Steps in a Functional Vision Evaluation

Steps in a Functional Vision Evaluation outlines the first part of the evaluation completed by a licensed Teacher for the Blind/Visually Impaired (Functional Vision Evaluation, Learning Media Assessment, and Expanded Core Curriculum Assessment). The goal is to demonstrate how Minnesota eligibility criteria under visually impaired is related to the evaluation information.

The review of the eye report indicates when an evaluation of functional use of vision is necessary. The indicators that a student has a vision loss will be found in the medical information.

The medical information alone does not indicate eligibility for service under an Individualized Education Program (IEP). The second part of the criteria is designed to show need for intervention and/or special instruction to accommodate the vision loss and its impact on learning.

The Functional Vision Evaluation involves several areas that are medically and educationally intertwined. Need is shown when a physical vision loss that cannot be corrected with corrective lenses creates a barrier to access information for learning and living. The functional vision difficulties are directly related to the eye condition or disease and not to other factors (cognitive, perceptual, etc.).

Referral

- Child ages birth to 3: Early Childhood Vision Observation and Interview Protocol
- Review the referral to determine if the referral is for vision impairment
    - Medically based vision loss/disease/condition
    - Should include the name of the eye specialist
    - Should include release of information forms (to be sent directly to teacher of the blind and visually impaired (TBVI))

Request Report from Eye Specialist

- Ask for specific information from the eye specialist in your letter
    - Ocular history (syndrome or condition) _____
    - The age of onset was _____
    - Best corrected visual acuity at distance is _____
    - Best corrected visual acuity for reading is _____
    - Muscle function is _____
    - Intraocular pressure readings are _____
    - Visual field is _____
    - Color vision is _____
    - Sensitivity to light is _____

    - The prognosis is _____
    - The treatment recommended is _____
    - The following are precautions or suggestions _____
    - The patient has/does not have a serious visual loss after correction
- Send appropriate release forms with your request
- Follow up with a phone call to eye specialist's office
- Send a thank you note to the eye specialist when report is received

Review Eye Report

- Identify medical eligibility factors and disqualifiers using Minnesota Eligibility Criteria
    - Part A:
        - "Visual acuity of 20/60 or less in better eye with best conventional correction"
            - "Estimation of acuity for difficult-to-test pupils"
            - "For pre-kindergarten, measured acuity must be significantly deviant from what is developmentally age-appropriate"
        - "Visual field of 20 degrees or less, or bilateral scotomas"
        - "Congenital or degenerative condition e.g., progressive cataract, glaucoma, retinitis pigmentosa"
- If some or all of these factors are contained in the eye report, the evaluation for educational need proceeds
- Functional Evaluation is Part B of the criteria which shows the accessibility needs of the student with the vision loss
    - Part B
        - The student's file must include a functional evaluation of visual abilities. A licensed teacher of the visually impaired must determine the student has or experiences at least **one** of the following:
            - Limited ability in visually accessing program-appropriate educational media without modification
            - Limited ability to visually access full range of program- appropriate media and materials without accommodating actions such as changes in posture, body movement, squinting, focal distance, etc.
            - Variable visual ability due to environmental factors that cannot be controlled such as contrast, weather, color, or movement
            - Reduced or variable visual acuity doe to visual fatigue or factors common to the eye condition

Functional Vision Evaluation

- The Functional Vision Evaluation (FVE) provides the information for Part B of the Eligibility Criteria
    - Review Medical Eye Examination Report
    - Review Low Vision Examination Report (if available)
- Dr. Irene Topor, University of Arizona, Tucson, AZ: "A functional vision assessment measures how well a child uses vision to perform routine tasks in different places and with different materials throughout the day. The functional vision assessment 'paints a picture' of how a child uses vision and what visual skills the child needs to develop further."

Environment

- Evaluator
    - Bring as few items into the situation as possible—don't overwhelm
    - Wear plain dark or neutral color clothing to avoid visual distraction
    - Avoid wearing perfume/cologne
    - Avoid wearing jewelry or other visually distracting items
    - Use a calm and encouraging voice
    - Be clear, concise and consistent in your directions for tasks
    - Be aware of any visual or verbal cues you may be giving the student
    - Be aware of the student's age, experience, and ability level
    - Be respectful of all involved
- Natural
    - Observation of the student performing tasks and navigating within his/her natural environments (minimum of three)
    - Observation should be made in multiple settings—classroom, lunchroom, hallway, gym, playground, etc.
- Controlled
    - Provide specific tasks for the student to perform with structure and control of environmental features (lighting, positioning, etc.)
    - Distractions in the environment should be minimal
    - Directions to the student should be clear and concisely stated
    - Introduce items with visual-only characteristics first—add other sensory characteristics as cues
    - If there is no response (some are very subtle) try a different strategy of presentation (don't forget wait time)

Relationship

- Before interacting and/or touching an infant or toddler, ask permission from the parent(s)
- Build a level of trust before working with the young child
- With older students, build a level of trust prior to asking them to perform tasks
- Explain to the student (and to their teacher/paraprofessional) what you will be doing together
- Before interaction, find out from parents, caregivers, teachers what motivates the student to use his/her vision (or if anything startles the child)

Positioning

- Student must be positioned for the TBVI to clearly observe the eye movements, head position, body position, and movements used by the student to perform tasks and access information
- Student must be comfortably situated with sufficient support given to the trunk so the child's head and neck are stable for best access to vision (not always seated)
- Student should be rested, fully alert and attending; evaluator needs to know what alertness, attending and avoidance of visual tasks looks like for the student
- Items used during the assessment must be positioned with attention to distance, proximity, size, color, contrast and lighting
    - All factors should be noted during the assessment tasks
- Lighting/Illumination should be closely monitored for level of intensity, glare, position, and source
- A statement of validity should be included in the report that states student was:
    - Well-supported
    - Well-rested
    - Attending
    - Activity participating

Materials

- Functional Vision Assessment: General Tools
    - Flashlight with colored filter caps
    - Penlight with colored filter caps
    - Red clown nose (focal point)
    - Near point acuity materials and charts
    - Standard 10- or 20-foot eye charts
    - Single symbol acuity cards
    - Stickers or Post-It notes to mark distances
    - Stopwatch or timer
    - Supportive seating/positioning
    - Table/desk/tray on chair
    - Tape measure
- Learning Media Assessment: Print Reading
    - Children's/chapter books (variety of fonts, print sizes, contrasts, etc.)
    - Classroom textbooks (reading, math, science, social studies, etc.)
    - Classroom workbooks
    - CD case with insert
    - Deck of cards
    - Dot to dot, hidden pictures, mazes
    - Graphs and charts appropriate to the grade level
    - iPad with apps
    - Maps (various sizes and complexity)
    - Menu
    - Newspaper/magazine
    - Photocopied materials (good to poor quality range)
    - Pictures (variety of color/black and white, complexity, contrasts, size, etc.)
    - Puzzle
    - Reading stand
    - Worksheets from the classroom
- Learning Media Assessment: Writing
    - Ballpoint pens (various colors)
    - Crayons (various sizes)
    - Gel pens (various colors)
    - Lined paper
        - Bold line
        - Printer paper without lines (white and various colors)
        - Raised line
        - Regular college rule blue-line

    - Markers (various colors and widths)
    - Pencils (No. 2, No. 3, erasable)
    - Scissors and bold outline shapes (to be cut)
- Young Children/Multiple Disabilities/Cortical Visual Impairment (CVI)
    - All-In-One Board (black felt on one side/whiteboard other side)
    - Colored objects (pastel, primary, neon)
    - Black cloth to cover working surface
    - Bubbles
    - Familiar objects from the environment
    - Formboard with basic shapes/forms
    - Glow sticks (light source/tracking)
    - Light box and overlays/objects
    - Light-up toys and objects
    - Mirror
    - Objects that move (ball, slinky, wind-up toy, etc.)
    - One-inch blocks and a container
    - Pairs of objects
    - Pegboard and pegs
    - Penlight with colored filters/caps
    - Puppets
    - Puzzle with simple pieces
    - Reflective objects (pom-pom, sparkly ball, etc.)
    - Slantboard
    - Stacking rings and stacker
    - Towel or cloth 36”x36” (one black, one white)
    - Toys that make sound and toys that do not make sound
    - Tray to keep objects within reach
    - Yellow and red objects of ½” to 10” in size

Procedures

Resources

- Early Childhood Vision Observation and Interview Protocol by Minnesota State Vision Network Community of Practice
- FVA for Infants and Toddlers Webinar with Lois Harrell
- FVE Checklist for Preverbal and Nonverbal Children by Lois Harrell
- Functional Vision and Learning Media Assessment (FVLMA) Practitioner’s Guidebook by American Printing House for the Blind (APH)

Observations

- Minimum of three environments/observations
    - Observer positions self to note and record for each observation:
    - Task performed
    - Distance from the task
    - Eye(s) used
    - Head position
    - Movement or lack of movement (tension in body/fatigue)
    - Posture of body (position of torso, feet, etc.)
    - Viewing angle
    - Visual behaviors: blinking, covering eye, squinting, straining, etc.
- Observer notes and records environmental factors during observation:
    - Lighting/illumination
        1. Color
        2. Contrast
        3. Depth
        4. Glare
        5. Light/dark adaptation
        6. Light source
    - Targets
        1. Color
        2. Complexity
        3. Distance
        4. Size
    - Visual Response/strategies
        1. How did the student approach the task?
        2. How did the student perform the task?
        3. How was the outcome influenced by visual factors?

Environmental Analysis

- Go through the settings accessed by the student and document the characteristics of different areas of the environment in terms of:
    - Color
    - Contrast
    - Electronics utilized by students
    - Glare
    - Information sources (bulletin boards, SmartBoards, etc.)
    - Lighting
    - Media sources

    - Obstacles
    - Teacher presentation styles
    - Viewing distances
    - Visual clutter
- It is helpful to wear a low vision simulator when analyzing environments

Functional Vision Evaluation

- Appearance of the Eyes
    - Blinks frequently
    - Bloodshot
    - Crusted eyelids
    - Eyes turn in, out, etc.
    - Discharge
    - Eyes have unusual characteristics
    - Movement back and forth (nystagmus)
    - Pupil size, equal, and responsive
    - Reddened
    - Stye
    - Watery
- Behaviors
    - Avoids visual tasks/eye contact
    - Bumps into objects
    - Closes/Covers one eye
    - Fatigue shown during visual tasks
    - Finger flicks or flicks objects
    - Finger or marker used to keep place
    - Frowns
    - Head angled to view
    - Head turning frequent
    - Holds materials close to eyes to see
    - Leans forward
    - Light gazes
    - Light sensitive
    - Looks away to reach
    - Loses objects in visual field
    - Loses place frequently reading
    - Presses on eyes
    - Reading regular print is difficult
    - Rocks

- Rubs eyes
- Seeks out additional light for tasks
- Squints
- Startles to movement
- Unaware of objects in visual field (front/sides)
- Visually hesitant/cautious

- Blink/Corneal Reflex
  - Purpose: blink eyes to protect from approaching object (present at 5 months of age)
  - Materials: fingers or visual target
  - Strategy: move hand or object quickly toward eyes (don't create air movement that can be felt)
  - Expected response: both eyes blink
- Color
  - Purpose: object recognition; visual discrimination of objects from background
  - Materials: Ishihara plates, paint swatches in pairs, pastel and primary colored matching cubes; neutral color surface or black/white cloth/paper
  - Strategy: present color items on neutral color surface; use different color markers on whiteboard; students with CVI often prefer red, yellow, orange colors
  - Expected response: matches/names color; reads or uses information written in colors on neutral background
- Contrast Sensitivity
  - Purpose: demonstrate ability to detect a form/shape/letter/number on a background
  - Materials: student's textbooks, newspapers, magazines, photocopies of varying quality, pictures, picture symbols, toys/objects on white/black cloth
  - Strategies: present materials to student and have him/her identify/acknowledge information; use different color markers to write on the whiteboard; use computer or iPad for access to writing and books; SmartBoard access
  - Expected response: identify picture, read words, find toy or object
- Convergence
  - Purpose: demonstrate ability to observe object move toward self (also diverge: move away)
  - Materials: visual targets of different sizes and colors
  - Strategies: student focuses on target; move target toward student's face and observe eye movement
  - Expected response: eyes will move together and follow the object moving toward self (repeat moving object away for divergence)
- Depth Perception
  - Purpose: use of visual information to determine depth and depth changes
  - Materials: items in the environment

- Strategies: ask student to identify which of two objects is closer/farther away; observe student reaction to changes in walking surfaces (anticipation of up/down/irregular changes)
- Expected response: student is able to determine which objects are closer/farther away and detect changes in walking surfaces from visual information

- Eye-Motor Coordination
  - Purpose: determine student's efficiency with visual interaction in fine and gross motor tasks
  - Materials: fine motor—opening, closing, inserting, removing, manipulating tasks; visually directed reach tasks; coloring, copying, tracing shapes; gross motor—obstacles, kickball
  - Strategies: work on fine motor and gross motor tasks noting head position, accuracy, detail, etc.
  - Expected response: student will complete tasks accurately
- Eye Preference
  - Purpose: determine if the student will use one eye rather than both eyes; determine if student will have head tilt, body posture changes for viewing
  - Materials: medical reports (amblyopia, anisometropia—difference of visual acuity between two eyes); monocular or keychain "viewfinder"
  - Strategies: ask student to cover one eye and note which eye student covers—preferred eye will remain uncovered; give student a monocular or keychain "viewfinder" and note which eye is used
  - Expected response: will use preferred eye for tasks requested of him/her
- Figure Ground
  - Purpose: determine if student can discriminate an object from its background when planning the presentation of learning materials
  - Materials: tray of items; shape tracing task; complex pictures; bulletin board; worksheets; student's textbooks
  - Strategies: work with student to have him/her visually locate items and information using simple to complex backgrounds; trace superimposed shapes: triangle, circle square
  - Expected response: students with CVI often have difficulty in this area; identify figures/objects from background visually
- Fixation
  - Purpose: determine if student can keep gaze focused on an light/object
  - Materials: near and distance tasks within the environment
  - Strategies: look for head tilting, squinting, use of one eye, etc.; note all visual behaviors; watch for eccentric viewing (looking around a blind spot)

    - Expected response: by 6 months of age should be able to fixate on a visual target with both eyes
    - Imitation
    - Purpose: determine effective levels of visual imitation for classroom use
    - Materials: movements; paper and pencil/marker
    - Strategies: at multiple distances and backgrounds, evaluator asks student to imitate or identify movements/expressions made by the evaluator; from a distance or from across the table, student copies shapes, letters, numbers made by the evaluator
    - Expected response: distance, size, contrast, color of movement or symbol noted for imitation purposes
- Light Reception
    - Purpose: determine if student has ability to distinguish light sources and in turn objects in the environment; there are five levels
        - Light perception—react to direct light source
        - Light projection—orient/turn to light source in environment
        - Shadow and form perception—shows awareness of objects placed/moving in front of a light source
        - Detection of movement—shows awareness of objects moving in peripheral visual field
        - Object perception—visual interest shown in items in the environment
    - Materials: darkened environment; environment with typical lighting; penlight or flashlight; colored caps for penlight or flashlight
    - Strategies: darken room; allow student to adapt to low lighting; turn on light source (note light source, size of light source, distance from student, position of light source)
    - Expected response: show interest in light source/object
- Light Sensitivity
    - Purpose: to determine if student has visual difficulties that increase with different levels of lighting and/or lighting changes (light-dark adaptation)
    - Materials: environments with a variety of lighting options; observation at different times of the day in the classroom (as sunlight changes); colored blocks; simple classroom tasks; student's textbooks
    - Strategies: work on tasks that are meaningful to the student in different areas/lighting within the classroom; observe student's visual behavior of squinting, avoiding light, shading eyes, etc.; note light adaptation time needed for comfort when coming in from/going outside; present colored blocks for matching in different lighting conditions (students with light-dark adaptation issues have difficulty with color when lighting changes)
    - Expected response: visual function and behavior under different lighting/dark conditions shown

- Matching, identifying, sorting, classifying, sequencing visually
    - Purpose: determine how vision is used to complete cognitive-visual tasks
    - Materials: objects, puzzles, print word cards, worksheets, pictures, storybooks, etc.
    - Strategies: create opportunities for the student to match, identify, sort, classify, and sequence using visually oriented materials
    - Expected response: accurate matching, identifying, sorting, classifying, and sequencing using visual information
- Muscle Balance
    - Purpose: determine if eyes move together in same direction at same time for optimum visual access
    - Materials: penlight; occlude; clown nose/target
    - Strategies:
        - Corneal reflection/Hirschberg test
            - Indicates tropia (cannot be controlled during fixation)
            - Penlight held 30-36 inches from student's eyes; observe if light reflected in each of the eyes in center of each cornea
        - Cover-uncover test
            - Indicates tropia (cannot be controlled during fixation)
            - Should wear corrective lenses; hold target in central position about 18 inches from the student's eyes; student fixates on target; cover one eye and note if there is movement in the uncovered eye to regain fixation on target; cover other eye and again note movement in the uncovered eye to regain fixation on target
        - Cross-cover test
            - Indicates phoria (can be controlled during fixation)
            - Should wear corrective lenses; hold target in central position about 18 inches from the student's eyes; student fixates on target; cover one eye and quickly move cover from to the other eye and back; note eye movement in uncovered eye to regain fixation on target
    - Expected response: eyes move together as a team; no movement of just one eye
- Pupillary Response
    - Purpose: demonstrates how much light goes in the eye with different lighting levels and how comfortable the student is with lighting and lighting changes
    - Materials: penlight in darkened area; movement from indoor to outdoor light (vice versa)
    - Strategies: shine penlight near (not directly in) one eye then the other from about 12 inches away, observe reaction change and time of reaction of each pupil; observe change in pupil reaction and time of reaction moving from one lighting level to another

    - Expected response: pupils dilate when light introduced or constrict when light is removed from the eyes; both pupils should react in the same manner; caution: students with CVI often have typical pupillary response but not functional vision
- Scanning
    - Purpose: using head and eyes to search and locate visual targets
    - Materials: objects in the environment (natural or created on desk); near and distance should be included
    - Strategies: ask student to search for named objects; observe pattern of search, size of visual search area, body/head positioning, efficiency of search, etc.
    - Expected response: systematic scanning left-to-right or top-to-bottom with eyes smoothly working together
- Shifting Visual Attention
    - Purpose: changing focus from one object or distance to another; note taking is an example
    - Materials: print and functional materials at different distances; materials with different spacing, clutter, size of print, and contrast
    - Strategies: present tasks that require student to look from one item to the other: copying, using communication board, drawing from a model, etc.
    - Expected response: student should demonstrate ability to look at target, release gaze, and look at second target while continuing to work (no blinking, excessive head movements, etc.)
- Tracing
    - Purpose: visually following a stationary line for spotting objects in the environment
    - Materials: natural environment, classroom; lines on paper
    - Strategies: ask student to find information (object, picture, etc.) by following a line formed in the environment or drawn on paper
    - Expected response: student will visually trace/follow the line to locate the requested information; watch for loss of fixation, back tracing
- Tracking
    - Purpose: visually follow a moving object; developmental tracking sequence: horizontal, vertical, circular, diagonal
    - Materials: objects of varying size, color, contrast, speed
    - Strategies: ask student to visually follow the moving object; “draw” the letter H in the air and ask student to visually track movements; person walking; bubbles; toy car
    - Expected response: eyes should stay focused on target and work together; watch for head tilts and visual strain
- Vestibular Ocular Reflex (VOR)—Doll’s Eyes
    - Purpose: eye movement independent of head movement for scanning, shift of gaze, tracing, and tracking to stabilize eye movements in reading

    - Materials: none
    - Strategies: assist student to move head back and forth horizontally
    - Expected response: after 3 months of age, eye movement should be independent of head movement (Doll's Eyes: eyes move with movement of head)
- Visual Attention
    - Purpose: determine the period of time the student can attend to visual material
    - Materials: distance and near tasks and materials
    - Strategies: complete activities using objects and print/pictures; document size, color, complexity, etc. of materials used; note visual attention to task and identify the signal that visual attention was ending
    - Expected response: continued visual attention
- Visual Acuity—Distance (standard)
    - Purpose: determine standardized logarithm visual acuity below 20/60 with best correction
    - Materials: 10- or 20-foot acuity chart; adequate lighting; occluder
    - Strategies: student stands facing chart from 10 or 20 feet away; cover left eye with occluder; student reads chart from largest to smallest possible
    - Expected response: distance visual acuity reading from chart
- Visual Acuity—Near (standard)
    - Purpose: determine standardized reading acuity with the best correction
    - Materials: standardized reading acuity chart
    - Strategies: hold chart 16 inches from eyes; read what is possible to see; note response; move chart to most comfortable distance and measure/record preferred distance and measure acuity by line read
    - Expected response: near point/reading visual acuity from chart
- Visual Acuity—Awareness/Identification/Preferred (functional)
    - Purpose: determine qualitatively what student is able to see at a distance
    - Materials: typical environments in building/classroom; camera
    - Strategies: in an area that is not visually familiar, ask student to describe the farthest object seen; once described ask if there is anything farther away (awareness acuity); measure or estimate distance—then ask student to walk forward until they think they can guess the visual target (identification acuity); measure or estimate distance—then ask the student to walk to a distance that is most comfortable for really looking at the target and identifying it (preferred acuity)—always record distance, lighting, size of target, color, contrast, etc. [repeat in several environments]
    - Expected response: functional description of what is actually seen
- Visual Field—Central (standard)
    - Purpose: determine if student is using visual field directly in front of face
    - Materials: penlight; visual field grid

- Strategies: shine a light 12 inches from student's face; show it in several positions above, below, to left and right of direct center of face; note where student attends to light
- Expected response: visual attention to light indicates visual field is intact

- Visual Field—Peripheral (standard)
  - Purpose: determine if student is using visual field to sides, top, bottom
  - Materials: penlight
  - Strategies: shine a light in several positions above, below, to left and right of student's head; note where student attends to light
  - Expected response: visual attention to light indicates visual field is intact
- Visual Field—Preferred (standard)
  - Purpose: determine if student prefers using a section of the visual field
  - Materials: two penlights or objects that are similar
  - Strategies: present each of two similar lights or objects in opposite visual fields (top-bottom; left-right, etc.)
  - Expected response: visual attention indicates visual field is favored
- Visual Field—Central (functional)
  - Purpose: determine if student is using visual field directly in front of face
  - Materials: visual target distance or near; tape measure; camera
  - Strategies: choose a visual target (object in distance or letter marked in text in a book); without moving the eyes (focusing on target) describe top most boundary of field, bottom, each side; take a picture and mark it to show field—for reading field, move pencil point inward at different points while student focuses on a letter in a paragraph; when pencil tip is seen mark spot and connect the dots to show field
  - Expected response: identifies functional boundaries of central visual field
- Visual Field—Peripheral (functional)
  - Purpose: determine if student is using visual field to sides, top, bottom
  - Materials: visual target; walkway of about 20 feet in length; clearance to each side of student; tape measure
  - Strategies: student focuses on target; evaluator walks silently past (without touching) on each side from student's back forward; student indicates when he/she is able to see any part of the evaluator; note distance in front of student
  - Expected response: visual awareness shows functional access to peripheral field for safety
- Visual Field—Preferred (functional)
  - Purpose: determine if student prefers using a section of the visual field
  - Materials: area to walk that contains objects and targets; circle divided into four equal parts

    - Strategies: walk together throughout the environment; student names objects and targets visually noticed; evaluator marks area of the field where object located in relation to student's visual field
    - Expected response: visual attention indicates visual field is favored
- Viewing Distance
    - Purpose: determine at what distance student comfortably works with visual materials for extended periods of time
    - Materials: visual tasks and classroom learning materials; slantboard
    - Strategies: ask student to complete a task or read materials; allow him/her to hold the material in the most comfortable position; note viewing distance, size of visual target, complexity of target, time attended; repeat with a variety of tasks
    - Expected response: demonstration of typical viewing distance for material with varying visual target sizes, color, contrast, etc.

Learning Media Assessment

The Learning Media Assessment uses observation, the functional vision evaluation data, and literacy tasks to determine the appropriate media for the student in a variety of situations. A student may be a print, large print, braille, digital, or auditory access learner.

Expanded Core Curriculum Assessment

The Expanded Core Curriculum (ECC) includes a review of specific skill level in each of the following areas:

- Career education
- Compensatory or functional skills, including communication modes
    - Braille
- Independent living skills
- Orientation and mobility (TBVI should do an orientation and mobility (O&M) screening)
- Recreation and leisure skills
- Self-determination
- Sensory efficiency skills
- Social interaction skills
- Use of assistive technology

Summary

Together, the learning media assessment, ECC assessment, team interviews, functional vision evaluation data and an orientation and mobility screening describe the student's visual strengths and needs. An IEP program can be developed with this information if the student shows an access/learning need for education.