Best Bumper Stickers of 2003

14. Everyone has a photographic memory...some just don’t have any film.
11. I used to have a handle on life...but it broke off.
7. Heart Attacks...God's revenge for eating His animalfriends.
6. Don't like my driving? Then quit watching me.
3. Try not to let your mind wander...It is too small and fragile to be out by itself.
2. Hang up and drive!

Low Vision Rehabilitation: Update for Eye Care Providers

Sean C. Knaak, OD
Elli J. Kollbaum, OD, FAAO
Low Vision Rehabilitation Services
IU School of Optometry
Overview

- Introduction

- Low vision tactics for eye care providers

- Low vision care in the referral/consult setting
  - Who are good patients to send for a low vision evaluation?
  - What is new?

- Cases

Estimates of Visual Impairment Prevalence in US

- For population >40 years old, the estimated number of blind individuals (≥20/200 in the better eye) in the US, based on the 2000 US population is 937,000 (0.78%)

- This number is estimated to increase by 70% to 1.6 million in the year 2020
Estimates of Visual Impairment Prevalence in US

- For population >40 years old, the estimated number of individuals with low vision (>20/40 in the better eye) in the US, based on the 2000 US population is 2.6 million (in addition to blind pop.).
- Blindness or low vision affects 1 in 28 people over the age of 40.


Visually Impaired Population

- The top offenders or causes of visual impairment:
  - AMD
    - Leading cause of blindness in white pop. (54.5%)
  - Glaucoma
  - Cataracts
  - Diabetes
- Not all are age-related causes, some of the VI population have early-onset congenital or hereditary disease:
  - Albinism, Congenital Glaucoma, ROP, Optic Nerve Hypoplasia

Combined account for 60% of blindness in black pop.
Not always the usual suspects…

- Traumatic brain injury
  - Diplopia
  - Visual field defects
  - Poor contrast
  - Poor visual processing
- Good VA, but not satisfactory functional vision
  - ERM
  - Ret vascular disease
  - Diabetes with macular capillary dropout
  - Optic nerve disease (glaucoma, optic neuritis, ONH edema, etc)
Low vision tactics in primary care optometry

- High Adds
- Emphasis on Illumination & Contrast
- Eccentric Viewing Techniques
- Resource connections
- Non-optical solutions
- Counseling on driving issues
High Adds

HIGH ADDS = MAGNIFICATION

● In adults:
  ○ NVA must equal at least 20/40 for adequate reading of continuous text
  ○ Most newsprint and magazines are 20/50, but...
    ● 20/50 on a single letter card is not sufficient for fluid reading of text
    ● VA obtained in office should be **subthreshold** level to give patient best results
    ● Testing with actual reading material is best confirmation of correct add

High Adds

● **How high can we go?**
  ○ +3.50D ADD (typically the highest from the optical lab)
  ○ Any add is actually possible

● For older individuals, a second pair for reading is usually the best choice rather than an add over +3.50D
● The +3.50D ADD will still help them with orienting to the food on their plate or items on a table or shelf if not used for reading
● If >+4.00D, prism is needed to maintain binocularity

**RULE OF THUMB:**
ADD POWER + 2 Δ BI per eye =

Prism needed to maintain binocularity
Field of View

In Spectacles-

- Progressives may not be best alternative for higher add, especially if patient has difficulty navigating which section to use
- Second pair of reading only glasses often easier for adds of +4.00 and up

High Adds

- How do I choose an add?
  - Trial framing of higher add powers OR
  - Take acuity with +2.50D add over distance Rx at 40cm
  - Think of how much closer it would need to be to give 20/40 acuity and then find the inverse of that working distance. Your answer is the dioptric demand for near.
Example

+2.50 gives 20/80 at 40 cm, what add is needed for a 20/40 VA?
The image needs to be twice the size or viewed at 20 cm which requires a +5.00D ADD.

Want an equation?
Try the revised Kestenbaum:

\[
\frac{\text{Denominator of Current NVA}}{\text{Denominator of Goal NVA}} = \frac{X}{+2.50}
\]

(X=New Add Required)

OR

REQUIRED ADD CHART

<table>
<thead>
<tr>
<th>VA @ 40cm w/ +2.50</th>
<th>ADD Needed for 20/40 NVA</th>
<th>New ADD WD (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/50</td>
<td>+3.00/+3.25D</td>
<td>30-33 cm</td>
</tr>
<tr>
<td>20/60</td>
<td>+3.75D</td>
<td>27 cm</td>
</tr>
<tr>
<td>20/70</td>
<td>+4.25/+4.50D</td>
<td>22-24 cm</td>
</tr>
<tr>
<td>20/80</td>
<td>+5.00D</td>
<td>20 cm</td>
</tr>
<tr>
<td>20/100</td>
<td>+6.25D</td>
<td>16 cm</td>
</tr>
</tbody>
</table>

** For NVA of 20/70 and above, separate RORX considered and prism if patient is binocular
High Adds

In children, remember-
- They need to see standard print size if at all possible. Access to materials significantly decreased if only possible to read large print.
- Accommodation in play and VI child can hold items close to read
- Accommodation will fatigue. A more comfortable working distance may be created with bifocal add

Illumination
- Increased luminance enhances contrast
- Overhead or typical room lighting is commonly insufficient for VI patient
Illumination – Patient Education

- Stand lamp with goose-neck or swing-arm and full shade will bring all light onto page
- Light should be positioned below eye level and at 45 degree angle from reading material
- Stronger bulb (75 Watt) incandescent helpful. Patients may also like halogen (heat may be an issue) or the new fluorescents.

Clinical Pearl:
Demonstration of acuity differences with and without stand lamp will solidify message for patient
Contrast Enhancement and Glare Control

- Filters
  - Tints may be adequate
    - Yellow and amber tints often preferred by visually impaired patients
  - Absorptive lenses with specific transmission curves often preferred
    - Certain wavelengths blocked and others with limited transmission levels
  - Hard science not there to support why they work, but clinically the patients respond to filters

- Hats and visors also combat glare
J.P., 75 yo Caucasian male

- Retired chemist. Visually impaired secondary to multiple BRVOs OD, RD OS.
- BVA on projector chart
  - 20/20- OD and CF OS, **but not satisfied**
  - Best NVA with +3.00 ADD 20/50+
- Goals: Read better in varied lighting or low contrast situations

Exam:
- Increase ADD to +3.50 improves VA to 20/30
- CPF 450 equivalent variable tint filter within lenses improves patient comfort at distance indoors
- NOIR 701 preferred outdoors
  - 10% Medium Amber

Recommendations:
- Two pairs of glasses:
  - Distance only with CPF 450 Filter
  - Near pair with +3.50 ADD power
- Wrap-around NOIR 701 Outdoor filter
Eccentric Viewing Techniques

- **Definition:** Using peripheral vision for best functional vision
- **Best outcome if patient uses one eye position for viewing objects and repeats that position regularly**
  - Discourage head turns and tilts (Makes finding right position more difficult)
- **Central scotoma patients appreciate explanation of eccentric viewing**
- **With practice, patient often will improve scanning and reading abilities**

**Clinical Pearl:**
Record eye position as a clock hour from patient’s point of view. E.g. 20/100 EV at 1 O’Clock
Resources connections

- Support groups
- Online resources
- Talking Books
- IRIS
- Large print checks and bills
- Free directory assistance
- Handicapped Placard or License Plate
- State Services for the Blind and Visually Impaired
- Transportation Options

*** See Bloomington LV Example***

Dealing with computer issues

- Most visually related problems are solved within the operating system
- Features included in MS 98 and up include:
  - Contrast enhancement
  - Large titles and statements
  - Magnifier with 1x-9x magnification
- Direct patients to Control Panel and then Accessibility Options
- Software packages available
  - Zoomtext
  - BigEye
  - Magic
Non-Optical Solutions

- Sock locks
- Black roller ball or felt tip pen
- Needle threader or special needles
- Talking watches and alarm clocks
- High power magnifying mirror
- Line guide (contrasting paper)
- Signature or check-writing guide
Counseling on Driving Issues

- IN Law requires:
  - 20/50 in better eye or 20/70 in both as a minimum VA for daylight only privileges
  - No visual field requirements; however, visual field of extreme importance
  - For bioptics or special waiver driving privileges, 120 degree visual field is required in addition to VA standards
Counseling on Driving Issues

- Consider evaluation with Driving Rehabilitation Specialists
  - available to evaluate drivers who have questionable skills or are re-entering the driving population after a hiatus
  - Evaluate and train bioptic drivers and drivers with other special accommodations
- WEBSITE:
  http://www.driver-ed.org

Is the driver Moving or Licensed in another state?

http://www.lowvisioncare.com/

*Website with each state’s laws listed*
J.S., 73 y.o. female

- presents for second opinion. (-) blur at distance or near
- POHx: ARMD, dx 1.5 yrs ago
- S/P Phaco w/ PCIOL OD, 5 yrs ago
- PMHx: Tachycardia, Kidney Stent, Carotid Endarterectomy
- MEDS: Pletal, Plavix, Altace, Pravachol
- MA: PCN

Exam Findings

- BVA: 20/60+ OD
  20/60+ OS
- NVA: 20/40+ OU
- With Refraction of:
  OD +1.00 –1.00 X102
  OS +1.75 –0.50 X085  ADD: +3.00
- Prelims: Unremarkable
Ocular Health Exam:

- **SLEexam:**
  - 3+ K guttata w/ pigment dusting OU
  - 2+ central stromal edema OU
  - OD PCIOL with open posterior cap
  - OS  NS 2-3+
- **Pachymetry:** 667microns OD/???
- **Ta:** 11/11 mmHg
- **DFE:** Trace RPE disruption centrally OU, otherwise unremarkable
Diagnosis: Fuchs’ Endothelial Dystrophy

Treatment
- Muro 128 (NaCl 5%) gtts qid OU
- Muro 128 unq qhs
- Counseling on functional implications and inheritance pattern
- Documentation and monitoring with pachymetry
- Hair dryer in AM to dehydrate cornea
- RTC 2 wks
J.S., Fuchs’ Dystrophy

1 year later:
Difficulty with glare outdoors, but no functional reading or distance complaints.
Enjoys mushroom hunting in spring
BVA: 20/60 OD/OS @D and 20/60- @ N’
Filter Eval: CPF Glare Cutters
PLAN: Order Glare Cutter as clip

Who is a good patient to send for a low vision evaluation?

Patients …
○ who are not satisfied with visual functioning conventional glasses provide
AND
○ with specific goals to accomplish
  ● “I want to see the numbers on the racecars at the track”
  ● “I need to read sheet music while sitting at a piano”
Who is a good patient to send for a low vision evaluation?

- Patients with visual problems that need further testing, rehabilitation, and possibly referrals to other resources
  - Trial and training with devices
  - Testing for driving qualifications
    - Bioptic
    - Special waiver
- Visual field loss and secondary mobility or neglect problems
  - Devices
  - AND/OR Orientation and mobility evaluation

The most successful low vision patients are the ones who are motivated to improve their situation.

What preparation is needed for a low vision evaluation?

- Patients should bring all glasses and magnifiers they have
  - Easier to compare differences
  - Can troubleshoot why they cannot achieve success with current devices
- List of tasks they are struggling and need help with
- Recent records are helpful
  - Decreases history time
  - Comparison of results possible if patient reporting changes
- Formal written request for consult from patient’s ECP is required for billing purposes
What’s new in low vision?
What is new in low vision?

Electronic devices and Adaptive Technology

- Autofocus bioptic telescope
- Portable CCTV options
  - Head-mounted devices
  - Small portable devices only slightly larger than a PDA
- Computer software
  - For screen enlargement/enhancement
  - For voice output/speech synthesis

Can be used for distance and near tasks or switching back and forth

Can be used for driving, but with autofocus feature OFF and telescope set for distance
Optelec’s Clearview Traveller
Optelec’s Compact

Introducing the world’s only low vision auto-reader™

1 866 773-2337 or 1 866 7-READER
What is new in low vision?

- New spectacle designs for visual field enhancement
- Scanning and textbook organization on DVD (IU and IUPUI Adaptive Technology Department)
Research

- Hemianopic lens design
- AMD Rehabilitation
- Eccentric Viewing Training
- Reading in Peripheral Vision
- Much More

Cases
E.S., 57 yo F

POHx: Diagnosed with optic atrophy secondary to MS six months prior.

Goals:
- read newspaper and documents at work
- cross-stitch
- decrease glare with bright lights
- discuss driving safety

E.S.

BVA @D(Snellen Projector):
- OD 20/150
- OS 20/70

BVA @D (Feinbloom/DFV):
- OD 10/100
- OS 10/60 (No improvement with EV)

NVA c +2.75 ADD@40cm:
- OD 3.2M
- OS 2.5M

Prefers dim illumination
E.S. (cont’d)

No improvement with refraction
Poor response to distance magnification
With +8.00D prism half-eyes, she achieved 0.6M at 10cm and was extremely pleased
She responded positively to 4%Plum UV Shield on outdoor filter eval and CPF 450 on indoor eval
Her Goldmann visual field showed 130 degree horizontal field. We assisted her in applying for a special waiver for driving with on-the-road testing required before licensure

B.R., 69 yo M, S/P CVA with Left Hemianopsia

- BVA: 20/20 OD 20/25 OS
- Rehabilitation Plan:
  - 15 prism diopters of base left Fresnel prism over left third of spectacles
  - Compensatory techniques for reading and scanning were discussed
    - Vertical page orientation for reading
  - Training with prism at dispensing
- F/U: 3 mo. Later, patient ordered prism ground into lenses
FS, 50 YO AA Male

- Dx: burned out retinal vasculitis and s/p vitrectomy OU.
- MHx: Kidney failure, on dialysis 2x/wk
- Goals: See TV during dialysis (10 ft away), reading medication bottles and bills
- Distance BVA: 10/40 OD and 10/200 OS
- NVA: 2M at 40cm OD, 8M at 40cm OS

F.S., Burned out retinal vasculitis

- With 2.5x Selsi Monocular, 10/10- VA OD
- Patient is prescribed a clip on monocular for TV viewing

- Predicted Near Mag
  - 2M/0.8M = X/+2.50D
    - X= +6.25D
  - Predicted +5.00 D needed at near
  - Patient does well with +6.00 D OD for 1M continuous text at 20cm and OS frosted
J.J., 21 yo F

- Snowboarding accident w/ secondary traumatic brain injury
- Reports no vision OS and “tunnel vision” OD
- Optic Atrophy OU, OS>OD
- BVA: OD 20/20  OS LP

Goals:
- Improve tracking with reading
- Wider FOV
- Improve climbing down stairs
J.J., 21 yo F, reduced FOV
- 4x reverse telescope for spot-checking in new environments
- 12Δ BU superior hemifield prism lens OD
- Orientation and mobility specialist evaluation
- “E” pattern reading and line guide recommended for reading
E.K., 74 yo M

- POHS with significant visual impairment since 1975
- BVA: 20/200 OD/OS on projector chart
  - NVA 20/100 with +5.25 at 14cm
- GOALS:
  - Needs RGP he uses OS for reading replaced

NOTE: Patient drove himself to exam

Addtnl GOAL: Discuss driving issues
E.K., 74 yo POHS

- With +15.50 Aphakic RGP, he is 20/40 at 7cm
- With 4.0x EFTS from Designs for Vision, he is 20/30+ on Snellen projector chart

PLAN:
- Dispense RGP
- Dispense bioptic telescope and train patient in-office for bioptic use. Patient then evaluated by and entered into Bioptic Training Program
Low vision rehabilitation truly encompasses multiple levels of patient management

- Individualized management plans are required for each visually impaired patient
- Integration of community resources is critical for care of the whole patient
- Many visually impaired patients can start receiving low vision care at their eye care provider’s office
- Complex cases benefit from evaluation by optometrists specializing in low vision rehabilitation

Low vision rehabilitation gives hope to patients suffering from vision loss.
Thank you!