

Sensory Integration Issues

A Mind-Eye Approach

“...just because your child's eyesight is 20/20, don't be so quick to assume all is well.”

By Deborah Zelinsky

The eyes may be the windows to the soul, but did you know that in infants, children and adults, eyes are also a door to the senses? When it comes to the eye, a whole lot more is going on inside than people may realize. In fact, undetected visual problems may contribute to future learning and/or behavioral issues.

Most of the brain activity that occurs when light strikes an eye, about eighty percent, is related directly to sight. Yet the remaining twenty percent gives the brain a whole gamut of information about the surrounding environment. For instance, researchers at Stanford University Medical Center have used MRIs to definitively demonstrate brain connections between visual and auditory processing. (Human Brain Mapping. 2008 July; 29(7): 848–857. In addition to hearing, the eye is linked with spatial orientation and balance, sleep cycles and body temperature. And since visual systems are so significant, changes to them can have far-reaching effects.

A growing group of rehabilitation professionals are focusing on the untapped potential of treatment via the eye. One organization, NORA, the Neuro-Optometric Rehabilitation Association, brings together doctors, therapists, and researchers from a range of disciplines to find new ways to help patients. The research also gives parents and caregivers insight into how to assist a child's sensory development from earliest infancy, so that many common issues can be avoided. Challenged children stand to benefit quite a bit from early neuro-optometric evaluation, allowing caregivers to head several

types of problems off in advance.

For instance, four-year-old Eric, who had multiple ear infections as a baby, refuses to speak with his grandmother on the phone. In fact, although he adores her in person, he becomes very distressed when she calls. His hearing tests fine, but since his visual and auditory development are out-of-sync, he can't visualize his grandmother's face when he hears her voice.

Little Gina was recently prescribed glasses. She is suddenly unable to locate her mother at the playground. "I'm right here, honey," calls her mother from behind her. She looks this way and that, but for some reason is not able to locate the source of her mother's voice. The glasses corrected Gina's central vision, but they changed the way she experiences her outer environment. Light bending onto her peripheral retina in a different way is confusing her auditory systems.

Later, in kindergarten and first grade, Eric and Gina are not ready for reading. They cannot seem to connect the printed shapes of words and letters with the familiar sounds and words they know, while their classmates have no trouble relating sounds to pictures and symbols. As they get older, they cannot take notes and understand the teacher at the same time. They also have subtle social skills problems. They are among the many children who are unable to watch and listen simultaneously.

Eric and Gina could have had an easier road if their sensory integration problems had been pinpointed earlier. Their parents certainly would have noticed a motor problem. But they could not peer into their children's eyes to see if their visual skills were developmentally on par.

Preschool screenings did not "catch on" to

their problems as they were tested for eyes and ears separately, however life requires that they are used together. General optometry, as well, usually tests aiming and focusing abilities separately under controlled conditions concentrating on eyesight functions. Since Eric's eyesight was 20/20, who would think he had a visual problem? Specialized neuro-optometrists look for many integrated issues, which allows them to often give a fuller picture of the child's neurological development. It is then possible to offer solutions in the form of customized eyeglasses or other appliances to remedy the problems.

WHAT CAN PARENTS DO?

Besides professional attention, parents can do a lot at home to promote healthy linkages. It's important to understand that development of visual processing requires stimulation at different stages and of different types. Central processing, peripheral vision, and linkages with other senses have typical timetables. If a child has missed some of these milestones due to health issues or other impairments, his long-term development will also be affected. Watching out for warning signs, supplementing with stimulating activities, and intervening early can help the child integrate later into school, older childhood, and adult life much more easily.

BEFORE BIRTH

Eye-brain development and its integration with other senses starts in the uterus, as the baby's head shifts from place to place. If the pregnant woman can't provide enough movement due to bed rest, or if the uterus is crowded with multiple fetuses, this stage in visual development could be delayed.



While there is not much you can do to change these situations before birth, make a mental note to provide additional stimulation after he is born.

NEWBORNS AND INFANTS

Peripheral eyesight should typically begin to develop right after birth, when the baby begins to visually scan his surroundings. If, however, he is fighting an internal struggle for health or survival, he won't be spending much time analyzing the external world, and peripheral eyesight development will be delayed. Parents can stimulate and enhance this crucial growth in several simple ways. For instance, they can alternate arms during feedings so each eye gets equal action. This will happen naturally for breast-fed infants, but the parent can remember to do it for bottle-fed babies as well.

(Binocular vision begins to develop between four and six months of age. Before this, it is common to see one eye wandering around while the other is fixating. This is normal and should not be a cause for concern.)

Making sure the baby's neck and shoulders are working properly is also important. The brain is learning how to control and

direct the eyes, what to anticipate in the environment, and where the individual is located in space. The reflexive visual processing centers in the brain are also supposed to develop a neurological connection to neck and shoulder muscles -- if the child is not able to move her neck and shoulders freely at an early age, many aspects of her vision will also be affected.

Eye muscle control is developing as the baby first looks at large, general objects and later at smaller details. This is important because when it's time for reading, the child will have to progress from big colorful pictures to large words and then to smaller printed text. Parents can encourage eye muscle use by changing the crib location from time to time. The baby will scan the room for important features such as the door ("that hole in the wall where my Mommy comes in"). They could also occasionally move the baby's car seat to a new spot in the car. An added benefit: Besides the scanning practice, it will also help get the child's senses used to reacting to changes in her environment. Doing this from infancy can help prevent the distress that some challenged children have when everything suddenly "looks different."

TODDLER/OLDER CHILD

As the child grows older, visual-motor skills need to blossom. The child should start to understand that there are different sides - left and right, front and back. And she should be able to create internal visual pictures to help her plan and orient her actions in space and even in time.

In the blue box below you will find some quick tips to help your very young child keep his sensory development on track. If you suspect your child has a sensory integration issue that would benefit from treatment, a neuro-developmental optometrist can be located through www.nora.cc or www.covd.org (College of Optometry and Vision Development). Professional development and continuing education is available through www.oepf.org (Optometric Extension Program).



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QUICK TIPS FOR THE VERY YOUNG CHILD

LIMIT TELEVISION, ELECTRONICS AND SCREENS

In today's technology-packed world, parents may have to try harder to provide the types of low-tech physical experiences so beneficial for eye-brain development. Car travel, television viewing and computer use must be well-balanced with old-fashioned, outdoor, large muscle play. Also, the modern trend of quickly flashing images is confusing to developing visual systems, not allowing enough time for central processing and throwing things off-kilter. Choose tamer programs with one central character to follow, such as Dora the Explorer, if you must.

BROADEN YOUR VIEW

"Go outside and play" is a great piece of advice. In addition to the wide variety of visual stimuli out of doors, children must continually focus on near and far objects.

HOP, SKIP AND JUMP

Physical activity affects the sensory system. A mobile child of five should be able to skip down the block, with the right arm and left leg moving forward together, and vice versa. Difficulty doing this could be a warning sign for neurological problems. Less mobile, even wheelchair bound kids can visualize the movements, which some studies show can be similarly effective. For the child whose neck and shoulder movement was restricted in

infancy, exaggerated arm swinging while walking can be very helpful.

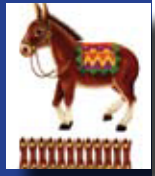
LEFT AND RIGHT

Use the words "left" and "right" as part of your daily vocabulary. Even if the child is not yet able to distinguish sides, she should be made aware of the concept.

GAMES

Parents could provide opportunities to exercise visual memory, adding in verbal cues and motions. Can your child visualize something without seeing it? Four-year-olds will enjoy the pillowcase game: gather some familiar

objects inside a pillowcase. Take turns feeling the items, describing them and guessing what they might be. Other blind-fold games such as "Pin the Tail on the Donkey" and "Marco Polo" are great for this, too.



IN YOUR MIND'S EYE

Here are some other games that will stimulate visual imagination. Draw ABC letters on your child's back instead of on paper or reading them from a book. This is a great bed-time activity. While waiting at a restaurant, make a design with forks and spoons on the table, then cover it up with a napkin. Next, ask the child to copy the pattern from memory with her own forks and spoons.

KEYS

Giving children their own keychain with keys helps them learn to visually distinguish sizes, shapes, and color differences.

MARKING TIME

You can even teach children to visualize time! Mark off days on a calendar toward a birthday or other event. It's seven pages (months) until their party. Now it's only five pages. Now it's only three boxes (days).

WATCH AND LISTEN

Emphasize the auditory component: Make a game of clapping in patterns and ask the child to repeat the rhythm. Play an easy version of "Simon Says". Read picture books aloud and have the child point in answer to questions.

CONCLUSION

All of these activities stimulate those hidden brain centers that are connected to the peripheral retina. Developing these senses together will help your child connect what is heard, seen and felt, and will prepare your child for higher level tasks such as reading, picking up on other people's facial expressions, and understanding abstract concepts.

