respondents that therapists make a concerted effort to investigate the current literature around this topic and to use the resources at their disposal, such as contact with the universities. Collaboration with therapists in other fields is also seen to be useful in order to investigate other assessment and treatment strategies that could possibly be adapted for use in this area. Therapists are encouraged to develop a good knowledge of the components of visual perception and how these influence occupational performance.

The complexity of this area suggests that without thorough knowledge of the topic therapists might struggle to manage it effectively. Therapists are also recommended to strive to up-skill in activity analysis. This skill is seen to be essential in the implementation of occupation based treatment activities and respondents found it to be a skill that is lacking in the population of occupational therapists worldwide.

6.2.1 Recommendations for further research

Research is needed to determine the appropriateness of the use of standardised tests in the South African population. Research is also needed to determine the effectiveness of using occupational performance tasks as modalities to remediate visual perception, as opposed to the use of the retraining of occupational performance as a treatment modality. More research is also needed in the South African context to evaluate the actual effects of the context on the therapy strategies used and the effectiveness of them. It may be useful to specifically investigate the effectiveness of therapy done in the home vs. therapy at an outpatient centre.

Appendix A

Interview Schedule

Interview Questions

What, in your opinion, constitutes visual perception and visual perceptual deficits in terms of specific components?

Prompts (if needed)

- Do you think that praxis falls under the definition of visual perception?
- Do you think that cognition falls under the definition of visual perception?
- Would you include visual neglect as part of visual perception?

What in your opinion are the most effect ways to assess visual perception in adult stroke patient?

Prompts (if needed)

- Describe why this method is appropriate to the SA context
- Is this method reliable and tested by research
- Can you give an example of how it has been used in a specific case study
- What about screening tools?
- Do you ever use functional activities?
- What about standardised tests?
- Which ones do you think are most cost and time effective?
- Do you ever refer out to other professionals for assessments to supplement your own?

What in your opinion are the most effect ways to treat visual perception in adult stroke patients?

Prompts (if needed)

- Describe why this method is appropriate to the SA context

- Is this method reliable and tested by research
- Can you give an example of how it has been used in a specific case study
- How does the actual patient influence the therapy technique chosen?
- Functional based or specific skill based and why?
- What is your opinion on visual tracking (or the lighthouse method) as therapy?

Appendix B

Ethical Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Miss Bronwyn Swanepoel

CLEARANCE CERTIFICATE	M10M101103
PROJECT	Expert Opinions on Best Practice for the Occupational Therapy Management of Visual Perceptual Deficits in Adults Post Stroke"
INVESTIGATORS	Miss Bronwyn Swanepoel.
DEPARTMENT	Department of Occupational Therapy
DATE CONSIDERED	26/11/2010
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 26/11/2010 CHAIRPERSON .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Mrs D Franzsen

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

Appendix C

Information Sheet

Dear Occupational Therapist,

My name is Bronwyn Swanepoel and I am a Masters student at the University of the Witwatersrand. I am doing my Master's degree by coursework in occupational therapy in the field of neurology and one of the requirements of the course is to produce a research report. I am conducting research with the title: "Opinions on Best Practice for the Occupational Therapy Management of Visual Perceptual Deficits in Adults post Stroke".

The research aims to determine the opinions of expert occupational therapists on the current best practice methods of assessment and treatment of visual perception in adults post stroke. It would be the first step to allow further research and the development of clinical guidelines for the management of visual perception post stroke.

The research will be qualitative in nature and will be done using individual interviews. There will be a one interview held and then a short process of member checking in order to achieve consensus. The participants for the research will be occupational therapists that are considered to be experts in the field of adult neurology. An expert will be defined, for the purpose of this research, as an occupational therapist who has worked in the field of adult neurology for five years or more and who holds a post graduate qualification (degree or diploma).

Since you fall into the expert group I am inviting you to participate in the research. This will require you to be interviewed by the researcher at a time and place of your convenience and the interview will be approximately one hour long. The interviews will be recorded in audio form and these recording will be transcribed in order to collect the data and formulate conclusions. Anonymity will be ensured during the process of

consensus gathering. Due to the nature of interviews it cannot be assured throughout the study as the identity of participants will be known to the researcher and the research supervisor. It is, however assured that only these parties will have access to the recordings made during the focus groups.

You have the right to refuse to answer any particular question and to withdraw from the study at any time without consequence. Feedback on the study will be available on request. Information collected will be kept in hard copy as well as electronically for the required amount of time after completion and recordings will then be destroyed.

If you have any further queries please do not hesitate contact me. At 083 304 2447
If you have any queries, concerns or complaints, you may also contact Anisa Keshav from the Research Ethics Committee on 011- 717 1234

Yours Sincerely

Bronwyn Swanepoel
BSc (OT)
Email: bronwynswanepoel@yahoo.com

Appendix D

Consent Forms

Consent to Participate in Research Study

I,_____, hereby consent to participate in research with the title: "Opinions on Best Practice for the Occupational Therapy Management of Visual Perceptual Deficits in Adults post Stroke".

- I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
- I understand that my participation is voluntary and I am free to withdraw from the study or refuse to answer any questions at any time.
- I understand that my confidentiality will be maintained and my identity will only be known to the researcher and her supervisor if necessary.

Name of Participant: _____

Signed at: _____

Signature: _____

Date: _____

Consent to Interview being recorded in Research Study

I,_____, hereby consent to my interview being recorded in research with the title: "Opinions on Best Practice for the Occupational Therapy Management of Visual Perceptual Deficits in Adults post Stroke".

- I understand that an audio recording will be done and I hereby give consent to be recorded in this way.

Name of Participant: _____

Signed at: _____

Signature: _____

Date: _____

Plagiarism Declaration



Postgraduate Office, Faculty of Health Sciences

Wits Medical School, 7 York Road, PARKTOWN, 2193, Johannesburg • Tel: (011) 717 2745 • Fax: (011) 717 2119 • e-mail: healthpg@health.wits.ac.za

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I _____ (Student number: _____) am a student registered for the degree of _____ in the academic year _____.

I hereby declare the following:

_ I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.

_ I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.

_ I have followed the required conventions in referencing the thoughts and ideas of others.

_ I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this in not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.

Signature: _____ Date: _____

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