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102 R & R SESSION - POLYTRAUMA INJURIES AND VISION REHABILITATION: BLAST-RELATED INJURIES AND THEIR SIGNIFICANCE FOR CIVILIAN TBI

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102.5 - World Trends and Statistics for Rehabilitation of Patients with Neurological Vision Deficits

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Neurological Vision Deficits occur in approximately 33% of all cases of acquired brain injury (ABI) which can be a result of stroke or traumatic event such as a car accident or military injury. Neuro Vision rehabilitation in the past has "fallen through the gaps". The primary vision impairment agencies such as the Blindness agencies have largely been unaware of this growing population and major stroke and rehabilitation hospitals have also neglected the need for a standardised functional visual assessment as part of a minimum standard of care in the rehabilitation of brain injury. World leading Neuropsychologists and neurological vision impairment centers are outlining the real issue with neurological vision impairment:

- Gianutsos, Ph.D., Sunnyside, N.Y., US - "50% of the patients in a head trauma rehabilitation centre show visual systems disorders not assessed before, although most of the patients were chronic and had been treated in other hospitals previously"

Statistics:

- Over 94,000 Australians are hospitalised with traumatic and acquired brain injury every year.
- 700,000 Americans have a stroke every year.
- Each year, 1.5 million Americans sustain a traumatic brain injury.
- 100,000 people in England and Wales have first strokes every year.
- 12 people in 1,000 of the population have a stroke in mainland China = 15.5 million per year
- Every year 65,000 Canadians will have a Traumatic Brain Injury.
- A further 50,000 Canadians suffer from Stroke every year.

Remember the 1960 & 70's, the era of Low Vision. Suddenly, there was a whole new population of individuals with low vision who required and demanded services. There were also a growing number of disciplines and a variety of professionals who had an interest in Low Vision, consequently research and publications became more prolific on the subject. Low Vision Clinics were being established across the world and Low Vision interest groups were being formed. Vision Rehabilitation service delivery for clients with Neurological Vision Impairment will be as monumental as the Low Vision era. This is a whole new client base which has "slipped through the cracks" and now is the time to implement these services. We had to adapt and evolve our training methods from focusing on clients who were totally blind to those with low vision. Now we must adapt and develop specific training methods for those clients with neurological vision deficit.



World Trends and Statistics for Rehabilitation of Patients with Neurological Vision Deficits

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Abstract. Neurological Vision Deficits occur in approximately 33% of all cases of acquired brain injury (ABI) which can be a result of stroke or traumatic event such as a car accident or military injury. Neuro Vision rehabilitation in the past has “fallen through the gaps”. The primary vision impairment agencies such as the Blindness agencies have largely been unaware of this growing population and major stroke and rehabilitation hospitals have also neglected the need for a standardised functional visual assessment as part of a minimum standard of care in the rehabilitation of brain injury. World leading Neuropsychologists and neurological vision impairment centers are outlining the real issue with neurological vision impairment: **“50% of the patients in a head trauma rehabilitation centre show visual systems disorders not assessed before, although most of the patients were chronic and had been treated in other hospitals previously”**.

Keywords: Homonymous Hemianopia; Acquired Brain Injury; Traumatic Brain Injury; Neurological Vision Loss; Stroke

1. Introduction

Historically, rehabilitation programs for in-patients and out-patients who have suffered an Acquired Brain Injury (ABI) or Traumatic Brain Injury (TBI) have focused on:

Physiotherapy – for improvement in loss of body functions or reduced movement.

Occupational Therapy – to increase upper body strength and activities of daily living.

Speech Therapy - swallowing, word pronunciation, comprehension etc.

Why is a **Vision Therapy** program not part of the therapy provided by an interdisciplinary team? Neurological Vision loss can seriously impede on the whole of the rehabilitation process and can lead to a compromise of the patient’s best rehabilitation outcome and increases the length of hospitalization. Vision Therapy provided on an interdisciplinary model can improve patient outcomes, decrease length of hospital stays and easier transition back to the home environment.

Did you know that the incidence of Neurological Vision Deficits is equivalent to that of language deficits following ABI? However, assessment and specific therapy to reduce the impact of neurological vision impairments is currently not standard practice in the majority of rehabilitation programs across the world. Why is this? Is it because vision deficits are not viewed as important in the health system and are seen as an extraneous service which can be seen to after discharge from hospital or outpatient clinics? Or is it because rehabilitation staff are not trained or experienced in recognising visual deficits and do not have the appropriate assessment tools to use. A world leading Neuropsychologist and neurological vision impairment centers have identified one of the real issues in relation to neurological vision impairment:

*“50% of the patients in a head trauma rehabilitation centre show visual systems disorders **not assessed** before, although most of the patients were chronic and had been treated in other hospitals previouslyⁱ”, Gianutsos.*

So it returns to a point of issue that currently, major stroke and rehabilitation hospitals have also neglected the need for a standardised functional visual assessment as part of a minimum standard of care in the rehabilitation of brain injury. Specific vision assessment and vision training should immediately become part of the **clinical standard of care for the rehabilitation of patients with Neurological Vision Deficits**.

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Patients referred to Blindness or Low Vision Agencies are often provided with programs designed for ocular disorders. Most staff have minimal understanding of the additional cognitive and physical deficits associated with acquired brain injury and may provide ineffectual or inappropriate interventions.

The direct neurological vision rehabilitation market is currently unquantified. Within the aged population there is an increased incidence of Hypertension, Obesity and Diabetes, all of which are risk factors for Stroke, one of the primary causes of Neurological Vision Deficits. An extremely high proportion of people who have a stroke enter the health care system via hospitalisation or GP consultation. Basic screening for visual symptoms should occur during this initial contact, and would be a source of onward referral for Vision Rehabilitation to Blindness and Low Vision Agencies.

2. Statistics on Acquired and Traumatic Brain Injury.

ABI is damage to the brain by a variety of causes; hypoxia, infection, tumour, substance abuse, degenerative neurological diseases, strokes or head trauma e.g., TBI. TBI implies trauma to the head and brain caused by an external force. Quite often ABI and TBI are interchanged in conversation but it is helpful to understand that TBI is actually a subset of ABI.

ABI can cause physical, cognitive, psychosocial and sensory impairments which may lead to restrictions in various areas of a person's life e.g., Activities of Daily Living, Personal Safety, Quality of Life and Mobility.

Australia:

- *Over 27,000 Australians are hospitalised with traumatic brain injury every year.*
- *Over 52,000 with a diagnosis of stroke every year.*
- *Over 15,163 with other non-traumatic ABI every year.*

America:

- *700,000 Americans have a stroke every year.*
- *Stroke is the number 3 killer and leading cause of severe long term disability.*
- *Each year 1.5 million Americans sustain a traumatic brain injury.*
- *Recent reports indicate 60% to 67% of injured US soldiers sent from Iraq to the Walter Reed Army Medical Center have been diagnosed with traumatic brain injuries.*
- *Annual stroke related services in the US equate to USD62.7 billion- American Stroke Association.*

United Kingdom:

- *100,000 people in England and Wales have first strokes every year.*
- *Stroke is the largest single cause of severe long term disability with many more suffering from acquired brain injury.*
- *Annual stroke related services in the UK costs the NHS £2.8 billion (Ref. Stroke Association - UK).*

China:

- *12 people in 1,000 of the population have a stroke in mainland China = 15.5 million per year.*

Spain:

- *3 people in every 1,000 of the population will have a stroke eg. Approx 134,500.*

New Zealand :

- *7,120 people suffer from stroke per year.*
- *170 hospitalized every week with Traumatic Brain Injury.*

Canada:

- *50,000 people suffer from Stroke every year.*
- *Every year 65,000 Canadians will have a Traumatic Brain Injury.*
- *300,000 Canadians are living with the effects of stroke.*
- *Direct and indirect costs associated with TBI are \$3 billion annually.*
- *The average acute care costs are \$27,500 per stroke.*
- *In 2001, the Heart and Stroke Foundation allocated \$7.6 million for stroke research.*

3. World Trends in Vision Rehabilitation.

When we look at the history of Vision Rehabilitation and in particular, Orientation and Mobility, we see how services have evolved over time. We look back at the era of Richard Hoover and Warren Bledsoe who introduced the program of “foot travel” to severely and totally blind veterans and to the programs introduced at Hines. This was the embryonic beginnings of what we now know today as Orientation and Mobility. We recognise the introduction of University preparation training programs, such as those conducted at Western Michigan University and at the beginnings of collection of clinical data and research conducted to evaluate training methodology. During this era severely visually impaired individuals were trained as though they had no useful vision or were deemed to not require any special vision rehabilitation services. So in essence until the **1950’s** and early 1960’s, the majority of people receiving Orientation and Mobility training were totally blind. Our techniques and methods were focused on the problems of the totally blind and there was a lack of knowledge about the unique aspects of seeing with limited vision.

Then came the 1960’s, the era of Low Vision. Suddenly, there was a whole new population of individuals with low vision who required and demanded services. There were also a growing number of disciplines and a variety of professionals who had an interest in Low Vision, consequently research and publications became more prolific on the subject. Barraga’s research in 1964, on increasing the visual efficiency of children who had very limited amounts of vision, was seen as a milestone. Low Vision Clinics were being established across the world and Low Vision interest groups were being formed. By the early 1970’s Low Vision Conferences were being held and Orientation and Mobility techniques were being evaluated for training clients with low vision. During this time not only were the professionals looking at the aspects of diseases of the eyeball, they were beginning to focus on issues which impact on Mobility training. Issues such as the psycho-social aspects of low vision, visual perception as it relates to low vision, increasing visual functioning and effectiveness and the aspect of delivering vision rehabilitation services via a multidisciplinary or interdisciplinary method. A new profession came about during this time, the Low Vision Specialist who trains the client in the use of low vision aides such as monoculars, CCTV’s, use of computer technology, JAWS etc. In the last three decades of the 20th century our profession grew in stature, expertise and professionalism.

And today we move into another exciting and challenging era. Vision Rehabilitation service delivery for clients with Neurological Vision Impairment will be as monumental as the realisation that not only could totally blind individuals receive training but also those with limited vision. There is a whole new client base which has “slipped through the cracks”. It is the clients who have suffered an ABI and have resulting neurological vision impairment. When I talk about Neurological Vision Deficits I am not just talking about those that present with homonymous field loss but also visual deficits such as systematic visual scanning, speed of visual processing, visual-perceptual deficits, visual memory, visual-spatial deficits, visual neglects and inattentions. These are the new deficits that we all need to understand. Don’t be fooled and say that this group of clients can be trained the same way as our current low vision clients. We had to adapt and evolve our training methods from focusing on clients who were totally blind to issues of low vision. Now we must again adapt and develop specific training methods for those clients with neurological vision impairment. We need to begin to think about this group of patients from a “**Brain not Eyeball**” point of view. Specialised training programmes are needed for O & M Instructors, Rehabilitation Officers, Low Vision Specialists, and Occupational Therapists to enable them to assess and provide vision therapy and rehabilitation services for this unique population.

4. Where to now?

Now we have identified that there is a population of patient’s with neurological vision deficits who deserve and are beginning to demand vision therapy programmes, how are we going to service this group.

It must be remembered that there is no “short cut fix” when talking about rehabilitation for Traumatic Brain Injury, in most cases this is a life long process, but experience has shown that early intervention and specific intervention for vision deficits improves quality of life, decreases the level of medical intervention and decreases the level of support required in the community setting once the patients are discharged from rehabilitation programmes.

While clinical vision assessments may be provided by Optometrists and Ophthalmologist, these usually occur much later than other rehabilitation assessments, some times the delay can be as long as many months. Many of the more complex visual perceptual deficits can go undiagnosed and untreated for even years. I would **recommend** the assessment and training of patients with Neurological Vision Deficits should be implemented in the early stages of recovery and become part of the **clinical standard of care for the rehabilitation of Traumatic Brain Injury**. In Australia this can occur as early as day two post stroke as long as the patient is medically stable.

Patients referred to Blind Rehabilitation Centers, Low Vision Clinics are often provided with programs designed for ocular disorders e.g. glaucoma, macular degeneration. Most staff have minimal understanding of the additional cognitive and physical deficits associated with traumatic brain injury. I would **recommend** BROS, VIST's, Orientation and Mobility Instructors, Low Vision Specialist, Orthoptist, Occupational Therapists and Optometrists be **trained to provide Neurological Vision Therapy assessment and intervention** programmes in the interdisciplinary settings of the Polytrauma units, Acute and Rehabilitation Hospital settings, specialised private rehabilitation facilities and Blindness Agencies.

5. Summary:

I have spent 25 years of my working life as a clinician in the area of vision rehabilitation for patients with neurological vision impairments. I have seen many successes over the years and have many successful stories to tell. My key motivator is improving patient quality of life and as such I believe passionately that a comprehensive commitment to training staff and providing assessment and training programmes such as the NVT Neuro Vision Rehabilitation System will provide internationally recognised, gold standard rehabilitation services to patients across the world.

The NVT system is not just a device but a therapy intervention program that actively transfers skills learnt in early phase recovery into functional tasks graded for a variety of settings, thus catering for the different entry and exit levels of a patient's performance. The main objective is to assess and train the patient in compensatory scanning techniques which are then transferred into all activities of daily living such as mobility, orientation, reading, personal safety and quality of life. It is designed for early intervention following trauma and to be conducted in an interdisciplinary setting to support other rehabilitation therapies. It is portable, can be used in clinics or the patient's own home.

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