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School of Occupational Therapy

Addressing Visual Dysfunction Following Neurological Events at Community Rehabilitation Hospital North

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Abstract

With the vastness of visual neural connections throughout the brain, an estimated 90% of individuals after a traumatic brain injury (TBI) and 60.5% of individuals after a cerebrovascular accident (CVA) experience visual deficits (Aravich & Troxell, 2021; Norup et al., 2016). Previous research indicates that despite high rates of patients with visual impairments following CVA and TBI, only between 54% and 63% of occupational therapists felt comfortable performing visual screening and providing interventions for clients with visual dysfunction (Winner et al., 2014). This project aimed to increase therapists' confidence levels in addressing visual dysfunction following a neurological event through the establishment of assessment protocols and referral pathways to neuro-optometry, incorporation of additional resources and vision equipment, and therapist education. The results indicated an increase in therapists' confidence level in assessing and addressing visual deficits by an average of 20.7% and 29.4% respectively.

Addressing Visual Dysfunction Following Neurological Events at Community Rehabilitation Hospital North

With the vastness of visual neural connections throughout the brain, an estimated 90% of individuals after a traumatic brain injury (TBI) and 60.5% of individuals after a cerebrovascular accident (CVA) experience visual deficits (Aravich & Troxell, 2021; Norup et al., 2016). Eye movement disorders and unaddressed visual concerns can result in impaired hand-eye coordination, problems with scanning, increased risk of falls, reduced independence with daily activities and limited participation in meaningful occupations (Smith et al., 2018; Turton et al., 2018). According to Warren (1993), visual perceptual dysfunction is a major treatment focus following brain injury but is one of the least understood areas of evaluation and treatment by occupational therapists (OT). In a survey of 100 OTs, only 58% reported feeling comfortable with performing vision screening (Winner et al., 2014).

Community Rehabilitation Hospital North (CRHN) is an inpatient facility that provides therapy and medical services to individuals with a broad range of diagnoses including spinal cord injury, TBI, CVA, and amputation. The facility received an advanced accreditation from the Commission on Accreditation of Rehabilitation Facilities in adult inpatient care, as well as their brain injury, stroke, and amputation specialty programs. In addition, CRHN earned the Joint Commission's Gold Seal of Approval for Amputation and Stroke Certification (Community Rehabilitation Hospital North, n.d.). However, CRHN currently does not consult with ophthalmology or optometry to supplement the care and therapy progress of their patients following a neurological event. The therapy team identified a need for improved visual rehabilitation protocols, resources, and patient education prior to and after discharge from their facility.

The purpose of this project was to improve the comprehensive care of patients with visual dysfunction following a neurological event by making evidence-based assessments and

interventions more accessible, establishing referral pathways for neuro-optometry, and increasing therapists' confidence with performing visual rehabilitation services. This paper provides a foundational knowledge about visual rehabilitation following a neurological event and outlines the project design, implementation, and outcomes, including justification for the guiding occupation-based model and frame of reference.

Background

OTs are non-vision specialists, but are typically the first to screen patients for visual impairments following a CVA or TBI, or notice dysfunction during completion of activities of daily living (Aravich & Troxell, 2021). However, recent studies have indicated a lack of formal visual assessment and inconsistency within hospital units regarding policies for visual assessments and referrals (Jarvis et al., 2012). In addition, despite high rates of patients with visual impairments following CVA and TBI, only between 54% and 63% of OTs felt comfortable performing visual screening and providing interventions for clients with visual deficits (Winner et al., 2014). As a collection, recent literature suggests the development of screening protocols for visual deficits within brain injury and stroke units and improved education for therapists, caregivers, and patients, providing a focus and purpose for this project.

Due to the overt and physical manifestation of some deficits following neurological events including, but not limited to, mobility limitations and impaired functional use of upper extremities, vision and visual-perceptual deficits are easily overlooked, leading to negative impacts on participation and patient and caregiver frustration (Beaudoin et al., 2013). Appropriate and effective vision screening in an inpatient setting helps inform treatment planning and reduces risk of injury during and after the inpatient stay (Grider et al., 2014; Smith et al., 2018). In a descriptive study by Grider et al. (2014), findings indicated that one-third of patients in the rehabilitation hospital exhibited visual concerns, with the highest rate among patients with acquired brain injuries. While many practitioners currently rely on observation of

visual dysfunction during functional tasks or activities of daily living, this top-down approach may not clearly delineate specific areas of impairment that should be further targeted in treatment planning (Cooke et al., 2005). According to Warren (1990), developer of the visual-perceptual hierarchy, evaluation results regarding vision can be misinterpreted when assessed top-down instead of bottom-up. Basic vision skills are critical to integrating visual information for effective higher-level visual functioning. Failure to recognize specific impairments could lead to ineffective treatment strategies, patient and caregiver frustration, and increased risk for injury (Warren, 1990; Smith et al., 2018). Based on this recommended bottom-up approach, vision screens should assess "eye alignment, convergence, saccades, smooth pursuits, visual fields, acuity, and contrast sensitivity" (Aravich & Troxell, 2018). Current literature identifies many shortcomings of vision screening and care following a neurological event including lack of standard vision procedures, inaccessible assessment tools and equipment, lack of implementation of evidence-based practices and screening, and length of current assessment tools (Vancleef et al., 2020). This project will address these limitations by establishing an evidence-based screening protocol that is suitable for bedside testing with accessible tools and ability to be completed in 15 minutes or less.

In addition, vision screening leads to targeted referrals to specialists, including neuro-optometrists and ophthalmologists. Unfortunately, many hospitals do not provide clear referral pathways and some providers prefer to wait six months for possible natural resolution of symptoms, despite present safety risks and patient frustration (Aravic & Troxell, 2021; Smith et al., 2018). In a survey of OTs regarding current practice, fewer than 45% of participants reported consulting an eye-care specialist or referred patients on a regular basis (Winner et al., 2014). Current guidelines and research recommends interprofessional collaboration between OT and neuro-optometry to improve comprehensive care for stroke survivors (Vancleef et al., 2020). Collaboration is necessary to determine how optometric interventions and optical devices impact

the long-term effectiveness of compensatory strategies and neuroplasticity-based interventions provided by OTs to maximize occupational performance (Blanchard et al., 2016). By testing functional vision through different modalities and under different conditions, providers can gain a better understanding of the severity of dysfunction and impact on quality of life (Roberts et al., 2017). Treatment planning developed by both vision and non-vision specialists support, integrate, and enhance visual processing and perceptual skills to optimize functional improvement in meaningful occupations (Roberts et al., 2017). Winner et al. (2014) indicated that therapist education should include content on strategies to identify local eye-care professionals and to form partnerships with them.

In addition to education on local vision specialists, OTs must be demonstrate increased awareness of the existence of visual deficits and knowledge in assessing and using evidence regarding visual rehabilitation (Norup et al, 2016; Smith et al., 2018). Turton et al. (2015) identified lack of training as a barrier to management of visual problems following a stroke. Due to a lack of training, vision interventions delivered by OTs are not always aligned with current best practices, especially when dealing with oculomotor function and visual stress impairments (Yoo et al., 2020). A survey administered to inpatient OTs revealed utilization of the same interventions regardless if the patient had a visual field cut, reduced visual acuity, or oculomotor dysfunction (Yoo et al., 2020). In a randomized controlled trial, Jarvis et al. (2012) determined whether providing OTs with objective information from neuro-optometry evaluations would enhance functional recovery of stroke survivors. While the researchers did not find a difference in patient outcomes between the experimental and control groups, the researchers cannot indicate whether access to evaluation results did not yield improved outcomes or if therapists' utilization and understanding of the information did not help. The lack of significant difference could be due to reduced therapist understanding of visual dysfunction and evaluation results. This project

focused on improving upon this research by providing therapists with specialized education on visual rehabilitation and collaboration with local vision specialists.

Shortcomings in the literature were also reflected in the needs assessment conducted with CRHN OTs. In the needs assessment, questions regarding confidence levels were formatted on a Likert scale from one to 10, with 10 representing the most confident. Additional questions asked therapists to identify current practices and perceived need for resources. Based on survey results, 56% of respondents reported a five or less when identifying their confidence level with identifying visual deficits. In regards to confidence with both assessing and addressing visual deficits, 78% of respondents reported a five or less. Respondents also identified a unanimous desire for additional educational resources regarding visual deficits following neurological events to improve their confidence in identifying, assessing, and addressing visual dysfunction. The results from the needs assessment informed the focus on the project: education for therapists and establishment of visual rehabilitation protocols.

Guiding Model and Frame of Reference

Mary Warren's Visual-Perceptual Hierarchy

Mary Warren's visual-perceptual hierarchy guided the development of visual rehabilitation interventions and assessment protocols. This developmental framework was created for individuals with an acquired brain injury and dictates a bottom-up approach to evaluation and treatment of visual-perceptual deficits (Warren, 1993). Each level in the hierarchy interacts and subserves each other; higher level skills, such as pattern recognition, evolve from the integration of lower level skills, such as oculomotor control. As a unit, all skills work together to integrate visual information efficiently and any disruption to the system impacts all skills higher in the hierarchy (Warren, 1993). The development of the protocols followed Warren's bottom-up approach to progress in sequence of integrated skills. In order to develop effective treatment plans and maximize function, visual-perceptual screening in acute or

rehabilitation settings following brain injury should be used as an important aspect of the process, especially for individuals whose goals include return to work, living alone, and return to driving (Cooke et al., 2005). By creating a protocol that includes screening and educating therapists on identifying lower-level dysfunction, CRHN can work toward identifying and reaching more patients and improving long-term outcomes.

Person-Environment-Occupation Model

To root this project in theory, the Person-Environment-Occupation (PEO) model was used to guide the implementation of vision interventions and communication with other members of the rehabilitation team. The PEO model focuses on maximizing the fit between the person, occupation, and environment to maximize functional performance (Cole & Tufano, 2008). Through this lens, modifications can be made to an individual's environment or occupations to adequately fit with his or her current visual-perceptual skills, progress toward the individual's goals, and produce improved functional vision. The model reflects the dynamic relationship between a client, their environment, and the task at hand, which helps all health professionals and caregivers recognize the complexity of the human experience and functioning (Strong et al., 1999).

Project

Project Design

Based on the suggestions from current literature and the needs assessment, this project provided the OT teams with updated binders containing evidence-based vision screening tools, assessments, intervention ideas, and background information regarding the visual system and visual dysfunction following neurological events. The therapy teams identified a lack of confidence in their knowledge of and ability to assess visual dysfunction. In addition, they requested additional resources and occupation-based intervention ideas to implement in the inpatient rehab setting. To minimize visual distractions commonly experienced in the communal

therapy gym, an individual room was designated to be used for vision-based treatment sessions. The room was designed to contain all of the necessary supplies for vision screening and interventions. Lastly, this project emphasized the importance of interdisciplinary collaboration and including neuro-optometrists in the patient's care plan through education to the therapists and development of referral pathways. To assess the outcomes of the project, a survey was developed for the occupational therapy teams that contained questions regarding therapist confidence level with different aspects of visual rehabilitation on a Likert scale.

Project Implementation

In order to implement the project and develop the binders, a narrative literature search using Academic Search Complete and CINAHL databases was conducted. Articles and information from the websites of established neuro-optometrists, American Stroke Association National Practice Guidelines, and an online vision rehabilitation course for occupational therapists was obtained. The information collected from the literature was used to defend equipment proposals to the therapy managers, referral pathways for neuro-optometry to the on-site physiatrist, and vision screening tools and interventions to the OTs. All aspects were well received, except the therapy mangers requested an alternative vision perception assessment than the one originally proposed. The literature recommended the Occupational Therapy Adult Perceptual Screening Test due to ease of administration and functional components, but the tool was inaccessible and had to be order from Australia. After further research, the Motor-Free Visual Perception Tool 4th edition (MVPT-4) was recommended and subsequently purchased. In addition to the assessment tool, evidence-based and occupation-based interventions were developed for oculomotor, accommodative, binocular, visual scanning, and visual perception dysfunction. The therapy team was educated on each intervention and possible modifications during two in-services. Instructions and recommendations for each intervention was also made accessible in the form of intervention cards, the intervention binder, and the therapy share drive.

All of the equipment was organized in the new vision room to provide a controlled environment for vision-based treatments (See Appendix B). Therapist education was also provided for administering and scoring the MVPT-4, oculomotor screening, and neuro-optometry referral pathways during the two in-services.

Project Outcomes

To evaluate the outcomes of the project, two surveys were sent out through Google Forms to collect pre and post-test data from the OTs at CRHN. Google Forms was chosen due to ease and accessibility. Each survey consisted of fewer than 10 questions to prevent lack of time commitment from being a barrier to data collection. Dichotomous questions inquired about absolute needs of the site and patient population, such as if the respondents believed additional vision resources would benefit the patient population. Likert scale questions addressed the confidence level of respondents in performing aspects of visual rehabilitation from one to 10, with 10 indicating most confident. The aspects included the ability to identify visual dysfunction, assess visual dysfunction, developing treatment plans or interventions to address visual dysfunction, and modifying treatment sessions based on visual dysfunction. Likert scale questions were chosen due to their ability to demonstrate potential improvement between the pre and post-test data. The pre-test was administered during week 1 and the post-test was administered during week 13 following both in-services. The average response was calculated for each aspect of visual rehabilitation in the pre and post-tests (See Appendix C). On average, the respondents indicated a 20.2% increase in confidence in identifying visual dysfunction and 20.7% increase in confidence in assessing visual dysfunction. In addition, the respondents indicated a 29.4% increase in confidence in developing vision treatment plans and 17.2% increase in confidence in modifying treatments plans based on visual dysfunction.

In addition to the quantitative data, OTs provided qualitative feedback in an open-ended question in the post-test. The qualitative feedback included comments such as “fantastic in-

service," "great ideas to modify and adapt for specific visual deficits," and "very beneficial information." The OTs were very accepting of the recommendations and expressed intent with utilizing the vision room and equipment.

Summary

According to Warren (1993), visual perceptual dysfunction is a major treatment focus following brain injury but is one of the least understood areas of evaluation and treatment by OTs. Recent studies have indicated a lack of formal visual assessment and inconsistency within hospital units regarding policies for visual assessments and referrals (Jarvis et al., 2012). As a collection, recent literature suggests the development of screening protocols for visual deficits within brain injury and stroke units along with improved education for therapists, caregivers, and patients. The needs assessment at CRHN revealed a unanimous desire amongst the occupational therapists for additional educational resources regarding visual dysfunction following neurological events to improve their confidence level in identifying, assessing, and addressing visual dysfunction. To address the shortcomings in the literature and needs of the site, this project developed vision protocols for assessing oculomotor and visual-perceptual dysfunction and referral pathways for neuro-optometry. In addition, this project focused on introducing new equipment and interventions for addressing vision. Lastly, two in-services were held to educate the therapists on new equipment, protocols, and referral pathways; in addition to how to modify tasks based on visual dysfunction severity. Following the in-services, a second Google Form was sent out to the OTs to collect post-test information. The results indicated an increase in therapists' confidence level in assessing and addressing visual deficits by an average of 20.7% and 29.4% respectively.

Conclusion

Through research and implementation, this project provided the OT team at CRHN with educational resources and new vision equipment to implement vision-related assessments and

treatment plans for patients following neurological events. The educational resources gathered and developed included information regarding areas of the brain involved in vision, importance of addressing vision during inpatient evaluations, oculomotor and visual-perception assessments, importance of collaboration with vision specialists, and evidence-based interventions for visual deficits. The new equipment developed for the site included a visual guide for the Senaptec Sensory Station, Motor-Free Visual Perception Test 4th edition, oculomotor intervention supplies, activities for visual-perception skills, and explanations and documentation recommendations for more than 50 vision interventions. Oculomotor intervention supplies included glasses and opaque tape for occlusion, mirrors for eye exercises, red/green reading sheets and glasses, a vision tracking tube, Marsden balls, and HART charts. The information and products of the project were compiled into a vision room for therapists to access during treatment sessions and disseminated to the team through two in-service presentations. In the post-test survey, the CRHN therapy team unanimously agreed that the project was beneficial and addressed the needs of the site and patient population. The equipment and vision room will continue to be utilized by the OT team and will benefit future patients at CRHN. In addition, the in-service presentations and educational resources were uploaded to the shared drive for continued education and future employees to access.

References

Aravich, D. & Troxell, L. (2021). Clinical practice guidelines for occupational therapists in the evaluation and treatment of oculomotor impairment following traumatic brain injury. *Current Physical Medicine and Rehabilitation Reports, 9*, 93-99.

Beaudoin, A. J., Fournier, B., Julien-Caron, L., Moleski, L., Simard, J., Mercier, L., & Desrosiers, J. (2013). Visuoperceptual deficits and participation in older adults after stroke. *Australian Occupational Therapy Journal, 60*, 260-266.

Blanchard, S., Chang, W., Heronema, A. M., Ramcharan, D. D., Stanton, K. L., & Stollberg, J. E. (2016). Common occupational therapy vision rehabilitation interventions for impaired and low vision associated with brain injury. *Optometry & Visual Performance, 4*(5), 265-274.

Cole, M. & Tufano, R. (2008). *Applied theories in occupational therapy: A practical approach*. SLACK Incorporated.

Community Rehabilitation Hospital North. (n.d.). Community Health Network. https://www.ecommunity.com/locations/community-rehabilitation-hospital-north

Cooke, D. M., McKenna, K., & Fleming, J. (2005). Development of a standardized occupational therapy screening tool for visual perception in adults. *Scandinavian Journal of Occupational Therapy, 12*, 59-71.

Grider, S. L., Yuen, H. K., Vogtle, L. K., & Warren, M. (2014). Visual concerns that interfere with daily activities in patients on rehabilitation units: A descriptive study. *Occupational Therapy in Health Care, 28*(4), 362-370.

Jarvis, K., Grant, E., Rowe, F., Evans, J., & Cristino-Amenos, M. (2012). Impact of visual impairment assessment on functional recovery in stroke patients: A pilot randomized controlled trial. *International Journal of Therapy and Rehabilitation, 19*(1), 11-22.

Norup, A., Guldberg, A., Friis, C. R., Deurell, E. M., & Forchhammer, H. B. (2016). An

interdisciplinary visual team in an acute and sub-acute stroke unit: Providing assessment and early rehabilitation. *NeuroRehabilitation, 39*, 451-461.

Roberts, P. S., Rizzo, J. R., Hreha, K., Wertheimer, J., Kaldenberg, J., Hironaka, D., Riggs, R., & Colenbrander, A. (2017). A conceptual model for vision rehabilitation. *Journal of Rehabilitation Research and Development, 53*(6), 693-704.

Smith, T. M., Pappadis, M. R., Krishnan, S., Reistetter, T. A. (2018). Stroke survivor and caregiver perspectives on post-stroke visual concerns and long-term consequences. *Behavioural Neurology,* 1-8.

Strong, S., Rigby, P., Stewart, D., Law, M., Letts, L., & Cooper, B. (1999). Application of the Person-Environment-Occupation model: A practical tool. *Canadian Journal of Occupational Therapy, 66*(3), 122-133.

Turton, A. J., Angilley, J., Chapman, M., Daniel, A., Longley, V., Clatworthy, P., & Gilchrist, I. D. (2015). Visual search training in occupational therapy – an example of expert practice in community-based stroke rehabilitation. *British Journal of Occupational Therapy, 78*(11), 674-687.

Turton, A. J., Angilley, J., Longley, V., Clatworthy, P., & Gilchrist, I. D. (2018). Search training for people with visual field loss after stroke: A cohort study. *British Journal of Occupational Therapy, 81*(5), 255-265.

Vancleef, K., Colwell, M. J., Hewitt, O., & Demeyere, N. (2020). Current practice and challenges in screening for visual perception deficits after stroke: A qualitative study. *Disability and Rehabilitation,* 1-10.

Warren, M. (1990). Identification of visual scanning deficits after cerebrovascular accident. *American Journal of Occupational Therapy, 44*(5), 391-399.

Warren, M. (1993). A hierarchical model for evaluation and treatment of visual perceptual dysfunction in adult acquired brain injury, part 1. *American Journal of Occupational*

Therapy, 47(1), 42-54.

Warren, M. (1993). A hierarchical model for evaluation and treatment of visual perceptual dysfunction in adult acquired brain injury, part 2. *American Journal of Occupational Therapy, 47*(1), 55-66.

Winner, S., Yuen, H. K., Vogtle, L. K., & Warren, M. (2014). Factors associated with comfort level of occupational therapy practitioners in providing low vision services. *American Journal of Occupational Therapy, 68*(1), 96-101.

Yoo, P. Y., Scott, K., Myszak, F., Mamann, S., Labelle, A., Holmes, M., . . . Bussieres, A. E. (2020). Interventions addressing vision, visual-perceptual impairments following acquired brain injury: A cross-sectional survey. *Canadian Journal of Occupational Therapy, 87*(2), 117-126.

Appendix A

Week	DCE Stage	Weekly Goal	Objectives	Tasks	Date complete
1	**Orientation**	Complete orientation and site-specific paperwork Initiate needs assessment and review of site equipment	Meet with site mentor, other site personnel, and the site participants to introduce myself and educate them on the purpose of my capstone Acquaint self with documentation program Review current vision binder and current equipment	Develop a supervision/weekly schedule with my site mentor Finalize MOU Develop survey for needs assessment Take online vision rehab course Collect vision notes from FWII A (worked with neuro-OD and vision deficits for mTBIs) Review first floor equipment and vision supplies	**1/14**
2	**Screen & Evaluation**	Complete needs assessment by end of week Review literature for vision deficits post-brain injury and vision protocols	Establish pre and post-test measures Compare literature search to literature found in current vision binder Continue reviewing current vision binder and current equipment	Disseminate pre-test to therapy team via email Search databases for vision-related literature Review second floor equipment and vision supplies Meet with on-site doctor to discuss current referral pathways	**1/21**
3	**Implementation**	Continue review of literature for vision deficits post-brain injury and vision protocols	Compile relevant literature in new vision research binder Continue accessing	Print and organize literature materials in binder Take notes/highlight	**1/28**

			databases to search for vision-related literature	articles while reading Make visual for areas of the brain impacting vision Write-up information about functional areas of the brain for vision	
4	**Implementation**	Initiate development of new vision protocols Complete review of literature for vision deficits post-brain injury and vision protocols	Brainstorm ideas for the new vision binder and how to incorporate current material and new research Initiate collection of neuro-OD information	Summarize findings in each research article Create table of contents for easy review of literature in vision binder Develop an outline for the vision binder and how to incorporate information Reach out to local outpatient vision rehab centers and neuro-ODs for information regarding continuation of care Reach out to appropriate manager to schedule in-services and meeting to discuss equipment	**2/4**
5	**Implementation**	Continue development of vision protocols and assessment binder	Develop assessment protocols for oculomotor screening Condense research finding on importance of assessing vision	Type up document outlining suggestions for occupational profile, ADL observation, oculomotor screening, and Brain Injury Vision Symptom Survey	**2/11**

				Print BIVSS forms	
6	**Implementation**	Continue development of vision protocols and assessment binder Explore continuum of care/interdisciplinary collaboration	Finalize neuro-OD list Start working on protocol for visual-perception assessment	Finalize neuro-OD document and send to Dr. Lyon for approval Research visual-perceptual assessment tools	**2/18**
7	**Implementation**	Continue exploring continuum of care and compare research to conversations with local providers	Expand collection of information to include interviews from OTs and neuro-ODs	Meet with local outpatient therapists to discuss experience with vision Shadow 2 neuro-ODs and ask questions about interdisciplinary collaboration	**2/25**
8	**Implementation**	Establish equipment that will be utilized in vision room	Finalize research on assessment tools and evidence-based vision equipment Determine what interventions can be DIY-ed and what should be ordered	Make a list of equipment to order to present to therapy manager with price and purpose	**3/4**
9	**Implementation**	Start development of intervention binder	Meet with therapy manager to review information Review literature and search for vision interventions to include in binder	Create document for meeting outline Present equipment list and project/vision room vision to therapy manager Find and print paper worksheets such as mazes, HART charts puzzles, word searches, connect the dots for intervention binder	**3/11**
10	**Implementation**	Continue developing plans for vision	Work on development of DIY interventions	Write up descriptions of interventions for	**3/18**

		interventions based on literature	and intervention binder	intervention binders Complete DIY interventions Complete intervention rings (include documentation, explanation, modifications, supplies) Order MVPT-4 Shadow Community outpatient vision/neuro OT	
11	**Implementation**	Initiate development of new vision room	Gain understanding of new visual-perception assessment tool	Clean room and clear out current equipment Develop a visual plan outlining the layout and purpose of each area in the vision room Create guide for Senaptec Sensory Station Review MVPT-4 manual and condense information into a handout for therapists	**3/25**
12	**Implementation /Dissemination**	Initiate transition of vision room Disseminate project	Conduct first in-service Continue setting up vision room	Create PPT presentation for in-service Finalize assessment binder Present PPT over neuro-OD referrals, oculomotor assessments, and vision dysfunction following	**4/1**

				neurological events Make labels and organize material and equipment in the vision room	
13	**Dissemination**	Disseminate project Develop post-test Work on vision room	Conduct second in-service Develop post-test outcome measure via Google form Continue making modifications and additions to vision room	Create PPT presentation for in-service Gather supplies for in-service to showcase new equipment Present PPT over visual-perception assessments and vision interventions Develop questions for post-test Finalize intervention binder Send out post-test to OTs	**4/8**
14	**Dissemination**	Disseminate project Finalize outcome assessment/evaluation of project	Continue dissemination process for future implications Finalize vision room Complete final evaluation of project with site mentor to ensure project met site needs/expectations	Analyze post-test data and compare to pre-test data Organize project documents into files Upload all educational resources and vision room/intervention information on share drive Finish putting up anchors, intervention cards, and HART charts on wall in vision room.	**4/15**

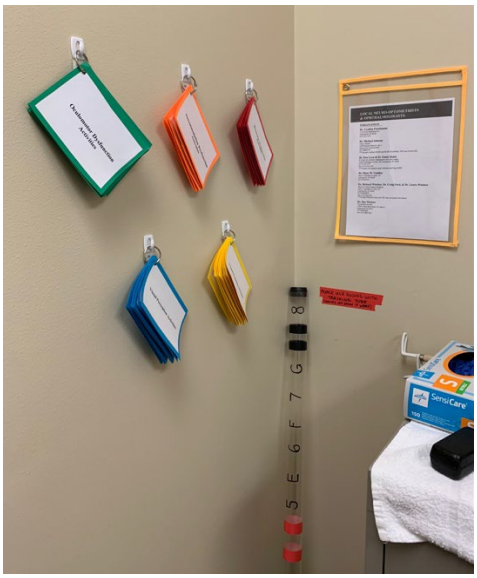
				Finish evaluations on CORE	

Appendix B

Vision Room Components

Figure B1

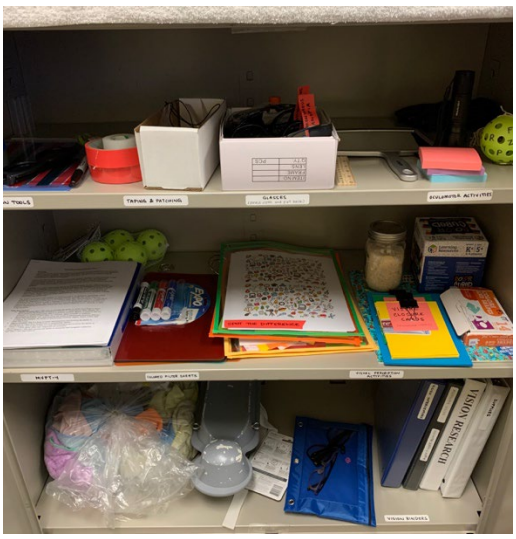
Vision Intervention Cards



Note. Each card provided instructions for an intervention, supplies, possible modifications, and documentation recommendations. The image also showcases the vision tracking tube and list of local neuro-optometrists.

Figure B2

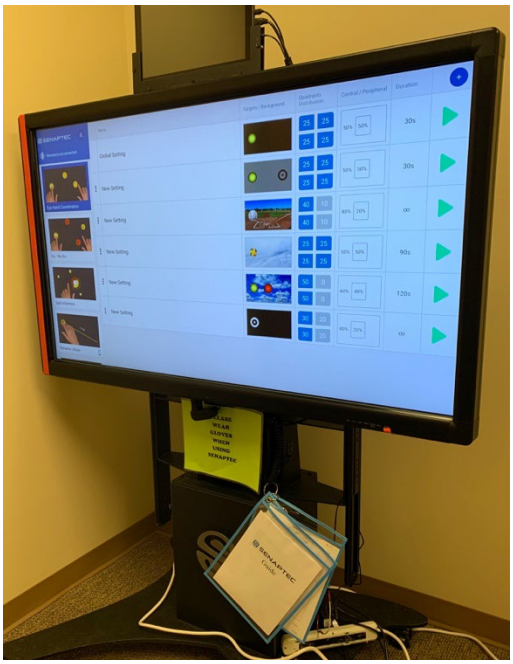
Vision Supplies



Note. Supplies and interventions were organized by purpose and labeled accordingly.

Figure B3

Senaptec Guide



Note. A visual guide was created for therapists to reference during treatment sessions with the Senaptec Sensory Station.

Appendix C

Therapists' Confidence in Performing Visual Rehabilitation

Clinical Areas	Pre-Test Average	Post-Test Average	Percentage Difference
Identifying Visual Dysfunction	5.11	7.13	20.2
Assessing Visual Dysfunction	4.56	6.63	20.7
Developing Treatment Plans to Address Visual Dysfunction	4.56	7.5	29.4
Modifying Treatment Plans based on Visual Dysfunction	5.78	7.5	17.2