There are many signs and symptoms that present very early as risk factors. Some of these signs and symptoms resolve during the course of development and some do not. Each of these signs and symptoms must be carefully monitored to ensure proper and appropriate development. For those that do not, early intervention is necessary and important to allow the child to reach full potential.

**ARNOLD GESELL, M.D.**

Vision is the key to a child’s whole development, therefore;
If vision is not working well, the child is not working well

**John W. Streff, O.D.**

When vision is working well, it guides and leads.
When it is not, it interferes

Vision is critical to all areas of development and learning. Moreover, the effective and efficient use of vision, including visual function and visual perception, is learned and follows a developmental progression

Zambone, AM Serving the young child with visual impairments: An overview of disability impact and intervention needs. Infant and Young Children 1989

**Social and Emotional Milestones at 12 months of age**

- Shy or anxious with strangers
- Cries when mother or father leaves
- Enjoys imitating people in his play
- Shows specific preferences for certain people and toys
- Tests parental responses to her actions during feedings
- Tests parental responses to his behavior
- May be fearful in some situations
- Prefers mother and/or regular caregiver over all others
- Repeats sounds or gestures for attention
- Finger-feeds herself
- Extends arm or leg to help when being dressed

**Cognitive Milestones at 12 Months of age**

- Explores objects in many different ways (shaking, banging, throwing, dropping)
- Finds hidden objects easily
- Looks at correct picture when the image is named
- Imitates gestures
- Begins to use objects correctly (drinking from cup, brushing hair, dialing phone, listening to receiver)

**Autism Markers at 12 months of age**

- By 2 to 3 months, your baby isn't making frequent eye contact.
By 3 months, he isn't smiling at you and the sound of your voice.
By 6 months, he doesn't laugh or make other joyful expressions.
Around 8 months, he isn't following your gaze when you look away from him towards something else.
By 9 months, he hasn't begun to babble.
By 1 year, he isn't consistently turning to you when you call his name
By 1 year, he shows a general disregard for vocalizations (ie, lack of response to his name), but has a keen awareness of environmental sounds.
By 1 year, he isn't engaging in back-and-forth vocalizations with you.
By 1 year, he hasn't begun to wave bye-bye.
By 1 year, he isn't "following a point" (looking towards something you point at).

Markers for Autism at 12 months of age
- Infant's Gaze May Be an Early, but Subtle, Marker for Autism Risk
  - *Journal of Child Psychology and Psychiatry* – Sept 2010
- Visual Pattern Preference May Be Indicator of Autism in Toddlers
  - *Archives of General Psychiatry* - September 6 issue
- Children With Autism Show Slower Pupil Responses
  - *Journal of Autism and Developmental Disorders*

Gaze Following
- Active gaze following by 12 months
  - 335 words – known by 18 months
- Babies without Active gaze following or other patterns patterns–
  - 195 words known by 18 months

The development of gaze following and its relation to language
*Developmental Science* 8:6 (2005), pp 535–543

**ACADEMIC DEMANDS ON STUDENTS**
- 1950
  - No kindergarten
  - No computer
  - Six kids in my class
- 1975
  - Kindergarten
  - One computer for the school
  - 30 kids in a portable classroom
- 2005
  - At least one computer in every classroom
  - Summer reading programs
  - Pressure for grades
- 2015??
  - Every student has a wireless hand-held computer
  - Will current standards be meaningless?
**Additional Visual Demands Kids Place on Themselves**
- Hand-held computer games
- Surfing the net
- TV shows
- The issue is not that kids use them – it is that they use/play them obsessively

**Adaptation**
- Normal Performance – Who has it?
- Stress – What is it?
- Stressed Performance – Who doesn’t have it?
- Adaptation – The result we measure

**Evaluation Strategies**

**Overview**
- As we evaluate, look at the child’s particular behavioral patterns
  - What is their strategy
  - Respect the child’s chosen modality for learning
- Expand the efficiency of other/all modalities to allow for greater options

**Refraction**
- Non-cycloplegic refraction to monitor variability that has a purpose
- Getman Observations – 50’s
- Forrest Observations – 70’s
- Tom Norton’s Work – 80’s
- Earl Smith’s Work – 90’s
- Whatham and Judge’s work – 01
- Steele’s Observation - 05

**Getman - OEP Papers-1950’s**
- Scissors motion at near - spherical at intermediate and far
- (-) X 90 at near - sph at int and far
- (-) X 180 at near - sph at int at far
- Spherical at near, int and far
- Went through the same process at intermediate and far distances

**Forrest Article AAO – 1970’s**
- PI –6.00 X 090 OU  20/20
- Auto accident and in traction
- C/O difficulty seeing with glasses
- PI –1.25 X 090  20/20
- Limitation of eye movement in the power meridian is associated with higher measurable astigmatism

**Tom Norton – UAB -1980’s**
- One-half ping pong ball on laboratory animal’s eye
- The part of the retina receiving stimulation showed normal growth
- The part of the retina with no form stimulation developed significant myopia
Earl Smith – UHCO – 1990’s
• +5.00, -5.00, +10.00, -10.00
• Eyes tend to grow toward the stimulus except for the +10.00 which also grew toward myopia

Whatham and Judge 2001
• Study done on ten laboratory animals
• Soft contact lenses on one eye only
• Eye with plus CTL showed more plus on cyclo
• Eye with minus CTL showed more minus
• Eye with no CTL or a plano CTL were relatively unaffected

Glen Steele – CVTC - 2005
• Retinoscopy demonstration - patient JH
• Moderate astigmatism X180 (+2.00 -2.00 X 180)
• Reached for target
• Plus and cyl decreased to Pl sph

CASES DEMONSTRATING THE IMPORTANCE OF EARLY INTERVENTION

Early CE Case
Age 10
Reduced stereo at near
High BO and low BI
Slight EP’
Reduced Accommodation

WHAT IS YOUR PLAN?

Early CI Case
Squinting one eye when outside
Reduced distance stereo – full near stereo
Exo at nearpoint – ortho at farpoint

WHAT IS YOUR PLAN?

Early XT Case
Squinting one eye when outside
Reduce distance stereo – full near stereo
Ortho at nearpoint – exp at farpoint

WHAT IS YOUR PLAN?

AS  age 3
• Rx OD +7.00 + 0.50 X 090
  OS +8.50 + 1.00 X 090
• Does not like to wear her glasses!!
• Cannot see airplanes
• Distance ret – runs up in plus to +7.00 to +8.00
• First change at + 5.00
• Near ret – stable at +3.00
• Ocular motility normal
• Four Dots with and without glasses
• Positive response on KBB without Rx
• No apparent movement with 10 pd prism
• CT aligned w/o Rx on penlight
• Goes into ET when accommodative target is used
• Maintains alignment on accommodative target when current Rx is used
• Maintains alignment on accommodative target with +3.50
• Dilated fundus examination - normal

WHAT IS YOUR PLAN?

CJ
• CASE  C.J. Age 2
• Has been seeing Dr. _____ for six months
• Left eye began turning when she looked at objects very close
• See eye turn approximately 10% of the time
• Glasses Rx for +4.50 + 1.50 X 090
• Hirschberg – aligned throughout examination w and w/o Rx
• Positive response on KBB
• Retinoscopy - +2.00 at nearpoint
  o Does release into more plus on occasion
• Full EOM
• Ocular health normal

WHAT IS YOUR PLAN?