Low Vision in the Fast Lane

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Case #1

“Surely Make you Lose Your Mind”

- 88 y.o. Russian Speaking Woman
- Accompanied by her son to translate who asks, “Just please do anything that can help her vision”
- “Unable to read and I want glasses, I have been to many doctors and no one can make me glasses for reading that work”
- Husband (deceased) was an optician
- Dx Dry AMD OU, Referred by OMD
- Cataract Sx over 10 years ago
- Lives Alone, No Mobility Problems, No Problems with household chores
- Does not use a computer, smart phone or tablet device
- No Distant Complaints (Watches Television)
- Does not use any magnifiers or any other low vision aids, does not want to, wants glasses!
Low Vision History

• Sighted or Not Sighted

• 1893 British Parliament defined blindness as “too blind to read the ordinary school books used by children”

• Sight Saving Techniques

• 1913 Perkins School, initiated its first class for “partially blind” children, emphasizing skills to help student’s take an active role within their community

• Realization that more can be done
History of Low Vision

• 1950’s “Low Vision” term is coined
  – No more thought of as sighted and blind
  – Emphasized rehabilitation and the use of optical and non-optical devices
Low Vision Defined

- World Health Organization
  - 20/30 to 20/60 Mild Vision Loss
  - 20/70 to 20/160 Moderate Visual Impairment
  - 20/200 to 20/400 Severe Visual Impairment
  - 20/500 to 20/1,000 Profound Visual Impairment
  - Less than 20/1,000 Near-Total Visual Impairment,

No Light Perception = Total Blindness
Low Vision Defined

• **National Eye Institute** = VA less than 20/40 in the better seeing eye

• **National Federation of the Blind** = Any person who must use alternative methods to engage in any activity that persons with normal vision would do using their eyes
Legally Blind

• BCVA of 20/200 or less in the better seeing eye or a visual field of 20 degrees or less.
The Statistics

• Over 285 million people in the world are visually impaired (WHO-2011)
  – 39 million are blind
  – 246 million have moderate to severe visual impairment

• 82% Aged 50 & Above
By the States

Top 5
• CA 790,700
• TX 634,600
• FL 494,900
• NY 402,800
• PA 285,300

• Over 200,000
  – NC, OH, TN, PR, GA, IL, MI

• Over 100,000
  – AZ, CO, IN, KY, LA, MD, MA, MI, MS, NJ, OK, OR, SC, VA, WA

• Under 100,000
  – AK, AR, CT, DE, DC, HI, ID, IA, KS, ME, MN, MT, NE, NV, NH, NM, ND, RI, SD, UT, VT, WV, WY
Low Vision Causes

- AMD
- Glaucoma
- Diabetic Retinopathy
- Retinal Dystrophies
- Retinal Vascular Disorders
- Cataracts!
Low Vision Need

All Vision Impaired

- All: 2010, 2030, 2050
- White: 2010, 2030, 2050
- Black: 2010, 2030, 2050
- Hispanic: 2010, 2030, 2050
- Other: 2010, 2030, 2050
Recognizing the Need

- 2015 National Health Interview Survey

Reported Estimated **23.7 million adult Americans** are visually impaired (*Self Reported Visual Impairment after Correction*)
Is the Need Still there for Magnification Aids?

• Study – Investigated if there is a change in the requirements for low vision magnification aids in recent years for AMD Patients.

• Compared 1999-2005 to 2007-2011

• Unchanged and Still High Demand for LV Magnification Aids, even with new treatments

Who is Offering Low Vision Services?

• NIH Survey in 2009 Reported:
  – 42.7% Private OD Practices
    • 4 Patients/Week
  – 17.4% Private OMD Practices
    • Most Referrals to LV Services (More than OD’s)
  – 11.2% Independent Agencies
  – 7.5% Government/State Agencies
    • 45 Clients/Week
  – 2.9%-3.5% University Clinics
  – <3.0% Hospital Clinics
The Blind or Visually Impaired Patient

• What are the patients needs?
  – Reading
  – Distance Vision
  – Orientation and Mobility
  – Daily Living Skills / Independent Living
  – Vocational Rehabilitation
  – Assistive Technology
  – Education Needs

• What are the patients wants?
  – Reading
  – Driving
  – Social
  – Independence
Depression & Low Vision

• 10% – 15% Depression in Elderly
• 26.9% - 33.7% Depression in Visually Impaired Seniors  (Bruijnming et al. Longitudinal observation, evaluation and interpretation of coping with mental (emotional) health in low vision rehabilitation using the Dutch ICF Activity Inventory. Health Quality Life Outcomes. 2014; 12:182

• The sooner someone is referred for Low Vision Evaluation the better the chances are of increased quality of life.
Depression and Low Vision

• Depression Affects:
  – Learning Capacity
  – Retention of information
  – Thought processes
  – Decision Making
  – Achieving Goals
FEAR, DEPRESSION, WORRY, STRESS, ANXIETY, PANIC
Case #2

“They knew all the right people, they took all the right pills”

- Received phone call from Retinologist to treat as VIP
- Report from OMD
  - Dx: CNVM OS, Injected Lucentis OS, Dry AMD OD
  - VA sc OD 20/30  PH 20/25
    OS 20/150 PHNI
- 73 y.o. Woman who has a demanding job for a high profile individual
- Phone Call: Panicked and Nervous, Making mistakes on emails at work, problems reading, problems with computer, very worried and concerned and wants to come in right away
Blind Etiquette

- It's okay to:
  - Use Visually Related Terms
    - See, Look, Watch
  - Use the Word “Blind” or “Visually Impaired”
    - When referring to a person with a disability, refer to them as a person first, not “Blind Person”, Say “Person Who is Blind”
- Use Descriptive Language.
- Never Distract a Guide Dog.
- Always leave things in the same place if asked to perform a task for a person who is blind or VI.
- If you see someone about to encounter a dangerous situation, be calm and clear about warning the person.
- Do not help someone complete tasks they can do on their own. If unsure first ask, then assist.
- Speak directly to the person who is blind, you do not need to raise your voice, unless they are hearing impaired as well.
- Introduce yourself, say who you are.
- Greet other people by name.
Being a Sighted Guide

• Always Ask
• If they accept, tap the back of your hand to their hand, they will then grab your elbow and you guide one step in front (do not push or pull)
• Narrow Spaces
Types of Low Vision Services

- Basic
- Intermediate
- Advanced
Basic Low Vision Services

- **Understand Patients Needs**
  - Depressed, Nervous, Anxious, “The Magic Glasses”, Prepare your staff, talk with patient, awareness and education

- **Low Vision Charts**
  - Distance Feinbloom Chart
  - Near Lighthouse Chart

- **Low Vision Referral**
  - Nearby LV Optometrist
  - Low Vision Clinic in the Community
  - Local or State Agencies & Brochures
  - Patient Education Materials (Freedom Scientific)

- **Non-Optical Aids**
  - Signature & or Check Writing Guide, Fit-Over Sunglasses, Brochure of items......
Intermediate Services

• Equipment
  – EDTRS Chart for Distance Acuity Testing
  – Full Spectrum Light (Ott-Lite)
  – Basic set of HH Mag and Stand Mag
    • (Nothing above 6X – 7X) Kits by Optelec
  – Portable Electronic Magnifier (RUBY) / ? CCTV
  – Filters
  – Monocular Telescope / ? Bioptics
  – Max Detail / Max TV
  – Some Non-Optical Aids (Large Print Cards, Large Clock, ect...)
  – iPad, iPhone, other technology...

• Office
  – Training on LV Aid or Devices
  – Staff Education on Low Vision
  – Knowledge on Assistive Technology and Computer Programs

• Referral Sources
  – Local LV Device Rep, O&M, Occupational Spec., be aware of State Services, Tech Consultant
Advanced Services

• Encompass all aspects of Low Vision or Blind Services:
  – LV Evaluation, Training, O&M, Technology Assessment, Occupational and Educational Help, Daily Living Skills, Counseling

• Multi-Disciplinary Approach
  – Optometrists, Ophthalmologists, Certified Low Vision Specialists, Occupational Therapists, Vision Rehabilitation Teachers, Vocational Rehabilitation Teachers, Social Workers, Psychologists
Potential for Servicing Low Vision Patients

• Secondary Low Vision Clinics can meet the needs of >70% of people with Visual Impairment.

• Secondary Clinics = Provide Low to Moderate Magnification Low Vision Devices and Basic Rehabilitation Services.

The Low Vision Evaluation

• How do I do this efficiently in a timely manner?

• What optics equations do I need to know?
Low Vision Equations for Distance

• General Rule (Picking Proper Telescope Power)

<table>
<thead>
<tr>
<th>VA</th>
<th>Telescope Power</th>
</tr>
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<tbody>
<tr>
<td>≤ 20/100</td>
<td>2.5X</td>
</tr>
<tr>
<td>20/120-20/300</td>
<td>4-6X</td>
</tr>
<tr>
<td>20/300-20/600</td>
<td>10X</td>
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</tbody>
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• VA 20/200 and want goal of 20/40 Vision

• 200 / 40 = 5X
Low Vision Equations for Near

• Kestenbaum Formula

  Predicts the amount of diopters needed for small print

  – 20/200 ➔ Inverse ➔ 200/20 = +10.00 Diopters

  – 20/120 ➔ Inverse ➔ 120/20 = +6.00 Diopters

  – 20/50 ➔ Inverse ➔ 50/20 = +2.50 Diopters
Low Vision Evaluation

• Problem Specific
  – Goal Oriented

• Acuity Testing

• Refraction
  – Trial Frame Refraction
  – JND
LV Aids & Other Testing
Solutions / LV Aids

- Glasses / High Plus Lenses / Prism
- Magnification / Magnifiers
- CCTV’s & Electronic Magnification
- Text-To-Speech Software / OCR
- Filters
- iPhone, iPad
- Distance Telescopes / Bioptics
Case #3

“Call the Doctor, I think I’m Gonna Crash”

• 88 y.o. Retired Gentleman
• Self Referred
• Dx CRVO OS, Dry AMD OD (Avastin)
• Very Active, Lives in City, Drives to Home Upstate and Home in Arizona, Wants Bioptics
• Can see 12pt type on computer, but looks “broken up”
• NYS Bioptic Driving
Match the Vision Loss to the Solution

- **AMD/Macula Disorders**
  - Magnification, Filters, Computer Programs, Telescopes, Biooptics, Daily Living Non-Optical Aids

- **Glaucoma**
  - Filters, Computer Programs, Text-To-Speech, Non-Optical Aids, Negative Contrast CCTV/Ruby

- **Diabetic Retinopathy**
  - Filters, Text-To-Speech, Non Optical Aids

- **Cataracts**
  - Filters, Best Correction

- **RP**
  - O&M, Filters, Refer State Agency or LV Clinic
Case #1
“Surely Make you Lose Your Mind”

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- Dx Dry AMD OU, Referred by OMD
- Accompanied by her son to translate who asks, “Just please do anything that can help her vision”
- “Unable to read and I want glasses, I have been to many doctors and no one can make me glasses for reading that work”
- Husband (deceased) was an optician
- Cataract Sx over 10 years ago
- Lives Alone, No Mobility Problems, No Problems with household chores
- Does not use a computer, smart phone or tablet device
- No Distant Complaints (Watches Television)
- Does not use any magnifiers or any other low vision aids
- “Does not Want to!”
Case #1

DVAsc OD: 20/2,000       NVAsc 4M (20/200)
OS:  20/100

TF Distance Refraction: No Improvement
TF +7.50D OU for NV, Able to read 20/60, but did not like close working distance
3.5x HHMag Reads 1M(20/50)

Able to show proficiency reading the NYT !!!

Unwilling to use magnifier, unwilling to try other assistive devices, unwilling to do books on tape, wants glasses but unwilling to accept closer working distance

Letter to Dr.:
Your Pt. can benefit from magnification but Pt  unwilling

Recommendation to Son:
Buy a magnifier online (gave catalog) and leave it in moms apartment, get her books on tape and possibly try showing her an iPad.
Case #2

“They knew all the right people, they took all the right pills”

- Received phone call from Retinologist to treat as VIP and try to see her ASAP
- Report from OMD
  - Dx: CNVM OS, Injected Lucentis OS, Dry AMD OD
  - VA sc OD 20/30  PH 20/25
  - OS 20/150 PHNI
- 73 y.o. Woman who has a demanding job for a high profile individual
- Panicked and Nervous, Making mistakes on emails at work, problems reading, problems with computer, very worried and concerned and wants to come in right away
Case #2

- At OMD office VA OD 20/30 PH 20/25 OS 20/150 PHNI
- Wanted to be seen immediately
- I was unable to see her until following week
- Offered her to see Local Freedom Scientific Rep to see LV products
- Saw Rep and was given a demo RUBY to borrow, and now using high contrast large keyboard
Case #2, 1 Week Later at LV Eval.

- “Vision has been improving over the week”
- **VAsc** OD 20/25  
  OS 20/40
- **Refraction**  
  OD +0.25  
  BCVA 20/25  
  OS PL -0.75 x 060  
  BCVA 20/30-
- **ADD**: +2.50 OU, Able to read 1M Print, NYT and read 10pt print off computer screen, no problems with mistakes at computer, no amsler defect, “very relieved”
- **Recommended**: UV Protection Sunglasses, Discussed Vitamins/Supplements, Reading Rx Given with Blue Light Filters and return RUBY to FS Rep.
Case #3
“Call the Doctor, I think I’m Gonna Crash”

• 88 y.o. Retired Gentleman
• Self Referred, found me online
• Dx CRVO OS, Dry AMD OD (Avastin)
• Lives alone, no assistance needed in the home
• Very Active, Lives in City, Drives to Home Upstate and Home in Arizona, Wants Bioptics
• Can see 12pt type on computer, but looks “broken up”
• NYS Bioptic Driving
Case #3

- **DVAsc**: OD 20/80
  OS 20/1600

- **Current DVRx:**
  OD +0.50 -0.75 x 064     VA 20/50-
  OS Plano       VA 20/1600

- **Current NVRx:**
  OD +4.50 -0.75 x 064   Able to Read 1M OU
  OS +4.00 @20cm

- Trialed 1.7X Sightscope Bioptic Telescope 20/30
- Tried Ruby, but wanted bigger screen, referred to FS Rep to look into larger Saphire or Screen Magnification Software
Case #3

• Ordered Bioptic attached to Frame
• 20/40 Vision Through Bioptic
• Referred to bioptic driving class

• Follow Up
  – Vision Got Worse for DV & Reading
  – Advised against driving
  – Still finds Bioptic Useful for DV (Spotting)
  – Now using Text-to-Speech Device
Case #4

“Went Rushing Down that Freeway”

- 51 y.o. Woman with RP referred by OMD

- Went to Manilla (Asian Stem Cell Institute), had autologous bone marrow cells injected into vitreous, which caused decreased vision OS next day, Injected with steroids. OMD in US looked at records 1 month later on what appears to be a CRAO.

- Works as an assistant, required to do computer work, invoices and using excel

- Having trouble with mobility, bumping into things.

- Lives with Husband in NJ, “needs to be independent, commute and keep job”

- On Vitamins and Supplements for RP
Case 4

• **VAcc:** OD -0.75 -0.50 x 180  DVA 20/40
  OS -0.75 -0.50 x 180  DVA LP

• **12 Degree Visual Field OD**

• Refraction:
  OD: -0.50 -0.50 x 180  20/30-
  OS:  Balance
  ADD: +2.50  NVA 20/40
Case #4

• Plan
  – Referred to New Jersey State Blind Services
  – Recommended White Cane Training
  – Assistive Technology Evaluation

• Returned 1 year later, OD VA 20/50 and feels decreased VF

• Now using White Cane, iPhone accessibility functions & learning JAWS
Case #5
“The lights are turnin' red”

- 10 year-old Girl
- Referred by Aunt who is OMD
- Diagnosis of Questionable Macula Dystrophy
- Extremely Photophobic (2 Years)
- Problems Reading (Parents “She does not read much, she may have dyslexia or a learning disability”)
- Likes to Play Basketball!
Case #5

• BCVA: 20/200 OD, OS, Snellen & FB Chart

• Near Acuity: 0.8M @ 10cm (Fantastic Reading Ability)

• Refraction: No Improvement
Case #5

• LV Devices:
  – 2.2X Bioptic Telescope VA 20/70 OU (Loaned)
  – Ruby Electronic Magnifier with Negative Contrast
  – Plum Color and Polarized Filters
  – Refer to School Special Services and get counselor with NYSCB
Case #5

• Got Services at School and Counselor
• Diagnosed with Autoimmune Optic Neuropathy
• Likes using Ruby
• Will talk to school about getting a monocular telescope
• Sunglasses Help, But Awkward to wear in the classroom & playing basketball
Case #5

• Photophobia Treatment
• Color Contact Lenses
  Consice Plano/8.6/14.5
  Consice Plano/8.6/14.5

  RB20  *OS
  RB30  *OD
  RB40
Case #6

“We've been up and down this highway; haven't seen a goddam thing”

- 78 y.o. Woman with Dry AMD and LTG referred by Ophthalmology
- “Small Window of usable vision in the left eye”
- LV Eval at Lighthouse years ago, wasn’t ready
- Uses HH Magnifier, Increases Font on Kindle (Uses 2\textsuperscript{nd} largest size), Trying to Learn iPhone, tried CCTV in past & maybe now interested
- Wears Fit Over Dark Sunglasses Daytime (Mild Sensitivity to Glare and Sun)
- Did Accupuncture Therapy to help Vision
- Complains of Dry Eyes, using Progesterone Ointment on Forehead

• Cc: Able to read but slowly, wants to use iPhone better, “Eyes feel imbalanced, not working together” “Feels better when closes right eye for DV and NV”
Case #6

• **DVAcc**: OD +0.50 -5.50 x 095 VA 20/200  
  OS +1.00 -1.25 x 168 VA 20/70

• **NVAcc**: OD: +3.25 -5.50 x 095  Able to read  
  OS: +3.75 -1.25 x 168  1M Print, but  
  Slowly, & Letters Dance Around

• **Trial Frame Refraction:**  
  OD: +0.50 -2.50 x 095 VA 20/200 ADD +3.00 OU  
  OS: +0.50 -2.25 x 150 VA 20/50 1M Print, & better with Lighting

• Feels more balanced, Still feels reading is slow with Glasses

• **LV Aids**: Ruby Electronic Magnifier (Liked Magnification and Negative Contrast), Ott-Lite, Yellow Filters (increased contrast and decreased glare) helped for reading

• Tried Text to Speech devices, but did not like being spoken too and would rather read on her own even if it is slow.
Case #6

• Plan:
  – New RX for DV and NV (Single Vision)
  – Get Ott-Lite for Reading
  – Arrange visit with FS Rep to go over Magnification Devices, possible CCTV or Camera System
  – Refer to Assistive Tech Specialist to teach iPhone & App Use
  – Refer to Glaucoma Support Group