

In the News



Vision Therapy has been making the news recently as the result of important new research published by the National Eye Institute (a branch of the National Institutes of Health of the US Department of Health). The research has important implications for children who struggle to read and stay on task because of vision-based learning problems.

Convergence insufficiency (CI) is a common childhood vision problem that can make reading and staying on task difficult for school-aged children. [Convergence Insufficiency](#) is caused by poor eye coordination that does not allow the eyes to work together, or "team", especially when viewing small images such as print. CI creates eyestrain, fatigue, headaches, and sometimes blurred or double vision during reading, making comprehension and attention poor. Unfortunately, the condition is often not diagnosed. School vision screening can't check for it, and it is often missed in routine eye exams.

The National Eye Institute, a branch of the National Institutes of Health (the medical research branch of the US Department of Health and Human Services) has been studying convergence insufficiency to determine the most effective course of treatment. Called the Convergence Insufficiency Treatment Trial (CITT), the study was conducted at medical research centers throughout the country, including the Mayo Clinic of Rochester, MN; the Bascom Palmer Eye Institute of Miami, FL; and the Ratner Children's Eye Center at the San Diego School of Medicine. The results of the study were published in the fall of 2008.

The study concluded that office-based vision therapy in conjunction with daily exercises at home is the only effective treatment option for convergence insufficiency. Other treatment options--including home exercises called pencil pushups and computer software programs--were significantly less effective than office-based vision therapy. For more information on the study, [click here](#).



Dear Abby

School woes caused by vision disorder

Dear Abby:

Please help me get the word out about a common condition that severely affects children's ability to succeed in school because it inhibits reading, spelling and concentration.

My daughter, who was obviously bright, tested at first-grade reading level in fifth grade. She had undergone all the school testing for learning disabilities, plus two days of testing at a respected university hospital. None of these tests or specialists revealed what could be wrong with her.

My child's self-esteem suffered. Her confidence faltered; she began acting out in school. At home she was a great kid, until it came time for schoolwork. Then the battles began. She thought she was dumb. When studying, she could read for only a very short time. She often begged me to read things to her. When working on spelling and assigned to rewrite the words she missed five times, she often recopied them wrong. We thought she just wasn't trying.

After much research on the Internet, I came across a disorder called "convergence insufficiency disorder." This visual condition is the leading cause of eyestrain. Fortunately, we had the opportunity to have her tested at the Mayo Clinic, where her condition was confirmed, and she was successfully treated with vision therapy.

It was as though a miracle had occurred. After six months of treatment, my daughter is almost at her age-appropriate reading level. Her comprehension and retention have markedly increased, and her self-esteem and attitude about reading are much better.

Children with this condition will not benefit from tutoring, special education or extra help from teachers until the condition is diagnosed and treated. My child had 20/20 vision and still had this disorder. It's not routinely checked with eye exams, and schools don't test for it.

I suspect that many children out there are undiagnosed or misdiagnosed and going untreated. The treatment for convergence insufficiency disorder is noninvasive, effective, and much of it can be done at home. Please help me get the word out so other families won't have to go through what we experienced. -- Angie W. in Minnesota

Dear Angie:

I am pleased to help you get the word out to other families whose children are struggling to learn. After reading your letter, I contacted my experts at the Mayo Clinic in Rochester, Minn., and was informed that this problem, where the eyes drift too much inward (or outward) in attempting to focus, can also be present in adults.

The symptoms can include eyestrain, headaches, blurred vision, sleepiness and trouble retaining information when reading. Other symptoms associated with convergence insufficiency include a "pulling" sensation around the eyes, the rubbing or closing of one eye when reading, words seeming to "jump" or "float" across the page, needing to reread the same line of words, frequent loss of place, general inability to concentrate and short attention span.

The good news is: Vision exercises can fix the problem in most cases, some done at home and some performed in-office with a vision therapist. Prism glasses are another option; however, they are more often prescribed for adults with this disorder than for children.



Going Binocular: Susan's First Snowfall

National Public Radio, [Morning Edition](#), June 26, 2006

This story begins with a chance conversation. Susan Barry, professor of neuroscience at Mount Holyoke College, was at a party when she happened to bump into Dr. Oliver Sacks. Sacks is a polymath. He's a physician and an author (*The Man Who Mistook His Wife for a Hat*, and *Awakenings*). His work has been turned into plays (one by Harold Pinter), short stories and movies (Robin Williams played him). He is also a marathon swimmer, a lover of ferns — and, as it happens, he is fascinated by stereoscopy.

Stereopsis is the ability to perceive depth and space. So instead of seeing something as flat, in two dimensions, when you see in stereo you see it in three dimensions. Some people find stereovision completely fascinating. So because Dr. Sacks has this enthusiasm, he was intrigued at the party when Susan Barry mentioned that she had been born cross-eyed. The problem wasn't surgically treated until she was past her second birthday.

Apparently, that two-year pause was crucial, because when she got to college, Barry learned that if baby cats or baby monkeys are cross-eyed during infancy, their eyes don't learn to work together and therefore their binocular brain cells don't develop and they lose the chance to see in stereo. The loss is forever, and what happens to baby cats, the professor said, happens to baby humans.

"Like me?" Barry wondered. She never imagined that she saw differently from other kids. But after the professor raised the question, Barry got herself tested and discovered she was indeed monocular. She could not see depth or space the way the rest of us do.

All this she told Oliver Sacks. She also told Sacks that she didn't think she was missing very much, not seeing in stereo. And that's when Sacks leaned in really close and said, "Do you think you can imagine what it's like to see the world with two eyes?"



Well, miracles do happen. Barry found out what it's like. And she wasn't imagining.

Near the approach of Barry's 50th birthday, Barry met Dr. Theresa Ruggiero, an optometrist who specializes in vision therapy. Barry started a vision therapy program and will never forget the astonishing moment some months later when against all expectations, her vision suddenly — after a half century — popped into 3-D. You can

hear her amazing account of this moment on National Public Radio Morning Edition website by [clicking here](#). Barry's vision is also the subject of an Oliver Sacks essay in the *New Yorker* magazine. For an abstract, [click here](#).

Barry's experience, it turns out, is not unique. Apparently other people have spent their lives with visual deficits expected to last forever and, through vision therapies suggested by their eye doctors, they say they have gotten back some of the sense they had lost.

What is especially fascinating about all these stories is they suggest that brains are more "plastic" — more changeable and repairable in adulthood — than many scientists and doctors had thought.

For a long time, leading neuroscientists taught that there is a brief "critical period" in infancy when a baby brain can rewire itself and change; when that period ends, change stops.

It would follow that if you are born cross-eyed and do nothing about it until you are 2 years old, you can never learn to see in stereo. Barry's story (and the others if they prove to be true) suggest that while baby brains are more malleable than adult brains, adult brains are not frozen in place.

They can change. Barry's did.

Miller: a vision for improving education

By Emily Sapienza
VillageSoup/Knox County Times Reporter

Debbie Miller is a woman with a vision. And she is willing to take big risks to see it realized.

Miller has a vision of a world with fewer children in special education and more in advanced placement; with fewer young people in juvenile detention, and more in higher education.

In her words, it's a vision of how to "save the world."

A cure for these social ills is more simple and more easily attained than people realize, said Miller. For the last 13 years Miller, 55, has dedicated all of her free time and much of her financial resources to alerting school systems and parents to a problem she has termed "functional vision issues."

Functional vision issues are problems in the synchronized movement of the eyes. People with functional vision issues have trouble moving their eyes in unison. Functional vision issues are not caused by medical problems such as nearsighted or farsighted vision, said Miller. But the issues often result in difficulties reading and therefore in learning and paying attention in school.

Children with functional vision issues are frequently misdiagnosed as learning disabled, said Miller, and are then treated through placement in special education programs that fail to address the issue and cost school systems a lot of money. She believes as much as 20 percent of the population could suffer from functional vision problems.

There are 21 different issues with functional vision that have been identified, though the most common are convergence excess, when the eyes aim closer than the object a person is trying to see; convergence insufficiency, when the eyes aim farther away than the object they are supposed to be pointing to; accommodative infacility, when the eyes do not focus on a visual space at the same distance; oculomotor dysfunction, when one eye produces a jerking motion during reading; and suppression, in which children shut out sight in one eye to enable them to see better, according to Miller's book "Imagine Seeing Thru My Eyes!"

Miller believes the answer to this problem is to screen elementary school students for functional vision issues. Working with optometrists, she designed a screening test and then an exercise program for the eyes that treats functional vision issues, making it possible for students to read. Treating these vision issues will keep children succeeding in school, which will in turn have a positive impact on many of the social problems the United States faces, said Miller.



Debbie Miller

Miller's journey to raise awareness about functional vision issues began when her own daughter Kim had trouble reading in the second grade. They were living in Florida at the time. Up until then, Kim had always been a good student who enjoyed school, said Miller. But in second grade, Miller said, Kim's teacher said Kim should be put to bed earlier because she constantly had her head down on the desk.

"Kim wasn't tired," said Miller. "She had convergence excess."

Convergence excess is one issue in functional vision that causes the eyes to converge when tracking words across a page. By putting her head down, Kim was actually attempting to cover one eye so she could read comfortably, said Miller. It took three years and countless visits to specialists before Kim was diagnosed, however. In that time she was placed in special education classes, developed behavior issues in school and became a pretty unhappy child, said Miller.

Miller had suspected that Kim's eyes might have been part of the problem. But she couldn't prove it, she said. "She had medically healthy eyes," said Miller. "She passed all the school eye screens."

Eventually, an acquaintance recommended that Miller take Kim to see an optometrist named Dr. Steven Franzblau. Franzblau identified the problem and provided exercises that trained Kim's eyes to work in unison again.

After Kim's convergence excess was treated, her behavior issues disappeared, said Miller, and by the end of the school year she was reading at grade level again.

With her daughter's issues taken care of, Miller was ready to move on to other things, until she thought about the other children who might be suffering in silence from similar vision issues. Working with Franzblau and two other optometrists, Dr. Rick Morris and Dr. Lawrence Lampert, Miller founded Future Vision Youth Development Inc., a nonprofit organization that aims to identify and treat functional vision problems.

Functional vision issues often present themselves around third grade, said Miller, because that is when most students begin to read books with longer paragraphs that require the reader to track their eyes back and forth across the page, she said. "If we can catch this in third grade, we've got it," said Miller.

Future Vision Youth Development worked within the public school system in Palm Beach County, Fla., running programs that screened students for functional vision issues and then treated them with vision therapy administered by optometrists certified as fellows of the "College of Optometrists in Vision Development."

It was Miller's dream to expand the program across the Florida public school system. She spent her free time and almost all of her money working to that end. She applied for grants, she went before school committees, she did everything she could to further her own vision of helping children by addressing their vision issues.

When Miller moved to Maine with her family in 2000, she was out of money but she was still dedicated to her goal, she said. Miller recently published a book "Imagine Seeing Thru My Eyes," which details functional vision and her experiences working in the field. It is her hope to bring her programs to the Maine public school system, she said. "I want Maine to do this," she said. "I want the industry built here. I want to develop education in the nation, whatever I have to do."

Miller believes that addressing functional vision can "effect change in the entire nation in the education system."

"That's what I want," she said. "I expect it to happen. There's no doubt in my mind."

Miller holds a master's degree in human relations from the New York Institute of Technology. While studying for her master's she did field work in psychiatric wards, where she worked with teenagers. "Most of the children in the psych ward had trouble in school," she said.

Catching vision problems and correcting them early will prevent countless children from ending up in costly special education programs, Miller said. "Instead of 'No child left behind' it will be 'catch me if you can,'" Miller said.

"This is a story about changing the world ... It's not going to change the world overnight. It's going to be subtle. But it's such good stuff."

Miller's book is available online and at area libraries.

No Need For Children With Lazy Eye To Wear Patches All Day

ScienceDaily (Sep. 17, 2007) — Children with amblyopia (commonly known as lazy eye) need only wear an eye patch for three to four hours a day for 12 weeks to improve vision, say researchers in a study recently published on the British Medical Journal website.



Patching for all waking hours for up to several years, which is often recommended, is almost certainly excessive, they argue.

Amblyopia results from a disturbance to the vision pathways between the eyes and the brain, which is often associated with blurred vision or crossed eyes (strabismus).

Studies have shown that occlusion therapy (patching) can improve vision, but results suggest that "maximal" doses (12 hours a day) are no more beneficial than "substantial" doses (six hours a day). Despite this, many doctors still prescribe large doses, above six hours a day.

So researchers at City University in London and McGill University in Montreal funded by Fight for Sight, London, set out to determine the amount of occlusion treatment required in children with amblyopia to achieve the best outcome.

The study involved 97 children aged 3-8 years with a confirmed diagnosis of amblyopia. All children had a full ophthalmic assessment and were instructed to wear glasses all the time for 18 weeks. On completion of this phase, 80 children who still met the study's definition of amblyopia were then told to wear a patch for either six or 12 hours a day.

Two electrodes were attached to the under surface of each patch to monitor the amount of occlusion each child actually received. Visual function was recorded every two weeks.

There was no significant difference in visual acuity between the two groups. However, the mean dose rates (hours a day with a patch) actually achieved were also not significantly different (4.2 in the six hour group and 6.2 in the 12 hour group).

Visual improvement was similar for those children who received 3-6 hours a day or 6-12 hours a day, but significantly worse for children who received less than three hours a day.

Children under 4 years of age required significantly less occlusion (under three hours a day) than older children to correct their vision.

This analysis suggests that achieving an initial dose rate of three to four hours a day should be a clinical priority, say the authors. The response depends on age, however, so for children under 4 years this could be reduced. Patching beyond 12 weeks did not confer additional benefit.

Eye patching can cause considerable distress for both the child and family, they add, so doctors should try to minimise the amounts necessary for the best expected outcome.

If you would like more information on learning-related vision problems, contact the national offices of Parents Active for Vision Education (PAVE), a nonprofit organization whose mission is to educate parents and teachers on the vital role vision plays in the learning process. Their toll free number is 1-800-PAVE-988.