

1999 Review, Reflect, Realise, Rehabilitation

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ABSTRACT

Rehabilitation or assisting someone who is ill to lead a normal life has been the role of the Orthoptist for many decades. Reskilling fighter pilots was the first recorded involvement of orthoptists in active rehabilitation, during World War 11.

The real push for Orthoptists to assume a rehabilitation role began in 1973 with involvement at the Spastic Centre of NSW with children with cerebral palsy. Other developments at this time included rehabilitation therapy for cerebro-vascular accident patients and the National Trachoma and Eye Health Programme in rural Australia. Orthoptic involvement in the Low Vision area began in 1977 with Orthoptists being employed at the Royal Blind Society of NSW in the Child Development Unit, Sensory Development program and the Low Vision Clinic, with a specialised Vision Training program. The Low Vision area has expanded with reading efficiency programs for the vision impaired student. Sports rehabilitation and the involvement of orthoptists in driving rehabilitation commenced in 1990.

Key Words: Rehabilitation, Orthoptist, Low vision, Driving, Stroke, Sport Rehabilitation.

REHABILITATION

Introduction.

Rehabilitation is Latin for re skilling¹ and, in the case of Orthoptic assessment and Treatment, involves assisting someone who is ill to lead a more normal life. Orthoptists have been involved in Rehabilitation since the 2nd World War, where "Workers in factories using precision instruments often required the help of the orthoptist as well as those cases in the Head Injury Hospitals where the orthoptists assisted in perimetry and the diagnosis and treatment of ocular muscle palsies."² Orthoptists then became involved in the assessment and treatment of children with cerebral palsy and developmental delay. To-day orthoptists are still employed in these areas and have expanded their role into driving, sport, stroke and low vision rehabilitation.

History of Rehabilitation in Australia.

Children with cerebral palsy have been assessed and rehabilitation programs developed by Orthoptists since 1973 at the Spastic Centre of NSW³. Treatment programs that involve repetitive saccadic and smooth pursuit movements have been used to assist some cerebral palsy children to control their eye movements⁴. The specialised assessment of the Developmentally delayed patient has continued from this pioneering work, with interesting findings presented in 1998 that these patients presented with a significantly higher incidence of visual impairment than the normal population⁵. The multi-handicapped, visually impaired child provides additional challenges in assessment and particularly the team approach to rehabilitation where an accurate assessment of the visual status is essential to the other team members⁶. Cortical blindness can be very difficult to assess and treat but some progress has been made in improving this to "panoramic vision"⁷. Aboriginal health has been a very important part of the Orthoptist rehabilitation expertise since our involvement with the National Trachoma and Eye Health Program⁸ which commenced in 1976 and has extended to orthoptists participating with the Hollows Foundation in overseas countries⁹.

Driving Rehabilitation.

The Orthoptist's role in driving rehabilitation is as a consultant to confirm the presence or absence of eye defects that may affect driving¹⁰ and advise on visual strategies to assist in overcoming any visual problem. Driving rehabilitation may benefit people who have suffered from a stroke, head injury, serious eye disease, or a general condition from birth with resulting eye condition (eg. cerebral palsy or spina bifida) that makes driving difficult¹¹. The Orthoptist will take a full medical history and Orthoptic Assessment will include visual acuity, visual fields, cover tests, ocular movements, binocular vision and colour vision tests. The Orthoptists may assess the driver's ability in the driving situation (on road) in order to observe their specific eye movements and visual deficiencies and needs. The most common vision problems found are visual field defects, neglect, monocular fixation, nystagmus, ocular movement defects and strabismus. The vision defect is assessed and techniques to enable safe driving are discussed which may include ensuring that the best glasses are prescribed for use when driving, discussing adaptations to the vehicle that will assist visual performance e.g. extra mirrors. Rehabilitation programs may be developed to ensure the best use of vision when driving e.g. for patients with visual field loss Orthoptists have also been involved in assessing the visual standards of adult drivers with a commercial

vision screening device thus proving this as a reliable test to measure visual function^{xi}. This was performed in collaboration with Vic Roads, with a later study which found that older drivers performed significantly worse on the vision screener showing a very marked increase in visual defects^{xii}.

Research is continuing into the effect of diplopia^{xv} on driving ability and the impact of visual field defects on driving^{xv}. The most recent work has been presented at the International Vision and Vehicles Conference in Boston (1999). The unique professional expertise the Orthoptist has in this field has involved the Orthoptist working closely with other professionals, not only in the allied health field, but also the licensing authorities.

Sport Rehabilitation.

The challenge for Orthoptists to become involved in Sport Rehabilitation was presented to the Orthoptic Association by Air Vice-Marshal Daley in 1970, who after discussing the importance of the Orthoptist in the training of pilots in World War II stated: "As you can see, learning to fly is visually rather like playing a ball game, and this brings me as a member of the A.M.A. S.M.F to the suggestion that there should be greater awareness by this body of the importance of orthoptics in sport and therefore greater links in this field."^{xvi} This challenge was not taken up until 1990 when the visual and ocular motility performance of one hundred cricketers was tested and compared to a normal population and no significant differences were found^{xvii}. The effects of aerobic exercise on reducing intraocular pressure was investigated^{xviii}. This was followed by a study of the latencies of horizontal saccades in table tennis players and non-table tennis players, with a group of the elite table tennis players exhibiting anticipatory saccades^{xix}.

The Orthoptic Sports Vision eye examination^{xx} involves tests designed to detect visual problems and include standard orthoptic assessment, Humphrey's field test, contrast sensitivity, dynamic visual acuity (measured with a moving target), stereopsis in the distance (measured with Mentor) and Ober 2 eye movements. Visuomotor deficiencies^{xxi} that could effect athletic performance are tested by assessing eye hand coordination (proaction and reaction, measured using the Acuvision 1000), peripheral awareness reaction time, total reaction time (i.e. the measurement of reaction time plus movement time based on responses from the visual, auditory and motor systems.), eye foot coordination (i.e. that ability of the feet to respond in a smooth and coordinated manner as a result of information provided by the visual system.) and coincidence anticipation (i.e. the ability to make a motor response coincident with the arrival of an object at a designated point.).

Sports Rehabilitation programs^{xxii} may involve treating visual deficiencies orthoptic and ophthalmic, sports specific programs may be developed for coaches and trainers both Off field (Visuomotor drill, quantifying and training skills) and On field (reinforcing the off field training with simulation

techniques e.g. peripheral vision on the netball court). The International level at which this rehabilitation is being presented is indicated by the involvement of the OAA in the International Congress on Sport Science, Sport Medicine and Physical Education held in Brisbane in 2000, prior to the Sydney Olympic Games.

Stroke Rehabilitation.

Orthoptists have been involved in the rehabilitation of the patient suffering from a Cerebro-Vascular Accident (CVA) from 1977. The multi-disciplinary team relies on the orthoptic assessment to prepare the most appropriate rehabilitation program for the patient^{xxiii,xxiv}. Assessment of visual function usually involves visual acuity, visual fields, ocular muscle balance, abnormal head posture, stereoscopic vision, colour vision, and investigation of an abnormal head posture used for adaptation to diplopia or to obtain the null point of nystagmus. Due to the varied and sometimes profound disabilities of these patients it is a challenge for the Orthoptist to adapt normal testing procedures to cope with patients who often suffer from hemiplegia, neglect, apraxia (inability to motor plan.), dysarthria (motor speech disorders), aphasia (communication disorder, impaired language comprehension) and frontal lobe induced behaviour problems (confusion).

Some of these adaptations include history taking reduced to simple "yes", "no" answers, checking correct glasses are being worn, or bi focals being used correctly, visual acuity testing with modified Sheridan Gardner or Catford Drum, using opto-kinetic nystagmus methods to test saccadic movements and using eye contact for gross eye motility.

Homonymous Hemianopia may occur following CVA, head injury or tumour removal, training with the SEETEC program or adaptation of this assists these patients to improve their tracking and scanning skills^{xxv}. This is done by the Orthoptist in the Rehabilitation setting and followed by a home visit to advise staff or carer's on management. The initial work with CVA patients has lead onto the involvement of the Orthoptist in working with the Head Injury patient^{xxvi} often presenting with the following clinical categories^{xxvii} orbital or soft tissue injury, refractive errors from traumatic cataract, lens dislocation or traumatic myopia, traumatic maculopathy or cranial neuropathies which may include neurogenic paralytic strabismus or visual field defects.

Also cerebral lesions, intra axial brainstem damage or glaucoma secondary to trauma may occur. Current research is being done to use predictive factors to assist in formulating the rehabilitation program for individual patients^{xxviii}.

Low Vision Rehabilitation.

During 1977 an Orthoptist was offered the position of Honorary Consultant to the Royal Blind Society of NSW. Working in a voluntary capacity for some time with the Sensory Development program, which was a program designed to assist clients who had recently lost their vision to make the best use of their other

senses and thus regain some independence^{xxxix}. Then being appointed as a consultant in the Low Vision Clinic^{xxx} instructing clients in the use of magnifiers and telescopes with advice as to adequate lighting. Home visits are also performed to ensure that the lighting is adequate and the low vision aid is being used appropriately. Eccentric viewing training programs^{xxxii} were pioneered in Australia in 1978 in close collaboration with Professor Lederer, head of NSW School of Optometry. This program was first described by Professors Otto and Bangerter in St. Gall, Switzerland, in which they describe the retraining of patients with macular degeneration to use a paramacular point as their primary point of fixation. Most patients improve in visual acuity but also showed a marked improvement in mobility and confidence to perform everyday tasks, which leads to them regaining their independence. An orthoptist was seconded from Sydney Eye Hospital to work in the Children's Development unit^{xxxiii}, with an Orthoptist on the Honorary Medical Advisory Panel. The Orthoptist's role was to determine the amount of useable vision the child had, develop a visual stimulation program for each child, to encourage them to utilise their residual vision^{xxxiii}. This work has continued to expand with the Royal Blind Society being one of the major employers of Orthoptists.

The orthoptic position at the Royal Victorian Institute for the Blind was pioneered in 1982 where a pilot program was performed to determine if visual efficiency and reading efficiency training could improve a visually impaired student's reading efficiency^{xxxiv}. This vision training consisted of eccentric vision training and null point training for patients with nystagmus. A review of these students twelve months later showed they were able to maintain an improved reading speed^{xxxv}. Following these pilot studies techniques to further develop these training programs^{xxxvi} were developed with subsequent development of vision training programs^{xxxvii} on the computer (EccVue^{xxxviii} and VizTest^{xxxix}), and the development of a Home Eccentric Viewing Kit. Studies were also done on the effect of Spectral composition of lighting on visual performance of persons with retinal pathology^{xl}.

The other states soon became involved and now Orthoptists are employed in low vision centres in all states. Each state has its own specific low vision needs and resources.

Eccentric viewing techniques are now being taught in all states with the future of eccentric viewing training resting with the patience of the orthoptist and the motivation of both orthoptist and patient, some patients like the structured computer approach while others prefer a more day to day hands on approach. Orthoptists working in this field have to be able to assess each patient's individual needs and abilities in order to assist with these specific problems. All Orthoptists are involved in some form of low vision rehabilitation even if it is as simple as suggesting an appropriate reading light to a patient with slightly reduced vision. Patients in this category are often the most affected by their visual loss as it makes everyday

tasks difficult (even presbyopia) simple techniques can be used to make life easier.

Orthoptists has taken on a major role in the management and administration of many low vision centres as we have the expertise to assess the client's total needs and co-ordinate the low vision team. An example of this is the Vision rehabilitation training program described at the 1998 OAA Scientific Conference, where orthoptists and other staff from the Royal Blind Society trained health professionals, teachers and community workers in Papua New Guinea^{xi}. Orthoptists are increasingly being consulted by government bodies and employment agencies as experts in this field such as the Queensland Department of Family Services and Aboriginal and Islander Affairs, Health Department Victoria, Victorian Department of Education, and the Department of Health Housing and Community Services. The role of the Orthoptist in the management of the low vision patient presents a challenge for the future as our training permits us to undertake so many varied roles with this patient group.

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Rehabilitation.

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