

Why Johnny and Jane Can't Focus in the Classroom:

The Relationship Between Learning Challenges and Vision Disorders

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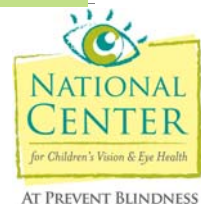
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Presenter Disclosures

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The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose



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Today's Presentation

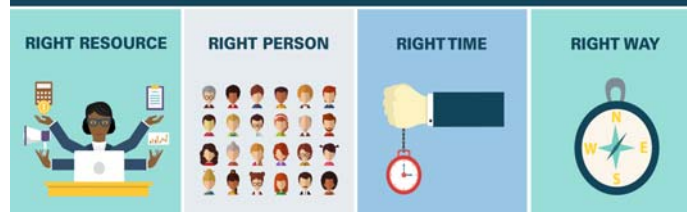
- **The Relationship Between Vision and Learning**
- **7 Classroom Behaviors that May be Related to Vision Disorders**
- **The Relationship Between Vision and Reading/Literacy Scores**
- **Social and Academic Impacts of Vision Correction**
- **Q & A**

Relationship Between Vision and Learning



Gaps in the System of Care

Access and equity = the right resource, for the
right person, at the right time, in the right way



Current State of Children's Vision in the U.S.

Vision disorders requiring treatment impact 1% to 6% of preschool-aged children and about 20% of school-aged children in the U.S.^a

- Eye and vision disorders in children are a time-sensitive concern.
- If left undiagnosed and untreated, eye diseases and vision disorders in children can lead to permanent and irreversible vision loss and/or cause problems socially, academically, and developmentally.
- Nearly 94% of the vision problems leading to the impairment in preschool-aged children can be identified early during a vision screening resulting in earlier access to an eye care provider and improvement in vision.^b
- Only 41% of children ages 5 years and younger are screened for vision problems.^c

a. U.S. Preventive Services Task Force. (2017). *Vision screening in children ages 6 months to 5 years* (Evidence Synthesis No. 153). Rockville, MD: Agency for Healthcare Research and Quality, U.S. Department of Health and Human Services. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0098873/>

b. Varma, R., Tarczy-Hornoch, K., & Jiang, X. (2017). Visual Impairment in Preschool Children in the United States: Demographic and Geographic Variations from 2015 to 2060. *JAMA Ophthalmology*.

c. Block, S., & Baldonado, K. (2018). *Staying Focused on Children's Vision: Leveraging Results from the 2016-2017 National Survey of Children's Health*. Association of Maternal and Child Health Programs. Arlington, VA.



Current State of Children's Vision in the United States

Disparities in access to eye care and vision treatment exist for minority populations and children from families of lower incomes.

- The Medical Expenditure Panel Survey (2009-2010), which used a nationally representative sample of 5-year-old children, found that 22% of children had never had their vision checked by a doctor or other health provider and also detected differences by race/ethnicity, family income, and insurance coverage.
- 30% of Hispanic children had never received vision screening, compared to 19% of non-Hispanic children.
- 31% of children in families with incomes less than 200% of the federal poverty level (FPL) had never received vision screening, compared with 15% of children in families with incomes at or above 200% FPL.
- 61% of children with no insurance had never had their vision screened, compared to 27% of children with public insurance only, and 17% of children with any private insurance.



Kemper AR, Crews JE, Strickland B, Saaddine JB. Vision Screening Among Children Aged <6 Years—Medical Expenditure Panel Survey, United States, 2009-2010. *MMWR*, 2014;63(2):43-46

Current State of Children's Vision in the United States

The economic costs of children's vision disorders are significant, \$10 billion annually in the United States.^a

- Estimate includes costs of medical care, vision aids and devices, caregivers, special education, vision screening programs, federal assistance programs, and quality of life losses.



A study of costs and outcomes from three screening scenarios found all three to be cost effective given a "willingness to pay" by policymakers of \$4,000 to \$10,500 for each case of visual loss **prevented**.^b

a. Wittenborn JS, Zhang X, Feagan CW, et al. The Economic Burden Of Vision Loss And Eye Disorders Among The United States Population Younger Than 40 Years. *Ophthalmology*, 2013;120(9):1728-1735.

b. Rein DB, Wittenborn JS, Zhang X, et al. The Potential Cost-Effectiveness Of Amblyopia Screening Programs. *Journal of Pediatric Ophthalmology & Strabismus*, 2012;49(3):146-155.



Vision Screening Requirements in United States

- Currently **40** states and Washington, DC, require vision screening for school-aged children.
- Only **17** states and Washington, DC, require vision screening for preschoolers.
- Wide variation exists between each state for screening procedures, data collection, referral criteria, and addressing high-risk populations.

Report: Children's Vision and Eye Health: A Snapshot of Current National Issues
(<http://nationalcenter.preventblindness.org/childrens-vision-and-eye-health>)

Gracy, D., Fabian, A., Basch, C. H., Scigliano, M., MacLean, S. A., MacKenzie, R. K., & Redlener, I. E. (2018). Missed opportunities: Do states require screening of children for health conditions that interfere with learning? *PLoS ONE*, 13(1), e0190254. Retrieved from <https://doi.org/10.1371/journal.pone.0190254>



7 Classroom Behaviors that May be Related to Vision Disorders

- Behaviors are not always related to vision.
- A vision disorder is something to consider when the behaviors occur.
- Conduct vision screening to rule out vision as a causal factor.



Talking in class – Child said he talked because he was asking other students to help him read material on board.

Notably quiet in class – Child said she stopped looking at board . . . She couldn't see material on board.

"Spacy" and in own world – Interrupt story time to come forward to see book pictures. "I can see that now!"

Difficulty sitting still – Up and moving in circle time or watching TV with brother. Loner and bored. Now sits and participates in group activities.

Gallin, P. F. (2015, May 15). Kids who can't see can't learn. The New York Times. Retrieved from http://www.nytimes.com/2015/05/15/opinion/kids-who-cant-see-cant-learn.html?_r=0
Screener and parent stories.

Frustrated with “academic work” – Before glasses, “things looked dusty”. Different child, happier, less frustrated.

Squinting during class activities – “Mommy! There are numbers on that circle on the wall!”

Clumsiness until receiving glasses – “I have realized through these screenings that vision can affect a child’s behavior, balance, and academic performance.”

Gallin, P. F. (2015, May 15). Kids who can't see can't learn. The New York Times. Retrieved from http://www.nytimes.com/2015/05/15/opinion/kids-who-cant-see-cant-learn.html?_r=0
Screener and parent stories.

The Relationship Between Vision and Reading/Literacy Scores



Comment to “Vision problems can harm kids’ development grades”

<https://medicalxpress.com/news/2017-07-vision-problems-kids-grades.html>

“I always thought I was just sitting too far from the blackboard to read the words and numbers the teachers were writing. It wasn’t until my 8th grade year (having repeated 6th grade) that I was vision tested. Geez, what a difference when I went back to school as a freshman in high school. I could read everything, and my learning was so much easier.”

Multistate Level



2015 Vision in Preschoolers –
Hyperopia in Preschoolers Study
(VIP-HIP) found:

- Children ages 4 and 5 years with uncorrected hyperopia (farsightedness ≥ 4.0 D) scored *significantly* worse on a test of early literacy than children with normal vision.
- ≤ 4.0 D also had lower scores, but difference not statistically significant

Test = TOPEL (Test of Preschool Early Literacy)

Performance most affected:

- Print knowledge subtest, which assesses the ability to identify letters and written words

VIP-HIP Study Group, Kulp, M. T., Ciner, E., Maguire, M., Moore, B., Pentimonti, J., Pistilli, M., Cyert, L., Candy, R., Quinn, G., & Ying, G. (2016). Uncorrected hyperopia and preschool early literacy: Results of the Vision In Preschoolers – Hyperopia In Preschoolers (VIP-HIP) Study. *Ophthalmology*, 123(4), 681-689.

Diopter defined

- “Diopter” refers to the strength of a prescription lens required to give a child the clearest vision possible. The higher the number, the stronger the prescription lens.
- A child requiring 4 diopters of correction in prescription glasses, or contact lenses, would likely struggle with blurred vision, crossed eyes, or both, and would see much better with prescription glasses.



MULTIPLE INNER CITY SCHOOLS LEVEL

- 317 2nd and 3rd grade students in 12 high-poverty schools in Baltimore City School District
- Children with uncorrected hyperopia did not perform as well on reading assessments compared with children without hyperopia.



Collins, M. E., Mudie, L., Slavin, R. E., Corcoran, R. P., Owoeye, J., Chang, D., Friedman, D. S., & Repka, M. X. (2016). Prevalence of eye disease and reading difficulty in an inner city elementary school population—preliminary results of the Baltimore Reading and Eye Disease Study (BREDS) [Abstract]. *Journal of AAPOS*, 20(4), e29-e30. Retrieved from [http://www.iaapos.org/article/S1091-8531\(16\)30239-7/abstract](http://www.iaapos.org/article/S1091-8531(16)30239-7/abstract)



SINGLE SCHOOL DISTRICT LEVEL

2015 study of low-income children ages 3 through 5 years screened in South Carolina's Charleston County School District – *after diagnosis and treatment with prescription glasses* – found:

- Improvement in academic progress.
- Increase in focus during lessons.
- Increase in participation and classroom interaction.
- Improvement in confidence and behavior.



Peterseim, M. M., Papa, C. E., Parades, C., Davidson, J., Sturges, A., Oslin, C., Merritt, I., & Morrison, M. (2015). Combining automated vision screening with on-site examinations in 23 schools: ReFocus on Children Program 2012 to 2013. *Journal of Pediatric Ophthalmology & Strabismus*, 52(1), 20-24.



Early Identification and Treatment Make a Difference

- First grade reading ability found to be predictive of 11th grade reading outcomes, including reading comprehension, vocabulary, and general knowledge.
- Children who lag in 1st grade but catch up by 3rd or 5th grade have good prognosis for future reading level.



Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental Psychology*, 33(6), 934-945.

What do the previous slides tell you?

Importance of:

- Evidence-based vision screening,
- Follow-up eye exams,
- Receiving vision treatment plan and related devices/materials (i.e., glasses, patching); and
- Following treatment plan for best vision now and in the future.



Social and Academic Impacts of Vision Correction or Impairment



Prescription Eyeglasses for Children

- A child is prescribed glasses to provide better (clearer) vision, so that a child may function better; to help straighten the eyes; to help strengthen the vision of a weak eye); or to provide protection for one eye if the other eye has poor vision.
- If a child is prescribed eyeglasses/contacts- it is critical that they wear them as the doctor indicates to promote healthy vision development.
- Children who need vision correction will generally wear their glasses because the glasses are helping them. Children with touch sensitivity may resist some types of frame materials.
- *Parents and Caregivers:* During the first few weeks of wearing glasses, ask your child to let you know if they are having any problems. Are they too tight or loose? Can your child see clearly with them on? Has your child had any headaches or eye strain while wearing them? If your child reports any problems, let your eye doctor know as soon as possible.
- Help the child understand how to take care of their glasses/contacts to keep them in good condition.



Social Considerations for Vision

Feelings of exclusion and social avoidance= mental health stressor

Victim of bullying

Dependency on friends, siblings, parents, others

Social relations and activities

Ride a bike, play a sport
Make friends
Recognize faces
Self-esteem

Self-care activities

Ability to dress self, brush teeth, bathe
Pour a drink
Identify coins

Family Impact

Parent worry, fear
Time spent on doctors visits or other services
Feelings toward discipline
Future expectations

DeCarlo, DK et al. Impact of Pediatric Vision Impairment on Daily Life: Results of Focus Groups; Optom Vis Sci. 2012 Sep; 89(9): 1409–1416. doi: 10.1097/OPX.0b013e318264f1dc

Dudovitz, RN et al. Parent, Teacher, and Student Perspectives on How Corrective Lenses Improve Child Wellbeing and School Function. Matern Child Health J (2016) 20:974–983.



Academic Considerations for Vision

- Improved GPA (reading and math)- more likely for hyperopes than myopes
- Increased satisfaction with school
- Reduced stress
- Improved cognition, attention span, and focus
- Improved test scores
- Less task avoidance and need for discipline
- Less labeling- ADD or ADHD
- Earlier identification leads to improved outcomes

Academic Performance of Oyer School Students after Receiving Spectacle Correction. Thesis by Kimberly L. Renner; Graduate Program in Vision Science; The Ohio State University, 2017

Healthier Students Are Better Learners: A Missing Link in School Reforms to Close the Achievement Gap. Basch, CE. EQUITY MATTERS: Research Review No. 6 Columbia University; March 2010. <https://sparkpe.org/wp-content/uploads/BaschReport.pdf>



Call to Action

- ❑ Necessary Changes
- ❑ Partnerships
- ❑ Joint Policy Efforts
- ❑ Educate
- ❑ Collaborate



Call to Action

- Engage all stakeholders in systems-level improvement- ensuring high-risk and vulnerable populations are represented.
- Implement uniform education, screening, and referral processes to take advantage of on-site eye care.
- Encourage collaboration among other child service providers, county and state agencies, funders, and professionals to integrate and utilize vision services and support them through policy development.
- Establish district, community, and state-level, child-based performance measures and accountability for vision care for children.
- Develop data collection protocols and systems that use unique child and provider identifiers. *Vision screening referral and eye care outcome data should be integrated with other child health data systems*



Cities Tackling the Vision Challenge

VISION FOR BALTIMORE



Students Schools About Calendar Staff Topics Q

Mayor Emanuel Announces
Expansion of School-Based Vision
Program to Give 30,000 CPS Students
Free Vision Exams and Glasses

Program is a Direct Result of The Mayor's Budget Commitment



What steps can you take in your school-based health center?

- Those with existing vision services on site
- Existing health centers that want to expand into vision services
- Areas that have little to no eye care providers available
- Communities with large populations of vulnerable children

The time is now to consider establishing and sustaining vision care services for the children you serve.



Thank you!

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