Assessment of Sensory Impairment in Older Adults

Kristen Carr MPAS, PA-C, DipACLM
Assistant Professor
Department of Physician Assistant Studies
Case Study

82 yo man is brought in for a visit with his PCP by his daughter. She reports that in the past 3-4 months he seems *irritable*, less *interactive*, and more *confused* about his medications, making several medication errors. She feels he is *losing weight* and not eating well, *rarely goes out* to shop or to have coffee and play cards like he used to. He disagrees, saying she is “overreacting” and he is “just getting old.”

- What do you suspect may be going on?
- What tools can you use to screen when patients or families report concerns?
- How might different team members help in the assessment/evaluation of these concerns?
Objectives

• Describe the impact of sensory impairments on cognition, function, social isolation, and health outcomes.

• Identify current guidelines and evidence-based tools for screening for sensory impairment in older individuals.

• Determine appropriate patients for referral to interprofessional team members
Sensory Impairment

- Vision
- Hearing
- Smell & taste
  - Tactile
    - Temperature, texture, sensation, pain
  - Vestibular
    - Balance, movement
  - Proprioception
    - Body position in environment
Why is this important?

- Identification of sensory impairments (SI) in older adults is critical to aging well and optimizing accommodations
- Growing elderly population
- Interprofessional teamwork
Prevalence of SI

- Increases with age

- For those 65+
  - 9% blindness or visual impairment (VI) (Assi 2021)
    - 18%+ for those over 70 (Crews)
  - 50% hearing impairment (HI) (Assi 2021)

- For those 80+
  - ~15%* report dual sensory impairment (DSI) (Hwang)
    - *range 8.6-21.9%
Prevalence of SI

• Hearing impairment (HI)
  – Age 65-74: ~25%
  – Age 75+: ~50%
  NIH data

• Olfactory impairment (OI) (Pang)
  – 50% age 65-80
  – 80% older than 80
Overall Impact

- Individualized and vary
  - Severity/Type
  - Occupation
  - Activity level & mobility
  - Roles in the home
  - Location/Access to care
  - Safety (ie: need to smell dangerous odors)
  - Belief systems
  - Personal choices
Vision Impairment

• Decreases in:
  – Leisure activities, IADL performance and social functioning (social isolation, depression)
    • Driving
  – ADL’s and mobility (falls, hip fractures) (Crews)
    • Safety (kitchen, bathroom)
• Increases in:
  – Physician visits and hospitalizations
  – Mortality
  – Family stress (Crews)
Hearing Impairment

• Decreased function and psychosocial impairments
  – Physical mobility & activity (falls)
  – Social engagement (social isolation)
  – Communication (QoL)

• Increased rates or risk of:
  – Depression
  – Dementia

• Uncorrected = accelerated cognitive decline in dementia (Crews)
Dual sensory impairment (DSI)

- More functional limitations than those with 1 or no impairment (Assi 2021)
  - Decreased mobility, self-care activities and household activities (IADLs)

- Increased physical disability measured by IADLs (women), imbalance, falls, hip fracture, mortality (Crews)

- Decreased quality of life (QoL) (Crews)

- Markedly worse psychosocial factors (Hajek & Konig)
  - Life satisfaction, positive/negative affect, depressive symptoms, loneliness, social isolation, self-esteem and autonomy
Smell & Taste (OI): Impacts

- Overall lower QoL
- Weight loss/malnutrition
  - Reduced appetite
  - Loss of joy in eating/preparing meals
    - Reduced social participation -> Depression
- Decreased safety
- 52% higher risk of all-cause mortality -> Frailty
- Early sign of neurodegenerative disorders/cognitive decline

(Pang)
Impact of SI on Cognition

- Cognitive inactivity, social isolation, poor diet, depression → Dementia

- Cross-sectional study of 18k age 45+ in China (Rong)
  - Word recall, orientation, serial 7s, intersecting pentagons
  - Visual and/or hearing impairments = higher risks of cognitive decline and depression
    - Worse performance in episodic memory, mental intactness, global cognition; worse depression symptoms
  - DSI: worse on all outcomes
DSI and Dementia

- DSI associated with cognitive impairment and dementia (Assi 2021)

- Risk factor for dementia
  - **GEM study**: RCT Age 75+ normal or MCI
    - Subset N= 2051 over 8 yrs (Hwang, et al)
    - 86% increased risk for all-cause dementia
    - 112% increased risk for Alzheimer's Dementia (AD)
    - Dose-response relationship
SI and Dementia

- HI and VI more common in people with dementia
- **SENSE-Cog Field Trial** (Leroi)
  - “sensory intervention” n=19 (+ study partner)
    - Hearing and vision assessment (58% had DSI)
    - Glasses/hearing aids
    - Weekly visits from sensory support therapist (subgroup)
      - Education, referrals, support, aids (glasses straps, lighting, etc)
  - **QoL and sensory functional ability improved** (qualitative)
    - More social engagement, less isolated, less dependent, increased communication
  - Assistance time for IADLs decreased
  - RCT coming…
Impact on Social Isolation

“Blindness cuts us off from things, deafness cuts us off from people” - Helen Keller

- Sight loss usually visible
  - Hearing loss, taste/touch/smell impairments less visible

- Increase risk of depression, anxiety, lack of self-esteem, loneliness (Rong, Assi, Hajek & Konig)
Impact on Health Outcomes

• 2017 Medicare Current Beneficiary Study (65+)
  – Increased odds of dissatisfaction with
    • Quality of care (DSI)
    • Information provided (all)
    • Doctors concern with overall health (DSI and HI)
    • Ease to get to a doctor visit and out-of-pocket costs (DSI and VI)

• COVID 2022 - UK Office for National Statistics (ONS)
  – Those age 30-69 with DSI ~12x as likely to die from COVID
  – Adjusted for age/residence, health status: 1.4x higher
Barriers

- Access to comprehensive/integrated care
  - Lack of routine eye care
  - Cost
    - hearing aids, corrective lenses
    - Specialty visits
  - Limited time in primary care visits
  - Travel
- Poor social network
- “Normal aging” – normalizing
- Fear
Sensory Impairment in Older Adults

ASSESSMENT & MANAGEMENT
Case Study

- Age 82, lives alone in own house
- Drives to familiar places
- Daughter provides 1 meal 1x week
- PMH
  - CAD s/p CABG 14 years ago
  - HTN
  - HLD
  - BPH
  - Up to date on vaccines, last clinic visit 6 months ago (stable)
- Vitals
  - BP 140/82, HR 55, BMI 26 – weight down 10 lbs
  - Has hearing aids, not wearing them
Hearing: Causes

- Genetics
- Age
- Noise exposure/trauma
- Infections
- Medications/toxins
- Tinnitus
- Wax
Ways to Screen Hearing

- “Do you have difficulty with your hearing?”
- Whispered Voice, Finger rub, watch tick tests
  - Tuning fork tests: Weber, Rinne
- AudioScope (Welch Allyn): handheld otoscope with built-in screening audiometer
- Audiometry apps
- Hearing Handicap Inventory for the Elderly-Screening (HHIE-S) questionnaire
- All confirmed with pure-tone audiometry
Hearing Loss: Ways to manage

- **Audiology** → Hearing aids
  - In US only 1 in 5 uses hearing aids
- **Pharmacy** – ototoxic medications
- Telephones that use text rather than speech
  - Voice to text apps
- Flashing light doorbells
- Vibrating pager systems
- Door chimes
- Vibrating alarm clocks
- Assistance dogs
- Sign language, Lip reading
Vision Loss: Causes

- Presbyopia - most
- Uncorrected refractive errors (access)
- Cataracts
  - ~50% of US adults 75+ (USPSTF 2022)
- Diabetic retinopathy
- Glaucoma
- Macular degeneration
- Genetics
- Injury
- Substance Use
Ways to Screen Vision Loss

- “Do you have concerns about your vision?”
- Visual Acuity  * not sensitive or specific
  - Snellen eye chart
  - Early Treatment Diabetic Retinopathy Study (ETDRS) chart
- Visual field testing
- Fundoscopy
- Refractive error
  - Pinhole test
- Macular Degeneration
  - Amsler grid
Vision Loss: Management

• **Optometry/Ophthalmology**
  – Glasses, contacts
  – Surgery - cataracts
  – Laser procedures
  – Injections
  – Medications/drops

• **Assistive Devices/Housing Adaptations**
  – *PT/OT*
  – Canes
  – Lighting
  – Rugs
  – Safety
Vision Loss: Management

• Medication Assistance - *Pharmacy, Nursing*
• Technology/Computing
  – Audio books
  – Font enlargement/Magnifiers
  – Voice to text
  – Talking clocks, watches
  – Large button telephones
• Guide dogs
• Meals on Wheels/food prep – *Social Work*
Smell & Taste: Causes

- Medications
- Chronic sinus disease
- Infections (URI, COVID)
- Brain injury
- Cancer
Ways to screen

- Open ended questions
- SNAQ
- Smell Identification Test (UPSIT)
Smell & Taste: Management

- **ENT**
  - Smell & taste testing
  - Tests: endoscopy, scans
  - Tx: steroids, antibiotics, surgery, smell/taste therapy

- **Dietician**

- **Speech Therapy**

- **Pharmacy**

- **Specialists: Neurology, Oncology…**

- **Support:** address loss to individual
  - *Behavioral Health*

- **Identify safety risks**
  - Smoke Detectors, spoiled food, etc
4Ms

What Matters
Know and align care with each older adult's specific health outcome goals and care preferences, including, but not limited to, end-of-life care, and across settings of care.

Medication
If medication is necessary, use Age-Friendly medication that does not interfere with What Matters to the older adult, Mobility, or Mentation across settings of care.

Mentation
Prevent, identify, treat, and manage dementia, depression, and delirium across settings of care.

Mobility
Ensure that older adults move safely every day in order to maintain function and do What Matters.
Cultural Humility

• “Tell me what a normal day looks like for you…”

• “What is the most difficult task for you to accomplish?”
  – “How do you handle that?”

• “I notice you wear glasses – when did you last see your eye doctor?”

• “How is your hearing? Does anyone ever say you aren’t hearing well?”

• “Do you ever stay home because its too difficult to go out?”
Communication

- **Purpose**
- **Effective Communication**
  - Well-lit room
  - Eye contact
  - Minimal background noise
  - Underreporting
- **Caregiver Input**

Nicholas
History and Exam

• History
  – ADLs, IADLs
  – Comorbid health conditions
• Physical Exam
  – General
  – Eye exam
  – Ear Exam
    • Otoscope (wax), Whispered voice test, tuning fork tests
  – Nose, Mouth/Throat & CN testing
  – Cognition
  – Mobility
Validated Screening Tools

### 10-Minute Geriatric Screener

<table>
<thead>
<tr>
<th>Problem</th>
<th>Screening Measure</th>
<th>Positive Screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision</td>
<td>2 Parts:</td>
<td>Yes to question and inability to read greater than 20/40 on Snellen chart</td>
</tr>
<tr>
<td></td>
<td>Ask: “Do you have difficulty driving, or watching television, or reading, or doing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>any of your daily activities because of your eyesight?”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If yes, then:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Test each eye with Snellen chart while patient wears corrective lenses (if applicable).</td>
<td></td>
</tr>
<tr>
<td>Hearing</td>
<td>Use audioscope set at 40 dB. Test hearing using 1,000 and 2,000 Hz.</td>
<td>Inability to hear 1,000 or 2,000 Hz in both ears or either of these frequencies in one ear</td>
</tr>
</tbody>
</table>

- **10-Minute Geriatric Screener**
  - Vision
  - Hearing
  - Mobility – Timed Get Up and Go (TUG) test
  - Physical Disability – 6 questions
  - Urinary Incontinence, Memory, Depression, Nutrition/Weight loss
# Integrated Care for Older People (ICOPE)

## Table 1. WHO ICOPE Screening Tool

<table>
<thead>
<tr>
<th>Priority conditions associated with declines in intrinsic capacity</th>
<th>Tests</th>
<th>Assess fully any domain with a checked circle</th>
</tr>
</thead>
</table>
| **COGNITIVE DECLINE** (Chapter 4)                                 | 1. Remember three words: flower, door, rice (for example)  
2. Orientation in time and space: What is the full date today? Where are you now (home, clinic, etc)?  
3. Recalls the three words? | | Wrong to either question or does not know  
|                                                                 | | Cannot recall all three words |
| **LIMITED MOBILITY** (Chapter 5)                                  | Chair rise test: Rise from chair five times without using arms. Did the person complete five chair rises within 14 seconds? | No |
| **MALNUTRITION** (Chapter 6)                                      | 1. Weight loss: Have you unintentionally lost more than 3 kg over the last three months?  
2. Appetite loss: Have you experienced loss of appetite? | Yes  
Yes |
| **VISUAL IMPAIRMENT** (Chapter 7)                                 | Do you have any problems with your eyes: difficulties in seeing far, reading, eye diseases or currently under medical treatment (e.g. diabetes, high blood pressure)? | Yes |
| **HEARING LOSS** (Chapter 8)                                      | Hears whispers (whisper test) or Screening audiometry result is 35 dB or less or Passes automated app-based digits-in-noise test | Fail |
| **DEPRESSIVE SYMPTOMS** (Chapter 9)                               | Over the past two weeks, have you been bothered by  
- feeling down, depressed or hopeless?  
- little interest or pleasure in doing things? | Yes  
Yes |
**HHIE-S**

- Higher score = higher probability of disability
- Refer to Audiology if score 10+

---

**Hearing Handicap Inventory for the Elderly Screening Version (HHIE-S)**

*Instructions:* Please check “yes,” “no,” or “sometimes” in response to each of the following items. Do not skip a question if you avoid a situation because of a hearing problem. If you use a hearing aid, please answer the way you hear without the aid.

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes (4 pts)</th>
<th>Sometimes (2 pts)</th>
<th>No (0 pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E  Does a hearing problem cause you to feel embarrassed when meeting new people?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E  Does a hearing problem cause you to feel frustrated when talking to members of your family?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S  Do you have difficulty hearing when someone speaks in a whisper?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E  Do you feel handicapped by a hearing problem?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S  Does a hearing problem cause you difficulty when visiting friends, relatives, or neighbors?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S  Does a hearing problem cause you to attend religious services less often than you would like?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E  Does a hearing problem cause you to have arguments with family members?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S  Does a hearing problem cause you difficulty when listening to TV or radio?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E  Do you feel that any difficulty with your hearing limits or hampers your personal or social life?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S  Does a hearing problem cause you difficulty when in a restaurant with relatives or friends?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL SCORE =** [sum of the points assigned to each of the items]
Rapid Geriatric Assessment (RGA)

- St. Louis University
**No copyright**

Components:
- FRAIL questionnaire - frailty
- SARC-F – sarcopenia
- SNAQ – appetite/taste (OI), weight loss
- Rapid Cognitive Score
  - 5 object recall
  - Clock draw
  - Story/memory
- Advance Directive Y/N

*no specific HI or VI screening*
Guidelines: WHO 2019

- Screen for declines in intrinsic capacity
  - ICOPE Screening Tool
    - Includes hearing loss, visual impairment
- Prevention
  - Vision
    - Optimize HTN, DM2, steroid use
    - Adapt home: lighting, contrasting colors, remove hazards
  - Hearing
    - If abnormal audiology → hearing aids/refer
    - Emotional support, auditory aids (phone, doorbell)
Recommendations

• USPSTF
  – Hearing loss: Insufficient evidence (2021)
  – Vision loss: Insufficient evidence
    • Visual acuity or glaucoma in older adults
    • Consider more frequent exams in patients at higher risk for glaucoma (African-American, Hispanic)

• Others
  – AAFP – agrees with USPSTF recommendation - I
  – American Academy of Ophthalmology
    • Comprehensive exam q 1-2 years in patients 65+
  – American Optometric Association
    • Yearly exam 65+
Medicare

- **IPPE**
  - Screen for depression
  - Direct observation or screener
    - ADLs, Fall risk, **Hearing Impairment**, Home safety
  - Exam: **visual acuity**

- **Annual Wellness Visit (AWV)**
  - Health Risk Assessment (HSA)
    - As above in IPPE plus:
      - Psychosocial risks (life satisfaction, social isolation..)
      - IADLs
      - Cognitive function (brief test)
Interprofessional Team

- PCP – MD, DO, PA, NP
- Audiologist
- Optometrist/Ophthalmologist
- ENT
- Dentist
- Nursing
- Therapists: OT, PT, ST
- Pharmacy
- Social Worker
- Behavioral Health
- Dietician
- Specialists
Caregivers

- Critical to implementation of the plan
- Day to day activities
- Support
- Caregiver Stress
When to Refer

- Concerns
  - Self-reported or caregiver/family
  - PCP or other team members
  - Atypical presentation
- Falls, injuries, accidents (driving)
- Cognitive Decline
- Poor self-care
- Socially isolating
- Mood change: depression, anxiety, irritability
- Weight loss/Malnutrition
Case Study

82 yo man is brought in for a visit with his PCP by his daughter. She reports that in the past 3-4 months he seems **irritable**, less **interactive**, and more **confused** about his medications, making several medication errors. She feels he is **losing weight** and not eating well, **rarely goes out** to shop or to have coffee and play cards like he used to. He disagrees, saying she is “overreacting” and he is “just getting old.”

- **What do you suspect may be going on?** How would a SI impact his health?

- **What tools can you use to screen when patients or families report concerns?**

- **How might different team members help in the assessment/evaluation of these concerns?**
Case Study

• Clinic visit
  – ICOPE or 10-minute geriatric screener
    • PHQ9, GDS, or other mood assessment
    • SNAQ or other nutrition assessment
    • MoCA, SLUMS, or other cognitive assessment
  – Medication review
  – Exam
    • Vision
    • Hearing - “Tell me more about your hearing aids….”
    • Weight loss
  – 4Ms
  – Caregiver input/support

• Referrals
• Follow up
Summary

- Describe the impact of sensory impairments on cognition, function, social isolation, and health outcomes.

- Identify current guidelines and evidence-based tools for screening for sensory impairment in older individuals.

- Determine appropriate patients for referral to interprofessional team members
Sources

Sources


