

# Week 6: Sensory Impairment (Hearing & Vision)

## Chapter 6

### I. Highlights

- A. For deaf children, hearing aids or cochlear implants + early intervention in an oral-deaf preschool can make it possible to be totally mainstreamed in school.
- B. Mainstreaming supports the child in a natural environment. If they're never separated, they don't feel so different.
- C. "Cooperation" is asking for parents' help. "Collaboration" is deeper, two-way, with respect and recognizing each other as equals
- D. Children learn through the senses, so any impairment in any sense (especially hearing or vision) will affect all domains of development.
- E. Can have partial hearing loss or be totally deaf. Makes a difference whether they go deaf before or after learning language. Different types of hearing loss depending on which parts of the ear/nerves/brain are involved.
- F. Deaf people can communicate through speech reading, cued speech, American Sign Language, or total communication method.
- G. Can have "low vision" up through totally blind. Different kinds of eye problems can be due to problems with how light refracts in the eyeball, or to how the muscles around the eye work.
- H. Seven sensory systems: tactile, auditory, visual, taste/oral tactile, olfactory, proprioceptive, vestibular. Each one can be hypersensitive (too sensitive) or hyposensitive (not sensitive enough). There are specific strategies for helping each kind.

## II. Homework

A. Midterm is next week! Bring a Scantron. See study guide.

1. Need 100-question Scantron, #2 pencil, 3 sheets of paper, and a pen.
2. Can use the other side of the same Scantron for the final, or buy 2.
3. Multiple-choice + short answer for chapters 1-6.
4. Ok to bring one sheet of notes. One sheet, one side, hand-written only. Can't use the back of the study guide.
5. Will have a short lecture, then take the midterm and go home when you're done. It is a limited time, but should be enough time.
6. "Short answer" = paragraph to 2/3 of a page with regular handwriting. If it takes three pages to answer the question, you're doing it wrong. If it's only two lines, it's not enough.

## III. Video: **There's a New Kid in School: She's Bright, Talks a Lot, Listens, and is Deaf. She'll Introduce You to New Possibilities.**

A. Krista: severe-profound deaf, uses hearing aids, goes to mainstream school.

1. Likes math and reading, wants to be a teacher.
2. New technologies in hearing aids/cochlear implants, oral-deaf preschools have opened up new possibilities
3. Parents had to educate school district

B. Andre: severe-profound deaf, uses hearing aids.

1. Likes math and art.
2. Entered mainstream kindergarten after three years at oral-deaf preschool.
3. Close collaboration between parents, preschool, and school district.
4. Successful transition model includes transitioning the whole family into the whole school. Not just one child into one teacher's classroom. Want to ensure

the child doesn't slip through the cracks or get overwhelmed by noise and large number of children.

C. Rachel: profoundly deaf, cochlear implants

1. Likes soccer, playing with friends, playing piano
2. School wanted her in segregated classroom, but mom pushed for inclusion and it worked.
3. Staff needs a "yes we can do this" attitude. Get to know the child past the IEP.

D. For years, teachers have heard, "A deaf child is coming" and lower their expectations. Now, "mainstreaming" means they're ready to access the same classroom level as their peers.

E. Lila: profound deaf, uses cochlear implant

1. School district funded her going to preschool in oral-deaf school
2. Lila now in mainstream kindergarten.
3. Teacher uses FM system (microphone for teacher, broadcasts directly to her hearing aid), twice-weekly visit from deaf education teacher

F. Christopher: profoundly deaf, uses cochlear implant, has cerebral palsy

1. took 5 years of intensive oral-deaf education to get him into mainstream kindergarten, but it worked
2. young children coming into mainstream require much less support than in segregated classes, is a good investment for school districts to support them there, plus lets them be in "least restrictive environment"

G. For more info on mainstreaming, see [agbell.org](http://agbell.org) or [oraldeafed.org](http://oraldeafed.org).

H. Another documentary years ago: "Dreams Made Real" on deaf children learning to listen and speak. These were the "before" stories. The kids earlier in the video are the same kids after oral-deaf preschool training.

1. Mom found out daughter was deaf, "went home and cried my brains out." Isn't going to have a first word, isn't ever going to go to neighborhood school, will be different forever. Then found out about mainstreaming options.
2. "Mainstreaming was an important goal for our family, because life is mainstreaming." Goal was for her to mainstream by kindergarten. Is successfully there now.
3. Most successful mainstreaming is when the parents see mainstreaming as the goal from the day of diagnosis.
4. "Parents don't just drop them off at our door. They are full partners." and "Parents are the children's best advocates."
5. Christopher first came to oral-deaf preschool as infant, couldn't hold his head up. Many people had told his parents not to have high expectations because he had so many special needs. Got cochlear implant at 16 months. Learned to listen and speak after lots of therapy.
6. Parents' hardest decision was whether to start him in mainstream kindergarten: if too early and didn't work out, would it break his confidence? Decided to give it a shot. Has been amazingly successful.
7. Support system in place for these kids help them succeed. Then these kids send the rest of us a strong message: Never underestimate a child with special needs. Believe in them and magical things can happen.
8. Andre is independent in his mainstream classroom. Needs an FM system to amplify sound, so teacher wears a microphone and there's a portable one the other kids hold when they're answering questions at circle time.

9. "Mainstreaming is more than just mainstreaming at school." Social life happens there, so helps them not be isolated.
10. Mom: "To parents who are getting ready to mainstream: be brave. Be brave."
11. Krista "is really assertive. She doesn't let her hearing impairment enable her not to do things." Will ask the teacher to turn on the FM system microphone if he forgets, will ask for clarification if needed.
12. Veronica identified late, got cochlear implant at age 7, therapy at age 3, not much language before then. Some predicted she would never learn to speak. Now reading on grade-level. Learning has exploded since cochlear implant, does better every year. Expects to graduate high school and go to college.
13. Suzy was single parent of two deaf daughters, Abigail and Rachel, both profoundly deaf with cochlear implants. Work day after day after day to teach them a single sound. Now both in mainstream classrooms, have hearing friends, talk on the phone, play on mainstream soccer team, play piano. Started new schools this year (moved), had to educate teachers about their abilities, schools were still resistant.

#### **IV. Discussion after Video**

- A. Mainstreaming supports the children in a natural environment. Not separated, don't feel they're different.
  1. Relies on parent-teacher cooperation. Parents have to send the hearing aids, keep the batteries current, get new glasses if needed, etc. Very difficult if the parents are not on board.
  2. Not all schools want to cooperate with this. Parents have to advocate for their children. Collaboration is the key.

B. See handout on “Elements of Collaboration.”

1. “Cooperation” is when you ask the parents to help you out in particular ways. “Collaboration” is more two-way = “a mutual respect and recognition of *equality* between parents and professionals.”
2. Teachers have to agree that parents know their children best. Parents were there from the beginning, will be there after the child leaves our program. We’ve had 20-50 teachers in our lives, but only one mother. Teachers are temporary; parents are forever. Parents know their children best.
3. Smart teachers develop a relationship so parents can share that knowledge with us. Parents know their child best, we know child development (educated in our profession). Collaboration brings these two pieces together to best serve the child.
4. Don’t see parents as someone spying on you to see what you’re doing wrong. Look at them as partners. Can tell us what works and doesn’t work for this child. Saves us a lot of trial and error.
5. Have to respect parents in my heart, mind, communications, approach, body language, etc. They’re more likely to share if I approach respectfully.
6. Use honest and clear communication. Don’t dance around a topic. Be honest.
7. Two-way journal between home and school can help a lot, especially for children with special needs. Write a couple sentences every day, let parents write back every morning.
8. Even if there’s no IEP or IFSP yet, still need to meet with parents to set goals. Start with small goals (this month, this academic year) we can all work toward. Make sure goals are individualized to the child’s needs and skills. Make sure goals are reachable.
9. Need consistency between home and school.

10. Goals are useless unless we're making progress toward the goal. Need to check in to evaluate if we're getting anywhere.
11. If it doesn't work, don't blame each other. Not helpful.
12. All children are individuals. Build the habit of learning about each child's home culture and uniqueness. True of children with and without special needs.

C. Discussion of children we observed for our paper:

1. 4-year-old with autism, getting services since age 18 months. Now recognizes mom and dad, responds to her name, starting to make eye contact, etc. Very bright.
2. Sensory processing disorder: really sensitive to sound, taste, touch. Severe social anxiety. Few years of occupational therapy, in kindergarten now, coping much better. Seems like typically-developing child now. Early intervention works!

D. Can cause problems if people are over-sensitive to senses, not just if they can't hear/see. Some people hear much much better, or nearly go blind from bright sunlight, etc. It can be overwhelming and make it hard for them to process information.

## V. PowerPoint: Sensory Impairment

A. Hearing and vision matter because individuals receive information or input from the environment. Sensory impairment affects the ability to sense the environment through a specific sensory modality such as hearing or vision.

1. Children learn and develop by getting information through the senses. Any sensory impairment, especially hearing or vision, will reduce their access to information and thus impair their development.

2. Any kind of impairment will affect language acquisition. If they can't hear it, they can't speak it. If they can hear it but not see what people are talking about, it takes longer to learn language.
3. Also affects cognitive development, social connections, etc. Everything is interrelated, woven together like a rug. Any impairment in any area of development will have an effect on the other domains of development.

## **B. Deafness and hearing loss**

1. Deafness = hearing loss so severe the individual cannot process spoken language, even with amplification devices.
2. Hearing loss = can be partial loss (reduced ability to hear) or fully deaf
3. Pre-lingual deafness = hearing loss before the child has acquired speech. Will not learn to speak without specific therapy, and will not learn language unless parents use sign or something else. (Means parents have to know the child is deaf. Otherwise they won't know to use sign. Early intervention is the key to success!)
4. Post-lingual deafness = hearing loss after the child has acquired speech. (Example: lost from medical problems at age 7 or 8.)
5. Audiologist = hearing specialist. Uses tools to evaluate how well you hear. Not the physician/ doctor.
6. Types of hearing loss
  - a) Outer ear = the part that sticks out. Middle ear = next level in, with the ear drum. Inner ear = behind the ear drum.
  - b) "Conductive hearing loss" = problem in the outer part of the middle ear
  - c) Cochlea = the snail-shaped structure in the inner ear
  - d) "Sensory-neural hearing loss" = malfunctioning of auditory nerve, nothing wrong with the ear, doesn't send the sound signal to the brain



- e) Higher auditory cortex = gray matter part of the brain that processes sound
  - f) Otitis media = chronic ear infection, causes intermittent hearing loss, may need ear tubes (surgery) or antibiotics. Fluid builds up behind the ear drum, causes infection, so children cannot hear properly because the fluid is there. Can sound like boiling water in their head! Chronic infection can cause a hole in the ear drum or can dissolve the tiny bones in the inner ear, permanently lose hearing in that ear. Take ear infections seriously.
  - g) Cochlear implants = surgically inserted into inner ear, outer part attached to skull behind ear, age 12 month to 18 years old
7. Impact of hearing loss on development
- a) Language development (impacts cognitive development)
  - b) Cognitive development (lack of language)
  - c) Social development (can't talk to friends)
  - d) Emotional development (have no friends, can't express self, don't understand other people, makes it hard to be happy or self-confident!)
  - e) Family life (parents who don't know how to communicate will give in to stop the tantrums)
8. Methods of communication
- a) Speech reading (lip reading, watching the mouth plus facial expression)
  - b) Cued speech (a few specific hand motions to emphasize beginning sounds while the person is lip reading)
  - c) American Sign Language
  - d) Total communication (speech reading + ASL combined, useful if mainstreaming, especially important if multiple impairments/ disabilities so they have the most access to language)

9. Early intervention guidelines for teachers (page 129)
- a) Important to be on the child's level so they can see your lips or signs easily
  - b) Don't mumble or cut off your words. Say every sound.
  - c) Use gestures whenever appropriate. Good for all children.
  - d) Use short sentences and make eye contact. Speak appropriately for their age. Don't shorten it to telegraphic speech like they might use. Model complete language.
  - e) Have the child sit directly across from you.
  - f) Face the light so your face is illuminated and the child doesn't see glare.
  - g) Gently touch the child to get their attention, unless they don't like touch.
  - h) Point to or touch whatever you're talking about.
  - i) Include children with hearing impairment in all music activities. Let them feel the vibrations and rhythms. If they have hearing aids, they can hear it too.
  - j) Involve all children in story time.
  - k) Keep a regular schedule every day. Can help to use a "visual schedule" with each part of the routine on Velcro.
  - l) If kids make strange noises, remember they don't know they are doing it. Help them keep their mouth busy some other way: sing-a-longs, etc. Do mouth exercises, make noises on purpose, help them become more aware of their noises. Distracts them from repetition. Not 100% successful but can help.
10. Which guidelines stand out to you?
- a) Being on the child's level, facing them directly, having the light behind them so your face is illuminated. Helps to have your back to the wall with a wall that's not too visually busy.
  - b) Speak clearly with short, real sentences.

- c) Teach peers how to get the child's attention and communicate effectively with the child.
11. Amplification devices = instruments that augment hearing, make it possible for the person to hear (such as hearing aids or cochlear implants)
- a) Ear-mold (the part inside the ear) is custom-shaped to the individual ear
  - b) If ear mold is not fitting or damaged or loose, it's problematic. Children will pull it out when it's uncomfortable.
  - c) Dead or weak batteries are an issue. When the battery drops, it squeaks/hums in their ear. Tiny batteries die fast, need replacing often. Can ask the parents to leave a charger at school so you'll have an alternative available.
  - d) Feedback, squealing sound is really annoying. May turn the hearing aid off to stop the noise, but then they can't hear.
  - e) On/off switch on the back
  - f) If fit is poor, makes ears sore, maybe red/irritated, very uncomfortable

### **C. Blindness and vision impairments**

1. Different levels: low vision, blind, total blindness
  - a) These are all beyond just wearing regular glasses for reading/driving/etc.
  - b) See textbook for definitions of these levels.
2. Visual acuity = how well the individual can see (can be measured, such as 20/20 vision. Can measure how far you can see and how wide you can see.)
3. Low vision = severe visual impairment
4. Refractive = correctable with glasses (image lands in the wrong part of the eye, but eye muscles all work)
5. Strabismus = eye muscle imbalance (makes it hard to focus properly)
6. Amblyopia = eye does not get enough use ("lazy eye")
7. Pediatric ophthalmologist is the eye doctor who specializes in children (usually is an eye surgeon too)

8. Physical abnormalities in eyes

- a) Cortical blindness
- b) Visual acuity problems
- c) Astigmatism = light refracts unevenly in the eye
- d) Myopia = near-sighted
- e) Hyperopia = far-sighted
- f) Muscular abnormalities = “lazy eye” or “cross-eyed” because muscles aren’t working right so the child can’t move the eye. Treated by putting a patch or cloudy glasses lens over the good eye to force the child to use the muscle of the lazy eye. Very uncomfortable, but it works a lot of the time. If not, then it’s a short surgery to release the muscles so the eye can move like it’s supposed to.
- g) Warning signs (page 135 in textbook)

9. Impact of vision problems

- a) Language development: a lot of learning happens through sight, knowing what people are pointing to or talking about
- b) Cognitive development
- c) Motor development: can’t see the way people walk/move, can’t perceive distance or see obstacles/hazards, eyes help control balance, awareness of space/mental maps
- d) Social development
- e) Family life: make adaptations at home, learn to operate safely outside of home

10. Makes a difference if they lose vision early on (birth or shortly after birth) or later on. Like losing hearing before/after developing language. If they get some spatial/visual mapping first, it helps a lot.

11. Restaurant in San Francisco is completely dark. Waiter verbally tells you what's on your table (where the silverware and glasses are, etc.), verbally tell you what's in the food, etc. People who are blind do fine, the rest of us knock everything over. (Expensive, gourmet food, but would be cool to visit.)

D. Activity: definition matching on page 144.

1. Otitis media = chronic ear infections causing intermittent hearing
2. Amplification device = hearing aid
3. Cochlea = inner ear structure
4. Strabismus = crossed eyes
5. American Sign Language = ASL
6. Residual vision = partial sight
7. Retrolental fibroplasia = scar tissue
8. Pediatric ophthalmologist = children's eye doctor
9. Snellen Illiterate E test = vision screening
10. Congenital blindness = blind at birth

**VI. DVD: Sensory Processing Disorder** *(Take notes to turn in for participation credit.)*

- A. DVD hosted by Jenny Clark Brock, a pediatric occupational therapist. Includes simulations for us to experience each type of sensory processing problem.
- B. For most of us, the sensory system is constantly, efficiently processing information from our environment and body, usually at an unconscious level.
- C. Most of us can automatically "modulate" sensory input, meaning we can direct more or less brain attention wherever it's needed so we can focus to get things done, but not get overwhelmed.
- D. Some kids have "hypersensitivity" to sensory input, meaning they're overly sensitive, so certain things will send them into a fight/flight/freeze stress response.

- E. Other kids have “hyposensitivity” to sensory input, meaning they don’t detect gentle signals and need more input to notice anything. These kids crave jumping, swinging, touching, etc.
- F. There are 7 sensory systems:
1. Tactile
  2. Auditory
  3. Visual
  4. Taste/oral tactile
  5. Olfactory (smell)
  6. Proprioceptive (sensing where your body is in space)
  7. Vestibular (sensing how fast you’re moving and in which direction, whether you’re upside-down or right-side-up, etc.)
- G. Vestibular = structures in the inner ear detect whether you’re upside-down, right-side-up, sideways, etc.
1. Hypersensitive kids (too sensitive) may be afraid of certain playground equipment, afraid of heights, etc.
  2. Hyposensitive kids (not sensitive enough) may crave movement, find it hard to sit still
    - a) Helps to sit on a ball chair, wobble cushion, or partially deflated beach ball, (gives movement while sitting)
    - b) Helps to put slit tennis balls (like you would on a walker) on two diagonal corners of their chair so it wobbles while they sit
    - c) Helps to allow “movement breaks” to let them run errands, grab things for you off the shelf, etc.
    - d) Crave trampolines, swings, bicycle riding, car trips, etc.
    - e) Avoid these activities right before bed because it makes it hard for them to settle down to sleep

3. Simulation for teachers: use a large magnifying lens from an overhead projector, put it in front of your face, then try to walk heel-toe. Then try it with your eyes closed.

H. Proprioceptive = receptors in joints, muscles, and tendons detect pressure, stretching, and hard work

1. Hyposensitive children may have poor coordination, poor articulation, may press too hard with their pencils, etc.
  - a) Can help to use a weighted lap bag (a heavy bean bag on their lap while at their desk or at circle)
  - b) Hugs can help (let the child initiate them)
  - c) Give them heavy things to carry
  - d) If the occupational therapist approves it, a weighted vest can help.
  - e) Good activities = swimming, karate, monkey bars, sandbox, helping clean up around the house
  - f) Can help to wear tight lycra/spandex under their clothes to give that deep squeezing feeling
2. Simulation for teachers: sit in a chair and try to lift your body up off the seat using just your arms. Repeat 10x. That deep compression in your joints and hard work in your muscles is what these kids are craving.

I. Tactile = cells in our skin sense light or deep touch or pain.

1. We have the most receptors in our hands and mouths, which is why young children explore that way.
2. Hypersensitive = called "tactile defensive," don't like tags in their shirts or fingerpaint or gak
  - a) Buy tagless shirts
  - b) Put fingerpaint in a Ziploc bag so they don't have to touch it directly
  - c) If they resist haircuts, try a scalp massage first

- d) If they can't handle getting their nails trimmed, soak their nails in warm water for 15 minutes first, then squeeze the nailbed while trimming the ends.
  - e) If they can't handle going to the dentist, let them wear the weighted x-ray apron during the cleaning. That deep touch is calming.
3. Hyposensitive = crave touch input, will touch the walls, touch other kids
- a) Helps them focus better if they have a "fidget toy" to hold in their hands
  - b) Offer various materials in the sensory tables
  - c) Offer snug pajamas and t-shirt material sheets on their beds
4. Both can benefit from petting the cat or dog
5. Simulation: reach into your purse with your eyes closed. Name each object and describe its shape / texture / size without looking at it.
- J. Visual = seeing
1. Includes several things:
- a) Acuity (things are in or out of focus)
  - b) Ocular motor (the muscles around the eyes let you track a ball through the air, or track words across a page while reading)
  - c) Visual motor coordination
  - d) Visual perception
2. Hypersensitive = may be bothered by fluorescent lights, too much hanging artwork, poor hand / eye coordination when coloring in the lines or cutting on the line, trouble reading across a page, trouble copying from the board far away
- a) Can help to have less hanging artwork, less stuff on the walls
  - b) Can help to adjust the lights (not fluorescent if possible)
  - c) Can help to prop books / papers up on a table easel



- d) Can help to use a “window guide” for reading to keep their place (it’s a solid piece of paper with a narrow slit opening that shows just one line of text at a time, blocks out the rest of the text)
  - e) Can help to have them copy from something close instead of from the board (give them a paper copy on their desk)
3. Hyposensitive (not sensitive enough)
- a) Can help to thicken the lines they’re supposed to cut on
  - b) Can help to use Wikistix to raise/emphasize the edge to help them color in the lines
  - c) Can help to use a colored overlay (colored plastic transparent sheet) when reading
4. For all children, make sure TV and computer screens are at the correct height (slightly below eye level)
5. Helps to play catch to practice eye/hand coordination
6. Simulation for teachers: try to do a dot-to-dot worksheet by looking in the mirror instead of at the paper (have to work very hard to process what your eyes are seeing and figure out what to make your hand do about it)
- K. Auditory = hearing and interpreting sounds, localizing sound (where did it come from), discriminating between different sounds (telling different notes or voices apart), and using sound to communicate
1. Hypersensitive = sensitive to loud sudden sounds, distracted by background noises
- a) Can help to offer headphones or ear plugs
  - b) Simplify the language you use when giving verbal instructions
  - c) Give them a warning before loud sounds (such as fire drills) so they can cover their ears
  - d) Use soft music to help them calm and focus (a soothing sound to focus on)

- e) Have them play in another room away from the vacuum cleaner or blender
- 2. Hyposensitive = may speak very loudly, crave loud music, loud drumming, screaming outside while playing, etc.
- 3. Simulation for teachers: play charades (requires reading facial expression, communicating without sound input)
- L. Motor planning = the act of executing a newly learned motor skill while relying on body sensors
  - 1. May have difficulty learning new motor activities, or may have poor articulation
  - 2. Need to offer them many opportunities to practice fine motor skills (such as writing) and gross motor skills (such as climbing)
  - 3. Simulation: copy the sentence "The quick brown fox jumps over the lazy dog." in cursive with your non-dominant hand (makes you think very hard about what to tell your hand to do, and it may not come out right)