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Agenda

- Definitions & Statistics
- Who helps?
- Challenges, solutions, and research
- Appendix as a solutions manual
- References
Special Note

Your appendix is an 84 page solutions guide covering 12 essential topics. Since we are covering all ADLs, our webinar will start with the newest, cutting edge solutions and research, and progress to only certain ADLs. The remainder of solutions and strategies are in your appendix guide.

Your Appendix will Cover

- Grocery Shopping
- Meal Prep / Kitchen safety
- Finance / Banking
- Time Management
- Recreation and Leisure
- Reading
- Television
- Social Life
- Health maintenance
- Depression
- Comorbid conditions
- Medical Conditions

Part 1: A Brief Overview of Low Vision in the US

- Definitions
  - Low Vision
- Prevalence
- Causes
- Who Treats Low Vision?
  - Role of OT’s
Definition of Low Vision

Low vision: a condition caused by eye disease, in which visual acuity is 20/70 or worse in the better-seeing eye, and cannot be corrected/improved with regular eyeglasses.

Definition of Legal Blindness

- “Legal blindness”: a definition used by the U.S. government to determine eligibility for voc training, rehab, schooling, disability benefits, low vision devices, and tax exemption programs. It’s not a functional definition and doesn’t tell us much about what a person can/cannot see.
- U.S. definition of legal blindness: acuity of 20/200 or less in the better-seeing eye with best conventional correction (regular glasses or contact lenses).

Prevalence of Visual Impairment in the U.S.

- Approximately 14 million Americans 12 yrs and older have self-reported visual impairment defined as distance visual acuity of 20/50 or worse.
- Approximately 11% of Americans 20 yrs and older with diabetes had some form of visual impairment (3.8% uncorrectable and 7.2% correctable). Among those without diabetes, 5.9% had some form of Visual Impairment (VI) (1.4% uncorrectable and 4.5% correctable).
- 3.4 million (3%) Americans 40 yrs and older are either blind (having visual acuity [VA] of 20/200 or less or a visual field of less than 20 degrees) or visually impaired (having VA of 20/40 or less).
- 1.66 million Americans 50 yrs and older have Age-related Macular Degeneration
- 5.3 million people (2.5% of all people) 18 yrs and older have diabetic retinopathy.
- 20.5 million Americans have cataracts (about 16%) 40 yrs and older
- 2.2 million Americans have glaucoma (about 2%) 40 years and older
Prevalence in the United States

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<td>Cataract (37%)</td>
<td>Glaucoma (29%)</td>
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<td>9%</td>
<td>Diabetic Retinopathy (26%)</td>
<td>Age Related Macular Degeneration (14%)</td>
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<td>Age Related Macular Degeneration (4%)</td>
<td>Diabetic Retinopathy (14%)</td>
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Health-Care Professionals that Treat Low Vision

- Ophthalmologists (eye doctors)
- Optometrists
- Occupational Therapists
- Vision Rehabilitation Therapists
- Orientation and Low Vision Therapists
- Social Workers

Role of an Occupational Therapist in Treating Low Vision

- After getting referred to occupational therapy by an ophthalmologist, occupational therapists focus on assisting people to engage in their activities of daily living and in occupations that they find purposeful.
Part 2: Challenges and Solutions

- Case Study: 70 year old woman with AMD
- Critical Thinking: What areas of life have been most impacted?
- Problems, Solutions, and Research

OT in Action: A Case Study of Age-Related Macular Degeneration (AMD)

What is Age-Related Macular Degeneration?

- Age-related macular degeneration, macular degeneration, AMD, or ARMD is deterioration of the macula.
- The macula: a small spot near the center of the retina. Responsible for sharp, central vision. Lets us see objects that are straight ahead.
- Macular health impacts ability to read, recognize faces, drive, watch television, use a computer, and perform tasks requiring fine detail.
- AMD is diagnosed as either dry (non-neovascular) or wet (neovascular). Dry AMD is more common and less severe than wet AMD.
- AMD usually produces a slow, painless loss of vision. In rare cases, vision loss can be sudden. Early signs of AMD include shadowy areas in your central vision or unusually fuzzy or distorted vision.
Through the Eyes of Someone With AMD

The Case of Tammy: A 70-year Old Woman with Macular Degeneration

Tammy is a 70-yr old woman with in both eyes. She has hypothyroidism and Type II Diabetes Mellitus (both controlled). Her vision has deteriorated rapidly. She faces difficulty in her job duties, carrying out ADLs, and managing her health. Her social life has also suffered greatly. This has led to a loss of independence, loss of meaningful activities (both leisure and work) and loss of meaningful relationships in her life. She has developed depression and anxiety. In the following slides, we will examine some of the challenges she faces, and the impact of AMD in the different domains of life, and some evidence-based solutions, tips, and strategies that Tammy can use to adapt to her new circumstances.

Transportation and Driving
ADL: Driving

- Tammy relies on her car for transportation. She uses her car to drive to work and to weekly health appointments. She also drives to her volunteering site on the other side of town, and to church every Sunday. She drives to go to the grocery store once a week as well.
- Additionally, driving is important to the maintenance of her social life. She drives to visit her friends and family at their homes, or to restaurants they decide to meet at. She also drives to meet up with her badminton partners once a week.

Challenge: Figuring Out Transportation

- As a result of her AMD, Tammy is afraid to drive, and worries that she will no longer be able to drive safely. Additionally, she is not aware of transportation resources in her area, and is worried that she will be house-locked because she won’t be able to find suitable transportation. She is afraid to depend on others for rides, is sad because she knows that she will eventually have to give up her driver’s license as her condition progresses, and is starting to wonder if she will no longer be able to live independently.
Bioptics for Driving: A Controversial Approach
Driving and Age-Related Macular Degeneration  C. Owsley, G. McGwin Jr -
Journal of visual impairment & blindness, 2008

- Bioptic driving is operating a car with the assistance of specialized bioptic
telescopic spectacles (called bioptics). These devices allow some drivers with
low vision (including those with AMD) to meet the minimum acuity standards for
licensing.
- During driving, bioptic devices are used briefly to see details (road signs, "spot"
landmarks). Most of the vision that is used while driving is through the person’s
regular eyewear.
- Although bioptic eyewear may improve acuity, a driver’s visual field is reduced
while looking through the bioptic device.
- Using bioptics to obtain a driver’s license and to drive is legal in some jurisdictions
in the US and worldwide. Among jurisdictions where bioptics are permitted, there
is variability in the details of the laws governing the use of bioptics.

The Research on Bioptics

Measuring the effectiveness of bioptic telescopes for
persons with central vision loss

Evaluated a vision rehabilitation program to train persons with central vision
loss to use a bioptic telescope for improving ADLs (including driving) and
compared the outcomes of subjects who are given bioptic telescopes with
and without training.

25 subjects ranging in age from 16 to 78 years, randomized to one of three
groups:

Group 1 received bioptic telescopes and training during the first approximately 3-month-
long period of the approximately 6-month-long study

Group 2 received lenses and training during the second approximately 3-month-long
period of the study

Group 3 received the lenses for approximately 3 months without any training.
Measuring the effectiveness of bioptic telescopes for persons with central vision loss

Significant improvement in all task categories with use of the telescopes. Improvement in all task groups with training, though a significant difference between the trained and untrained groups existed only in the Recognition, Peripheral Identification, and Scanning Categories, but not in Mobility, Tracking, or Visual Memory. When the tasks involving driving-related skills were analyzed separately, training also had a significant effect.

Bottom line: We need training for individuals with AMD with regard to using bioptic telescopes. This is where the help of an OT or an O&M specialist may come in handy.

Public Transit and Disability Transit

The Americans with Disabilities Act (ADA) gives people with disabilities many important rights in the area of transportation. If you have a disability, you are entitled to the same right to use and enjoy public transportation as people without disabilities. Examples of things that your local transit authority must do to make a transportation system accessible: Public buses need to be accessible to those in wheelchairs, drivers need to announce their stops out loud to benefit visually impaired persons who ride the bus etc.

Paratransit Services  If the local transit authority cannot adequately serve its clients with disabilities in its regular system, it is required to create a parallel transportation system for people with disabilities. This system is referred to as a paratransit system. Paratransit systems are curb-to-curb demand-responsive systems. What this means is that you should be able to schedule a trip, be picked up at your door, be taken to your destination, and returned home. You should be able to schedule your ride just 24 hours in advance. Your pickup time should be within one hour before or after your desired departure time. You should not be asked to schedule your trip during off peak hours. The transit authority should put additional vans and buses on the road during peak hours to keep up with the demand.

Additional Transportation Options  In some communities, accessible transportation may still be a problem. The Lions Club is one organization that can establish transportation services for people who are blind and visually impaired in communities where accessible transportation does not exist. You can also try the Prevent Blindness Paratransit Directory.

Other Tips and Tricks

- Carpooling - ask coworkers for a ride to work, ask neighbors to drive you to the grocery store when they go shopping.
- Local churches / community groups may have “volunteer” transportation programs that provide rides free of charge.
- Local taxi companies may be willing to negotiate discounts for disabled passengers who frequently use their services.
- There are new “rideshare” services cropping up such as Uber and Lyft in most major cities nationally. These services offer rides on demand within minutes in private vehicles, as taxi alternatives. They have mobile apps used to request the ride and handle fees electronically.
More Tips and Tricks

● Some people keep their vehicle and hire a personal driver. You may want to advertise locally, interview candidates carefully, do a background check, ask about their driving record, negotiate fees and secure appropriate insurance coverage. This option involves other expenses such as car maintenance, registration and tags, insurance and gas.

● Some communities offer a ‘voucher transportation program’ through the senior services or community services center. These programs are subsidized by federal and local agencies to provide transportation for seniors and disabled adults. The rider buys a book of vouchers at a low cost and exchanges them with a certified driver at the time of service. The driver then cashes in the vouchers for a subsidized amount.

Transportation Resources and Education

● City or county government information or disability service offices, such as the Office of Vocational Rehabilitation, may have transportation resource guides available or put you in contact with an Orientation and Mobility Instructor.

● The Regional Metropolitan Planning Organization (MPO) for urban areas can provide transportation choices that are available in those areas, as well as current and upcoming projects.

● The Regional Council of Governments (COG) for rural areas provides a similar service as MPO’s, but the focus is on several towns within a state.

● Centers for Independent Living work with public transit to help others develop independent living skills, and therefore, may have information on transit routes and contact information. To find Centers for Independent Living in your state visit http://www.vtulid.org/.

● American Public Transportation Association, at http://www.publictransportation.org, is the best resource for locating public transportation and ADA complementary paratransit services.

● Easter Seals Project ACTION (hotline for information on accessible transportation), 1-800-659-6428 or http://www.projectaction.org, is a good place to ask accessible transportation questions of any kind and get referrals for transportation services in your community.

Personal and Community Mobility
ADL: Walking Around the Neighborhood

- For exercise, Tammy likes to walk around the neighborhood for at least half an hour a day. She lives in a suburb, about a ten minute walk from downtown. If she is running simple errands, such as going to the bank or to pick up a single item at the grocery store, she likes to walk because it affords her the opportunity to exercise.
- Since she has Type II Diabetes Mellitus, her doctor recommends she walks after a meal or do light household work in order to stabilize and regulate her blood sugar levels.

Challenge: Barriers in the Natural and Built Environment

- Walking around the neighborhood presents its own set of challenges. She is unable to see curb edges and ramps due to decreased contrast sensitivity. There are inconsistencies in the level of sidewalks where she lives as well. Additionally, there are parts of her walk across town that don't have a sidewalk, and she feels uncomfortable when she has to transition from the sidewalk onto uneven gravel, or grass. Additionally, crossing roads makes her feel uncomfortable, and she has hit her head on scaffolding, and is afraid to go out.
- As a result, she does not want to leave her house because she is afraid that she will get injured if she leaves her house due to environmental barriers she faces that preclude her access and community participation.

The Research on Barriers
These authors conducted in-depth interviews with 35 adults over age 50, who used an assistive device and lived in King County, Washington, U.S. Participants were on average of 67 years of age (range: 50–86) and predominantly used canes (57%), walkers (57%), or wheelchairs (46%). In addition, participants wore Global Positioning Systems (GPS) devices for 3 days prior to the interview.

Key themes: curb ramp availability and condition, sidewalk availability and condition, hills, aesthetics, lighting, ramp availability, weather, presence and features of crosswalks, availability of resting places and shelter on streets, paved or smooth walking paths, safety, and traffic on roads.

Results showed that a variety of built environment barriers and facilitators to neighborhood-based activity exist for midlife and older adults with mobility disabilities.

*The bottom line: preparing our neighborhood environments for an aging population that uses assistive devices will be important to foster independence and health.*
Assistive Devices That Improve Mobility

- **Laser Cane**
  - An electronic cane that uses invisible laser beams to detect obstacles, drop offs, and similar hazards. Once the cane detects the obstacle or drop off, it produces a specific audio signal. There are 3 distinct audio signals. The audio signal informs the user of the distance of the obstacle or the height of the drop off. This device can detect objects and hazards up to a distance of 12 feet. Part of the cane's handle also vibrates when there is an object in front of the user. Mobility experts strongly recommend that blind persons first learn to use a long white cane before using the laser cane.

- **Sonic Mobility Device**
  - This device is mounted on the user's head. It uses ultrasonic technology to detect obstacles and other objects. The sonic mobility device uses the musical scale’s 8 tones to indicate the distance of the object. Each tone signifies a particular distance from the obstruction. The user hears tones through the device’s earpiece. Although suitable for outdoor use, it may not be used in places with extremely loud noise. This device should be used with a cane or a guide dog.

- **Handheld Mobility Device**
  - This is a small device which the user points around the surroundings. Once the handheld device detects a particular object, the device will vibrate. The vibration enables the user to identify that there is an object nearby. Certain handheld mobility devices produce a level of vibration depending on the distance of the object. A fainter vibration for a relatively far object and a stronger vibration to a near one. These devices should be used with a cane.

- **GPS Devices for the Blind**
  - Although mainly used in identifying one’s location, GPS (Global Positioning System) devices also help blind persons in traveling independently. Blind persons can use portable GPS systems to determine and verify the correct travel route. They can use these devices whether they are walking or riding a vehicle. GPS devices for the blind include screen readers so the user can hear the information. Other GPS devices are connected to a Braille display so the user can read the information displayed in Braille. Blind persons should use a particular mobility device in addition to the GPS system.
Assistive Devices Enhance Mobility: Supporting Research

Investigated environmental factors affecting people with motor impairments and people with visual impairments in urban neighborhoods.

Nonrandom sample of users of four types of assistive mobility technologies: guide dogs, long canes, motorized & manual wheelchairs.

Most participants in all groups using assistive technologies rated their neighborhoods as accessible, although they also reported many specific barriers. Users of assistive mobility technologies differed in the amount of reported physical activity and on specific barriers. Problems with sidewalk pavement and puddles/poor drainage were the most frequently mentioned environmental barriers. Users of assistive mobility technologies were more similar on main strategies for dealing with barriers. All groups reported having to plan routes for outings, to alter planned routes, to go more slowly than planned, or to wait for a different time.

Despite legislative requirements for accommodation, people with disabilities face barriers to physical activity, both in the built and social environments. Determined people with disabilities were able to overcome barriers, but required additional expenditure of resources to do so. Community design that can include people with disabilities requires detailed understanding of barriers specific both to types of impairments and to different types of assistive mobility technologies.
The White Cane: A Very Useful Tool

- White canes are white because of George A. Bonham. In 1930, Bonham, president of the Peoria Lions Club (Illinois), watched a man who was blind attempting to cross a street. The man's cane was black and motorists couldn't see it, so Bonham proposed painting the cane white with a red stripe to make it more noticeable.
- A white cane is a long rod-like device used by blind or visually impaired travelers to give them information about the environment they are traveling through.
- Using a cane can warn them of obstacles in their path. The cane can tell people if they need to avoid a gaping hole, step over a puddle, or simply walk over a harmless shadow.
- The cane is also useful for judging the depth of a curb. The cane will also do something else, it will alert others around them that they are blind, and this can be very helpful. Many, if not all, states have laws concerning how drivers must act when encountering a person using a white cane.

Get Your Free White Cane Here

The National Federation for the Blind provides a white cane, free of charge, to the user. Any blind individual in the fifty states, the District of Columbia and Puerto Rico may request a white cane for their personal use. Please see the online application or download the paper application to view available cane sizes.

Website: https://nfb.org/free-cane-program

Echolocation: Not Just for Bats

- Echolocation is the ability to detect objects in the environments by sensing reflected sound waves from objects.
- Human echolocation is similar in principle to active sonar and to the echolocation employed by some animal species, including bats and dolphins.
- This ability is also used by some blind persons to navigate independently within a variety of environments by actively creating sounds (snapping the fingers, making clicking sounds with the mouth and tongue) and then interpreting the sound waves as they are reflected from nearby objects. A person trained to navigate by echolocation can accurately identify the location – and sometimes size – of nearby objects and use this information to travel independently in a variety of indoor and outdoor environments.
Echolocation may have real-life advantages for blind people: an analysis of survey data

Lore Thaler Front Physiol. 2013, 4: 98

Previous research has shown that echolocation improves blind people's spatial sensing ability. The current study investigated whether there is evidence for functional benefits of echolocation in real life.

Online survey was conducted with 37 blind people.

The majority of participants (34 out of 37) used a long cane, and all participants who reported to echolocate, also reported using the cane.

The bottom line:

The benefit of echolocation might be conditional upon the long cane being used as well. The investigation was correlational in nature, and cannot be used to determine causality. Echolocation offers real-life advantages for blind people, and that echolocation may be involved in people's successful adaptation to vision loss.

How to Teach Echolocation

- To experience echolocation, try closing your eyes and making a sound while you move your head closer to a wall. Pay attention to how the sound changes. Some people describe the sound as more "echo-y," while other people "sense the presence" of the wall in ways they can't describe and are surprised to discover it is their hearing that is "sensing" the wall.

- Echolocation used to be called "facial vision" because the sensation often seems to be in the perception of the skin rather than the ears.
Using Hearing

Everyday sounds can provide many clues about your surroundings, including:

- The hum of the refrigerator in your kitchen
- Traffic sounds in the street outside your home
- Pedestrians passing you on the sidewalk

O&M instruction can teach you to:

- Use the hum of your refrigerator or traffic sounds as “landmarks” to help you determine where you are, both inside your home and outdoors;
- Determine the direction of a sound and its distance from you;
- Use traffic and pedestrian sounds to determine the width of a street, the location of a traffic signal or stop sign, and the direction to face when crossing the street

Echolocation Resources

- To learn more about echolocation, I recommend contacting Daniel Kish, the founder and president of World Access for the Blind, an organization that provides instruction in FlashSonar (echolocation), mobility, and life skills to blind youth and adults.
- Daniel lost his vision from retinal cancer when he was 13 months old. He has developed a wide array of echolocation techniques and uses those techniques to lead “no-holds-barred” hiking, mountain biking, and wilderness expeditions. World Access for the Blind believes that recreational activities are valuable ways for blind persons to build confidence, improve their navigation skills, and fully participate in society.

Echolocation Video

https://www.youtube.com/watch?v=A8lztrJ1u4o
Role of Balance in ADLs

- Balance and vision are interdependent. When a patient loses vision, the information sent to the brain is less complete so the brain cannot make typical adjustments to maintain balance.
- There are many strategies to improve balance.

The Research on Balance

The effects of balance of low vision patients on activities of daily living

Investigated the relationship between balance and activities of daily living (ADL). Used the NEI-VFQ-25 vision-related Activities of Daily Living evaluation, MMSE-K, and TETRAX to evaluate 30 low-vision outpatients in Daejeon, South Korea.

Balance in the normal eyes open (NO) posture correlated with the normal eyes closed posture and age, but showed no correlation with NEI-VFQ 25. The ADL level correlated with monocular vision, female gender, cognition, and NO posture. These variables explained 54.4% of the aspects of their ADL.
The effects of balance of low vision patients on activities of daily living.

This research proves that low vision adversely affects balance ability, and is influenced by type of vision, gender, and cognitive assessment.

Balance training and visual rehabilitation of AMD patients

Measured the impact of balance training on visuomotor functions and reading speed.
54 AMD patients, 55 normal controls.

Sixteen patients and 14 controls subsequently received balance training sessions on a postural platform (Multitest) stressing sensorimotor coordination by selectively inhibiting or disturbing either, visual, vestibular or somatosensory input.

Assessed postural sway, pointing accuracy, reading performance and, for the patients, the effect of low vision training and balance training on the shift from several spontaneous Preferred Retinal Loci (PRLs) to one or more Trained Retinal Loci (TRL).

Even after a limited number of sessions of cross-modal balance training, the results show a significant improvement for the vestibular input and fixation stability.

A decrease of visual dependency was observed only in the control group. Apart from these improvements, pointing accuracy and reading speed were not significantly improved compared to controls, leading to the conclusion that more training sessions may be necessary to gain more significant improvement of visuomotor functions.
How To Teach Balance Video
https://www.youtube.com/watch?v=j-GXnpMeN6Q

Eccentric Viewing

Preferred Retinal Locus

- Many people compensate for reduced central vision by shifting their vision slightly so that they can see things more clearly. They use the "next-best spot" (the Preferred Retinal Locus, or "PRL").

- Adapting to non-central vision can be challenging. Therapists optimize remaining vision by teaching patients how to identify "the best" area of the retina to use and how to shift the visual field from straight ahead to peripheral vision. One way to learn to use peripheral vision is through eccentric viewing and fixation. Most patients find this hard at first, but as they train, they are soon able to utilize the PRL. There are also various adaptable protocols to increase specific abilities such as reading or far visual scanning. For example, if you look directly at something, such as a person's nose, you can make it disappear in the blind spot. However, if you look slightly to the side, the blind spot moves off to the side, and using your peripheral vision, you can see the person's nose again.
How To Improve Peripheral Vision in Low Vision Clients: Eccentric Viewing

- Because AMD affects people in different ways, the "sweet spot" for someone might be at the "one o'clock" position in their field of vision and someone else might see better at the "nine o'clock" position. The key is teaching patients to tilt their heads up, down, right or left until they can determine their optimal viewing angle using peripheral vision.

- Once a patient has been taught to locate the "sweet spot," many visual tasks become easier.

Eccentric Viewing: An Effectiveness Study

Patients with AMD and a large absolute central scotoma can be trained successfully to use eccentric viewing, as demonstrated in a scanning laser ophthalmoscope.


20 patients with AMD, an absolute central scotoma, and a mean visual acuity of 0.04 (20/475)

20 patients trained to use a new / more favorable retinal locus for reading, above (or occasionally below) the retinal lesion, first by reading scrolled text under simultaneous fixation monitoring and instruction and then by reading printed text, using high magnification (mean 14.3×).

For the 18 patients who learned to use eccentric viewing, reading speed with adequate magnification prior to training was 9.0 ± 5.8 words/min. With training (mean 5.2 hours), it increased significantly (p<0.001) to 68.3 ± 19.4 words per min.

The Bottom Line: Training of eccentric reading has been proved to be successful.

Eccentric Viewing Video

https://www.youtube.com/watch?v=cx191Ysp17A
Visual Scanning: A How to Guide

- Scanning teaches people who have limited peripheral vision how to better negotiate the environment. This technique involves learning to move the head systematically to enable maximal viewing.
- Example exercise: paper and pencil task. The therapist creates a sheet with many letters printed at random on the page. The patient has to find all the same letters ("A" for example) and circle them. Another way to practice is to have a friend or family member scatter items on a table or bed and have the patient scan all directions to locate them all. To make it this exercise even more challenging, one can scatter items on the floor in random places over several rooms.
- These scanning techniques should be practiced regularly. When scanning is mastered, the risk of bumping into things and tripping is significantly reduced.

The Brainport Device for Balance
The BrainPort® V100 Vision Aid is a non-invasive assistive device for the blind based on sensory substitution. The device translates camera images into electrotactile stimuli delivered to the tongue. The BrainPort has recently received the CE mark and FDA approval and it is currently marketed to augment the traditional assistive technologies.

**The bottom line:** The BrainPort enables blind people to perceive light, identify simple objects, recognize short words, localize simple objects, and detect motion/ orientation of objects. Proper rehabilitation and training regimes are crucial for using this device.

**BrainPort V100 Vision Aid. Video**

https://www.youtube.com/watch?v=xNkw28fz9u0
ADL: Work

- Tammy works as a secretary at a dentist’s office. She has been working at the same office for 40+ years, ever since she had children of her own.
- As a part of her job, she uses a computer and smartphone to make appointments for clients, answers main phone lines, records important meeting notes, makes photocopies of patient information for the dentists and files them, enters data from client intake forms and from phone-calls, and must locate and highlight important information pertaining to education and after-care for patients who have had a dental procedure done.

Challenges at the Workplace: Accessibility

- As a result of her visual impairment, she has trouble finding documents on her computer, since the computer menus are in small font. Her smartphone display is too small to read and she finds it hard to make appointments. When she does client intakes, she squints at the tiny font on the forms and struggles with data entry. Filing is difficult because the files all look the same due to decreased contrast sensitivity. Directing phone calls to the appropriate dentist is harder because the buttons on the phone are too tiny to read. She has trouble recording meeting notes because she can’t always see what she is writing. Highlighting the aftercare and education information has become a hassle for her because her contrast sensitivity has decreased. She is afraid that she will be forced to leave her job because she can no longer carry out her essential job duties.

Workplace Solutions
Know Your Rights!

- People who are blind or have low vision can access a wide range of rehab, voc, and other training resources that can provide the skills necessary to maintain and/or pursue a wide range of employment options.
- Legislation has addressed equal rights and reduced discrimination, while societal attitudes toward people with disabilities have improved during the past decade.
- Additional sources of information are the U.S. Department of Labor's Job Accommodation Network (JAN) and your local Department of Rehabilitation Services. Take advantage of these free and helpful available resources.
- Familiarize yourself with the Americans with Disabilities Act and federal and state law here: https://www.eeoc.gov/eeoc/publications/qa_vision.cfm

Reading Printed Materials At Work

- Closed circuit television (CCTV) system, which is sometimes referred to as an electronic or video magnifier
- Hand, stand, or portable magnifier
- Photo copier enlarged paper material
- Color paper, acetate sheet, or overlay to increase color contrast between printed text and document background
- Frequent breaks to rest eyes when fatigue is a factor
- Auditory versions of printed document
- Reformatted document that displays as accessible Web page
- The Kurzweil-National Federation of the Blind Reader, which takes a picture of a text document and reads the contents of the printed document in clear
- Optical character recognition (OCR), which scans printed text and provides a synthetic speech output or text-based computer file
- Qualified reader, which may be used to "be the eyes" for a person with a vision impairment

CCTV's

- Video magnifiers, sometimes called closed circuit televisions (CCTV's), are tools that can significantly enlarge both text and images to make them easier to see.
- There are separate controls to change the focus, level of magnification, and screen color. These controls can be color coded to make them easier to identify.
- There is a proper way to sit in front of the machine. Clients should sit upright without slouching. Another important key is to advise the client about the proper distance he/she should sit in front of the machine. A simple fact is that the image is substantially increased when a patient sits closer to the CCTV.
- There now are some hand held units that magnify text a few sentences at a time for as little as $295.
Making the Computer More Accessible

- Increased operating system font size with large-size computer monitors
- Note: Computer users can modify their computer display so that text is shown in large print
- Screen magnification software
- Softwares that enable "talk back" (e.g. JAWS or Magic) or in-built computer accessibility software
- Locator dots and/or large print keyboard labels for keyboard navigation
- External computer screen magnifier
- Flicker-free monitor
- Anti-glare guard and computer glasses to reduce glare
- Frequent breaks to rest eyes when fatigue is a factor

Computer Keyboards

- Computer keyboard keys can be tiny and difficult to view. The task is to make the keys easier to see.
- Possible solutions: have the patient use a large print keyboard ($23.95). Apply high contrast labels on each key ($12.95), mark keys with tactile, high contrast, adhesive backed dots ($3.49 per sheet).
- Teach typing formally

Writing Notes And Completing Documentation

- CCTV system
- Pens that include a bold felt tip or lighted pen, 20/20 pens
- Paper with tactile lines, bold print, or low glare
- Form/line guide
- Personal data assistants, notetakers, and laptops with speech output
- A digital recorder to record notes at meetings
- At meetings, try to sit in a place that is close to the presenter
Making the Phone More Accessible

- Large print/color labels or tactile markings on telephone to identify keys and lines
- Hand/stand magnifier or optical magnifier
- Telephone light sensor, which is held over a phone line to indicate if a line is lit steady or blinking (Note: Line status is indicated by audible or vibrating signal)
- Talking telephone console indicators and message displays

Filing Papers at Work

- Try printing out large print, 36 point labels on the computer, and stick them on file folders.
- Use a gooseneck task lamp on top of the file cabinet.
- Direct the light onto the folders.

Home Living
ADL: Moving Around the House

- Tammy has lived in the same home for the last 40 years, since she and her husband had purchased the house when she had her first child. Her husband had passed away five years ago from heart-related complications, leaving her alone to maintain the house.
- The house is an older colonial style and has two floors and stairs. The floor is uneven near the doorways. Her house has wood flooring, and she has decorative rugs with different colors and textures covering the floors. There are lots of fixtures and cabinets that protrude from the walls of her kitchen. Each room has a window which lets a large amount of light in during the day, and her bathroom floor is tile, and her bathtub has a slippery floor. She tends to have some clutter lying around, as she is a self-proclaimed “pack-rat”.

Challenge: Structural Household Hazards

- She is having some trouble with walking around her house due her inability to see protruding objects, has stumbled near doorways with uneven floor, has trouble getting in and out of her bathtub, and has difficulty climbing stairs and seeing due to the glare from her windows, and faces challenges finding smaller objects, including personal grooming items (toothbrush), keys, light-switches, and using plug-in outlets.

Home Safety
What is a Home Modification Program?

- OT or rehabilitation therapists can perform an ‘audit’, giving you recommendations for the home. Ask your optometrist or ophthalmologist for assistance in obtaining a referral to a local agency. Some of the tasks that therapists help with:
  - Evaluate the home to see if it can be modified to make the most of one’s vision.
  - Identify what vision aids would be most helpful and how to use them.
  - Identify and mark items that need to stand out by providing contrast and marking them with bright tape.
  - Increase lighting to improve viewing.
  - Reduce clutter on floors, countertops, and tables to increase safety.
  - Educate a person on how to use other senses (touch, hearing and smell).
  - Training in the use of assistive devices (magnifiers, voice activated clocks, computers, microwaves).
  - Teach how to maximize residual and peripheral vision.

Assistance with ADL Completion

Additionally, OTs can come into the home to make recommendations with ADLs

Cooking and Meal Preparation
- Grocery Shopping
- Phone Skills
- Writing Skills - increase writing legibility and accuracy using adaptive aids and adequate lighting
- Reading
- Transportation and Mobility and getting around the community
- Medication Management
- Personal Grooming such as shaving, showering, dressing
- Hobbies, Games, Crafts
- Managing Finances - teaching how to identify money and write a check using aids like a check writing guide

Research on Home Barriers
Examined the effectiveness of an OT home modification intervention program by examining changes in self-reported occupational performance before/after intervention. An OT intervention was provided in the homes of 16 older adults with functional limitations. The intervention included:

- changing the existing space by the provision of adaptive equipment
- making architectural modifications (including major remodeling)
- no remedative treatment was provided.

The Canadian Occupational Performance Measure was used to measure satisfaction and performance in ADLs in the home before and after the intervention.

Scores on the satisfaction and performance subscales showed improvement in performance and satisfaction with occupational performance.

Initially, the average number of barriers in each home was 4.7. An average of 2.5 barriers were solved during the intervention.

The removal of environmental barriers from the homes of older adults with functional limitations can significantly improve occupational performance and satisfaction with one’s ability to perform ADLs.
What is the Benefit of A Home Lighting Assessment?

- People with low vision struggle with **impacts of glare** in the performance of everyday activities. Three major types of glare, dazzling glare, veiling glare, and scotomatic glare, result from a different lighting situation and cause a different visual effect.

- One of the biggest problem sources of light is a large amount of natural light. Large amounts of natural light can interfere with the elderly person’s vision when spending time outdoors or when driving during the daylight. It can also impair vision indoors when large windows face the sun or when there are very bright artificial light sources.

- Lighting can also cause glare. Trial different lighting to learn what types of lighting works for patients.

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**Research on Home Lighting**

**Lighting and the visual environment for seniors and the low vision population**


**The Bottom Line:** It is understood that healthcare costs will increase as our elderly population ages. As the U.S. prepares for this economic impact, appropriate lighting and a supportive visual environment should be considered a preventive measure to reduce the risk of falls, sleep disorders and long-term care, and therefore given a top priority by all code officials, governmental agencies and the tax-paying public.
These authors developed the HELA: an objective, comprehensive, near-task home lighting assessment for older adults with low vision.

Clinical utility was assessed by OTs with expertise in low vision rehabilitation.

Interrater reliability was high. Test–retest reliability was moderate. Responses to a Clinical Utility Feedback Form developed for this study indicated that the Home Environment Lighting Assessment (HELA) has strong clinical utility.

The bottom line: The HELA provides a structured tool to describe quantitative and qualitative aspects of home lighting environments. It can be used to plan lighting interventions. The HELA can aid assessment and intervention practices of professionals and improve near-task performance of patients with low vision.

31 individuals (aged 79.1 ± 5.6 years) with AMD

Interviewees did not receive any formal home modification assessment. Nevertheless, 70 per cent of participants stated that they undertook home modifications themselves or with the assistance of family and friends.

Most important functional modifications as perceived by the participants were: installation of hand rails, non-slip matting, colour contrasting safety stair nosing, single lever taps, slip resistant flooring, lift chairs and motion sensors that activated pathway lighting.

Kitchens, steps and bathrooms were perceived as hazardous locations. Most participants had difficulties with reading fine-print material on kitchen appliances, washing machines, microwave ovens and remote controls for electronic devices in the home.

The Bottom Line: This information, provided by people with visual impairment, is a valuable resource for others with visual impairment who may not have developed adaptive strategies. Industrial and interior designers and low vision specialists who aim to improve functionality of the home environment should take heed of this information.
Glare

- Sheer drapes (lets in light while cutting glare)
- Lightly tinted sunshields.
- Sunshields allows the sunlight in to illuminate the surroundings yet reduces the glare that would have otherwise have hit the eyes.
  Sunshields may offer the advantage of adding contrast to aid in reading.
- Yellow sunshields turns white paper backgrounds yellow which adds contrast to the black print. When dealing with outside glare, darker sunshields work best.
- Experiment with dark sunshields for outside travel as well as lighter sunshields.

Lighting Makes All the Difference

- Example: lighting for a kitchen counter. An inexpensive, small desk lamp kept on the kitchen counter can make reading a recipe, cutting vegetables or mixing ingredients in a bowl easier.
- A desk lamp near telephones can be helpful. Another tool is a small flashlight that can be carried around in a pocket. Someone can use the flashlight to look for something on a shelf, read a menu in a dark restaurant or read the can label in a grocery store.
- Penlights: Good desk lamps are great but there are many situations where they are not practical. In those circumstances a small pocket flashlight can be a very valuable tool for low vision patients. Everything from setting thermostat controls to operating CD players to reading a can is made so much easier when some directed light is used.

Showering

- Mark the step into the shower stall with contrasting color.
- Use a non-skid shower mat that is a color contrast with the shower floor.
- Installing a grab bar on the shower wall makes getting in and out of the shower safer.
- Use good lighting in the shower area.
- Use shower stools to increase stability.
- Always turn on the cold water first and then add the hot water to prevent burns.
- Face cloths should be brightly colored to make them easier to see.
- Using a shower caddy to keep all the soap and shampoo in one place. Soaps and shampoos in pump dispensers prevents spills.
- Use soap on a rope.
Stairs

- The stair treads, because they are all the same color, blend together. Most low vision patients simply cannot see one stair step ending and another one beginning.
- We absolutely discourage our patients from counting steps just because of the scenario described above. Any distraction can lead to a problem. Instead, we encourage patients to mark the edge of the stair treads with contrasting tape.
- It truly is remarkable how much of a difference the contrasting tape makes. Each individual stair really stands out.
- Another, obvious, strategy is to teach patients to make sure they are lightly holding onto the handrail as they descend the stairs.
- Good lighting also is very helpful. Sometimes that is as easy as changing light bulbs to higher wattage.

Rug Replacement

- A thin area rug will roll and wrinkle more easily, and that creates an uneven, potentially hazardous floor surface.
- Use a bright solid-colored floor mat with nonskid backing. Get one as large as possible to set the floor area and perhaps a carpet with a heavier gauge to keep the edges from rolling over. Think about a solid color, a large, heavy carpet with a nonstick backing.

Bathing

- Mark the edge of the bathtub with a strip of contrasting tape.
- Arrange for grab bars to be installed.
- Wrap contrasting tape around the grab bar to make it easier to see.
- To differentiate between the shampoo and the conditioner, put a rubber band around one of the bottles so that you can tell them apart.
- For the bath, put something bright that floats in the water while it is filling up to help you tell how high the water is.
Less is More: A Decluttering Guide

- Finding items is challenging if there is a lot of clutter.
- Keep things in the same place so that they can easily be found.
- Place items that are used on a daily basis within reach on the counter in a designated area.
- Ex. keep your coffee-making supplies on a tray on the counter, but put away any boxes of cookies you may not eat every time you make yourself a cup of coffee.

Electrical Outlets

- Making things stand out visually increases contrast.
- Using nail polish of a contrasting color can be very helpful.
- A ribbon of nail polish is applied to surround the outlet. This effectively makes a "target" that makes it much easier to see where the electrical plug should be inserted.

Using Keys

- Split keys into two key chains; one brightly colored key chain for the front door, and the rest on another key chain.
- Buy brightly colored rings that go around the top of the key. They can be found at any hardware store and come in a pack that contains many bright colors.
  - For example, the red ring can go on the front door key and the yellow ring on the back door key.
- Use a pocket flashlight. Shine the flashlight beam on the door lock while inserting the key.
ADL: Dressing the Part

- Tammy prides herself on her elegant and well-groomed appearance. She has a large selection of clothing, jewelry, cosmetics, and shoes. Each morning before work, she likes to try on a couple of outfits before picking the best outfit to go to work.

Challenge: Deteriorated Color Perception

- As a result of her AMD, her color perception has deteriorated. Her ability to discriminate and match colors has been affected, and she is not able to apply the appropriate makeup and coordinate outfits and shoes as a result. She feels self-conscious that may go to work wearing a mismatched outfit. Since her perception of color has also dulled, she is more prone to putting on makeup more heavily. She was unaware of this until her daughter had asked why she was wearing so much more makeup than she normally would. Tammy became self-conscious as a result and would try to hide from others as a result.
Research on Color Sensitivity

Reduced Color Sensitivity in Individuals with AMD
Color vision deficits in intermediate age-related macular degeneration
Downie, Laura E., Ada S. Cheng, and Algis J. Vingrys

These authors assessed the effect of intermediate AMD on foveal cone-contrast thresholds.

The Bottom Line: Eyes with the same phenotype of intermediate AMD may have varying degrees of color threshold loss.

Strategies for Personal Grooming
Wearing Makeup

- Consider minimal or "natural" makeup initially.
- Use a headband to pull hair away from your face.
- Keep a wet washcloth, wet wipes, or paper towels nearby to remove makeup from the fingertips.
- Protect clothing by placing a towel in your lap.
- Try a lighted makeup mirror with a flexible gooseneck.
- Storing makeup in the refrigerator can provide a temperature difference that makes application easier.
- Steady the hand against the face or with the other hand when applying mascara, eyeliner, or lipstick, which require precision and control.

Tooth-Brushing

- Place a finger next to the toothbrush bristles and use it as a tactile guide to locate bristles.
- Place the toothbrush over a contrasting surface (dark towel).
- Squirt a little toothpaste directly into the mouth.

Organizing Clothes

- Place a small safety pin behind the collar.
- Hang a complete outfit that goes together all on one hanger.
- Hang clothes according to categories such as dressiness, season, purpose, color, etc.
- Use small safety pins in different numbers, patterns of placement and location of placement to help distinguish between clothing.
- Keep a flashlight in the closet to make it easier to identify different clothing.
Finding Shoes

- Divided the closet floor into four sections using bright colored duct tape.
- Divide shoes into categories: sneakers in blue section, casual shoes in the yellow section, dress shoes in the red section and slippers in the green section.
- The layout is then reproduced onto a piece of paper and taped to the closet door as a reference guide.

Thank You

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Appendix
Appendix Solutions

- Grocery Shopping
- Meal Prep / Kitchen safety
- Finance / Banking
- Time Management
- Recreation and Leisure
- Reading
- Television
- Social Life
- Health maintenance
- Depression
- Comorbid conditions
- Medical Conditions

Grocery Shopping

**ADL: Grocery Shopping**

- Each weekend, Tammy drives to her local grocery stores and purchases fresh ingredients with which to cook with. Since she experiments with lots of new recipes, she has to navigate to different parts of the store to locate the appropriate ingredients. When selecting produce, she goes with the brightest produce, she she believes that it is the most fresh.
Challenges with Grocery Shopping

- As if getting to the grocery store is not challenging enough, navigating the grocery store with AMD poses its own set of difficulties. For the first time, she is aware that stores are huge, and there are thousands of items. Reading the signs at the top of each aisle is near impossible, so she is not able to locate ingredients she needs in the store. Reading nutritional information and finding the price information for each item is time-consuming, and picking out meat is difficult when she is not able to see the expiration date. As her color perception has deteriorated, she cannot rely on the basis of her vision alone when she selects good-quality and fresh produce.

Grocery Shopping with Visual Impairment: A Changing Paradigm

- Bring a lighted magnifiers.
- Bring a strong, small flashlight.
- Supermarkets can assign an associate to accompany and assist low vision shoppers. Some supermarkets have specifically trained associates to help someone who is low vision shopper. These associates will stay with the person throughout the entire shopping trip and help select items.
- Using the same brands each time helps patients know ingredients, instructions and other information without reading.
Determining Freshness of Food

When selecting produce, try the following:

- Gently press an avocado to see if it is ripe, and if gives slightly that means it is ready for consumption.
- Smell the end of cantaloupes for ripeness if it is emitting a sweet smell it is ready to be consumed.
- Recognizing the freshness of fruits and other produce by their smell and feel will come with time and experience.

Pen Friend Device

The PenFriend 2 Voice Labeling System ($150)

- The PenFriend has labels and a scanner with a built-in microphone. The first step is to choose an item for identification. Next, record the information one wants onto the label. The label is then affixed to the container the person wants to identify. They then can pick up the can and have the PenFriend scan the label. It will read back the information recorded.
- This is an easy way to identify canned goods, frozen food, important papers, CD's, or items of clothing. More labels can be ordered allowing many hundreds of items to be easily identified. It is very easy to use.

Pen Friend Device Video

https://www.youtube.com/watch?v=VXq8ZvlRfLY
Groceries Delivered To Your Door

- Utilize online grocery shopping and delivery services, which several grocery stores offer.
- Turn on the magnification feature on your computer so you can shop more easily.
- Examples of some companies that offer this service include:
  - Peapod by Stop and Shop
  - Walmart
  - Amazon Fresh
  - Whole Foods
  - And many more...

Meal Preparation

ADL: Cooking

- An avid food-lover, Tammy’s daughter purchased a cookbook for her with over a thousand recipes from all over the world. Each weekend, Tammy likes to try a new recipe from the book. She also likes to bake fresh homemade cookies for her grandchildren when they come over after church.
- During this process, she has to locate and read the correct recipe in her cookbook, use the appropriate measurements, organize and find the right kitchen utensils to use to prepare the meal, and use sharp knives to chop and cut the vegetables and meat. She also has to handle and transfer hot food from the stove and the oven, and has to determine the “readiness” of dishes, usually by their appearance.
Challenge: Kitchen Safety, Organization, Reading Cookbooks

- As a result of her AMD, she has difficulty reading her cookbook, using the appropriate utensils for cooking, finding the right ingredients from her fridge, measuring spices for baking, using her microwave, checking the freshness of the food she is cooking, washing dishes, setting dials on her stovetop or oven, handling hot food, and determining doneness of the dishes she is preparing.

Kitchen Safety and Cooking with Vision Loss: A Guide

Recipes Made Easy

- Use a gooseneck lamp or a handheld magnifier device to read recipes
- Bookmark recipes one plans to make
- Purchase large-print cookbooks at a store or online
- There are thousands of online recipes, even some that are particularly targeted to low vision consumers
Making Your Way Around a Microwave

- Mark microwave controls panels with raised, self-stick, dots to help identify different control settings.
- Make a large print templates to identify specific buttons.

How To Cut Meat

- Place the piece of meat on a contrasting colored plate.
- Next, place the edge of the knife along one side of the meat for locating purposes. This is the starting point.
- Lift the knife just over the edge of the meat, place the knife blade so that it is lying flat on top of the meat.
- Take a fork and insert it along the opposite side of the knife into the meat. This move has marked out a roughly half inch strip of meat that can be cut using the fork as a guide.
- Cut that piece off and continue cutting the strip until the meat is in bite size pieces.

Chopping Produce and Vegetables

- Use the right size tool for the job (e.g. don't use a knife to peel)
- Ensure proper lighting, place a lamp over the foods you will cut
- Increase lighting on kitchen counters (desk lamp, LED lighting, overhead lighting)
- Choose a cutting board that has a strong grip, as well as a color that contrasts with the color of the countertop and the food to be cut.
- Increase contrast (cutting board that is white on one side and black on the other side)
- Special gloves made of a cut-resistant material can be purchased.
- Purchase pre-cut fruits or vegetables, or frozen vegetables. It costs more money, but it is healthier than eating frozen or microwaveable meals
Baking and Meal Readiness

- Use long oven mitts that go up to the elbow and avoid loose, long sleeves.
- Pull the oven rack out of the oven to remove a hot item rather than reaching your arms inside.
- Adjust oven shelves before turning on the oven.
- Use an audible kitchen timer with large numbers that can be seen easily when setting.
- Mark the temperature settings on an oven so they can be seen more easily.

Transferring Foods Safely

- Put plates and glasses on a tray
- Get a mobile tea cart
- Use baskets that hook on to walkers or rollators
- Move the kitchen table closer to the counter.

Organizing the Fridge and Pantry

- Common food items should always be located in the same area. For example, milk might be on the right side of the top shelf.
- Each refrigerator shelf should be reserved for certain items even if there are not enough items to fill the shelf.
- Label shelves and label food when it comes home from the grocery store.
- Foods may be labeled with a label maker using large font, or you may use other household items to label foods, such as colored tape or rubber bands, which also provide a tactile label.
- Consider placing the items you use most frequently at a height that is most accessible.
- First in, first out: Place older items in the front and new items in the back in the refrigerator and pantry.
Making Tea

- The "Hot Shot Beverage Maker" ($17.99) is an alternative. It starts when someone pours cold water into the beverage maker reservoir.
- The patient only has to press a button and in 90 seconds hot water is ready to use.
- Pressing another button dispenses hot water right into a mug or bowl.
- Low vision patients do not have to do any pouring. They can make instant coffee, tea, hot chocolate or oatmeal with ease and safety.

Try a Liquid Indicator

Measuring and Pouring

- Place the cup on a contrasting surface. A dark colored place mat makes a white cup really stand out.
- Placing the pouring spout of the right on the lip of the cup eliminates any pouring distance thereby reducing the risk of a spill.
- Use measuring cups that enhance contrast and have large-print markings.
- Measure dark foods in a light colored cup and vice versa to utilize contrast properly.
- Use dry or nested measuring cups for liquids.
Appliance Dials

- Mark commonly used stove dials at certain degrees with small, bright stick-on dots.
- The same system can be used to mark other kitchen appliances as well as washers and dryers.
- Placing the buttons on start and stop pads makes operating appliances much easier.

Personal Finance and Banking

ADL: Managing Personal Finances

- Tammy is responsible for all of her household finances. She pays in both cash and credit when she goes shopping, and is responsible for banking, writing checks, tracking her accounts and monitoring her monthly spending, and paying her bills on time.
Challenges: Organizing Bills, Paying on Time, Reading Bills

- As a result of her AMD, Tammy struggles with bill identification. It takes her a long time to find the correct bills or and she feels embarrassed while she fumbles for money in front of the store clerk. She also struggles with paying with credit/debit card and reading the small screens at stores and signing in the right places. She struggles to sort her mail into non-important and important bills, and as a result, she forgets to pay some of her bills on time. She has trouble calculating some of her finances, has some trouble reading the small-print on bank forms and pertinent documents and trouble with signing checks.

Managing Personal Finances with Low Vision

Reading and Paying Bills

- Place bills in large/bright folders for easy identification
- Pay bills in an area which the patient has defined as their “reading and writing” area.
- Ensure that this area is uncluttered and has a good desk lamp.
- Use a 20/20 pen or other dark writing instrument.
- An option that is also available is to use a bill paying service.
- Use a plastic check writing guide/template.
- Order large sized checks.
Identifying Money

- The number one rule here: Fold each denomination differently.
  - $1 bills: keep them flat and unfolded.
  - $5 bills: fold in half vertically
  - $10 bills: fold horizontally
  - $20 bills: fold in fourths vertically.
- Patients can go to their local bank and get each denomination bundled separately and then fold the bills when they get home.
- Coins are easy to identify once patients learn some basic facts.
  - Quarters and dimes have a ridged edge. The quarters are larger than dimes so patients can easily feel the difference.
  - Nickels and pennies both have smooth edges. Once the smooth edge has been identified, patients can feel that nickels are larger and heavier than pennies.

More on Writing Checks

- Almost every bank can order large print checks at a small additional charge. These checks often come printed on yellow paper which offers better contrast. The lines for writing are printed in black and are bold.
- Magnifiers can also be helpful. Some patients prefer to use a plastic check writing guide ($5.95). These writing guides clearly indicate where things should be written on the check, including a signature line. Once a check has been written, the patient will need a large print check register. These registers can be bought or made using a computer.

Credit Cards

- Use magnifiers and good lighting.
- Write down credit card information on a secure, separate note card.
- Writing down the information using a black marker on a yellow note card makes it easier to read the numbers.
- If possible, a friend or relative can type and print out the information using a computer to make the font even larger, 18 or 20 point.
- The patient can file the cards in a recipe box or a file folder to keep everything organized.
Time Management and Commitments

ADL: Managing Appointments

- For a 70 year old woman, Tammy sure is busy! She works full-time, she volunteers at her local food drive, she babysits her grandchildren, she manages her personal finances, she has health appointments to go to, and has an active social life. She uses a small pocketbook planner that she purchases at the beginning of each calendar year to keep track of her obligations.

Challenge: Staying Organized

- After onset of her AMD, she has been finding it increasingly difficult to stay organized. She has difficulty with writing and reading small font, she has shunned her pocketbook planner altogether in lieu of rote memorization. However, she is finding she can not always trust her memory. Tammy has always been a punctual and organized person. As a result of not using a personal planner, she is late (or even misses) to her appointments and obligations outside of work, which has never happened before. She realizes she needs a new system of organization before she misses yet another appointment.
Staying on Top of Scheduling: Tips and Strategies

Calendars, Calendars, Calendars

- Use a large print calendar.
- Color code appointments. For example; blue lettering for doctors’ appointments, red for family events and green for plans with friends.
- Assemble a loose leaf binder with each page representing a day. Any appointments can be written in with plenty space on each sheet to make notes.
- Use a 20/20 pen.

New Time-Keeper (Aka A Watch)

- One approach is to use a watch with a larger contrasting, colored face. The faces come in both black and white. Many people prefer a black face with white numbers. These watches range from $16 to $60.
- Another approach is a talking watch. It is hard to believe but these talking watches can be purchased for as little as $11 and they even come in five different languages. Very stylish talking watches only cost $50. Can you imagine a better gift to give a low vision patient for a birthday or holiday gift?
Recreation and Leisure

ADL: Leisure Activities

- When Tammy is not working or running the household, she has a number of leisurely pursuits she engages in. She enjoys reading novels before going to bed, watching soap operas on her television while she eats an early breakfast, going out to eat at restaurants with friends, listening to music, and playing badminton with a group of other women her age.

Challenges with Leisurely Pursuits

- Due to her AMD, she can no longer read paper-back novels easily, and she has had to give up on reading. Watching TV is no longer enjoyable, since she can’t really see the facial expressions of the actors on screen from her couch. She also has trouble with the small buttons on the remote, and has difficulty controlling volume and finding the correct channels.
The authors sought to determine whether training saccadic eye movements, without direct practice in reading sentences, could increase reading speed in patients with AMD.

16 patients with AMD (age range, 65–87 years; mean, 77). 8 week training.

The training program consisted of a series of exercises that were designed to allow the patients to practice eye movements. At the beginning of training, the subjects practiced small horizontal saccades in response to cognitively easy stimuli (e.g., dots). The training progressed to practicing larger eye movements and then to practicing saccades with single letters, pairs of letters, and three-letter words. Reading of sentences was practiced in only the last session of the training.

The difference between average reading speeds before and after training was 24.7 wpm.

The Bottom Line: The results showed that a training curriculum that concentrates on eye-movement control can increase reading speed in patients with AMD.
Reading: Manual Methods

- Using a bright piece of paper or envelope, cut to page width, can help the eyes move down one line at a time.
- Place the paper under the line that is read and follow the words to the end of the paper.

Reading: Automatic Methods

- "The Talking Book Program"
- Twenty-five thousand audiobooks available.
- The "books" are USB flash-drive cartridges that easily get inserted into the Talking Book machine.
- Each cartridge is an audio book.
- Programs like Overdrive (at some local libraries) and Hoopla
Seeing the Screen More Easily

- Note: a large screen television is usually not the best solution.
- Low vision patients rarely can see the whole picture of a large screen television.
- Sitting closer to a smaller television works better for most patients.
- Position the television to minimize glare. If necessary, place the television on a movable cart to make positioning easier.
- Low vision specialists can prescribe special television viewing glasses.

Accessible TV Remotes- Hint: Talk To Your Cable Provider

- Many cable companies offer large button remote controls for free. If a cable provider does not provide free television remotes, they can be purchased for about twenty dollars.
- Apply brightly colored bump dots to strategic buttons; the power, volume control, and channel up down buttons.
- Use the bump dots in combination with holding the remote under a good light.

Cable Box

- Comcast has introduced a voice controlled cable box, the X1 cable box, that might be helpful. Once programmed, viewers can speak the channel they want the cable box to access. There is no need to push buttons. The box can announce what is currently on the television and read any text.
- Depending on what subscription a user has, there may or may not be any additional charge to upgrade to the X1 cable box.
Understanding the Plot: TV and Movies

Audio described videos are available to borrow from regional libraries for free. The described videos provide narration of a program's key visual elements, such as characters' actions, costuming, gestures and facial expressions. It may say something like "John is now walking across the room and getting a gun from the drawer." These descriptions are heard during the natural pauses in dialogue. The result is a finished soundtrack that enables visually impaired viewers to fully understand the film through listening.

Social Life

Tammy has a thriving social life. She lives a short walk away from downtown, where there are many food options. She likes to try new restaurants, and enjoys sampling international cuisines from all around the world. She also attends church every Sunday with her daughter’s family. She enjoys having her friends over or going to friends houses a few times a month as well. She also meets up with some of her friends a few times a month to play bridge, a card game.
Challenges: Accessibility in Public Spaces and Reading Facial Expressions

- As a result of her AMD, she can no longer see facial expressions, which makes it challenging to interact in a meaningful manner with her friends. When she goes out to eat with her friends, she can’t read the menu easily, and doesn’t know what to order. She can’t read the Bible they hand out in church, so she has stopped attending as regularly. She occasionally likes to play bridge with her friends, and she can’t see the symbols on the playing cards. Rather than deal with the frustration, she chooses to avoid these social situations altogether.

Research on Emotion / Face Recognition

Recognition Of Facial Emotion In Macular Degeneration Patients
Johnson, Aaron P., Heather Woods-Fry, and Walter Wittich

The authors investigated performance of AMD patients in a face emotion perception task in comparison to an age-match control sample. They also investigated whether the commonly used technique of magnification would improve performance in both tasks.

The Bottom Line: AMD patients perform worse than age-matched controls in emotion recognition and detection tasks. Stimulus magnification did not improve face emotion perception.
**Bioptics May Improve Facial Recognition**
**Face recognition in age related macular degeneration: perceived disability, measured disability, and performance with a bioptic device**


These authors explored the relationship between performance on tasks of familiar face recognition (FFR) and face expression difference discrimination (FED) with both perceived disability in face recognition and clinical measures of visual function in persons with AMD.

30 subjects with AMD (age range 66–90 years)

FFR task: images of famous people had to be identified.

FED: assessed by a forced choice test where subjects had to decide which one of four images showed a different facial expression. These tasks were repeated with subjects using a bioptic device.

With the bioptic telescope, FFR performance improved in 86% of subjects, while FED performance increased in 79% of subjects.

**The Bottom Line:** A Bioptic low vision device can offer a significant improvement in performance for face recognition tasks.

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**A new theoretical approach to improving face recognition in disorders of central vision: Face caricaturing**


Damage to central vision leaves patients with blurred peripheral vision. Previous approaches to improving face recognition in AMD have employed:

Image manipulations designed to enhance early-stage visual processing (e.g., magnification, increased HSF contrast).

Further improvement may be attainable by targeting known properties of mid- and/or high-level face processing. We enhance identity-related shape information in the face by caricaturing each individual away from an average face.

Results showed that caricaturing may assist in improving face recognition in AMD and other disorders of central vision.

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**Social Strategies and Maintenance of Meaningful Relationships with Visual Impairment**
Using a Phone

- Big button phones. Low vision patients can determine which color combination works best for them. Some states, like Mass., have a program that distributes these adapted phones for FREE. Many of these phones have memory buttons to make calling out even easier. These buttons can be color coded to make them easy to use when calling specific people.
- Teach patients to become more familiar with the dial pad. Most people, do not realize that there is a raised dot on the number “5” which when located serves as a “home key.” When the number “5” is located, someone can easily find the number “2” immediately above of the number “6” to the right of the “5 home key.”
- Make a large diagram of the phone dial pad including memory buttons that is easier for people to see and use as a guide when making calls.

Using a Phone Book

- To look up new phone-books, you can use websites like http://www.whitepages.com/ to look up a friend or family members number since the computer has accessibility settings.

Playing Cards

- Purchase large print playing cards from several online vendors
  Here is an example: https://www.maxiaids.com/large-print-bridge-size-playing-cards
Going Out To Eat

- Learn to “spider walk” fingers around the dinner table to enable a person to locate glasses, silverware and everything else on the table.
- Use a small pocket flashlight and magnifiers to look at the menu.
- Many restaurants have their menus posted online so that patients can go to the restaurant’s website and take the time they need to read the menu. This also helps the self-consciousness many patients feel when they have to ask their server to read the menu for them.

Spirituality Made Accessible

- There are many places where someone can buy a large print Bible, including Amazon.
- Try this organization which sends out large print Bibles and hymnals for free to eligible, low vision patients, the Lutheran Braille Workers Association (800-925-6092). They have Bibles in Spanish.
- The Dynamic Catholic organization offers low cost, large print Catholic books (859) 980-7900.
- Jewish low vision patients can get free Bibles and prayer books from The Jewish Braille Institute (800-433-1531).
ADL: Health Maintenance of Concurrent Health Conditions

- Aforementioned, Tammy has two concurrent health condition that she manages. She has **Hypothyroidism** and **Type II Diabetes Mellitus**. To maintain these health conditions, she has to regularly monitor her blood glucose levels, is on a daily regimen of differing medications and vitamins her primary care physician recommended she take, and she walks everyday and plays badminton once a week with a group of women her age to maintain her health.

Challenges with Health Maintenance: Staying Fit, Medication Management, Health Monitoring, Mental Health Status

- As a result of her visual impairment, she is no longer able to play badminton, so she is not able to exercise and stays home more often than not, and has gained weight. She has had difficulty with medication adherence, since she is taking several medications on an intermittent schedule. Additionally, the display on her glucose monitor is too small for her to read, so she is not monitoring her blood sugar levels as regularly as she used to. As a result of her difficulties and lack of coping strategies and resources, she has developed some secondary depression and anxiety.

Adverse Impact of Low Vision on Diet and Exercise

- Cooking and eating is a challenge with low vision.
- Those with low vision may not attempt fruit / vegetable preparation. These foods often are not consumed due to the difficulty in chopping safely and quickly.
- Persons who cannot read the small print on nutrition labels may have difficulty obtaining information about the nutritional content of foods, which makes it more challenging for them to make good food choices.
- The difficulty in getting to a grocery store independently may limit the frequency of shopping, making it less viable to buy healthier, fresh foods
- Activity limitations in walking and environmental barriers, such as transportation and the lack of accessible exercise equipment, can hamper a person’s ability to be physically active, which is a key component to maintaining a healthy weight.
Research on Low Vision and Health

Adverse Impacts of Low-Vision on Body Mass Index

The authors examined the food experiences and eating patterns of visually impaired and blind people. Influencing factors were also investigated.

9 blind or severely visually impaired subjects were recruited through blindness-related organizations in British Columbia. Participants experienced blindness-related obstacles when eating out of the home, shopping for food, preparing food. Inaccessible materials and environments facilitated a diet lacking in variety and limited access to physical activity. Seven participants were overweight or obese.

The Bottom Line: Nutrition and low vision therapists must work together to reduce the food-related obstacles faced by visually impaired / blind people. Professionals must address both individual skill development and social and structural inequities.

Low Vision and Depression
Why Low Vision Rehabilitation Needs to Consider Mental Health Status

- The American Academy of Ophthalmology reports that vision loss causes more depression than any other physical impairment.
- Attributed to loss of independence and decrease in community participation, and decrease in meaningful relationships and activities.
- That is why it is so important for people with low vision to have access to mental health resources.
- Promoting interactions between ophthalmology, optometry, rehabilitation, psychiatry, and behavioral psychology may prevent depression in this population.

Depression Research

Individuals with Low Vision Vulnerable to Depression

Activity loss and depression in age-related macular degeneration.


51 patients with bilateral AMD

Investigate the interrelationships of disease severity, disability, and depression and focused on loss of valued activities as an emblematic disabling consequence of AMD.

They characterized depression by the Center for Epidemiologic Studies–Depression (CES–D) score, a syndromal state based on the CES–D, and as a level of distress (Index of Affective Suffering; IAS).

30 people (58.8%) had loss of a valued, discretionary activity. They had worse visual acuity and more depressive symptoms. Visual acuity was significantly correlated with level of distress, activity loss mediated the relationship between visual acuity and level of distress.
The authors sought to develop and evaluate a psychosocial intervention program for AMD patients. 14 individuals (mean age of 73.1 years) in the interventional group and 8 participants (mean age of 72.6 years) in the comparison group.

6 modules carried out in five weekly group sessions. Modules:

(a) progressive muscle relaxation
(b) exchange of disease-related experiences
(c) understanding the connections among thought, emotion, and behavior
(d) description of and emphasis on the use of available resources
(e) improvement of general problem-solving skills
(f) information exchange on ARMD-related treatment and rehabilitation options.

The Bottom Line: Psychosocial group intervention is a promising approach to improve the quality of life in patients suffering from ARMD.

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Tips for Maintaining Concurrent Health Conditions

Glucose Monitors for Maintenance of Diabetes Mellitus

- Talking glucose meters announce the glucose level and have a large print display of the result (about $30). Talking glucose monitors are reimbursable by many insurance companies, including Medicare, as long as the physician writes a detailed prescription and includes an eye report indicating that the patient is legally blind.
Liquid Medication

- Drugstores sell medication syringes. Mark the syringe barrel at the appropriate mark, using a piece of high contrast tape to make it easier to see. Mark the plunger at the correct spot so that it was easy to see when to stop withdrawing the plunger.
- Pour medication into a clean bowl with a cover. To obtain the correct dosage, the patient scoops up the medicine from the bowl using the appropriate measuring spoon. This method will ensure that the patient receives just the right amount of medicine.

Using Oxygen

- Mark them with bold contrasting colors so the indicator ball can be seen.
- Make an arrow on the oxygen control knob to indicate which direction increases the oxygen flow.
- Markings should be brightly colored and tactile (puffy paint).

Applying Eye Drops

- Lie down while taking drops. Use the bridge of the nose as a landmark to position the eye drop bottle.
- Experiment with some inexpensive aids.
- Another aid helps arthritic hands grip tiny bottles ($3.95). The medicine bottle is placed into a plastic sleeve that holds the bottle. This sleeve is easy to hold and squeeze. Gently squeezing the plastic sleeve will release just the right number of drops.
- The combination of good technique and adaptive equipment makes it much easier to take eye drops.
Managing Medicine

- Mark the tops of medication vials with a high contrast colors
- Try special magnifiers that go around pill vials.
- Use a special pill containers with raised, colored markings
- A medicine spoon with raised markings helps taking liquid medications easier.
- There is a device that can be attached to a pill vial that can record the name of the medication.
- Lay out the pills on to a dark cloth to make them easier to see and identify.
- Use good, direct light. Effective lighting, like a desk lamp, makes seeing the pills much easier.
- Script Talk reader

Healthy Eating Tips

- Cook more at home
- Simple meal planning
- Purchase frozen or pre-cut vegetables to save time and reduce risk of injury from cutting
- Avoid unhealthy microwaveable meals
- When going out to eat, choose foods that are broiled, low fat, or steamed
- Purchase healthful convenience foods e.g. canned soups, nuts, and vegetables with low sodium and fat content

Finding a New Exercise Regimen

- Everyone, including people with visual impairments, can benefit from some form of exercise. Discuss your exercise plans with your medical doctor and your eye doctor, since some medical and eye conditions can be affected by bending, lifting, straining, or rapid movement.
- Discuss your needs with a fitness instructor at a local gym, health club, or community center. Most instructors can work one-on-one with you to create a fitness program that is safe and effective. They can also teach proper form and movement when performing new exercises.
Exercise and Exercise Equipment

- Exercise equipment with dials requiring specific settings or defining specific boundaries can be marked with contrasting tape, raised dots, or large print.
- Low impact aerobics or exercise equipment, such as a treadmill or stationary bike, can help with cardiovascular workouts.
- For muscle definition, use hand weights, rubber bands, resistance equipment, and body balls.
- Think about balance and flexibility. There are a number of simple exercises that you can use to improve both.
- Try static stretching, such as tai chi or yoga, to enhance muscle tone and enhance body awareness and movement in space.
- Think about new ways to adapt an activity. Walk with a friend, use a track for running instead of running on the road, or try cross-country skiing instead of downhill skiing.

Yoga for persons with severe visual impairment: a feasibility study.


Investigated the feasibility of an Ashtanga-based Yoga Therapy (AYT) program for improving sleep disturbances, balance, and negative psychosocial states, which are prevalent issues for visually impaired (VI) individuals.

10 legally blind adult participants were randomized to an 8-week AYT program.

Positive exit survey responses (all subjects were extremely or mostly satisfied, and wanted to continue AYT) and good participation rates (7 subjects attended at least 7 of the 8 weekly sessions) support the feasibility of the AYT.

The Bottom Line: This study provides evidence for potential benefits of Ashtanga Yoga-Based Therapy that may be observed in VI subjects.

References


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