

Crosses to bear no more?

One of the banes of childhood is crossed eyes. Roughly 3 percent of U.S. children under the age of 3 suffer the condition. Eye exercises and drug treatment help some kids, but for others, surgery is necessary. And uncrossed eyes can be like children — they just don't want to stay put.

The key to avoiding second, third and sometimes fourth eye operations may lie in letting the brain enjoy uncrossed eyes, via lenses, prior to surgery. Uncontrolled trials at Wayne State University in Detroit and the University of Iowa in Iowa City using this concept on about 115 children have brought the usual 50 to 60 percent success rate of an initial operation up to over 90 percent.

Crossed eyes foul up stereoscopic vision — since each eye is looking at something different, the brain cannot integrate the message from each eye into a three-dimensional scene.

In the study, children with crossed eyes were fitted with prisms that bend the light so the eye sees what it would if it were properly aligned. "We're producing an ocular alignment via optical means," says John D. Baker of Wayne State, one of the investigators. Often the eyes cross further but, Baker says, they eventually stabilize. The degree of surgical correction is based on the final eye position. In surgery, eye muscles that pull the eyeball off course are severed from the eyeball and reattached at a point where they will not skew alignment.

An 11-center National Eye Institute study of 300 to 400 children aims to determine the success of the procedure. The trial, kicked off last spring, will also determine whether the benefit comes from finding a truer angle of crossing or by "priming" the brain to deal with stereoscopic vision, so that when the third dimension is endowed surgically the brain will lock onto it.

Down the up escalator

The best way to approach a moving stairway, says Theodore L. Cohn, is from the side, with one eye closed. It may look a little furtive, but such a strategy could prevent some of the 60,000 falls that occur on escalators in the United States each year, the University of California at Berkeley professor says.

The falls can result from disorientation caused by the way we see the cleats and grooves on each step, Cohn says. The lines of each step are so close together and so difficult to distinguish that each eye focuses on a different point, skewing the brain's ability to calculate the distance. The step can look 5 inches above or below its actual location.

"Closing one eye while viewing an escalator turns off the depth illusion, and disorientation does not occur," Cohn says. Tilting the head helps keep the brain from fusing the striped patterns.

Glaucoma rates high in blacks

While a disproportionately high incidence of glaucoma-caused blindness among blacks has been known since the 1960s, the problem is just beginning to get attention. Johns Hopkins University has just begun a five-year study of possible reasons. An initial survey at the university's eye clinic in Baltimore indicated that while blacks make up 49 percent of the patients, they represent 82 percent of the glaucoma sufferers. Socioeconomic factors being considered in the survey include poorer health care and lower drug-taking compliance, but, says Hopkins's Alfred Sommer, "The results strongly suggest to us that there is a strong biologic difference in risk of glaucoma between blacks and whites."

In the eyes of a child

Testing an infant's vision isn't easy. They can't very well describe what they're seeing, so Anthony M. Norcia and his colleagues at the Medical Research Institute in San Francisco have developed a test that measures visual processing in the brain. In the procedure,

the researchers show babies increasingly finer patterns of stripes at a set clip, then look for the same rate of brain activity through electrodes glued to the babies' heads.

The researchers tested 250 infants and found that newborns are able to discern finer detail than had been believed. The vision of babies 1 to 4 weeks old is worse than adults' by only a factor of six — a level three to five times better than had been measured in cruder tests. "By the age of 8 months," Norcia says, "infants are very close to adult levels."

The finding has implications for when babies' eyesight should be corrected. Development of the brain's visual processing system occurs after birth and is driven by input from the environment. Since the quality of vision determines development, correction is necessary before development is completed.

"If the infant visual system is like the adult, it's very important that infants' vision is corrected," Norcia says. "If the poorer eye is deprived of input, connections will never form, and glasses [at a later age] won't make a difference."

Will babies wear glasses? Babies who need glasses adapt well to them, Norcia says.

But all is not lost if a child doesn't have perfect vision. While early visual acuity may determine later visual ability, absolutely perfect sight is not a *sine qua non* for school performance, according to Eugene M. Helveston of Indiana University School of Medicine in Indianapolis. He and his colleagues compared the visual ability of 1,910 Indiana first- through third-graders with their academic achievement. "There appeared to be no relation between eye function and academic performance," Helveston says. That's not to say children who need glasses shouldn't get them — all the children in the study with correctable vision had glasses.

What it does mean is that eye "training" programs, which can cost thousands of dollars, Helveston says, are not worthwhile. In these programs, children "train" their eyes by such exercises as following the movement of an object.

"Activities directed specifically at the eye to modify academic performance at this point do not have any justification," Helveston says. Minor eye problems — slight color blindness, eye crossing, refractive imperfections, difficulty in closely following a moving object — do not cause school failure, he says, so parents seeking to understand poor grades should look beyond their child's eyes.

No more tears?

The most common complaint at eye clinics is dry eye, and the usual solution is eye drops. Serious problems call for surgical blocking of the tear drainage site or tightening of the lids. But sometimes dry eye just won't quit, and when it persists it can turn the cornea, the clear covering over the iris and pupil, into dry, skinlike tissue, blurring or obscuring vision.

Putting artificial tears or drops into a dry eye is like putting a drop of water onto a piece of cellophane. "It just doesn't spread," says Scheffer Chuei-Goong Tseng of the Massachusetts Eye and Ear Infirmary in Boston.

Since vitamin A is important in eyesight, Tseng thought that supplying this factor might stimulate tear-producing cells called goblet cells. So he tried vitamin A ointment on 41 eyes in 23 people with chronic dry eye.

"After treatment, clinical symptoms of dryness, irritation and light sensitivity were invariably relieved in all cases," he reports. Tear production was also enhanced in all patients, and visual acuity in most patients improved. The vitamin A, he says, stimulates the development of goblet cells, curing rather than merely treating the condition.

"This new method of treatment with ointment containing vitamin A appears to be the first treatment modality, to our best knowledge, that can reverse the diseased tissue change," Tseng says.