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## Adults with Low Vision: Continuing Education for Occupational Therapists and Occupational Therapy Students

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Adults with Low Vision: Continuing Education for Occupational Therapists and  
Occupational Therapy Students

by

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A Scholarly Project

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of the

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for the degree of

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This Scholarly Project Paper, submitted by Ashley Berglund and Kelli Hughes in partial fulfillment of the requirement for the Degree of Master's of Occupational Therapy from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

  
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Faculty Advisor

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## PERMISSION

Title            Adults with Low Vision: An Education Course for Occupational Therapists

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## ABSTRACT

Low vision is a condition that occurs when an individual has “some amount of usable vision, but their visual functioning is impaired and interferes with their ability to carry out desired tasks” (Lampert & Lapolice, 1995, p. 885). Impairments in vision cause disruptions in areas of daily living including work and leisure, routines, habits, roles, and social participation. There is a great need for holistic and client-centered occupational therapy in low vision rehabilitation services to improve an individual’s functional performance and overall quality of life.

A comprehensive literature review was conducted on low vision definitions and medical conditions, the variety of current low vision rehabilitation programs, low vision professionals, assistive technology, driving, and reimbursement. Various textbooks were obtained and provided useful background knowledge regarding occupational therapy for low vision. Credible internet sites were accessed for relevant clinical resources. Additional information was gained from attending a DriveSmart Symposium in Aberdeen, SD and completing an Assistive Technology II Practicum at the North Dakota School for the Blind. In addition, theories and models of occupational therapy practice were explored. It was determined that the Ecological Model of Occupation (Kramer, Hinojosa, & Royeen, 2003) and the Human Activity

Assistive Technology Model (Cook & Hussey, 2002) would best guide occupational therapy practice for individuals with low vision.

Through this process, it was determined that occupational therapists must be informed about this growing area of service need and further educate themselves on various aspects of low vision and the role of occupational therapy. The educational product developed through this scholarly project process is a Microsoft® PowerPoint® presentation and supplemental lecture notes containing information regarding low vision disorders, the low vision rehabilitation process including occupational therapy's role in evaluation, treatment planning, and interventions, low vision and driving, and family and caregiver education. This educational presentation is intended for education of occupational therapy students and practitioners.

## CHAPTER I

### INTRODUCTION

Imagine going out to a nice, relaxing dinner at a local restaurant. The lighting is low and you are not able to read the menu. When your food arrives, you are not able to differentiate between the food items on your plate. At the end of dinner, the bill arrives and you are not able to read it. You have reached the point where you must rely on your spouse when trying to have an enjoyable evening together. Unfortunately, this scenario occurs far too often. According to Lighthouse International (2005), “16.5 million people reports some form of vision impairment, even when wearing glasses or contact lenses” (p. 2).

Vision has an effect on all areas of an individual’s life. These areas may include daily activities involving work and leisure, routines, habits, roles, social participation, and an individual’s independence and self-esteem. Impairments in vision cause disruptions in these areas and, without proper intervention, an individual may experience a decrease in their quality of life. There is a great need for occupational therapy in low vision rehabilitation services to improve an individual’s functional performance and overall quality of life. Vision plays an integral role in an individual’s performance in occupations, socials participation, and psychosocial aspect of activities thus making low vision the major cause of activity limitation. These limitations can be improved by an occupational therapist by focusing on compensatory strategies, use of residual vision,

environmental modifications, task adaptations, and addressing the emotional impact of vision on activities (Bachelder & Harkins, 1995). Occupational therapists are a vital component in the “unique and specialized area of [low vision rehabilitation] that requires a solid foundation of knowledge and skills to provide comprehensive and individualized care” (Sokol-McKay & Michels, 2005, p. 15).

Low vision occurs when an individual has “some amount of usable vision, but their visual functioning is impaired and interferes with their ability to carry out desired tasks” (Lampert & Lapolice, 1995, p. 885). Vision impairments may result from age-related diseases such as macular degeneration, glaucoma, cataracts, and diabetic retinopathy. Vision impairments may also result from physical trauma such as cerebral vascular accidents, spinal cord injuries, and brain injuries. There is a growing body of literature that indicates the need for occupational therapy in low vision, especially as the general population lifespan increases. This literature will be presented in Chapter II.

“The occupational therapists comprehensive knowledge of the physical, cognitive, sensory, and psychosocial aspects of the disability enable him or her to implement interventions that will enhance the outcomes for an individual involved in the process of vision rehabilitation” (Gentile, 1997, p. 502).

Occupational therapists address a variety of aspects of daily living to enhance independence and quality of life. One vital aspect of occupational therapy intervention is providing a holistic and client-centered approach to treatment. According to Mary Warren, “low vision [is] becoming an expanding practice area

for occupational therapists [and] that low vision has the potential to become a major specialty area for the profession” (Gourley, 2001, p. 1).

Bachelder and Harkins (1995) addressed four major reasons why occupational therapists should have a primary role in low vision rehabilitation. First, evidence shows the growing older population and the need for vision-specific services. Second, occupational therapists will be confronted with low vision issues while working with the older population and will need to appropriately address and provide services. In order to comprehensively treat an individual, vision will be a primary factor in early intervention for safety and prevention. Third, occupational therapists have a broad scope of employment opportunities in both rural and urban settings. Because of this, occupational therapists will be available to provide necessary services for the individuals to function as independently as possible with their visual impairment. The fourth reason for occupational therapists to be involved in vision rehabilitation is that emerging, descriptive research has found occupational therapy services to be effective in treating this population.

An occupational therapist’s entry-level educational background provides the knowledge of necessary skills and abilities to treat individuals with visual impairments. “The occupational therapists comprehensive knowledge of the physical, cognitive, sensory, and psychosocial aspects of the disability enable him or her to implement interventions that will enhance the outcomes for an individual involved in the process of vision rehabilitation” (Gentile, 1997, p. 502).

Occupational therapists also have the necessary education in evaluations, assistive technology devices, and providing client-centered and holistic interventions.

As further research is conducted on low vision disorders and rehabilitation, it is vital for occupational therapists to seek out additional education services in order to provide optimal care to individuals with low vision. By attending continuing education courses, occupational therapists are able to further define the role of occupational therapy in low vision as well as increase their knowledge in low vision rehabilitation. Overall, continuing education is important to the occupational therapist, the individuals whom they serve, and the profession of occupational therapy as it is necessary to remain competent and advance in an ever-changing world. This scholarly project entailed the development of a continuing education course for occupational therapists on low vision rehabilitation methods and resources. These materials are included within Chapter IV.

The Ecological Model of Occupation served as a guide in developing the low vision educational course for occupational therapists for this scholarly project. This model focuses on four major constructs including person, task, context, and performance. When addressing an individual with low vision, occupational therapists will take into consideration the individual's abilities, experiences, and the quality of task performance. Within the task, the occupational therapist assesses the individual's ability to accomplish goals. The context is evaluated to determine social and cultural meanings of tasks. During these tasks, assessing an individual's performance will determine how they use

their skills and abilities within the context. Overall, the Ecological Model of Occupation provides the occupational therapist with a holistic approach to provide optimal interventions for individuals with low vision to improve quality of life (Kramer, Hinojosa, & Royeen, 2003).

The Human Activity Assistive Technology Model (HAAT) is another model recommended to guide occupational therapists in the use of low vision assistive technology for evaluation and intervention phases. The HAAT model incorporates viewing an individual with low vision holistically. The model includes four main components to assess the compatibility of the individual and the assistive device. These components include the human, the context, the desired activity, and the assistive technology (Cook & Hussey, 2002).

Occupational therapists consider these components to ensure the proper use and longevity of the chosen assistive device.

The following chapters include the comprehensive literature review, the methodology, the educational course, including the Microsoft® PowerPoint® presentation in Chapter IV, and a summary of the findings and areas of further research needed in regards to occupational therapy's role in low vision. In addition, a glossary of terms has been included at the end of this chapter to reference common terms utilized throughout this scholarly project. A comprehensive literature review was conducted to address occupational therapy's role in low vision and the need for further involvement and education of occupational therapists in low vision intervention for adults. This literature review is presented in the following Chapter II.



## GLOSSARY OF TERMS

**Accommodation**-ability to keep objects focused clearly on the retina by changing the refractive power of the lens (Hyvarinen, 1995).

**Cataracts**-an opacity occurring in the normally transparent lens, causing reduced visual acuity; generally due to the aging process but can also occur as a result from trauma (Scheiman, 2002, p.40)

**Contrast Sensitivity**-ability to detect subtle differences in the luminance between adjacent surfaces (Hyvarinen, 1995).

**Diabetic Retinopathy**-microaneurysms, retinal hemorrhages, and exudates due to disease of retinal vasculature secondary to diabetes (Scheiman, 2002, p.41).

**Glaucoma**-visual field defects caused by damage to retinal nerve fiber bundles at the optic nerve head (Scheiman, 2002, p.42).

**Low Vision**-Bilateral subnormal visual acuity or abnormal visual field resulting from a disorder in the visual system that results in decreased visual performance; the range of low vision is from 20/80 to 20/1000 (Reed, 2001, p.215).

**Age-Related Macular Degeneration**-eye disease that affects central or straight-ahead vision (Sokol-McKay & Michels, 2005); number one cause of blindness in the United States in people over age 60 (S Scheiman, 2002, p.41).

**Ophthalmologist**-physicians who specialize in medical and surgical care of the eyes and visual system and in the prevention of eye disease and injury; can provide total eye care, however do not commonly have a specialty in low vision (Scheiman, 2002, p.311).

**Optometrist**-primary health care providers who examine, diagnosis, treat, and manage diseases and disorders of the visual system, the eye, and associated structures, as well as diagnose related systemic conditions; able to provide eyeglasses and contact lenses, low vision aids, vision therapy, and medicines to treat eye diseases; establish specialty areas such as low vision rehabilitation (Scheiman, 2002, p.311).

**Social Worker**-role on the low vision team is to provide individual and group counseling and facilitate consumer access to appropriate community-based support services including public assistance programs, vision rehabilitation programs, senior centers, agencies, hospitals, and clinics (Scheiman, 2002, p.312).

**Visual Acuity**-the measuring of resolving power of the eye; an individual with 20/20 acuity is considered to have normal ability to see small detail at the distance tested (Scheiman, 2002, p.17).

**Visual Adaptation**-ability of the eye to adapt to changes in lighting (Hyvarinen, 1995).

**Visual Field**-the area that can be seen when a person is looking straight ahead (Hyvarinen, 1995)

**Visual Sphere**-the distance within which one can respond to an object of a certain size, contrast, color, and speed of movement (Hyvarinen, 1995).

## CHAPTER II

### LITERATURE REVIEW

According to Massof (2002) one in six adults aged 45 and older have some form of vision impairment. This number makes up approximately 13.5 million Americans. As individuals' age, their visual impairments rapidly increase, especially between the ages of 65-74 and 75-85. As Americans age and technology continues to advance, the number of new low vision and blind persons each year will continue to increase and the demand for vision therapy will therefore increase.

A piece of Massof's low vision research, published in 1995, recommends expanding the role of optometrists to allow them to refer low vision patients to occupational therapy services (Stelmack, 2005). The article written by Massof utilized a team approach of professionals treating individuals with low vision. Health professionals, including occupational therapists play an important role to assist in maximizing daily function. Throughout an individual's life span, low vision may involve a broad range of low vision rehabilitative services which include ophthalmologists, optometrists, occupational therapists, speech and language therapists, rehabilitation counselors, vocational evaluators, and orientation and mobility specialists (Bachelder & Harkins, 1995).

## Team Approach

“Collaborative efforts with other disciplines and professionals are important to ensure identification of all of a patient’s needs and to promote the development of a comprehensive intervention program” (Lampert & Lapolice, 1995, p. 889). A study completed by McCabe, Nason, Turco, Friedman, and Seddon (2000) tested the effectiveness of using a rehabilitation team consisting of occupational therapy, optometry, and social work services. The optometrist was responsible for the low vision evaluation and functional response to low vision devices. The occupational therapist taught the individuals how to correctly use optical and non-optical devices as well as developing adaptive techniques. The social worker assisted with the individuals’ psychological assessments, support services, and community referrals. Throughout observation of visual tasks and self-report of activities of daily living (ADLs) performance, the researchers found a significant improvement in using a team approach with individuals with low vision.

McCabe et al. (2000) researched the effectiveness of a vision rehabilitation team on an individual’s functional performance with low vision. The occupational therapist provided training in prescribed optical and nonoptical devices. The occupational therapist also provided education on adaptive techniques to further the individuals’ performance within their environment. The results demonstrated a significant increase in the individuals’ level of function and their perceived level of independence using the device during daily tasks.

The Visual Independence Program (VIP) was developed in 1992 in Kansas City as an outpatient rehabilitation clinic. The program was created to utilize a team approach to treat children and adults holistically. The program combining ophthalmology and occupational therapy services was reported as effective and needed in low vision rehabilitation (Warren, 1995). Individuals with low vision were typically seen by an ophthalmologist for a vision assessment and then referred to occupational therapy for further services. Other team members were also involved to further assess community mobility, counseling needs, work re-entry, and technology specialty needs.

#### Occupational Therapy Evaluation Role

Occupational therapists comprehensively evaluate individuals with low vision using formal assessments as well as observation and interview. Formal assessments include visual acuity, visual sphere, contrast sensitivity, visual field, visual adaptation, color vision, accommodation, oculomotor deficits, and response to visual stimulation (Hyvarinen, 1995). Two common standardized tests are used to measure reading ability and attention including the Pepper Visual Skills for Reading Test (VSRT) and the MNRead. The VSRT assesses the visual component of the reading process as well as word recognition skills, while the MNRead estimates maximum reading speed (Warren, 1995). Although the tests are good measures of an individual's reading ability, these standardized tests do not account for generalized performance in different contexts. Therefore, standardized testing should be paired with observation and self-report interview.

Observation and self-report interview will be an important factor to accurately assess an individual's performance in daily occupations. Observation and interview of individuals interacting in their environment will allow occupational therapists to meet their vision needs most effectively by evaluating "the functional impact of the vision loss on day-to-day activities" (Lampert & Lapolice, 1995, p. 888). Self-report interviews offer the occupational therapist the ability to gain insight on the individual's perspective of their vision loss as well as developing comprehensive intervention programs specific to each individual (Scott, Smiddy, Schiffman, Feuer, & Pappas, 1999).

Reading and writing abilities have an impact on all areas of occupation including activities of daily living (ADLs), instrumental activities of daily living (IADLs), work, education, leisure, and play. For an individual with low vision, IADLs may be affected in limiting an individual's ability to perform tasks such as managing finances, driving, shopping, and home management. A major area of occupation affected by low vision includes ADLs. Individuals with vision impairments may be affected by limitations or unsafe performance in areas of daily living such as bathing, dressing, eating, functional mobility, personal hygiene and grooming, and toilet hygiene (AOTA, 2002).

Another area occupational therapists need to be aware of when evaluating an individual with low vision are psychosocial aspects of the individual. An occupational therapist may evaluate psychosocial aspects through observations and interviews. Common signs of psychosocial limitations include withdrawing from activities and/or the environment, feeling fearful of voices or noises, loss of

self-confidence and self-esteem, and/or passivity (Reed, 2001, p. 247). Scott et al. (1999) researched individuals' quality of life and functional status when living with low vision and concluded that individuals' perceived their quality of life as significantly impaired due to their visual impairment. The participating individuals' identified role limitations and blurred vision during activities as the major factors leading to decreased quality of life. In this study, role limitations were characterized by physical health problems, fatigue, and emotional health problems. Based on this information, occupational therapists are advised to incorporate the individuals' perspective of their strengths and weaknesses relative to their quality of life. Focusing on the subjective as well as objective information for each individual's overall lifestyle, occupational therapists are better able to build rapport and gain a holistic perspective of each individual living with visual impairments.

#### Assistive Technology

“Low vision creates major disruptions in family life, employment, and social interactions...which often lead to functional dependence and depression” (Copolillo & Teitelman, 2005, p. 306). This quote illustrates the complexity of role limitation, psychosocial factors, and activity or occupational decline that often accompanies low vision. A solution to these limitations or losses can often be assistive technology.

With the use of low vision assistive devices (LVADs), individuals have the opportunity to “increase and sustain engagement in occupation” as well as increase active participation in their communities (Copolillo & Teitelman, 2005).

LVADs include optical devices and nonoptical (electronic) devices. Optical devices consist of eyeglasses, handheld magnifiers, microscopes, and telescopic lens. Nonoptical devices consist of closed-circuit televisions (CCTVs), electronic reading systems, screen enlargement systems, electronic Braille displays, and computer software (Beaver & Mann, 1995).

Beaver and Mann (1995) state that next to home safety, “the two most pressing needs of many persons with low vision are reading and writing” (p. 915). Reading and writing have a plethora of assistive technology options. Nonelectric magnifiers provide greater magnification allowing the individual to read printed material. These devices assist individuals in many contexts of daily activity such as reading the newspaper, looking up phone numbers, reading a menu, and reading recipes. For tasks requiring a longer period of time, CCTVs may be beneficial. CCTVs have a variety of components but the ultimate purpose is to enlarge printed or graphic materials onto a monitor screen. The individual using a CCTV is required to sit at a stationary desk to read the material on the screen. This stationary position may be a disadvantage for some individuals because of the lack of portability, eye fatigue, and movement to read each line of the text. As a result, some individuals may prefer large print material, audiocassette, or Braille books. Another option is an electronic reading system which requires the use of a computer. The individual scans the printed material which is then converted by a software program and read aloud to the individual by a speech synthesizer. There are many additional computer options that may enhance an individual’s vision



including screen enlargement systems, speech output systems, and electronic Braille displays (Beaver & Mann, 1995).

The ability to write is an important task in daily occupations such as education, home management, and vocational tasks. Low technology assistive devices include, but are not limited to, bold line paper, cassette recorders, check and envelope writing guides, enlarged checks and registers, as well as carbon paper notebooks. High technology for low vision includes a variety of software programs for computers (Beaver & Mann, 1995). High technology enables individuals with low vision the ability to communicate and interact with others in their environment. Occupational therapists are familiar with a variety of options found in standard computer programs as well as specialized programs. Word processing programs have the capability of adjusting color contrast and text size along with speech recognition and speech output options.

There is also specific assistive technology software available for specific tasks such as financial management and banking tasks, leisure activities, and educational uses. Home and business computer programs assist with balancing checkbooks, budgeting options, creating envelope templates, and large print calculators. Catalogs and internet availability allow individuals to purchase large print games, BINGO and playing cards, and other leisure/play activities. Companies have developed nonoptical adaptations for individuals with low vision who wish to participate in leisure activities. These nonoptical adaptations include brightly colored clothing and sporting equipment to safely alert others of their presence (Beaver & Mann, 1995). Educational software programs are available to

aid individuals with such features as voice activated writing and writing out loud programs.

### Occupational Therapy and Assistive Technology

Occupational therapists have the educational background to assess and prescribe assistive technology devices. Occupational therapists engage in entry-level assistive technology courses to develop an understanding of the capabilities and uses of specific assistive devices. In-service education and workshops are offered to further knowledge of the application of assistive technology for individuals with low vision, such as education regarding augmentative communication, product or product lines, and funding of assistive technology. The Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) also offers further certification opportunities for occupational therapists to become assistive technology practitioners (ATPs), in order to provide proper analysis of an individual's specific vision needs, provide device training, and gain knowledge of assistive technology resources (Cook & Hussey, 2002).

With knowledge from the Occupational Therapy Practice Framework (OTPF) (American Occupational Therapy Association, 2002), occupational therapists are experienced with understanding an individual and their disability, their environment, and their desired outcomes for the assistive device. The OTPF provides a guideline for occupational therapists to follow when evaluating individuals with low vision to prescribe appropriate assistive devices. When following the OTPF, the occupational therapist is able to assess an individual's

client factors as well as the activity demands that must be met using the assistive device.

According to Beaver and Mann (1995), appropriate selection of low vision devices includes the following components: a comprehensive clinical evaluation, functional abilities, finance options, individual interview, instruction in device use, environmental modifications, final selection, and ongoing follow-up. The occupational therapist encourages the individual and his/her support network to be involved in the assistive device selection and integration process.

When considering an assistive technology device for an individual, the occupational therapist takes into account an individual's skills and abilities, the setting(s) in which the device will be used, and the activities that it will be used for. According to Copolillo and Teitelman (2005), "cost has been identified as the primary barrier to acquiring all assistive technology, including LVADs [low vision assistive devices]" (p. 306). A role of the occupational therapist is to be aware of available funding resources as well as the variety of devices available. The occupational therapist should also consider the impact the device may have on the individual's self-perception. Developing an understanding of medical knowledge regarding visual disorders through continuing education courses is important to the occupational therapist when making decisions about the longevity and versatility of a device for each individual (Copolillo & Teitelman, 2005).

An important role of the occupational therapist is to educate the individual about their vision limitations along with adaptive devices and techniques to use.

Ivanhoff, Sonn, and Svensson (2002) investigated the impact of a health education program provided by occupational therapists upon individuals with age-related macular degeneration. The health education program was developed to improve perceived sense of security in these individuals during occupations. The occupational therapist led a small group to educate and prepare the individuals on glasses and magnification, optical aids and reading, and lighting. The information provided by the occupational therapist was presented in a problem solving method and booklets and strategies were used to promote discussion. The authors found significant differences in perceived security among the individuals using adaptive devices in thirteen occupations (e.g. “finding utensils and supplies in closet/box, deciding if dishes are clean, dialing on your phone, and finding your way in your local shop”) and overall differences in twenty-two daily occupations (p. 328).

“Many of the studies have suggested that a lack of training in the use of LVAs [low vision aids] is a fundamental reason for the limited effectiveness” (Reeves, Harper, & Russell, 2004, p.1443). Without proper training, individuals commonly abandon their device (Copolillo & Teitelman, 2005). Rather, with proper education and training by an occupational therapist, McCabe et al. (2000) and Ivanhoff, Sonn, and Svensson (2002) demonstrated that individuals not only performed more confidently but also displayed improved functional performance.

### Environmental Modifications

An occupational therapist will commonly assess an individual’s work, home, and/or school environments to determine safety and accessibility options as well as functional performance of the individual that is visually impaired (AOTA,

2002). This process usually involves interview and observation of the individual's environment to gather a comprehensive assessment of the individual's living style and potential modifications. Understanding an individual's primary contexts and performance patterns will allow occupational therapists to provide client centered modifications for individuals with low vision (AOTA, 2002).

Remaining independent at home is often a concern of individuals with visual impairments, as stated by Sokol-McKay and Michels (2005). "Simple adaptations in decorating may be all that is needed to improve mobility and acquire a greater degree of independence in the home" (Beaver & Mann, 1995, p. 915). An occupational therapist has the knowledge in addressing home modifications such as lighting, contrast, glare control, and organizational change (Sokol-McKay & Michels, 2005).

Lighting is the most crucial factor in addressing modifications to encourage use of residual vision (Sokol-McKay & Michels, 2005). This either involves adding more light or rearranging the lighting set-up to be most effective. For example, a floorlamp may be more beneficial than a ceiling lamp for reducing glare. Motion lights may also be used to aid in the safety of an individual entering a room. Other considerations in lighting are light bulb-wattage and types of lighting such as fluorescent, halogen, and incandescent (Beaver & Mann, 1995).

Other key factors for assessing an individual's environment are color and contrast. Lighter colors are suggested for walls and carpeted areas while darker

colors should be used for furniture, light switch plugs, and electric sockets to increase contrast. Using colors as a safety precaution is also an important home modification to increase awareness of changes in depth (e.g., staircases, bathtubs), coding for locations, and coding for identification. The highest color contrast is bright yellow or white against a black or dark blue background (Beaver & Mann, 1995).

Organization is also important when implementing home modifications. Items such as furniture should be “kept in consistent, memorable locations” to reduce chance of injury (Sokol-McKay, 2005, p. 12). Wall mounted clocks will help reduce clutter and the possibility of tripping over cords. Cordless telephones may be carried with the individual into all areas of their home to prevent falls from hurrying to answer a phone call. Throw rugs should be removed from all flooring to prevent falls; if necessary only non-skid rugs should be used. Label-making devices, tactile marks, and mainstream market devices (e.g., sewing machine magnifiers, self-threading needles, magnetic padlocks) are things to consider when organizing an individual’s home environment (Beaver & Mann, 1995). An occupational therapist not only assists with home modifications but also educates individuals in organizing their environment and maximizing their remaining vision.

### Driving

The ability to drive is an important factor in maintaining an individual’s independence. “Although driving was once considered a luxury, it is now an integral component of our lifestyle, necessary for most vocations and highly

desirable for maintaining quality of life” (Mazer, Sofer, Korner-Bitensky, Gelinas, Hanley, & Wood-Dauphinee, 2003, p. 541). According to the Occupational Therapy Practice Framework (OTPF) (American Occupational Therapy Association, 2002), driving is considered an instrumental activity of daily living, which allows an individual to be independent with community mobility. When an individual is not able to drive any longer, they may experience feelings of depression and loneliness, as well as possibly becoming more introverted. With the reduction and/or loss of driving abilities, an individual’s lifestyle is likely to change, mainly in one’s roles, habits, and routines.

A natural process in aging involves deficits in visual processing which requires occupational therapists to become more involved with this population (Mazer et al., 2003). Driving is a complex activity that involves fundamental components of the visual system. “Vision is 90% of the information required for driving” and requires evaluation of many areas (Sheffield, 2005, p. 10).

Occupational therapists focus evaluation for individuals who have low vision on visual scanning, visual fields, visual acuity, visual convergence and divergence, and visual skills such as accommodation, binocular vision, and stereopsis vision. Other considerations include oculomotor control, ocular alignment, and acuity (Reed, 2001).

For an occupational therapist interested in broadening their knowledge in the driving rehabilitation process, he/she must continue their education by attending seminars such as the one offered by the Association of Driving Educators for the Disabled (Gentile, 1997). Gaining information from these

seminars will provide occupational therapists with the knowledge and resources to develop driving programs at their facility such as the 'OT Drive Smart' program at Avera St. Luke's Hospital in Aberdeen, South Dakota, developed by Tammy Phipps, OTR/L (Drive Smart Symposium, October 5, 2005).

In research completed by Mazer et al. (2003), certified occupational therapists were chosen to complete off-road and on-road evaluations on driving performance in clients after stroke. The occupational therapists performed traditional perceptual training to improve the outcome of on-road driving as the research study intervention. Visual perceptual tests administered prior to the on-road evaluation included: Complex Reaction Timer, Motor-free Visual Perception Test (MVPT), Single and Double Cancellation Tests, and road map tests. These assessments allowed the occupational therapist to gain information on the individual's scanning ability, reaction times, spatial relations, memory, and direction (Mazer et al., 2003). The on-road evaluation involved taking a driving route through various traffic settings including residential areas and busier main roads, which evaluated the individual's ability to perform necessary driving tasks safely. This portion of the evaluation was pass or fail. If an individual failed the on-road test, they had the opportunity to receive driving lessons which included Dynavision training.

In a study completed by Klavora et al. (1995, p. 537), the researchers found that Dynavision training in areas of "visual-motor coordination and response time, peripheral awareness, visual attention, eye scanning, concentration, simple cognitive processing, and physical endurance" showed a significant



improvement in behind-the-wheel driving performance. The study included 10 participants with a cerebral vascular accident that had failed a behind-the-wheel driving assessment. Upon completion of a 6-week Dynavision training program, 6 out of the 10 individuals earned a rating of “safe to resume driving and/or to receive on-road driving lessons” after their second behind-the-wheel attempt (Klavora et al., 1995, p. 537).

Although 6 out of 10 of the subjects participating in the study completed by Klavora et al. (1995) were successful on their behind-the-wheel, 4 of the participants were still assessed as “unsafe to drive” (p. 537). In the case that additional driving training is unsuccessful, occupational therapists can play an important role in informing the individual that they are unsafe to continue driving. Occupational therapists, along with physicians and social workers, encourage family members to become involved in this process as well. Although “some older drivers relinquish their driving privileges on their own, most need to be persuaded to stop driving by a relative” or health care professional (Adams, 2003, paragraph 15). In times when the older driver persists to drive, although unsafe, some states allow for anonymous filing of a hazardous driver report through the Department of Motor Vehicles (Adams, 2003). Through the difficult process of coping with the inability to continue driving, occupational therapists should be available to assist individuals with coping as well as advocate resources for alternative transportation and community mobility services (Sheffield, 2005).

## Funding

Stelmack (2005) states the need for occupational therapy to have a defined role in low vision service delivery. It is important for occupational therapy's role in low vision rehabilitation to be defined in order to discover a place in the reimbursement system. Having an understanding of health care coverage and reimbursement guidelines will support reimbursement for occupational therapy low vision services. Some or all of the low vision population will be covered under Medicare services in the United States. Optometric vision care services were first covered under Medicare in 1986. In 1990, the definition of physical impairments was changed to include visual impairments, thus allowing occupational therapists to provide services to individuals with vision loss under Medicare coverage. Although occupational therapists were covered to provide vision services, optometrists were not allowed to write referrals for occupational therapy services until the Balanced Budget Act was passed in 1999. Although changes have been made in Medicare acts to support occupational therapy for low vision services, further research and continuity of state laws will be large factors in occupational therapy's continued ability to make and accept referrals to and from other professionals (Stelmack, 2005).

In 1998, the American Occupational Therapy Association's (AOTAs) *Occupational Guidelines for Adults with Low Vision* were published (Stelmack, 2005). "The Reimbursement and Regulatory Policy area of the AOTA website is an excellent resource for current, detailed information about specific payment systems, such as Medicare prospective payment system (PPS) or state-based

reimbursement issues” (Scheiman, 2002, p. 316). Other reimbursement services such as medical assistance (MA), health maintenance organizations (HMOs), private insurance, and state agencies for the blind and visually are available. Occupational therapists should be aware of the reimbursement providers’ documentation requirements and procedure codes (Scheiman, 2002). See Appendix A for a table of occupational therapy current procedural terminology (CPT) codes.

### Additional Education

Occupational therapists working in the field of low vision should seek out additional education services for providing optimal care to individuals with low vision. By attending continuing education courses, occupational therapists are able to further define the role of occupational therapy in low vision and increase their knowledge in low vision rehabilitation. Continuing education workshops and in-services may address topics such as “pathology causing vision loss, treatment procedures and application of modalities, and the use of prescribed optical devices” (Gentile, 1997, p. 502). Whether an occupational therapist is working in a specialized low vision facility, general rehabilitation facility, or in community settings, he/she may receive in-service training organized by the facility as well as direct learning through experience.

Occupational therapists may also gain additional knowledge through professional team members but, in the absence of a team setting, occupational therapists should seek out journal articles and text books to gain an understanding and knowledge of vision research. In the following section, efficacy studies of

low vision rehabilitation programs, many of which include occupational therapy services, are reported. Occupational therapists also need to become knowledgeable in current low vision services, associations supporting low vision, and community resources available to assist individuals with low vision. These services may include the Veteran's Administration, Lighthouse International, American Foundation for the Blind, and local and state grant and non-profit agencies. Occupational therapists can find information regarding continuing education and certification through the American Occupational Therapy Association (AOTA) (Scheiman, 2002).

#### Efficacy of Low Vision Services

Ivanoff, Sonn, and Svensson (2002) conducted a study to evaluate the effectiveness of a health education program with individuals with vision impairments. This study compared perceived security in the performance of daily occupation of two programs: a health education program and an individual intervention program.

According to the authors, one of the earliest signs of occupational dysfunction that persons with macular degeneration perceive is a sense of insecurity. The health education program, lead by an occupational therapist, focused on discussing strategies to regain security, using problem-solving, and individual readings to discuss during group sessions. The individual intervention program is a standard clinical program used at low vision clinics. It focused on using optical aids to improve reading, near and far distance viewing, as well as providing reading material about the disease per request of an individual.

The results of this study revealed significant differences between the two programs. The health education program resulted in a higher level of security in 22 daily occupations compared to the individual intervention program which showed changes toward a lower or unchanged level in 23 occupations. This study concluded that a health education program can enhance the level of security in individuals with macular degeneration and may slow the progressive decline in perceived security. It may also provide an early detection of insecurity when performing daily occupations.

Reeves, Harper, and Russell (2004) performed a randomized controlled study to compare the effectiveness of three interventions with individuals with age-related macular degeneration (ARMD) on improving quality of life: conventional low vision rehabilitation (CLVR), enhanced low vision rehabilitation (ELVR), and controlled for additional contact time in enhanced low vision rehabilitation (CELVR). The ELVR contained the identical components of the CLVR with the addition of a trained rehabilitation officer. The CELVR used a community care worker as opposed to a trained rehabilitation officer.

The results found no evidence of benefit from the ELVR approaches compared to the CLVR in relation to the quality of life. One area to consider in this study is the correlation between the use of low vision aids (LVA) and quality of life. The overall quality of life of the participants did not improve, however, the use of LVAs increased throughout the study. Thus, the use of LVAs may not be relevant to an individuals' quality of life, yet are important to performance in daily activities. Occupational therapists can use this information when planning

task oriented interventions with individuals who have low vision. An individuals' ability, for example, to read, spend time with their family, or watch TV may be more important to the individual than performing essential activities in a modified way. Interviewing a client prior to treatment will enable the therapist to provide more meaningful and client-centered interventions thus, aspiring to improve overall quality of life for individuals with low vision.

A study by McCabe, Nason, Turco, Friedman, and Seddon (2000) was conducted to evaluate the effectiveness of a vision rehabilitation intervention using optometry, occupational therapy, and social work. Occupational therapists provided participants with education and training in low vision and developed appropriate adaptive devices and techniques. Functional evaluations were used by the occupational therapist to address issues such as meal preparation, handwriting, reading, and safety. Additional services provided by occupational therapy included, as needed, environmental modifications, energy conservation, work simplification, and community services/interventions.

The vision rehabilitation services significantly increased visual capacity, decreased dependency among others, and decreased difficulty in performing tasks. The study outcomes resulted in an improvement of performance after rehabilitation. The rehabilitation interventions used a team approach with several other professionals to provide optimum success. Vision rehabilitation can improve the functional performance and abilities of the individuals involved; therefore, more referrals should be made for multidisciplinary treatment.

Klavora et al. (1995) researched the use of the Dynavision apparatus which is designed to “train visual scanning, peripheral visual awareness, visual attention, and visual-motor reaction time across a broad, active visual field” (p. 534). In this particular quasi-experimental study, the Dynavision was used to retrain individuals who had suffered a cerebrovascular accident (CVA) for the purpose of driving. The individuals in this study reported having “marked visual and attentional difficulties while driving,” were between the ages of 45 and 80, and had “already been judged unsafe to drive in one behind-the-wheel driving assessment” (Klavora et al., 1995, p.535). Overall, the authors found that the Dynavision training program “improved driving performance” (Klavora et al., 1995, p. 539).

This study is relevant to low vision rehabilitation because it presents another intervention strategy that allows occupational therapists to retrain and/or maintain an individual’s level of vision. With proper training and individualized programs, the Dynavision is capable of improving “visual-motor speed, coordination, peripheral vision, visual attention, mental endurance” (Klavora et al., 1995, p. 539).

Teresi et al. (2005) conducted a descriptive study to examine the effects of a low vision intervention program at a skilled nursing facility. Participants were divided into three groups including a control group, a group that was supplied with eyeglasses, and a group that was supplied with eyeglasses and received verbal encouragement from staff members to wear their glasses. The nursing staff attended three education sessions including 1) a pre- and posttest session of vision

disorders and how lighting affects vision, 2) videotape representing resident-staff interactions and techniques to increase quality of life at the nursing home, and 3) implementation tasks to “ensure that the residents with eyeglasses were wearing their eyeglasses at all appropriate times” (Teresi et al., 2005, p.101).

The authors found that the group of residents that wore eyeglasses and received encouragement from staff members had a higher success rate at wearing their eyeglasses which overall improved their independence in ADLs and mobility (Teresi et al., 2005). When treating individuals with low vision, occupational therapists should educate their clients on the importance of utilizing their low vision aids and encourage prolonged use.

Chapter III consists of the methodology used throughout the scholarly project. The chapter describes the authors’ interest in low vision, the process of conducting the literature review, the goal of the scholarly project, and an overview of the final product, a PowerPoint® presentation containing low vision information.



## CHAPTER III

### METHODOLOGY

Through the UND occupational therapy course, OT: 461 Management in the U.S. Healthcare System, we were required to develop a program plan for a facility within the Grand Forks region. Occupational therapy professionals at RiverView Health, located in Crookston, MN, requested the development of a low vision occupational therapy program plan. Through the process of developing this program plan, a needs assessment and initial literature review were completed. The research indicated occupational therapy is needed for individuals with low vision.

Also, throughout Level II Fieldwork experiences, it was recognized that low vision is becoming a growing healthcare issue. A large number of individuals seen in physical and psychosocial disabilities settings indicate a need for low vision services. The professionals working with these individuals, including occupational therapists, physical therapists, psychiatrists, psychologists, and social workers expressed the need for more specialized care for individuals with low vision.

Based on these experiences, interest rose and the research process began for this scholarly project. A comprehensive literature review was conducted on topics such as low vision and pertinent diagnoses, assistive technology, driving, and reimbursement. Additional information was gained from attending a

DriveSmart Symposium in Aberdeen, SD and completing an Assistive Technology II Practicum at the North Dakota School for the Blind. Research was conducted through the American Occupational Therapy Association's (AOTA) OT Search and other credible databases and Internet resources. Also, various textbooks were obtained regarding occupational therapy and low vision. In addition, theories and models of occupational therapy practice were researched to determine which would best guide occupational therapists working with individuals with low vision. The Ecological Model of Occupation (Kramer, Hinojosa, & Royeen, 2003) and the Human Activity Assistive Technology Model (Cook & Hussey, 2002) were selected as viable theoretical approaches to guide occupational therapy service delivery for persons who have low vision.

After conducting the comprehensive literature review of the available research, the need for occupational therapists to work with individuals with low vision was evident due to the aging of the older population. It was also apparent that more evidence-based research and outcome measures must be completed in order to strengthen the efficacy of occupational therapy services. Through these findings, it was determined that occupational therapists must be informed about this growing area and further educate themselves on various aspects and the role of occupational therapy in low vision in order to fully develop this area of practice based on evidence. Therefore, the goal of this scholarly project was to provide occupational therapists and students with continuing education regarding their involvement in low vision rehabilitation with the adult population. Once the pertinent information had been gathered and the overall goal was identified, a

continuing education module for occupational therapists and students was developed using Microsoft® PowerPoint®.

Chapter IV consists of the educational PowerPoint® presentation containing information regarding: low vision disorders, low vision professionals, the occupational therapist's involvement in low vision rehabilitation, occupational therapy evaluation and intervention planning, compensatory strategies and assistive devices, occupational therapy's role in driving, family and caregiver education, and continuing education with additional resources provided for the OT education participant. Additionally, the PowerPoint® presentation is supplemented with thorough lecture notes for the speaker.

## CHAPTER IV

### PRODUCT

Low vision is an emerging area for occupational therapists (Digsby, 2005). In order for occupational therapists to become involved in this developing service, continuing education is necessary to effectively assist individuals with low vision to function in their daily life. The following product is an educational presentation designed to inform occupational therapists and students regarding the role that occupational therapy plays in low vision rehabilitation of the adult population.

The educational product developed is in the form of a Microsoft® PowerPoint® presentation. It contains information regarding: low vision disorders, low vision professionals, the occupational therapist's involvement in low vision rehabilitation, occupational therapy evaluation and treatment planning, compensatory strategies and assistive devices, occupational therapy's roles in driving, family and caregiver education, and continuing education with additional resources. Additionally, the presentation includes lecture notes which will provide the speaker with supplemental information to accompany the PowerPoint® slides. When presenting the information, an outline view of the PowerPoint® presentation would be a beneficial handout for audience members.

The Microsoft® PowerPoint® presentation is designed to last approximately 75-90 minutes. Upon completion of the presentation, time should be allowed for a question and answer session. The development of this product was intended for occupational therapists and occupational therapy students in a variety of settings. Such settings include, but are not limited to, hospitals, clinics, and classrooms, as well as the North Dakota Occupational Therapy Association (NDOTA) annual conference and/or the American Occupational Therapy Association (AOTA) annual conference.



# Adults with Low Vision: Continuing Education for Occupational Therapists and Occupational Therapy Students

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## Objectives

- Understand low vision disorders
- Knowledge of low vision rehabilitation professionals
- Occupational Therapy (OT) involvement in low vision rehabilitation
- OT evaluation and intervention planning
- Compensatory strategies and assistive devices
- OT roles in driving
- Continuing education and additional resources

## Low Vision Facts

- 1 in 6 adults aged 45 and older have some form of visual impairment totaling **13.5 million** Americans (Massof, 2002).
- Between the ages of 65-74 and 75-85, visual impairments rapidly increase (Massof, 2002).
- The number of individuals with low vision is projected to increase by at least 70% within the next 15 years (Digsby, 2005).



## Low Vision

- The American Occupational Therapy Association (AOTA) defines low vision as “a visual impairment severe enough to interfere with successful performance of activities of daily living (ADLs) but allowing some usable vision” (Warren, 2001, p. 3).
- Bilateral subnormal visual acuity or abnormal visual field from a disorder in the visual system that results in decreased visual performance; the range of low vision is from 20/80 to 20/1000 (Reed, 2001, p.215).

### Degrees of vision loss

- Normal vision to near-normal vision: 20/12 to 20/60
- Moderate low vision: 20/80 to 20/160
  - Normal performance with magnifiers and other visual aids
- Severe low vision: 20/200 to 20/400
  - Slower than normal with visual aids
- Profound low vision: 20/500 to 20/1000
  - Limited reading with visual aids and orientation/mobility problems
- Near-blindness: 20/1250 to 20/2500
- Total blindness: no vision

•(Warren, 2001, p. 4)



“Low vision [is] becoming an expanding practice area for occupational therapists, [Mary] Warren believes that low vision has the potential to become a major specialty area for the profession.”

■ (Gourley, 2001, p. 1)

- Low vision is an emerging practice area for occupational therapy
- As the adult population is increasing, the occupational therapist will be required to assist individual's in maintaining independent lifestyles
- Including occupational therapy in low vision rehabilitation will broaden the field of occupational therapy and maintain a continuum of care for individuals with low vision
- Low vision professionals are recognizing the need for occupational therapy services in low vision rehabilitation to promote maximum functioning in daily occupations
- Mary Warren is a leading pioneer in occupational therapy's role in low vision rehabilitation
  - University of Alabama at Birmingham (UAB) online graduate certificate program for occupational therapists working in low vision
  - 'Suggestions for Starting a Low Vision Rehabilitation Program in Health Care Using Occupational Therapy'
  - ([www.visabilities.com](http://www.visabilities.com))
  - Involved in opening the country's premiere low vision center at UAB called the Helen Keller Center for Vision Rehabilitation
  - (Gourley, 2001, p.1)

## Low Vision Disorders

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- Age-Related Macular Degeneration (ARMD)
- Inoperable Cataracts
- Glaucoma
- Diabetic Retinopathy



## Age-Related Macular Degeneration

### Definition:

- Eye disease that affects central or straight-ahead vision (Sokol-McKay & Michels, 2005); number one cause of blindness in the United States in people over age 60 (Scheiman, 2002, p.41).

### Functional Implications:

- Difficulty adapting to environmental changes (e.g., glare)
- Loss of fine detail recognition (e.g., reading)
- Decreased exploration abilities
  - (Scheiman, 2002, p. 222)

- Macular degeneration usually produces a slow, or rarely, sudden painless loss of vision. Early signs of vision loss associated with age-related macular degeneration can include seeing shadowy areas in your central vision or experiencing unusually fuzzy or distorted vision.

- The exact causes of age-related macular degeneration are still unknown.

- There is no cure for macular degeneration, but some treatments may delay its progression or even improve vision.

- (Haddrill, 2005)

# Inoperable Cataracts

- Definition:
  - An opacity occurring in the normally transparent lens, causing reduced visual acuity; generally due to the aging process but can also occur as a result of trauma (Scheiman, 2002, p.40)
- Functional Implications:
  - Decreased contrast, light, and resolution
  - Increase in glare
  - Decreased visual acuity
  - Blurred vision
  - Redness and inflammation of the eye
    - (Gentile, 1997, p. 50)

- A cataract is a clouding of the eye's natural lens, and over time, it may grow larger and cloud more of the lens.

- A cataract starts out small and at first has little effect on vision. An individual may notice their vision is a little blurry. Colors may not appear as bright as they once did.

- The cause for a cataract is unknown.

- (Lee & Bailey, 2005)



# Glaucoma

## Definition:

- Visual field defects caused by damage to retinal nerve fiber bundles at the optic nerve head (Scheiman, 2002, p.42).

## Functional Implications:

- Significant visual acuity loss
- Decreased contrast sensitivity
- Visual field loss
- Seeing halos around lights
- Headaches in the front portion of the head
  - (Gentile, 1997, p. 50)

•Intraocular pressure (IOP) increases to dangerous levels, it damages the optic nerve. This can result in decreased peripheral vision and, eventually, blindness.

•There are two major types of glaucoma: **chronic or primary open-angle glaucoma (POAG)** and **acute closed-angle glaucoma**. Other variations include congenital glaucoma, pigmentary glaucoma and secondary glaucoma.

•**Chronic glaucoma** often creeps up on an individual with no warning sign and no hint that anything is wrong. About half of Americans with chronic glaucoma don't know they have it.

•**acute closed-angle glaucoma** produces sudden symptoms such as eye pain, headaches, haloes around lights, dilated pupils, vision loss, red eyes, nausea and vomiting. These signs may last for a few hours, then return again for another round. Each attack takes with it part of your field of vision.

•(Lee & Bailey, 2005)

# Diabetic Retinopathy

## Definition:

- Microaneurysms, retinal hemorrhages, and exudates due to disease of retinal vasculature secondary to diabetes (Scheiman, 2002, p.41).

## Functional Implications:

- Inability to accommodate
- Diplopia (double vision)
- Loss of color vision
- Decreased visual acuity
  - (Gentile, 1997, p.49)

- When blood sugar gets too high it can damage the blood vessels in the eyes. This damage may lead to diabetic retinopathy.
- Individuals who have diabetes are at risk for developing diabetic retinopathy, but not all diabetics do develop it.
- Signs are blind spots, floaters, and/or double vision
  - (Lee & Bailey, 2005)



## Other Low Vision-Related Disorders

- Cerebral Vascular Accidents (CVA)
- Brain Injuries (TBI)
- Multiple Sclerosis (MS)

### Functional Implications:

- Visual neglect/lack of awareness
- Visual field cut
- Decreased contrast sensitivity
- Fixation deficits
- Difficulty with accommodation
- Incoordination in the use of both eyes

• (Gentile, 1997, p.273)

# Settings for OT Low Vision Services

- In-patient
- Out-patient
- Community-based programs
- Home health

## **Inpatient**

- Skilled nursing and extended care facilities
  - Provide rehabilitation to persons who may have physical impairments including vision loss
  - Treatment consists of 2-3 sessions with client and caregiver to address functional deficits caused by vision loss
- Rehabilitation centers
  - Vision impairments in conjunction with other disabilities (e. g., head trauma, cerebral vascular accident, multiple sclerosis)
  - Treatment is integrated into overall therapy program
  - Specialized treatment for low vision may be continued after discharge

## **Out-patient**

- Specialty clinics
  - Treatment is 1-2 sessions per week, generally not to exceed 10 sessions per week
  - Usually referred by the ophthalmologist or optometrist

## **Community-based programs**

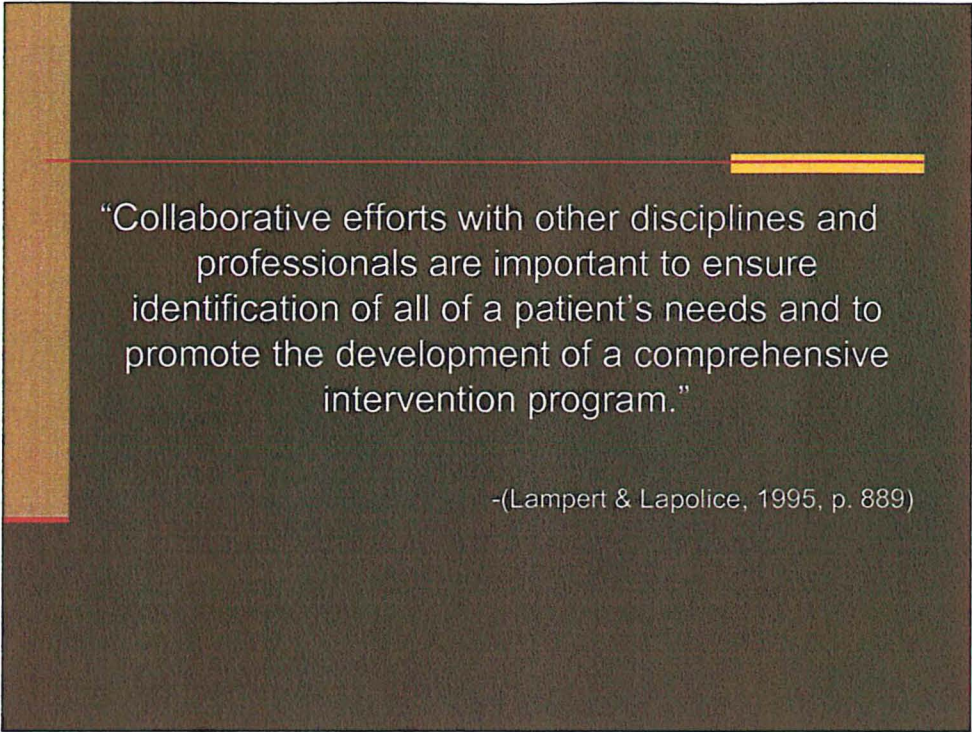
- Private and State funded agencies
- Rehab services through community-based programs and OT's may be employed in these agencies along with other low vision professionals

## **Home health**

- Visual impairment may be the primary reason for referral
- Treatment is 1-2 sessions per week, generally not to exceed 10 sessions per week

•(Warren, 2001, p. 7-8)





“Collaborative efforts with other disciplines and professionals are important to ensure identification of all of a patient’s needs and to promote the development of a comprehensive intervention program.”

-(Lampert & Lapolice, 1995, p. 889)

## Low Vision Professionals

- Occupational Therapists (OTs)
- Optometrist
- Ophthalmologist
- Certified Low Vision Therapists (CLVTs)
- Social Worker
- Orientation and Mobility Specialists (O&Ms)
- Rehabilitation Teachers (RTs)
- Certified Driving Rehabilitation Specialists (CDRSs)
  - (Scheiman, 2002, p. 311)

•**Optometrist:** primary health care providers who examine, diagnosis, treat, and manage diseases and disorders of the visual system, the eye, and associated structures, as well as diagnose related systemic conditions; able to provide eyeglasses and contact lenses, low vision aids, vision therapy, and medicines to treat eye diseases; establish specialty areas such as low vision rehabilitation (Scheiman, 2002, p. 311).

•**Ophthalmologist:** physicians who specialize in medical and surgical care of the eyes and visual system and in the prevention of eye disease and injury; can provide total eye care, however do not commonly have a specialty in low vision (Scheiman, 2002, p. 311).

•**Certified Low Vision Therapist:** provide functional assessments of visual abilities and the environment, provide modifications, instruction in the use of residual vision, optical and nonoptical devices, and environmental cues (Scheiman, 2002, p. 311)

•**Social Worker:** role on the low vision team is to provide individual and group counseling and facilitate consumer access to appropriate community-based support services including public assistance programs, vision rehabilitation programs, senior centers, agencies, hospitals, and clinics (Scheiman, 2002, p. 312).

•**Orientation and Mobility Specialist:** specialized in teaching travel skills using sighted guides, canes, and electronic devices; also may teach use of dog guide; GOAL= travel safely, efficiently, and confidently (Scheiman, 2002, p. 290)

•**Rehabilitation Teacher:** provide instruction and guidance in adaptive independent skills in order to confidently carry out daily activities (Scheiman, 2002, p. 290)

•**Certified Driving Rehabilitation Specialist:** evaluate specific performance skills related to driving, provide intervention for driving needs, follow-up driving services (OT DriveSmart)



## Occupational Therapy

- Financial Coverage
- Documentation
- Theoretical Considerations
- Evaluation
- Intervention Services

## Financial Coverage of OT Services

- 1986
  - Optometric vision care covered under Medicare
- 1990
  - Occupational therapy low vision services covered by Medicare
- 1997
  - Optometrists allowed to write referrals for occupational therapy low vision services
    - (Stelmack, 2005, p. 321)
- 1999
  - The Balanced Budget Refinement Act further validated the role of occupational therapy in treating Medicare clients with low vision
    - (Warren, 2001, p. 6)

- 1990: definition of physical impairments was changed to include visual impairments (Stelmack, 2005).

- referral process differs from state to state

- optometrist ability to refer to OT

- OT ability to accept referral

- OT ability to refer to optometry, as well as other practitioners

- the Reimbursement and Regulatory Policy Area of the AOTA website is an excellent resource for current information on reimbursement issues



## Financial Coverage of OT Services

- Medical Assistance (MA)
  - Health Maintenance Organizations (HMOs)
  - Private Insurance Companies
  - State Agencies for the Blind and Visually Impaired
- (Scheiman, 2002, p. 317)

### Medical Assistance:

- Serves low income families, individuals under age 21, individuals aged 65 or over, a parent or caretaker of a dependent child, pregnant women, certified blind or disabled, be a U.S. citizen or a non-citizen lawfully residing in the U.S.
- Income limits vary depending on family size, age and whether someone is pregnant, blind or has a disability.
- Community-based waivers are also available once the individual applies and meets certain requirements.

### Health Maintenance Organization (HMOs):

- The oldest type of managed care. HMO is an organization and its purpose is to provide health care to the subscriber. It provides, offers, or arranges for coverage of designated health services required by members for a fixed prepaid premium.
- HMOs require the use of specific plan providers.

### Private Insurance Companies:

- The individual selects an insurance company.
- Coverage policies can change based on the particular plan that an individual has selected, the specific type of service being provided, and the part of the country in which the service is delivered.

### State Agencies, Private Voluntary Agencies, and Consumer Groups:

- Funding through grants to vision rehabilitation not-for-profit agencies from local city or state legislative and county initiatives.
- Commission for the Blind is provided by every state to offer services
- United Way and/or Lions Club

To access services for individuals with low vision consult the American Foundation for the Blind *Directory of Services*, 1993, or call 1-800-AFB-LINE for a list of local organization.

• (Gentile, 1997, p. 500-501)

## OT Documentation

- The client's physical/visual deficits must be linked to functional deficits
- Additional issues that must be included
  - Safety
  - Timeliness
  - Impact on mood and health status
  - Compromises or adaptations necessary to complete the task
    - (Scheiman, 2002, p. 316)

•The client must demonstrate measurable functional improvement weekly in in-patient rehabilitation centers, acute care hospitals, and sub-acute units.

•The client must demonstrate measurable functional improvement every two weeks in skilled nursing and extended care facilities, home care, and specialty clinics/out-patient apartments.

•(Warren, 2001)



## Reimbursement Criteria

1. Services must be prescribed by a physician and furnished under a physician-approved plan of care (including optometrists)
2. Services must be performed by a qualified occupational therapist (OT) or occupational therapist assistant (OTA) under general supervision of an OT
3. Services must be reasonable and necessary for the treatment of the individual's illness or injury
  - (Scheiman, 2002, p. 316)

## Current Procedural Terminology (CPT) codes used for Visual Rehabilitation

### Evaluations

- 97003- Occupational therapy evaluation
- 97004- Occupational therapy re-evaluation

### Therapeutic Procedures

- 97530- Therapeutic activities, dynamic activities to improve functional performance
- 97532- Development of cognitive skills
- 97533- Sensory integrative techniques
- 97535- Self-care/home management training
- 97537- Community work/re-integration
- 97110- Therapeutic procedures for strength/motion
- 97112- Therapeutic procedures neuromuscular re-education
- 97716- Therapeutic procedure gait training

\*Vision rehabilitation is covered under Medicare using these CPT codes

-(Stelmack, 2005, p.322)

- CPT codes shown are as of 2005.
- CPT codes are updated annually.
- New and revised codes become effective January 1 of each year.
- Always refer to updated CPT publications for most current codes.
- (Warren, 2001)



# Theoretical Considerations for Service Provision

## Ecological Model of Occupation

- **Person:** client-centered
- **Task:** engage in performance that accomplishes a goal
- **Context:** temporal & environment, supports/barriers
- **Performance:** engage in a task within a context, uses skills and abilities
  - (Kramer, Hinojosa, & Royeen, 2002, p. 225-227)

- **Person:** values/interests, skills, abilities, experiences, psychosocial skills
- **Task:** observe specific behaviors, ability to access tasks, and organization of tasks
- **Context:** conditions that surround an individual which facilitates or hinders performance
- **Performance:** use skills and abilities; interaction between persons variables (skills, abilities, motivation) and the context variables (supports and barriers)
- During occupational therapy services, the components of the Ecological Model of Occupation will provide a foundation for intervention. By assessing the individual's needs and performance capabilities, as well as skills needed to complete a specific task, will allow the occupational therapist to choose appropriate interventions in the most optimal environment. Together, this takes into account the individual's unique characteristics and provides a holistic, client-centered approach to achieve maximum functioning.
- **5 Intervention strategies**
  - Establish/restore
    - e. g., teaching the individual with low vision how to use assistive devices to reduce the visual impairment and increase functionality
  - Alter
    - e. g., instruct the individual to change environments to allow for greater use of residual vision
  - Modify task
    - e. g., change the task or task expectations Utilize assistive devices to complete desired tasks
  - Modify context
    - e. g., modify the environment to provide necessary adaptations to complete tasks
  - Prevent
    - e. g., provide assistive devices to keep problems from occurring (i.e. wear a cap to prevent glare)
- These strategies will provide the occupational therapist with a combination of intervention options to support the individual's uniqueness and performance capabilities. Utilizing the strategies, the occupational therapist is able to focus the intervention towards the ultimate goal.
  - (Kramer, Hinojosa, & Royeen, 2002, p. 225-227)



# OT Evaluation Process

## Vision Rehabilitation Indicators

Observation is a key factor in recognizing individuals with visual impairments. Indicators may include:

- Avoiding a task by doing as little as possible
- Experiencing pain or other symptoms (e.g., headaches, overall body fatigue)
- Falling asleep while reading
- Eye discomfort
- Blurred vision
- Comprehension difficulties
- Attention and concentration difficulties
- Memory difficulty
- Double vision with visual tasks
- Lowered visual performance
- Sensitivity to light

• (Cantu, 2005, p. 12)

## Development of Occupational Profile

- Occupational history & experiences
- Patterns of daily living
- Interests, values, & needs
- Client's perspective & background
- Client's goals & priorities
- Build a therapeutic relationship!

■ (American Occupational Therapy Association [AOTA], 2002, p. 616)

Occupational profile can be developed through formal interview, standardized assessments, casual conversation

### Common questions:

- Who is the client?
- Why is the client seeking service? Concerns relative to engaging in occupations?
- What areas of occupation are successful? What areas are causing problems/risks?
- What contexts support and/or inhibit engagement in occupations?
- What is the client's occupational history (life experiences, values, interests, patterns, and meanings)?
- What are the client's priorities and desired outcomes?

(American Occupational Therapy Association, 2002, p. 616)



## Evaluation of Occupational Performance

- Ability to carry out activities of daily life including:
    - Activities of daily living (ADLs)
    - Instrumental activities of daily living (IADLs)
    - Education
    - Work
    - Leisure
    - Social participation
- (AOTA, 2002, p. 617)

### Evaluation Process:

- gather information from the client's occupational profile
- observe client's performance
- select assessments
- interpret data
- create goals in collaboration with client
- determine appropriate intervention approach

The occupational therapist uses the information gathered in the occupational profile to guide decision-making in the evaluation process. Particular areas to focus on include the individual's needs, problems, and priorities. This will assist the therapist in selecting a specific activity to further analyze their performance. The occupational therapist observes the individual's performance and gathers necessary information regarding specific skills and performance patterns during task completion. Assessments may be selected to measure performance skills and patterns. A selection of assessments to identify contexts, activity demands, and client factors may also be used to measure performance skills and patterns. Upon completion of the data gathering, interpretation of the results will identify supports and hindrances of performance. Through this process, collaboration between the occupational therapist and the individual with low vision will develop goals to target desired outcomes. It is important for the occupational therapist to confirm outcome measures to help support the efficacy of low vision intervention approaches.

•(AOTA, 2002, p. 617)



## Analysis of Performance Patterns & Contexts

### ■ Patterns

- Habits
- Routines
- Roles

### ■ Contexts

- Cultural
- Physical
- Social
- Personal
- Spiritual
- Temporal
- Virtual


■ (AOTA, 2002, p. 623)

### Habits

- useful habits-support performance
  - impoverished habits-not established or need to improve
  - dominated habits-demanding or compulsive
- (AOTA, 2002, p. 623)

It is important for occupational therapists to analyze daily patterns of individual's with low vision in order to gather information regarding their habits, routines, and roles. The individual will provide the occupational therapist with information regarding previous habits and routines, as well as habits and routines that may have been altered or eliminated due to visual impairments. With this information, the occupational therapist is able to determine appropriate intervention strategies in which the individual is capable of and willing to carry out. Along with changes in habits and routines, individuals daily roles may also change due to visual impairments. The occupational therapist will take into consideration roles that the individual would like to continue and/or establish throughout the rehabilitation process.

Evaluation of various contexts will greatly influence the intervention process. The occupational therapist must consider all contexts that may impact an individual's daily functioning. Developing rapport with the individual will assist the occupational therapist in determining contextual differences. The occupational therapist must be aware of the needs of the individual with low vision, in order to successfully determine and implement meaningful interventions.



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Occupational therapists working with individuals with low vision are aware of the demands of activities and how those demands will affect an individual's performance.

Occupational therapists recognize how client factors can affect an individual's ability to engage in occupations.

(AOTA, 2002, p. 613)



# Assistive Technology Evaluation

## ■ Human Activity Assistive Technology Model (HAAT)

- Human: intrinsic enablers (skills and abilities)
- Activity: performance areas, life roles
- Assistive Technology: extrinsic enablers (hard and soft technology components)
- Context: setting, social, cultural, physical
  - (Cook & Hussey, 2002)

### Human

- ability=trait of person
- skill=level of proficiency

### Activity

- defines the overall goal of the assistive technology system
- the process of doing something and the functional result of human performance

### Assistive Technology

- hard=actual AT device
- soft=human component (decision making, training)

### Context

- setting (home, school, employment, community)
- social (peers, strangers, alone)
- cultural
- physical (light, sound, heat)

Occupational therapists utilize the HAAT model in order to comprehensively assess the individual with low vision as well as the use of assistive devices. The model allows the occupational therapist to evaluate the skills of the individual, the skills needed to complete activities, the assistive device that will allow the individual to complete the activity, and the context in which the activity is carried out. This evaluation provides the occupational therapist with pertinent information to provide low vision aids that will assist the individual in successfully completing daily activities.

## Low Vision Assessments

- Vision
  - Near and Far Visual Acuity
  - Color vision
  - Contrast sensitivity
  - Visual accommodation
  - Visual adaptation
- Cognition
  - Clock Drawing Test
    - (Gentile, 1997, p. 356-366)

### Snellen

- visual acuity test
- normal visual acuity=20/20

### MnRead Acuity Chart

- near vision acuity chart
  - (Gentile, 1997, p. 476)
- Based on cognitive and/or physical capabilities, other visual acuity assessments are available based on diagnosis (ie: CVA, TBI).

### Clock drawing test

- assess field cut/neglect





# OT Intervention

## Low Vision Intervention Approaches

- Create
- Maintain
- Modify

■ (AOTA, 2002, p. 627)

Create approach will allow individual's with low vision to enhance quality of life by creating healthy habits, roles, and routines. In doing this, the occupational therapist may create low vision support groups, community events, and/or equipment lending libraries.

Maintain approach will be used to train individual's in the use of residual vision. Also, this approach will educate individuals with low vision to maintain the knowledge and techniques learned throughout occupational therapy services. Maintaining the way the individual's live in a safe environment after discharge from occupational therapy.

Modify approach will allow for home adaptations for safety, compensatory techniques, assistive devices, and environmental modifications to reduce unsafe environments.



## Environmental Modifications

- Adequate lighting
- Contrast
- Decreased glare
- Adjustable lamps
- Magnetic padlocks
- Tactile markings
- Keep doors closed
- Motion lights
- Remove clutter
- Eliminate throw rugs
- Portable phone
- Wall clocks
- Consistency with personal items and furniture
- Reduce electrical cords on floor

■ (Gentile, 1997, p. 450-454)

•An occupational therapist will commonly assess an individual's work, home, and/or school environments to determine safety and accessibility options as well as functional performance of the individual that is visually impaired. Understanding an individual's primary contexts and performance patterns will allow occupational therapists to provide client centered modifications for individual's with low vision (AOTA, 2002).

•Lighting is the most crucial factor in addressing modifications to encourage use of residual vision (Sokol-McKay & Michels, 2005). This either involves adding more light or rearranging the lighting set-up to be most effective. For example, a floorlamp may be more beneficial than a ceiling lamp for reducing glare. Motion lights may also be used to aid in the safety of an individual entering a room. Other considerations in lighting are light bulb-wattage and types of lighting such as fluorescent, halogen, and incandescent (Beaver & Mann, 1995).

•Lighter colors are suggested for walls and carpeted areas while darker colors should be used for furniture, light switch plugs, and electric sockets to increase contrast. Using colors as a safety precaution is also an important home modification to increase awareness of changes in depth (e.g., staircases, bathtubs), coding for locations, and coding for identification. The highest color contrast is bright yellow or white against a black or dark blue background (Beaver & Mann, 1995).

•Items such as furniture should be "kept in consistent, memorable locations" to reduce chance of injury (Sokol-McKay, 2005, p. 12). Wall mounted clocks will help reduce clutter and the possibility of tripping over cords. Cordless telephones may be carried with the individual into all areas of their home to prevent falls from hurrying to answer a phone call. Throw rugs should be removed from all flooring to prevent falls; if necessary only non-skid rugs should be used. Label-making devices, tactile marks, and mainstream market devices (e.g., sewing machine magnifiers, self-threading needles, magnetic padlocks) are things to consider when organizing an individual's home environment (Beaver & Mann, 1995).

•An occupational therapist not only assists with home modifications but also educates individuals in organizing their environment and maximizing their remaining vision.



# Assistive Devices

## Nonoptical

- Large print
- Reading stands
- Electronic aids
- Closed-circuit televisions (CCTVs)
- Electronic reading systems
- Screen enlargement systems
- Electronic Braille displays
- Computer software

■ (Beaver & Mann, 1995)

## Optical

- Spectacles
- Sunglasses
- Hand magnifiers
- Stand magnifiers
- Telescopes/biopic lenses

■ (Gentile, 1997, p. 450-454)

### Aids for leisure activities:

- large print playing cards
- large print crossword puzzles
- large print board games
- large print books and audio tapes

### Electronic aids may include:

- talking clocks
- talking watches
- liquid level indicator
- timers/alarms

The occupational therapist is responsible for making recommendations for assistive devices, evaluating the individual's capability to use the device, the environment in which the device will be used, and discussing financial resources and/or available funding with the individual. The occupational therapist may need to consult other professionals in making recommendations for devices that may be used in multiple contexts for multiple activities.

“Although driving was once considered a luxury, it is now an integral component of our lifestyle, necessary for most vocations and highly desirable for maintaining quality of life.”

(Mazer, Sofer, Korner-Bitensky, Gelinas, Hanley, & Wood-Dauphinee, 2003, p. 541)

## OT Role in Driving

- Occupational therapists may interact with individuals who may show signs of decreased visual scanning, visual fields, visual acuity, visual convergence and divergence, and visual skills such as accommodation, binocular vision, and stereopsis vision.
- Referral to a Certified Driving Rehabilitation Specialist should be considered.
  - (Gentile, 1997, p. 324)
- Additional continuing education for occupational therapists is highly recommended



## OT Role in Driving

- Occupational therapists are becoming more involved with the driving industry and have established driving programs throughout the United States.
- The Association of Driver Educators for the Disabled is an organization of occupational therapists, driver educators, and others.
- The Association certifies professionals with the title of Certified Driver Rehab Specialist.
  - (Gentile, 1997, p. 324)

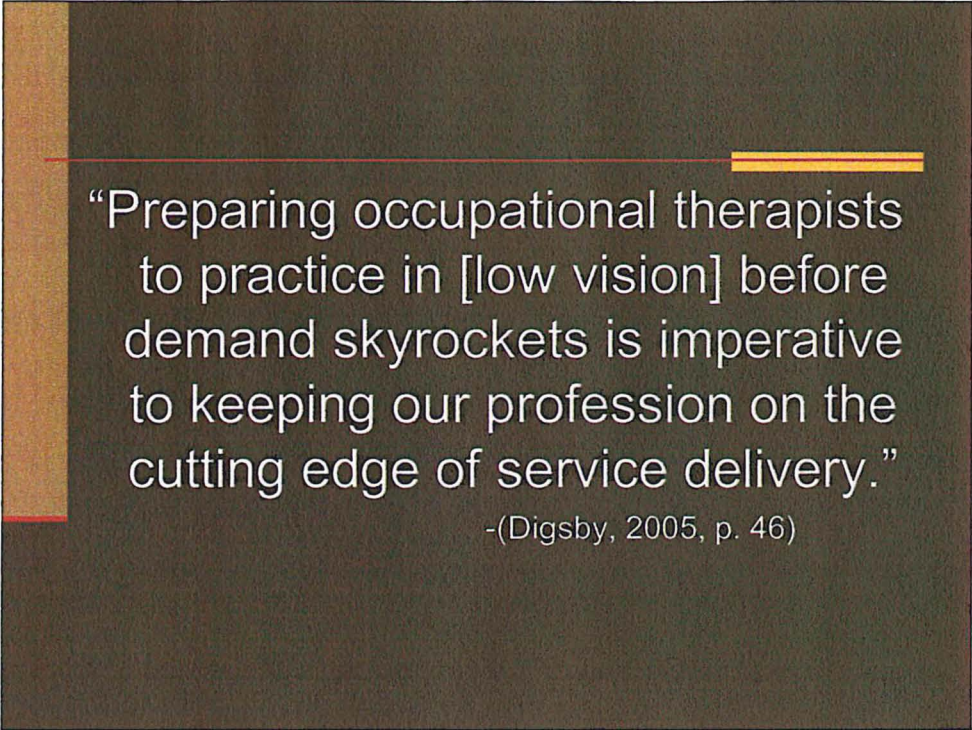
## Family and Caregiver Education

- “Family members and friends frequently express confusion about the person’s level of impairment, disability, and handicap.”

■ (Warren, 2001, p. 17)

- Visual impairments often are a hidden disability
- The occupational therapist should consult with the individual with low vision about their family and/or friends’ perceptions, behaviors, and involvement
- Educating the individual and their family on the effects of their visual impairment, the permanency or temporariness of the impairment, and appropriate use of remaining vision
- The occupational therapist must be assertive in addressing safety with the individual and their family
- Education consisting of environmental modifications, adaptive equipment, and additional resources





“Preparing occupational therapists  
to practice in [low vision] before  
demand skyrockets is imperative  
to keeping our profession on the  
cutting edge of service delivery.”

-(Digsby, 2005, p. 46)

## Continuing Education

- Low vision workshops and courses
- Books and journals
- Advance degree programs
- Specialty certification in low vision
- Reimbursement advocacy

### Low vision workshops and courses:

- self-study course by AOTA designed for occupational therapists entitled *Low Vision: Occupational Therapy Intervention with the Older Adult* ([www.aota.org](http://www.aota.org))

### Books:

- Gentile, M. *Functional Visual Behavior in Adults: An Occupational Therapy Guide to Evaluation and Treatment Options*, 2<sup>nd</sup> Edition
- Scheiman, M. *Understanding and Managing Visual Deficits: A Guide for Occupational Therapists*, 2<sup>nd</sup> Edition
- Both books are available at [www.aota.org](http://www.aota.org)

### Journals:

- *Journal of Visual Impairment and Blindness (JVIB)* ([www.afb.org/jvib.asp](http://www.afb.org/jvib.asp))
- *Rehabilitation and Education for Blindness and Visual Impairment* ([www.heldref.org/html/revu.html](http://www.heldref.org/html/revu.html))
- *American Journal of Occupational Therapy* ([www.aota.org](http://www.aota.org))
- *Ophthalmology Clinics of North America*

### Advance Degree Programs:

- Orientation and mobility
- Low vision rehabilitation
- Rehabilitation teaching

### Specialty certification:

- Academy for Certification of Vision Rehabilitation and Education Professionals (ACVREP)
  - Offers certification for low vision therapists (CLVT), rehabilitation teacher (RT), and orientation and mobility specialists (O&M)
- University of Alabama at Birmingham (UAB)
  - Offers a 17-hour online course for occupational therapists to receive a graduate certificate in low vision rehabilitation

### Reimbursement advocacy:

- Reimbursement and Regulatory Policy link from [www.aota.org](http://www.aota.org)



## Additional Resources

### Organizations

- American Occupational Therapy Association ([www.aota.org](http://www.aota.org))
  - Occupational Therapy Practice Framework (2001)
- Association for Education and Rehabilitation of the Blind and Visually Impaired ([www.aerbvi.org](http://www.aerbvi.org))
- Academy for Certification of Vision Rehabilitation and Educational Professionals ([www.acvrep.org](http://www.acvrep.org))
- Lighthouse International ([www.lighthouse.org](http://www.lighthouse.org))
- visABILITIES Rehab Services, Inc. ([www.visabilities.com](http://www.visabilities.com))

AOTA: nationally recognized professional association for more than 50,000 OT's and OTA's. AOTA offers a variety of resources, continuing education options, and research in emerging areas of occupational therapy, including low vision rehabilitation.

AER: international membership organization dedicated to supporting and assisting the professionals who work in all phases of education and rehabilitation of blind and visually impaired children and adults

ACVREP: certifying agency for low vision therapists, orientation and mobility specialists, and rehabilitation teachers

Lighthouse: leading resource worldwide on vision impairment and vision rehabilitation through its pioneering work in vision rehabilitation services, education, research, and advocacy

visABILITIES Rehab Services, Inc.: provides continuing education seminars and educational materials by leading experts in the area of vision research and clinical practice.

•(Scheiman, 2002, Appendix D)



## Additional Resources

### Low vision supplies and equipment

- American Printing House for the Blind, Inc. ([www.aph.org/index.html](http://www.aph.org/index.html)), general products catalog
- Ann Morris Enterprises, Inc. ([www.annmorris.com](http://www.annmorris.com)), consumer products catalog
- HumanWare, Inc. ([www.humanware.com](http://www.humanware.com)), assistive technology catalog
- Independent Living Aids, Inc. ([www.independentliving.com](http://www.independentliving.com)), consumer products catalog
- Lighthouse International ([www.lighthouse.org](http://www.lighthouse.org)), optical and nonoptical catalog and consumer product catalog

## Summary

- Occupational therapists are skilled in providing holistic low vision intervention to improve an individual's functional performance and overall quality of life
- Continuing education will provide occupational therapists with comprehensive knowledge on their involvement with the low vision population



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## CHAPTER V

### SUMMARY

Vision has an effect on all areas of an individual's life (Digsby, 2005). These areas may include daily activities involving work and leisure, routines, habits, roles, social participation, and an individual's independence and self-esteem. Impairments in vision cause disruptions in these areas and, without proper intervention, an individual may experience a decrease in their quality of life. Through review of literature, it has been determined that there is a great need for occupational therapy in low vision rehabilitation services to improve an individual's functional performance and overall quality of life. Therefore, an educational Microsoft® PowerPoint® presentation was developed with the intent of providing occupational therapists and occupational therapy students with knowledge and resources regarding services they can provide in low vision rehabilitation.

The implementation of this project will include collaboration with the University of North Dakota's occupational therapy professors in order to incorporate the presentation into the curriculum. Pilot testing of the PowerPoint® presentation in the future will allow for OT students and practicing occupational therapists to provide constructive feedback to successfully develop the most beneficial information about low vision through the continuing education presentation.

This presentation has limitations of being introductory in its content and the information has been developed to only target services for adults living with low vision. In the future, this product could be expanded in its relevance for children and adolescents who experience low vision.

In summary, occupational therapists address a variety of aspects of daily living to enhance independence and quality of life. A vital aspect of occupational therapy is providing a holistic and client-centered approach to treatment. In order to provide holistic services, additional education and research will be required by occupational therapists to treat individuals with low vision most efficiently and effectively. Through continuing education, occupational therapists are able to further define the role of occupational therapy in low vision as well as increase their knowledge in low vision rehabilitation. Overall, continuing education is vital to the occupational therapist, the individuals whom they serve, and the profession of occupational therapy as it is necessary to remain competent and advance in an ever-changing world.

Recommendations for the future include: 1) educating occupational therapists on the importance of conducting outcomes research to further validate occupational therapy services in low vision, 2) pilot testing, followed by necessary revisions, then the incorporation of the Microsoft® PowerPoint® presentation into the curriculum of occupational therapy at the University of North Dakota, and 3) the ongoing addition and refinement of information included in this Microsoft® PowerPoint® presentation to include the most optimal and current information.

## Appendix A

### Current Procedural Terminology Codes

#### **Evaluation Codes**

- 97003 Occupational Therapy evaluation
- 97004 Occupational Therapy re-evaluation

#### **Therapeutic Procedures**

- 97530 Therapeutic activities, dynamic activities to improve functional performance
- 97532 Development of cognitive skills
- 97533 Sensory integrative techniques
- 97535 Self-care/home management training
- 97537 Community work/re-integration
- 97110 Therapeutic procedures for strength/motion
- 97112 Therapeutic procedures neuromuscular re-education
- 97716 Therapeutic procedure gait training

(Stelmack, 2005, p. 322)

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