BASIC ASSUMPTIONS

There are some assumptions that are basic to an understanding of how the visual system contributes to early development (and can impede development if dysfunctional). They are important to any discussion of visual impairment and young children, and must be understood if a philosophical foundation for intervention is to be established. Each assumption will be discussed separately, but, like building blocks, they should support each other in establishing a knowledge base.

Vision is the primary data-gathering system of the human organism.

Of all the senses, vision provides the most information to the brain. It is both a near and distance sense, and can integrate the information it gathers. Hearing is largely a sequential sense (gathering one piece of information at a time), and relies on vision to give meaning to sounds. Touch can only provide information within arm's reach (thus, is a near point sense), and can only collect data sequentially; it relies on the brain to integrate the data into a meaningful whole. Taste and smell are immediate senses and have a much narrower range of information-gathering abilities. Only vision can perceive shape, size, color, distance, and spatial location - all in one glance. The other senses together cannot provide equal information to the brain.

Vision is the feedback system for all other developing systems in the young child.

The infant's early development depends on vision, since all of the body systems require visual feedback for practice and refinement. When the visual system is impaired or dysfunctional, the other body systems do have a monitoring tool to assure their smooth and timely development. Every other body system can be delayed in developing when vision is severely impaired or absent. Early intervention can minimize or eliminate most delays but must be provided at the appropriate time - not after a delay occurs. It is the VI teacher who can make the appropriate suggestions for intervention activities, but must be an early member of the intervention team to do so.

You cannot wait until a vision loss has caused a developmental delay to bring in the VI teacher.

Current practice suggests that early intervention may be based on a deficit model. That is, strategies address delays. The time to intervene is before the delay occurs; the goal is to **prevent** the delay, if possible. That is why the identification of a vision problem, as early as possible (through vision screening and follow-up treatment) is essential. As soon as a visual problem is identified, the VI teacher should be called upon to be a member of the IFSP team. The sooner intervention can be provided, the more likely it is that delays can be minimized or prevented.

Vision happens in the brain, not in the eyes.

The visual system is made up of an ocular system (the eyes and eye muscles) connected to a perceptual (understanding) system - the brain. Each without the other is diminished in function. It takes both eyes and brain for vision to occur. When **either** system is dysfunctional or defective, the visual system becomes impaired and cannot provide adequate visual information for the infant or child. Thus, brain damage will have implications for visual function, and ocular defects can have impact on cognitive function. The two systems are inter-related, inter-connected, and interactive. This is a basic concept essential to early intervention.

You don't conserve vision by not using it.

You cannot "save" vision; it must be used to be effective. Moreover, it must be practiced to become most efficient. The most critical time for visual "practice" is in the first few years of life, when the eye-brain connections are being made. Early intervention activities during those early years can help establish good visual patterns that utilize maximum available vision.

Age-of-onset is a critical factor in visual impairment.

Visual impairments that exist at birth (i.e., are "congenital") are more likely to cause developmental delays than visual problems that occur

later. The identification of visual defects or diseases, as early as possible, can have long-term advantages for the child, since immediate treatment and early intervention may minimize the deleterious effects. Visual conditions whose effects occur later (as in a progressive disease or defect) may allow the earliest development to progress normally, with intact or useful vision present to assist in the process. Even several months or a year of useful vision (even when impaired) can imprint visual patterns in the brain; such visual memory can provide spatial references that will become essential to orientation and mobility later.

At least 60% of the current population of disabled children, B-3. have multiple disabilities, and visual impairments are very likely to be among those disabilities

Since the visual system is neurologically based, any defect in, or disease of, the neurological system (including the brain) can also affect vision. Many disabling conditions involve the brain (e.g., brain damage, mental retardation, cerebral palsy), and a high number of these children may also have vision problems. Keeping in mind that the visual system depends on the brain for understanding of visual stimuli, it is evident that when the brain does not function as it should, the visual system cannot function adequately either. No amount of visual stimulation, training, or therapy can change the way the brain processes if the capability is not present. The one exception to this rule is in cortical visual impairment (CVI): because of the "plasticity" of the young brain, visual intervention may be effective in improving visual function, but the "rule of thumb" is usually "the earlier the better." The prognosis for increased visual function is better for a two year old than for a five or six year old.

Development occurs in sequential steps, but the timing varies with the individual child.

Most early childhood "experts" agree that early development progresses in an orderly fashion. Body systems mature in time for developmental milestones to occur. Eyes and hands become coordinated in time for reach to become a functional skill. Muscles in the neck, arms, and torso gain sufficient strength and coordination to allow sitting. Motor coordination and visual acuity develop in time for locomotion (creeping and crawling) to happen. Individual differences

are in the timing, not in the sequences. Developmental "norms" are based on when **most** children achieve milestone skills, but there is temporal latitude (range of months) incorporated into the norms. With intervention, otherwise intact visually impaired children can achieve the same milestone skills as sighted children; it might just take a little longer. Current research (Project Prism) suggests that early intervention for visually impaired infants and toddlers is effective.

Development proceeds in an organized, predictable way

It has been observed repeatedly that the progression is: from head to tail (or top to bottom - cephalocaudal), near to far (proximodistal), and gross to fine. The brain controls the head and neck before the torso, which is before the arms and legs. Arm movement is refined before hand movement, and torso/hip movement before leg movement. Gross movement is learned before fine motor skills (e.g., hand and finger control) and walking. This progression is as true of visually impaired children as it is of normally sighted children; the timing - and the need for additional practice - are the only adjustments in the process. Visually impaired children may need appropriate intervention and extra practice (and may take longer) to achieve their skills, but are usually (in the absence of other disabilities) physically capable of reaching developmental milestones in a timely fashion.

The early years - from birth to age 6 - are especially critical developmental years for visually impaired children.

Although there is increasing research to support the importance of the early years for all children, visually impaired youngsters are at even greater risk for developmental delays entire learning experience of a visually impaired child. It is crucial that VI specialists (both VI teachers and O&M specialists), parents and early childhood personnel work cooperatively with young visually impaired children, in order to build the skills and provide the experiences that will make best use of the potential in these children. (Occupational therapists and/or physical therapists may also be part of the critical team.)

There are "windows of opportunity" for development and learning.

Educators have long accepted the concept of "readiness" in learning (although it is not necessarily universally **practiced**). Beginning reading depends on a mature visual system, the recognition of similar/different written configurations, and motivation. Beginning math instruction relies on the acquisition of one-to-one correspondence, conservation, and symbolic decoding. Phonics is a reading approach that is most effective during the first three years of school. So it is for vision. The first 6-8 weeks of life are critical in stimulating retinal function; defective vision that prevents this stimulation during that time period (as in congenital cataracts) can cause impaired vision for life, despite treatment. "Vision stimulation" as an intervention technique may be most effective during the first year or two of life, both chronologically and developmentally, and may be ineffective later on; the "window of opportunity" may have passed by the time a child is school age. When eyes are not in alignment (allowing fusion to occur), a permanent vision loss (amblyopia) can occur if the condition is left untreated. Age two is the peak time for treatment, and the prognosis for improvement (i.e., alleviating the amblyopia) lessens a little with each passing year; after about age 7 or 8, prognosis for improvement is almost nil . The VI teacher can recommend appropriate techniques and timing, for individual situations.

Hearing is not an equal motivator in encouraging "reach:"

It is often assumed that a sound-making lure can be substituted for a visual stimuli in encouraging a visually impaired infant to reach for an object. This is an erroneous assumption, however, since there's a mismatch in timing between when an infant is physically ready to reach (by about 5 months) and when auditory processing ability can attach some meaning to sound (the last quarter of the first year). Since the development of reach is critical for severely visually impaired infants (they will use their hands to explore their environment, and to attach meaning to their world), it should be a primary goal for all visually impaired infants. The VI teacher will have some ideas or suggestions to help motivate a visually impaired infant to reach out.