

## An Interdisciplinary Approach to Improve Head Tilt in Pediatric Torticollis Patients with the Use of Prism Glasses

Amber Cumings, OD, FAAO  
Clarendon Vision Development Center  
Westmont, Illinois USA

Carla Pister, PT  
Independent Contractor, Chicagoland Area

### ABSTRACT

#### Background

Infants with head tilts are most often diagnosed with torticollis and are referred to a pediatric physical therapist for evaluation and treatment. Determining if the head position is muscular or non-muscular when assessing these infants is key in making the appropriate referrals to other specialists and determining the best treatment approach. Most pediatric physical therapists treat patients with head tilts with manual therapy (i.e. massage, myofascial release, and passive/active

*Correspondence regarding this article should be emailed to Amber Cumings, OD, FAAO, at [ambercumingsod@gmail.com](mailto:ambercumingsod@gmail.com). All statements are the authors' personal opinions and may not reflect the opinions of the College of Optometrists in Vision Development, Vision Development & Rehabilitation or any institution or organization to which the authors may be affiliated. Permission to use reprints of this article must be obtained from the editor. Copyright 2021 College of Optometrists in Vision Development. VDR is indexed in the Directory of Open Access Journals. Online access is available at [covd.org](http://covd.org). <https://doi.org/10.31707/VDR2021.7.4.p235>.*

Cumings A, Pister C. An interdisciplinary approach to improve head tilt in pediatric torticollis patients with the use of prism glasses. *Vision Dev & Rehab* 2021; 7(4): 235-44.

**Keywords:** defective stereopsis, glasses, head tilt, ocular torticollis, pediatric prism therapy, physical therapy, prism, torticollis, vertical heterophoria,

range of motion). Many physical therapists only consider a visual etiology as a possibility after other treatment options have been exhausted and the head tilt persists.

Although the incidence of torticollis has increased, based on the author's experience, the number of cases of non-muscular etiology has also increased. There is a lack of current research on the use of prism glasses for treating head tilts in young children and infants carrying a diagnosis of torticollis, especially those presenting without any active/passive motion limitations. Traditionally, these patients undergo years of treatment without resolution of the head tilt.

#### Case Report

A two-year-old patient initially presented with a diagnosis of torticollis with an intermittent and alternating head tilt for physical therapy. After several months of manual therapy, with little improvement in her head posture, the patient's physical therapist referred her to a behavioral optometrist for a comprehensive vision examination and to pursue alternative treatment options. The optometric evaluation revealed ocular misalignment causing poor depth perception skills and prism glasses were prescribed full-time with the recommendation of continuing physical therapy for gross motor development.

#### Conclusion

Prism glasses are an appropriate treatment consideration for some pediatric patients with persistent head tilts because they can provide immediate improvement in head position and depth perception. It is important to include optometrists in the multi-disciplinary team when working with patients with head tilts. Pediatric physical therapists would benefit from training on how to properly screen visual skills when evaluating children with head tilts. With such training, an appropriate optometric referral could be initiated early on in treatment.

## INTRODUCTION

There are two main types of torticollis—congenital (present at birth) and acquired.

Congenital torticollis can include birth injuries, in utero maldevelopment, hip dysplasia, and skeletal deformities. Acquired torticollis can be secondary to plagiocephaly, lack of tummy time positioning, and ocular disorders.<sup>1</sup> Much of the more recent literature also uses the terms muscular and non-muscular torticollis. The incidence of torticollis in infants continues to rise with a prevalence of 3.9- 16% according to recent studies.<sup>2</sup> Given that 20% of torticollis cases are of non-muscular origin, the physical therapist is challenged with determining the etiology.<sup>1</sup> Head tilts are a relatively common occurrence in many children and adults for a variety of reasons. These can include birth injury, in utero maldevelopment, hip dysplasia, cervical fusion, and ocular disorders.<sup>2</sup>

For cases of congenital muscular torticollis, treatment is highly successful with physical therapy. The incidence of improved range of motion, craniofacial symmetry, and head tilt is close to 92% when using manual therapy.<sup>2</sup> During the initial physical therapy evaluation, if a nonmuscular etiology is determined, an appropriate referral to other specialists should be initiated. Screening for a visual etiology for head tilting is not common practice amongst physical therapists despite the recommendation documented in the 2018 Physical Therapy Guidelines for treating torticollis. In many instances, a referral for a formal vision assessment is recommended after many months of physical therapy without resolution of the head tilt. Behavioral optometrists should be included earlier on as a member of the health care team in treating children with torticollis.

Some patients that are referred for a vision assessment seek care from a provider who may be untrained in behavioral optometry. In many cases, the child may present with normal acuity and ocular health which leads to dismissing an ocular etiology despite there being signs of visual misalignment. In certain scenarios,

some of these same patients are later seen by a behavioral optometrist who has a more thorough understanding of visual function.

When presented with a patient referred with a head tilt, the behavioral optometrist determines if it is of ocular etiology, also referred to as ocular torticollis. One of the most important parts of the evaluation is a thorough case history. Photographic evidence of the tilt occurring more than once and over an extended period of time is helpful for the treatment approach. A common compensatory action for misaligned eyes is to tilt the head. This action relieves visual stress such as diplopia. It can be reasonably deduced that without a compensating head posture, the patient likely has poor depth perception and poor coordination skills. Prism glasses are an appropriate tool for alleviating the symptoms of visual misalignment such as compensatory head tilts.

## CASE PRESENTATION

AO presents as a 2 year 5 month old girl with a diagnosis of Trisomy 9, torticollis, cortical visual impairment and a seizure disorder. She was seen for a physical therapy evaluation at the age of two through the Early Intervention System. At that time, her seizures remained uncontrolled and she received all of her nutrition through a Gastrointestinal tube. Developmentally she was able to roll from supine to her side to both directions and assume a semi-side lying position. AO required moderate support to sit, did not tolerate any positioning in prone, did not reach or grasp for toys, and did not consistently visually attend to people or things in her surroundings. AO's mother reported that earlier vision assessments had not recommended any corrective lenses despite AO carrying a diagnosis of cortical vision impairment.

While in supported sitting, AO strongly tipped her body and her head from side to side in resistance to being supported upright in a neutral position. This coupled with her ability to hold her body against gravity in a semi-side

lying position, which requires significant trunk and head control, led her therapist to question if her vision was playing a role in her resistance to sitting upright with support. Her therapist considered that perhaps AO was tipping her head to accommodate for a lack of depth perception or to alleviate diplopia.

Following two months of physical therapy, which was conducted twice a week with little noted progress in AO's head position, the physical therapist referred AO to a behavioral optometrist.

### **Initial Vision Evaluation 12-10-2018**

AO presented to the optometry clinic with a chief parent complaint of a lack of eye contact towards faces. The parents also noted that the patient liked high contrast targets such as black on white. Pertinent personal and ocular history findings included cortical vision impairment, delayed visual maturation, premature twin at 31 weeks but denied findings of retinopathy of prematurity from past ophthalmologists, diagnosis of trisomy 9, epilepsy, high blood pressure, bronchial difficulties, global motor delays, and fed using a G-tube. AO and her twin sister were adopted and therefore a thorough medical history was unknown other than a family history of thyroid disease.

Upon examination, visual acuities were not noted with a Snellen equivalent because AO was not fixating or engaging in near targets and was nonverbal. Version and extraocular muscle eye movements were found to be unrestricted and smooth OD and OS. Near point of convergence was to-the-nose with moderate effort. Distance cover test was unable to be performed due to poor distance fixation. Near cover test showed 8 prism diopter (PD) exophoria and 4 PD right hypophoria. Confrontation visual fields were grossly full OD and OS. Hirschberg reflexes showed a slight right hypophoria with an initial eso but eventually became more orthophoric as the examination continued. This finding was likely influenced by the accommodative system from uncorrected hyperopia and overall poor

motor control. Bruckner's reflexes were equal and bright OU. The optokinetic nystagmus drum results showed no nasal-temporal or temporal-nasal nystagmus response with either eye. Near point retinoscopy showed miotic pupils with a dull with-motion reflex. A +2.00D lens was placed over each eye and still showed dull with-motion. A +4.00D lens was placed over both eyes and there was better engagement but the patient was resistant to wearing the lenses. A set of 3PD base-in prism glasses were then placed over each eye and the patient would not keep the glasses on and wasn't engaging visually. Dry retinoscopy at distance showed +5.00D OD and +4.50D OS with poor fixation which resulted in somewhat unreliable measurements.

Intraocular pressures were performed by the digital palpation method and were soft and palpable OU. The patient was dilated with Paremyd 1% and showed more visual engagement visually following the mild cycloplegia with a +2.00D OU set of lenses. There was no increase in plus with damp retinoscopy. Anterior ocular health was unremarkable. Dilated posterior ocular health revealed tilted nerve heads with 0.10 C/D ratio in both eyes, and was otherwise unremarkable.

Diagnoses of vertical heterophoria and exophoria were made alongside bilateral hyperopia. The esophoria was not listed because of its brief nature. Although retinoscopy initially showed asymmetry, near reflexes were more engaged with symmetrical lenses presented which is ultimately why +2.00D OU was finalized. A final glasses prescription was created for the patient to be worn full time; those values were +2.00DS OU with 0.50PD base-in OU. The base-in prism was indicated due to a higher exophoria compared to the lower, more variable vertical heterophoria. The amount of 0.50BI prism was used to lessen the amount that the eyes have to converge to overcome the larger exophoric posture. The author typically starts with the lowest amount possible to create a positive response so as not to become heavily reliant on high amounts of prism.

## Physical Therapy Reassessment – First Set of Glasses

AO received her glasses in the optometrist's office and was video-taped to document her reaction. (See video 1) With placement of the glasses, she was noted to quickly bring her gaze up from the ground with a neutral head position and notice herself in a hand held mirror held in front of her. During the dispensing adjustment, AO did not try to remove the glasses herself and she resisted the removal of the glasses by the optician. She visually scanned the room, noting people and objects.

On the second day of wearing her glasses, the patient was able to sit unsupported for several minutes once placed in sitting. (See Video 2) She also began visually tracking and reaching for toys. (See Video 3) On day 14, she was able to transition to sitting from supine on her own. After two months with her glasses, the patient was able to roll across the room to get to a toy. She showed significant improvement in her visual attention to toys and people and her motivation for independent mobility accelerated her progress in all areas of development.

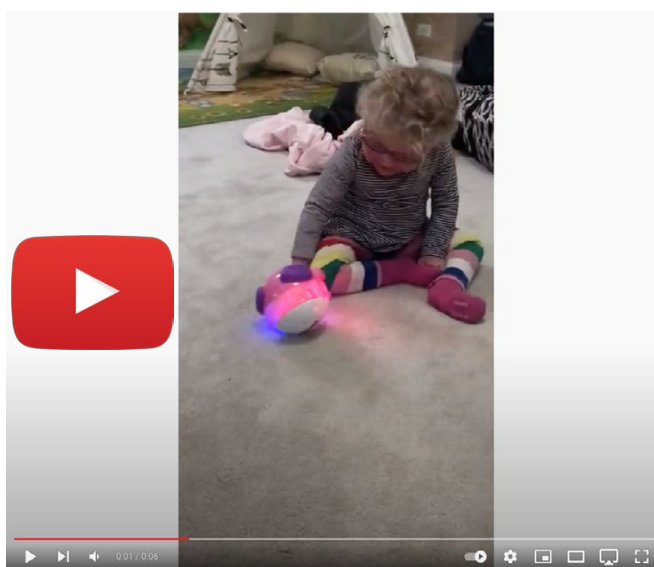
## Second Vision Evaluation 4-29-2019

AO returned to the clinic for a progress assessment on April 29, 2019. According to her parents, AO had initially done well wearing glasses full time until about 6 weeks prior to this appointment when she became resistant to wearing the glasses. It was noted that her head tilt started occurring to the left with the right eye having a preference for fixating. The patient's mother did not specify whether the non-fixating eye was drifting in or out, up or down. No significant medical or ocular history changes had occurred since the initial evaluation.

Examination findings did not include visual acuity again because the patient was still nonverbal and had unreliable fixation. Version and extraocular muscle testing showed a new finding of a slight abduction deficit in both eyes. No palpebral fissure narrowing was noted. Near point of convergence testing still showed an



**Video 1.** AO with first fitting at optometrist office, first set of glasses.



**Video 2.** AO day two with glasses at home sitting on her own once placed without support for the first time.



**Video 3.** AO day fourteen with glasses assuming sitting position independently.





**Figure 1.** Patient AO without and with second set of prism glasses

ability to converge to the nose. The near cover test findings showed a moderate, intermittent, right esotropia with a consistent head tilt to the left. Near retinoscopy was still showing miotic pupils, a dull reflex, and slight with-motion. In keeping with a symmetrical prescription over both eyes, a set of +1.00D lenses over both eyes showed slightly more visual engagement as did a 0.50PD base-up lens over the right eye. However, engagement was brief for both situations. A trial frame refraction of +0.50DS OU with 0.50PD base-up OD and 0.50PD base-down OS showed improved head posture and more engagement visually. The prism amounts were presented to give a minimal amount of correction for the right hypo deviation. Intraocular pressures were soft and palpable OU using the palpation method. Anterior ocular health was unremarkable. Posterior ocular health was not assessed at the examination. A final glasses prescription was created with +0.50DS OU, 0.50PD base-up OD, and 0.50PD base-down OS with binasal occlusion to be worn full-time to allow for peripheral awareness and prevention of crossfixation due to the new onset esotropia. A cycloplegic exam was deferred due to the patient being resistant to the higher amount of plus that

she had previously been prescribed. Visually, the patient was more engaged with lower plus even though she was esotropic.

### **Physical Therapy Reassessment – Second Pair of Glasses**

AO had much improved head posture with the second pair of glasses (See Figure 1) and made amazing progress over the next year and a half in other gross and fine motor skills. She continued to progress with her mobility around her surroundings with rolling and occasionally attempted belly crawling. She began tolerating work on hands and knees in an assisted crawling device and was able to propel herself in this device from room to room. She was fitted for a manual wheelchair and began propelling it on her own in her classroom at school. Her overall social interaction improved dramatically and she began training with an augmentative communication system. She continued to resist tracking into leftgaze and therefore a re-assessment was requested with the optometrist. (See Videos 3 & 4)

### **Third Vision Evaluation 1-12-21**

AO returned for an annual eye health evaluation and reassessment for glasses. Present at



**Video 4.** AO without second set of glasses visually tracking.



**Video 5.** AO with second set of glasses visually tracking.

the exam were her mother, nurse, and physical therapist. Of importance was that AO hadn't been wearing her glasses for several months during the COVID-19 lockdown and mom no longer noticed any eye drifting or turning while uncorrected. She also underwent approximately seven surgeries in the last year relating to her health. In the previous year, AO also began standing from a seated position and was using a wheelchair unsupported.

The nurse and PT noted that for several months without glasses wear, AO started tipping her neck/body to the left again and they were concerned that her vision may have changed. Several weeks prior to the vision evaluation, they had AO restart wearing her glasses close to full

time and noticeable improvements in neck/body posture were made along with visual engagement during activities. The PT noticed that even when AO took her glasses off for short periods of time, her neck/body posture remained neutral.

Examination findings did not include a standard visual acuity again due to poor verbal skills and fixation. Extraocular muscle movements were full with no restrictions OU. Near point of convergence with habitual glasses was about 2cm before AO would look away. Hirschberg showed a subtle right hypo-deviation with the glasses removed for testing. Pursuits had poor engagement unless using a penlight flickering on a finger. Saccades showed no engagement. Near retinoscopy showed large with-motion at near. It was repeated with +2.00D OU and had significantly improved engagement visually and slight with-motion. It was repeated with +1.50D OU and 0.50BU OD with 0.50BD OS which resulted in better visual engagement and a plano reflex response. The spherical plus lenses were selected to keep the eyes symmetrical to promote equal emmetropization while also have the most engaged near response on retinoscopy. The prism amounts were determined by selecting minimal compensation for maximum response in head position to neutralize the right hypo/left hyper deviation. Optokinetic nystagmus was attempted using the OKN drum which showed a very slow nasal-temporal response of the right eye and no response of the left eye. Ocular health was unremarkable both anteriorly and posteriorly, though the patient was very sensitive to the bright lights. A final full-time glasses prescription was written for +1.50D OU, 0.50BU OD and 0.50BD OS to allow for visual efficiency and with a BlueTech amber tint to help with light sensitivity.

### **Physical Therapy Reassessment – Third Set of Glasses**

With placement of the third set of glasses, she was noted to stop squinting, open her eyes fully (See figure 2), and engage with the therapist and her surroundings in all planes of motion. Without





**Figure 2.** AO without and with third set of glasses

the glasses she quickly began tipping her head and disengaging visually along with squinting when trying to fixate. (See Video 3 and 4)

One month later, a re-assessment with the optometrist was recommended due to a noted decrease in her tolerance for wearing the glasses. The nose piece was removed from her glasses and earpiece stabilizers were added to improve the fit. The following day her nurse



**Video 7.** AO with third set of glasses tracking sitting on platform swing.



**Video 6.** AO without glasses tracking sitting on platform swing.

noted that she wore her glasses all day without taking them off.

## DISCUSSION

This case shows remarkable and immediate improvement in the child's head position and gross motor development with the use of prism glasses. The patient became more socially involved with her twin sister and family, and engaged with toys in her environment more

readily. She also began showing interest in moving around in her surroundings which had not been observed prior to using the prism glasses. Her immediate ability to sit on her own after one day of receiving her first pair of glasses confirmed that AO struggled with depth perception and spatial awareness. Subsequent prescriptions focused on the increase in near work such as utilizing communication devices and also for the motor changes that occurred as AO developed.

With the initiation of the Back to Sleep Program, infants are spending less time on their tummies even when they are awake.<sup>1,4</sup> The incidence of plagiocephaly is growing rapidly which in turn has led to an increase in acquired torticollis.<sup>4</sup> Because of poor head position, infants with torticollis tolerate tummy time less than those with a neutral head position. Research shows that eye convergence and depth perception begin developing at around 3-5 months of age when babies start to better tolerate tummy time.<sup>5-6</sup> This is followed by a rapid onset of fusion followed by the development of stereopsis.

Although many infants struggle with tolerating tummy time, those infants with torticollis have an increased intolerance. Therefore, it is not surprising that infants with torticollis show delays in acquiring certain visual skills which in turn delays their overall motor development. Infants with torticollis often go on to increase their head tilt when they begin sitting, crawling and walking. Most therapists believe that this is due to insufficient trunk and head/neck strength to maintain a neutral head in these new developmental positions. However, it is more likely that the worsening tilt with more complex body postures could be linked to decompensation of a binocular vision condition. It creates more cognitive load for the patient when transitioning from a simple body position to one more complex. Therefore, the patient creates a compensatory posture, such as a head tilt, to relieve visual stress. Many infants with torticollis sit, crawl, and walk late but there is no research

on the impact that delayed visual development has on these milestones being attained.

One of the common vision related differential diagnoses for torticollis is superior oblique palsy.<sup>7-10</sup> Sometimes these can present as vertical heterophorias which have an approximate prevalence of 20% of the population.<sup>11</sup> With vertical heterophorias, patients oftentimes have a compensatory head tilt to alleviate visual stress such as diplopia. The most common way to correct vertical heterophorias is by the use of vertical compensatory prism.<sup>11-15</sup> One such study found that those with superior oblique palsies specifically had upwards of 92% satisfaction rate with the use of prism correction.<sup>11</sup> The patient in this case report had a vertical heterophoria but a more prominent initial exophoria which is why base-in prism was initially prescribed. The horizontal deviation altered as the patient developed which is why vertical prism was later implemented.

The current PT guidelines for treating torticollis recommend “including screens of vision” in assessing infants with non-muscular causes for torticollis. The guideline indicates that the physical therapist includes the following in their screening: symmetrical eye tracking in all directions, noting visual field defects, and nystagmus as potential ocular causes of asymmetrical postures. However, there is little description on how physical therapists should perform this part of the assessment or what is considered atypical. There is no guidance on how the assessments are affected when strabismus is involved. Action statement 6 in these guidelines recommends if poor visual tracking is noted during the screening, therapists should refer these patients to a physician. Again this statement is vague, without clear guidance on which type of physician is appropriate for a referral.

Educating pediatric physical therapists on the importance of appropriate optometric consultation for children with persistent head tilting is essential. Physical therapists should be educated on the InfantSee Program and refer



infants between the age of 6-12 months with noted vision asymmetries or persistent head tilts despite ongoing direct physical therapy.

Once a patient with suspected ocular torticollis is assessed by a behavioral optometrist, a diagnosis and treatment approach is initiated. Being that most cases of ocular torticollis result from a vertical heterophoria, the recommended treatment is to prescribe vertical prism to alleviate the deviation.<sup>11-15</sup> This will subsequently improve the head/neck posture so that the child can continue to work on other gross motor milestones.

### Limitations

The scope of practice for pediatric physical therapists is limited in the evaluation of binocular vision dysfunctions especially when they may be contributing to a head tilt. Prism glasses are also not well understood by pediatric physical therapists as an option for improving head tilts. When a referral is made, some patients have difficulty finding nearby experienced behavioral optometrists who are comfortable prescribing specialty lenses to infants. Many pediatric patients also do not have vision plans or medical insurance coverage which can limit their access to purchasing prism glasses.

### CONCLUSION

Torticollis incidents continue to grow annually, however, physical therapy treatments remain predominantly manual therapy based. Many infants with torticollis present without limitations in their active and/or passive neck motion, leaving therapists questioning the best therapy approach to use. There are currently few studies on the impact of treating infants with torticollis using a vision-based approach. Further research is recommended on this topic along with training for physical therapists to properly screen and refer patients.

Prism glasses can show an immediate improvement in head position in pediatric patients with head tilts caused by a visual misalignment. Behavioral optometry is a necessary part of the

interdisciplinary team when working with patients presenting with head tilts. Prism glasses and their effectiveness in treating children with head tilts with or without a diagnosis of torticollis should be further researched.

### REFERENCES

1. Kaplan, S. L., Coulter, C., & Fetters, L. (2013). Physical Therapy Management of Congenital Muscular Torticollis: An Evidence-Based Clinical Practice Guideline. *Academy of Pediatric Physical Therapy*, 348-394. <https://doi.org/gf327p>
2. Sargent, B., Kaplan, S. L., Coulter, C., & Baker, C. (2019, August). Congenital Muscular Torticollis: Bridging the Gap Between Research and Clinical Practice. *American Academy of Pediatrics*, 144(2). Retrieved from <https://doi.org/g8bj>
3. Kaplan, S. L., Coulter, C., & Sargent, B. (2018). Physical Therapy Management of Congenital Muscular Torticollis: A 2018 Evidence-Based Clinical Practice Guideline From the Academy of Pediatric Physical Therapy. *Academy of Pediatric Physical Therapy*, 240-290. <https://doi.org/gfpcf>
4. O'Connell, M. D. (2016). Descriptions of physical therapy management for infants with congenital muscular torticollis in the United States of America, Doctoral dissertation, The State University of New Jersey Rutgers.
5. Tumturk, A., Kaya Ozcora, G., Kacar Bayram, A., Kabaklioglu, M., Doganay, S., Canpolat, M., ... Per, H. (2015, June 5). Torticollis in children: an alert symptom not to be turned away. *Child's Nervous System*, 31(9), 1461-1470. <https://doi.org/f7p465>
6. Duckman, R. H. (2006). *Visual Development, Diagnosis, and Treatment of the Pediatric Patient* (pp. 124-140). Philadelphia, PA: Lippincott Williams and Wilkins.
7. Narayanappa, D., Srinivasamurthy Rajani, H., Girish Anita, T., & Rashmi, N. (2013, April 3). A Case of Ocular Torticollis. *Oman Medical Journal*, 28(4).
8. Williams, C. P., O'Flynn, E., Clarke, N. P., & Morris, R. J. (1996, February 21). Torticollis Secondary to Ocular Pathology. *The Journal of Bone and Joint Surgery*, 78(B), 620-624.
9. Toopchizadeh, V., Zolghadr, M., & Nabie, R. (2016). A case of missed ocular torticollis. *Therapeutic Advances in Musculoskeletal Disease*, 8(2), 49-50. <https://doi.org/g8bm>
10. Shapiro, J. (1994, May 12). Relation between Vertical Facial Asymmetry and Postural Changes of the Spine and Ancillary Muscles. *Optometry and Vision Science*, 71(8), 529-538.
11. AOA Evidence-Based Optometry Guideline Development Group. (2017). *Comprehensive Pediatric Eye and Vision Examination* (pp. 20-39). St. Louis, MO: American Optometric Association.
12. Tamhankar, M. A., Ying, G., & Volpe, N. J. (2011, September). Success of Prisms in the Management of Diplopia Due to Fourth Nerve Palsy. *Journal of Neuro-Ophthalmology*, 31(3), 206-209. <https://doi.org/ckqv3p>
13. Tea, Y. C. (2008, February 15). Back to the Basics, Part 1: Prime Yourself to Prescribe Prism. *Review of Optometry*, 145(2).

14. Wendlandt, P. (2013). Torticollis: An Optometrist's Role in Treatment. American Academy of Optometry Residents Day Posters.
15. Cooper, J. S., Burns, C. R., Cotter, S. A., Daum, K. M., Griffin, J. R., & Scheiman, M. M. (2011). Care of the Patient with Accommodative and Vergence Dysfunction (2nd ed., pp. 57-58). St. Louis, MO: American Optometric Association.



**CORRESPONDING AUTHOR BIOGRAPHY:  
Amber Cumings, OD, FAAO**

Westmont, Illinois USA

Dr. Cumings graduated from the Michigan College of Optometry in 2018, and completed a Pediatric and Vision Therapy/Neuro-Rehabilitation residency in 2019 at the private practice of Curtis Baxstrom, OD, FAAO, FCOVD, FNORA through Pacific University College of Optometry. She works at Clarendon Vision Development Center in a suburb of Chicago where she continues to provide services for patients with special needs, amblyopia, strabismus, developmental delays, binocular vision dysfunctions, and visual perceptual deficits. In her free time, she enjoys hiking, kayaking, reading, and spending time with her fiancé.



**AUTHOR BIOGRAPHY:**

**Carla Pister, PT**

Westmont, Illinois USA

Carla Pister graduated from Marquette University in 1986 with a Bachelor of Science in Physical Therapy. She has her NDT and Advanced Baby NDT certifications specializing in treating infants with neurological disorders. Following two decades of treating infants with torticollis with manual physical therapy and noting that their head tilts worsened when they began walking, she began to wonder...what if these infants were struggling with depth perception issues and that is why they were tilting their heads? She sought out pediatric optometrist in the Chicagoland area to help her answer this question. With their guidance she began treating her infants with torticollis from a vision-based approach starting with emphasizing their ability to converge their eyes in midline. She saw immediate improvements in their head positions and started to wonder if putting these infants in prism glasses early on would help in earlier resolution of their torticollis. Fast forward 15 years and now the 7/10 of her patients are in prism glasses and her knowledge and success with a vision-based approach to treating torticollis and head tilts has made her a sought-after instructor on this topic.