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PRACTICAL LOW VISION REHABILITATION
Low Vision facts¹:

- 3.3 million low vision patients in U.S.
- 5.5 million low vision patients by 2010
- “Big 4” causes: ARMD, Diabetic Retinopathy, Glaucoma, Cataract
- Other causes: Retinitis pigmentosa, optic atrophy, degenerative myopia
- Patients over age 85: fastest growing segment of population
Patient Concepts regarding Low Vision

- Key findings from National Eye Institute article *Life with Low Vision*²:
  - Awareness of services and low vision devices is lacking
  - Patients and families want more information about available resources and about their disease process
  - They want someone to tell them that they can help
Presentation Goals:

at the end of this presentation, the learner should be able to:

- Define low vision and identify patients that will benefit from low vision rehabilitation
- Assess a patient with low vision for functional disabilities and visual performance
Goals (cont.)

- Name the approaches used in low vision rehabilitation
- Formulate a plan for carrying out basic low vision rehabilitation services in the context of a comprehensive ophthalmology practice
Low vision definitions:

- A level of visual impairment characterized by useful residual vision that is less than normal
- Described in terms of remaining visual acuity and visual field
- Five categories according to ICD-9 (see next slide):
Low vision definitions (cont.)

- **Moderate** visual impairment: ≤ 20/70 to 20/160
- **Severe**: < 20/160 to 20/400 or VF diameter ≤ 20° (Goldmann III4e target)
- **Profound**: < 20/400 to 20/1000 or VF ≤ 10°
- **Near total**: ≤ 20/1250
- **Total**: no light perception
Blindness definitions

- Legal blindness:
  - BCVA = 20/200 or less in better eye OR central VF of 20 degrees or less

- Industrial blindness: worker cannot perform assigned duties

- Automobile blindness: state DMV will not issue a driver’s license due to level of vision

- Color blindness: inaccurate term; color perception abnormality is preferable
Goals of Treatment

- Maximize functional independence
- Maintain quality of life
- Help patient adapt to the psychosocial aspects of vision loss
- Emphasize Seeing in a New Way
Patient assessment

- Functional history
- Evaluation of visual performance
Functional history: four areas

- Problem areas and their significance: how has your life changed?
- Home-based near vision tasks: reading is most common
- Distance vision skills
- Mobility and community skills
Evaluation of visual performance

- Measure near and distance visual acuity
- Measure visual field and central scotomas
- Test contrast sensitivity
Visual acuity measurement

- **Distance acuity**: for $\leq 20/100$, use portable test charts; eliminates need for “count fingers” notation

- **Near acuity**: specify letter size and reading distance. Use continuous text to assess reading speed (MNRead™, etc.)
Visual field testing

- Automated
- Goldmann
- Central scotoma mapping: tangent screen technique with laser pointer or single-letter targets mounted on flash cards
Contrast sensitivity

- Visual function depends on both size of target as well as contrast (difference between target and surroundings)
- Testing contrast sensitivity helps predict functioning in the "real world"
- Test with various charts (e.g., Pelli-Robson™)
Treatment: based on goals and level of impairment

- Revise spectacle prescription if needed
- Lighting
- Contrast enhancement
- Glare control
- Magnification
- Eccentric viewing training
- Nonoptical aids
Treatment (cont.)

- Training in adaptation for activities of daily living
- Counseling and support groups
- Local and national resources
- Team approach is optimal for more complex needs
Revise Spectacle Correction

- **RETINOSCOPY:** a critical skill in accurately refracting these patients
- **Trial frame:** allows for eccentric fixation; do not rely on phoropter to determine new refraction effectiveness
- **High power reading adds:** must balance magnification with working distance
Lighting

- Critical for most patients with decreased acuity and/or decreased contrast sensitivity
- ARMD patients: often need intense illumination
- Optic neuropathy patients: bright light may decrease visual performance
Contrast enhancement

- Improved lighting
- High contrast reading materials
- Tinted lenses: yellow or orange
- Closed circuit television (CCTV); computer contrast enhancement
- Plates and cups with contrasting colors
Contrast example
Glare control

- Tinted and/or polarized lenses
- Side shields on glasses frame
- Visors
- Window blinds to direct sunlight
- Covering polished tables with table cloth
Magnification

- Kestenbaum formula:
  - $1/\text{visual acuity} = \text{dioptic power to see J5 print (1M)}$
  - *Twice this power to see J1 print*
  - *An approximation only*

Power of a simple magnifier = $D/4$
## Magnification

<table>
<thead>
<tr>
<th>Low Vision</th>
<th>Moderate visual impairment</th>
<th>20/70</th>
<th>20/80</th>
<th>20/100</th>
<th>20/125</th>
<th>20/160</th>
<th>(Near-) normal performance with magnifiers and other aids</th>
<th>16-10 cm:</th>
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<tbody>
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<td>Half-eye glasses (6-10 D) (with prisms for binocularity)</td>
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<td>Stronger magnifiers (&gt;8 D)</td>
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<td>Severe visual impairment</td>
<td>20/200</td>
<td>20/250</td>
<td>20/300</td>
<td>20/400</td>
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<td>Slow than normal with visual aids</td>
<td>8-5 cm (cannot be binocular):</td>
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<td>High-power reading lenses (12-20 D)</td>
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<td>High-power magnifiers (&gt;16 D)</td>
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<td>Profound visual impairment</td>
<td>20/500</td>
<td>20/600</td>
<td>20/800</td>
<td>20/1000</td>
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<td>Limited spot reading with visual aids</td>
<td>4-2 cm (cannot be binocular):</td>
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<td>High-power magnifiers (&gt;28 D)</td>
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<td>Video magnifier</td>
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<td>Vision substitutions*</td>
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</tbody>
</table>
Magnifiers: high-plus spectacles *(base-in prism compensates for base-out prismatic effect of high-plus lenses)*
Magnifiers: handheld/stand
Magnifiers: CCTV
Magnifiers: telescopes
Eccentric viewing training

- Most often used for patients with central scotomas
- Patients learn to identify and use a “preferred retinal locus”: PRL
- Exercises teach patient to develop eye-hand coordination with their PRL
Nonoptical devices

- Talking watches and clocks
- Large-print checks
- Felt-tip pens to create broad-stroke letters
- Liquid-level indicators
- Voice-activated computers and speech recognition software
Adaptation training for ADL’s

- Individualized training to address functional problems
- Cooking, cleaning, grooming, shopping, mobility
- Offered by Occupational Therapists, Rehabilitation Teachers, Orientation/Mobility specialists and certified low vision therapists
Counseling and Support Groups

- Vision loss leads to functional loss: correlates strongly with depression
- Patients experience stages of grieving with vision loss; may need to be addressed before rehabilitation can begin
- Support groups can provide role models of successful rehabilitation
Local and national resources

- Transportation
- Newspaper/magazine reading services
- Directory assistance
- State agencies that provide in home assistance and other services
- Library of Congress Talking Books Program
- Internet resources
  www.nei.nih.gov/health/lowvision
Referral

- Our responsibility as eye care providers: inform and direct patients to low vision resources

- Offer hope: patients experience feelings of abandonment, confusion and despair if they hear “nothing more can be done”
Low Vision rehabilitation for the community ophthalmologist

- Identify patients with early vision loss
- Identify a nurse/tech with interest in this area
- Assemble a Resource Kit for patients and families
- Assemble a sample aid kit
Identify patients early

- Work primarily with early vision loss: 20/40 to 20/80
- These patients adapt more readily to aids, especially as vision worsens
- Patients with worse vision will need more extensive rehabilitation and/or referral to low vision service
Identify nurse/tech with interest

- This person can coordinate appointments and equipment needs
- Provides continuity for patients/families as a contact person
- Educate all staff to identify patients with functional deficits
Assemble a Resource Kit

- Patient information packet on low vision and specific disease entities
- Information on resources: national, state, community; catalogs
Assemble a sample aid kit

- Nonoptical aides
- Handheld and stand magnifiers
- Low power telescopes/binoculars
- If patient finds aids useful, a loan program can be very useful
- Re-evaluate aid use periodically
Be aware of patient’s functional needs
Start early in the vision loss process
Plan ahead: gather information and resources for patients and families
Be prepared in your practice with personnel and office resources
Emphasize remaining vision
Above all:

- Give hope and encouragement!
References
