Chapter 6: Sensory Impairments: Hearing and Vision
Prepared by Debbie Laffranchini, Instructor
In Class Assignment: 10 points

- In groups of three, write one paper with all first and last names of team members and respond to the following:
  - Identify the types of hearing loss
  - Identify warning signs of hearing loss
  - Identify the impact of hearing loss on all domains of development
  - Describe the effect of hearing loss on family life
  - Identify the methods of communication (which is your favorite?)
  - Identify strategies that teachers can use to support children with hearing loss (there are 14 in your book; provide your favorite 7)
  - Talk about amplification devices
- Discuss and identify strategies for teachers for teaching children with vision loss (at least 7 ideas out of 12 in book)
Deafness and Hearing Loss

- Two classifications of hearing loss:
  - **Deafness**
    - Hearing loss so severe the individual cannot process spoken language, even with amplification devices
  - **Hard of hearing**
    - Lesser hearing loss but has effect on social, cognitive, and language development

- Loss can be:
  - **Pre-lingual**
    - Greater difficulties in all areas of development throughout growing years
  - **Post-lingual**

- Most severe developmental interference occurs when hearing loss is congenital
Types of Hearing Loss

- Testing should be done by pediatric audiologist
  - Audiogram
- Loss is classified by WHERE the loss occurs
  - Outer or middle ear: conductive hearing loss
    - Hearing aids or amplification can help
  - Inner ear: sensorineural hearing loss
    - Cochlea or auditory nerve
    - Cochlear implant can help with sound but understanding speech can be problem
  - Loss in the higher auditory cortex produces central deafness
- Combined loss: two or more types of hearing loss
- Otitis media: intermittent hearing loss, antibiotics not routinely prescribed
Anatomy of The Ear

1. Ear
2. Ear canal
3. Eardrum
4. Bones of middle ear
5. Hair cells
6. Auditory nerve
To Brain

Outer ear
Middle ear
Inner ear

How hearing works
Anatomy of the Ear
Cochlear Implant

Understanding Cochlear Implants

How a cochlear implant works

1. Sounds are picked up by the microphone.

2. The signal is then “coded” (turned into a special pattern of electrical pulses).

3. These pulses are sent to the coil and are then transmitted across the skin to the implant.

4. The implant sends a pattern of electrical pulses to the electrodes in the cochlea.

5. The auditory nerve picks up these electrical pulses and sends them to the brain. The brain recognizes these signals as sound.
• Challenges: lifestyle changes, breakage, noise
• Works best in children <30 months to integrate auditory and visual information
Evidence of hearing in infants:
- Startle to noises
- Localize in direction of sound
- Indicate preference for mother’s voice

Residual hearing allows infant to respond some of the time

Infants make random movements so difficult to detect

Loss may not be detected until three years of age

Indications of hearing problems in young children:
- Persistent ear infections
- Discharge from ears
- Constant poking or pulling at ears
- Drop certain initial voiceless consonants
  - P, h, s, f

Marked delay in speech and language development is major warning sign
Warning Signs of Hearing Loss

- Doesn’t respond when spoken to
- Doesn’t understand, looks puzzled when addressed directly with simple question or request
- Cocks head to one side, studies speaker’s face or watches speaker’s mouth
- Asks “Huh? What?”
- Turns one ear to the source of sound or speech
- Seems shy, avoids children and teachers
- Inattentive
- Makes inconsistent or irrelevant responses
- Complains of ringing or buzzing in the ears
- Articulation or voice problem
- Speaks too loudly or too softly
Impact of Hearing Loss on Development

- Cumulative effect
  - Children with moderate to severe hearing loss are educationally delayed by as much as three to five years
  - Significant social problems
  - Significant behavioral problems

- Effect on language development
  - Most serious and far-reaching effect of hearing loss is on early speech and language development
  - Cumulative: hearing loss, inadequate auditory input, serious problem in speech production, family and teachers don’t talk to child, child’s range of responses is limited, inadequate feedback for family and friends, language skills even more delayed
Impact of Hearing Loss on Development (cont)

- **Effect on cognitive development**
  - Cognitive skills intertwined with language skills
    - Poor language skills leads to poor performance in cognitive skills
    - With inadequate auditory input, child is denied major channel for cognitive development

- **Effect on social development**
  - Social isolation
  - Left out of things even within family
    - Unintentional ignoring
  - Poor communication between child and others leads to social adjustment difficulties
  - Child may be impulsive, aggressive, demonstrate low self-esteem, low frustration threshold, appear indifferent to needs and feelings of others
    - Lack the “language of sympathizing”
  - Social immaturity continues as child ages

- **Effect on family life**
  - More severe loss, greater the impact
  - Countless frustrations
  - Difficult to establish behavior limits because of lack of communication
  - Time and effort for intervention procedures
  - Behavior management, family therapy, facilitation of family communication all common
Methods of Communication

- Speech reading (lip reading)
  - Not accurate
- Cued speech
  - Visual communication using 8 hand shapes in four different placements near face combined with mouth movements of speech to make the sounds of spoken language look different from each other
  - Effective when paired with cochlear implants
- American Sign Language (ASL)
  - Complete, complex language, including facial expressions and postures of the body
- Signing Exact English (SEE)
  - Signs word for word in English, not preferred and sometimes not even recognized in deaf community
- Finger spelling
  - Hand-formed letters corresponding to alphabet
- Total communication
  - Combines speech and signing
  - Oral Deaf Education
Videos: You Tube

- Sound and the Fury
  - [http://www.youtube.com/watch?v=oki4qo-Dfos](http://www.youtube.com/watch?v=oki4qo-Dfos)

- Silent Memoirs: Life Stories from the Deaf
  - [http://www.youtube.com/watch?v=YWyieOw4NOk](http://www.youtube.com/watch?v=YWyieOw4NOk)

- (Toddlers chatting)
  - [http://www.youtube.com/watch?v=5-fwQpCylW4](http://www.youtube.com/watch?v=5-fwQpCylW4)

- 2-year-old talking with her mom (both are deaf)
  - [http://www.youtube.com/watch?v=xgljsnHknF4](http://www.youtube.com/watch?v=xgljsnHknF4)
Guidelines for Teachers

1. Sit, kneel, or bend down to child’s level to talk
   - Look at the child directly, face to face
2. Use clear speech, slower pace, careful pronunciation
   - Avoid being overly loud and over enunciation
3. Use gestures when appropriate but avoid over gesturing
4. Use brief but complete sentences at appropriate stage, using holophrases and telegraphic speech when appropriate
5. Seat child directly across from teacher
6. Face the light when talking to child with hearing disability
   - Check for glare and don’t speak when child has to look into the glare
7. Be aware of startling the child when touching them to get their attention
8. Use physical props, point to things, touch things, hold them up
9. Include in music activities
   - Put their hands on instruments to feel vibrations, let them play instruments, use rhythmic activities (clapping, jumping, rolling, twirling), pair with hearing child for musical games
   - Give child a balloon to “hear” the music through vibration
10. Involve in story time, choosing books with bright pictures that tell the story and give clues to story’s mood through gesture and facial expression
11. Keep daily schedule
12. Find subtle ways to help child be quiet (sometimes make noises unaware)
13. Avoid moving about the room or writing on the board while talking
14. When using manual interpreter, allow child and interpreter to choose seating
Amplification Devices

• Problems:
  • Improperly fitting or damaged earmold
  • Dead or feeble batteries
  • Feedback
  • On/off switch
  • Sore ears

• FM systems
  • Miniature radio station
  • Batteries and on/off switch problems
Christian and his mother

- http://www.youtube.com/watch?v=oWCbkyRocyo
**Blindness and Vision Impairments**

- **American Foundation for the Blind:**
  - **Low vision:** read large print or regular print under special conditions
  - **Blind:** not possible to read print, needs to use Braille for educational purposes and other materials using touch or sound
  - **Total blindness:** no light perception
    - Most individuals have slight vision, seeing rough, general outlines of things but no details; others distinguish light and dark or very bright colors
Types of Vision Problems

- Physical abnormalities
  - Majority of true visual impairments are caused by physical problems
- Visual acuity
  - Refractive errors, correctable with eyeglasses
- Muscle problems
  - Muscle imbalance problems correctable by glasses, patching, or surgery
    - Strabismus
    - Amblyopia
- Pediatric ophthalmologist
Physical Abnormalities

- Visual disorders linked to prenatal development:
  - Cataracts (progressive clouding of lens of one or both eyes)
  - Glaucoma (gradual destruction of optic nerve as result of buildup of pressure caused by poor circulation of the fluids of the eye)
- Disorders linked to time of birth:
  - ROP
    - Before mid-1950’s, excessive oxygen caused retrolental fibroplasia
    - Found in ELBW even if oxygen is ideal
- Physical problems within the brain:
  - Infections or injuries before, during, or after birth damages optic nerve or visual cortex
    - Vision affected but eye appears normal
Physical Abnormalities

- **Cortical blindness:**
  - Damage is in the brain, occipital lobe, from: stroke, TBI, meningitis, encephalitis, et al

- **Visual acuity problems:**
  - Normal-appearing eyes might have refractive errors
    - Bending of light rays

- **Astigmatism**
  - Uneven refraction in different planes of the eye

- **Myopia**
  - Nearsighted

- **Hyperopia**
  - Farsighted
Muscular Abnormalities

- **Strabismus**
  - Crossed eyes, wandering eye, or one eye turned inward, don’t work together as a unified pair
    - In young children, brain suppresses one image from one eye, leading to permanent loss of vision if not corrected unless child is able to alternate focus between eyes
- **Amblyopia ("lazy eye")**
  - Marked differences in visual acuity between eyes OR
  - Strabismus that results in repression of vision from the same eye leading to blindness
  - Eyes look normal unless strabismus is involved
  - Causes lack of normal depth perception
- **Nystagmus**
  - Quick, jerky, back and forth or up and down eye movements
  - Not abnormality of eye muscles
  - Neurological abnormality
  - Improves with age
Identifying Vision Problems

- Partial vision loss is difficult to recognize
- Snellen Illiterate E test used to identify visual acuity and amblyopia
- Teller Acuity Cards used for young children and low-functioning older children without requiring a verbal response
- Child doesn’t know that they can’t see clearly or that others see things differently
Warning Signs of Vision Loss

- Rubs eyes excessively
- Shuts or covers one eye, tilts head or thrusts it forward
- Difficulty doing work or playing games close up
- Unable to see distant things clearly
- Squints, squeezes eyelids together, frowns
- Cossed eyes or eyes each turn outward
- Red-rimmed, encrusted, or swollen eyelids
- Inflamed, infected, or watery eyes
- Recurring sties
- Itchy, burning, or scratchy-feeling eyes
- Inability to see well
- Dizziness, headaches, or nausea following close work
- Blurred or double vision
Impact of Vision Problems on Development

- Child who is blind will likely have significant developmental delays, even with average or above-average intelligence
  - We learn from scanning the environment and focusing on particular stimuli
  - We learn from watching others, imitating them, and observing what happens next
- Inability to play freely is great hindrance to development
- Infants who are blind remain passive
  - Don’t know what they are not seeing
- Behavioral mannerisms: blindisms
  - Some children with severe vision loss
  - Self-stimulatory behaviors
    - Rolling the head
    - Swaying the body
    - Waving fingers in front of the face
    - Forcibly blinking
    - Pressing the eyes
Effect of Vision Problems on Language Development

- Need to discover and identify objects and actions to acquire language
  - Instead, child learns through touch or sound, limiting learning opportunities
  - Parents and teachers can provide objects to explore, model language, and describe
  - With moderate to severe vision impairment, language skills are delayed at least one year, catching up by school age
Effects of Vision Problems on Cognitive, Motor, and Social Development

- **Cognitive:** delays during first few years of life, by school age, caught up unless other disability is involved
- **Motor:** delays in reaching, crawling, walking, localizing sound and move toward sound
  - Skills requiring judging distance, direction, body position, and object’s position in space are delayed
  - May develop strange ways of walking and positioning themselves because no visual reference points or models
- **Social:** infants tend to be passive and quiet, need family and teachers to provide running commentary on what is happening (respectfully, without interfering), play skills develop more slowly, toys used less creatively and more stereotyped
  - Inclusion with typically developing children is helpful but must have specific strategies for promoting socialization
Effects on Family Life

- Early diagnosis can contribute to depression in mother
- Lack of infant responses can contribute to depression and cause parents to not try to engage their child, may not smile at their child
  - Baby can’t feel parents emotion because parents aren’t projecting it
  - When babies sense the affection, they respond
Early Intervention

- First year usually home-based
  - Instruction is for parents understanding effects of vision impairment on overall development
  - Instruction is to coach parents in techniques in interacting with baby
    - Call child’s name and touch them to get attention
    - Place things directly into child’s hand and name it
    - Describe things specifically
- Toddlers and preschoolers usually are center-based programs with parents active participants
  - Using helpful, willing peers is a great strategy and builds social relationships
- Orientation and mobility specialist and developmental therapist part of team
  - Initially child may need segregated program to learn adaptive skills, depending on degree of vision loss
Teaching Children with Vision Loss

- [http://www.youtube.com/watch?v=oe-T4dBXUpc](http://www.youtube.com/watch?v=oe-T4dBXUpc)
  - Independent living skills
- Specialist trained to work with children with visual impairments is essential
  - Arranging classroom
  - Curriculum activities to ensure effective learning experiences
  - Strengthening child’s intact sensory abilities through touch and sound
- Child needs to explore the environment
  - Will get bumps, fall down, get up, and begin again
  - Environment must be orderly and safe
- Mobilizing safely and efficiently is primary concern
- Support the child in advocating for themselves, providing the words when necessary and support them in the follow through
Guidelines for Teachers

- **Determine degree of vision**
  - Peripheral vision maybe best vision, turning away head may not be inattention
- **Orientation and mobility skills are a teaching priority**
  - Inform of any room changes
- **Put identifying materials or subtle noisemakers on the floor, doors, room dividers, lockers**
  - Wind chime near outside door
  - Tile in creative areas
  - Carpet in blocks and large group area
  - Rough matting by doors to outdoors
  - Patch of velveteen glued to child's locker/cubby
- **Use specific direction words, avoid “there, here, be careful”**
- **Talk about everything in environment, naming objects and then give them object to feel, use, and explore**
- **Give action words**
- **Help child localize and sort out sounds**
  - Describe the sound and tell where sound is coming from
- **Play auditory guessing games*****
- **Teach sounds that signal danger in contrast to sounds that are merely scary**
  - Lawn mower versus vacuum; fire alarm; squeaking chain of swing
- **Provide opportunities to smell, touch, and taste*****
  - Use real objects instead of plastic replicas
  - Cooking experiences
  - Sorting activities (shape, size, texture, weight, odor)
- **Physical prompts**
  - Position behind the child, doing hand over hand, scaffolding, ready to let child do independently
- **Provide left to right training, top to bottom, in preparation of reading/Braille**
• http://www.youtube.com/watch?v=tJbmuFhbnmQ
• http://www.youtube.com/watch?v=qLziFMF4DHAA
• http://www.youtube.com/watch?v=Dn4AlevfbiQ
• http://www.braillebookstore.com/Hands--On-Braille