

Low Vision: More Than a Magnifier

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What is low vision?

- American Academy of Ophthalmology: A best-corrected visual acuity of 20/40 or worse
- World Health Organization: 20/60 or worse
- Among the leading causes of disability in the United States
- ICD-10 categories begin at 20/70
- WHO defines blindness as BCVA of 20/400 or worse
- **Vision that is not adequate for an individual's needs**

What is legal blindness?

- A visual acuity worse than or equal to 20/200 in the better seeing eye or, if the visual acuity in that eye is better than 20/200, a visual field less than or equal to 20 degrees in the widest diameter
- No letters read on the 20/100 line if has lines between 20/100 and 20/200
- Social Security Blue Book

Prevalence of Low Vision

- Older adults – 3.9% worse than 20/40, 1.1% worse than 20/60, 1.0% worse than 20/200
- Middle aged – 0.6% worse than 20/40, 0.12% worse than 20/60, 0.04% worse than 20/200
- Children – 1.5% worse than 20/40, 0.3% worse than 20/60, 0.2% worse than 20/200
- And it shows signs of increasing!

From: **Estimates of Incidence and Prevalence of Visual Impairment, Low Vision, and Blindness in the United States**

JAMA Ophthalmol. 2018;136(1):12-19. doi:10.1001/jamaophthalmol.2017.4655

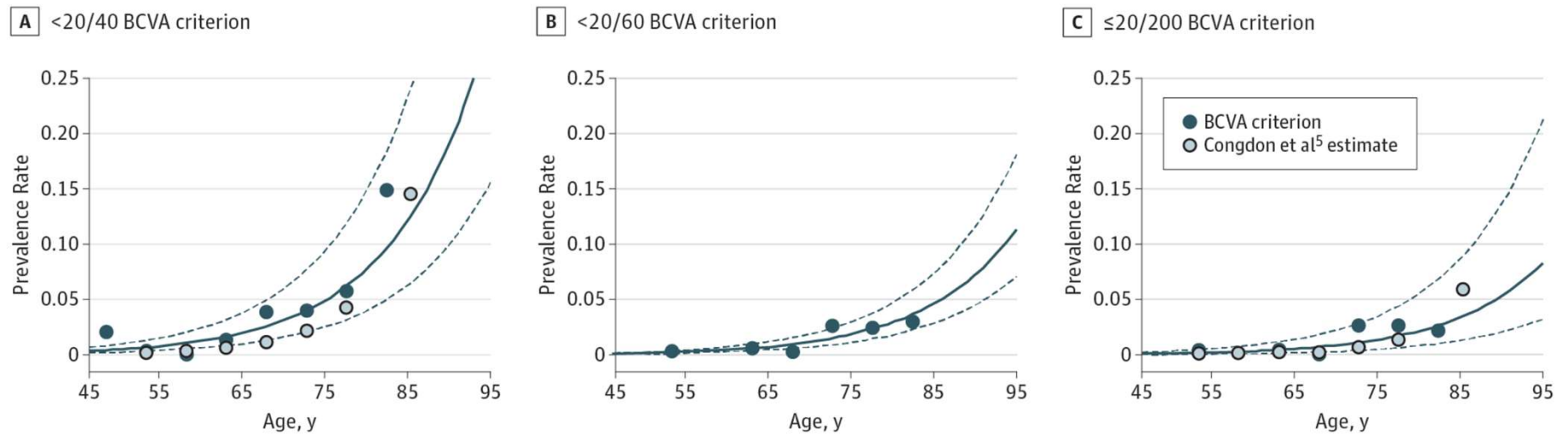


Figure Legend:

Prevalence Rate vs Age for 3 Best-Corrected Visual Acuity (BCVA) Criteria. Solid circles indicate the fit of the exponential model to the National Health and Nutrition Examination Survey prevalence rate vs age for the BCVA criteria of less than 20/40 (A), less than 20/60 (B), and 20/200 or less (C), with the rate constant constrained to 0.087. Dotted lines bound the 95% CI for the estimated function (indicated by solid lines). Open circles in panels A and C are estimates from the Congdon et al study and are plotted for comparison.

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SEE Project

- Salisbury Eye Evaluation
- Studied the relationship between visual impairment and functional disability
- Questionnaires and clinical examinations
 - Mobility, tasks of daily living with visual component, visually intensive tasks
- Essentially linear relationship between visual impairment and functional disability
 - Many factors, including age, race, gender, and other comorbidities, play into individual function

Patient HM

- 50 yo HM presents for low vision consultation
- History of multifocal choroiditis OU
- Visual acuity
 - OD CF @ 6"
 - OS HM
- Has small island of vision OD
- Works in food prep, has trouble seeing recipes
- Would like help with walking at night
- "Everything is difficult for me."
- Spanish-speaking – history obtained through remote interpreter

Patient HM

- No improvement with trial frame refraction
- Device evaluation – no improvement with Smartlux, Visolux, or high powered Miniframe Bifocal Readers
- Filter evaluation – no subjective improvement in contrast or light sensitivity with any
- Our usual tactics are not helpful at this point, so what now?

Patient HM

- Would be a good candidate for high-tech low vision aids
 - ORCam
 - Meta glasses
 - CCTVs with text to voice capabilities
- Needs more functional assistance
 - Orientation and mobility training
 - Vocational rehabilitation
 - Set up with local resources
 - Bluegrass Council of the Blind
 - Inpatient/residential help?

Functionality

- Activities of Daily Living (ADL)
 - Basic self-care tasks
 - Eating
 - Dressing
 - Hygiene/grooming
- Instrumental Activities of Daily Living
 - Complex skills for independent living
 - Finance management
 - Cleaning/housework
 - Driving
 - Shopping
 - Meal preparation
 - Medication management

Orientation and Mobility

- Ability to safely navigate their home, public spaces
- Stairs, walkways, streets
- Specialized orientation and mobility training may be required
 - Cane training
- Factors into independence, whether it's getting around their own home without bumping into things or finding their way in a new doctor's office

Kentucky Blind Services Division

- Through Kentucky Career Services
- Independence and employment
- Independent Living and Older Blind program
- Orientation and Mobility Services
- Deaf Blind program
- Bioptic Driving program

Charles W. McDowell Center for the Blind

- Louisville, KY
- Dormitory, cafeteria, recreational and fitness spaces, classrooms, computer labs
- Training for those looking for work or looking to gain independence
- Develop positive attitudes about blindness/vision impairments
- Does require some level of independence in ADLs
- Must be medically stable

Short- and Long -Term Effects of an Intensive Inpatient Vision Rehabilitation Program

- Questionnaire administered to 178 consecutive patients from Hines Blind Rehabilitation Center (Veterans Affairs)
- Statistically significant improvement in visual abilities 3 months and then 1 year post discharge from BRC
- Some decline at the 1 year mark, but still statistically and clinically significant improvement compared to prerehabilitation

Patient HM

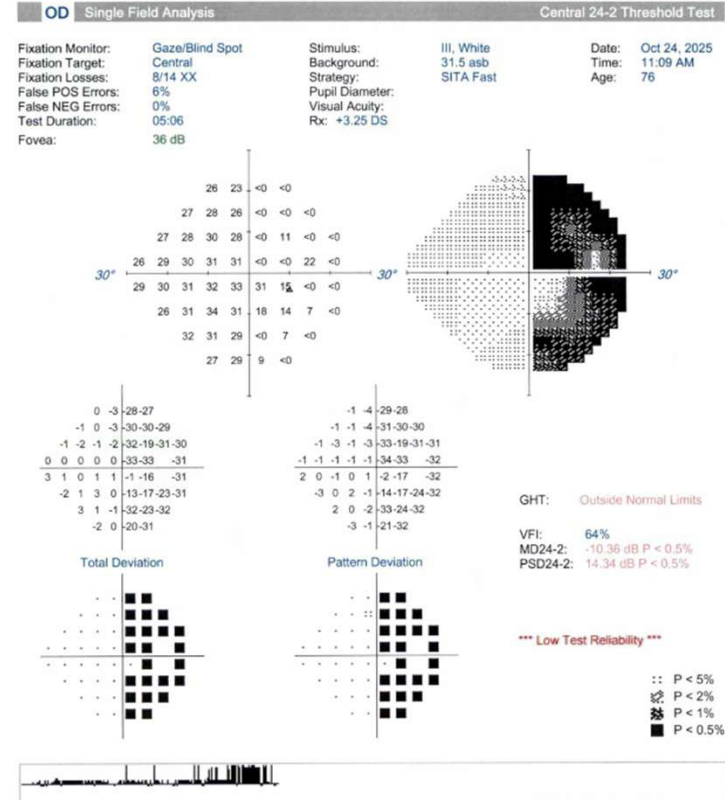
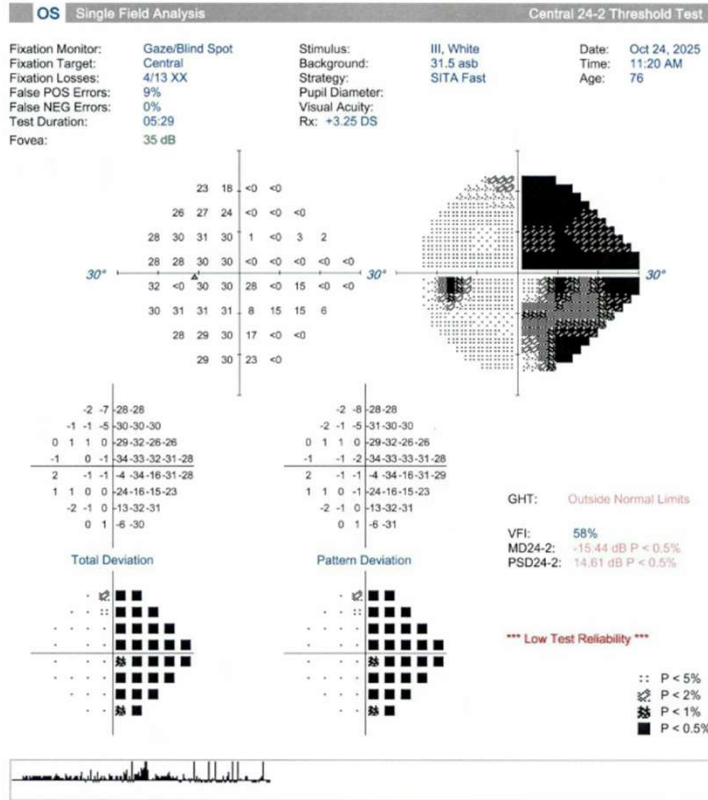
- Referred to OVR for help with accommodations at work
- Referred to Independent Living for help with O&M
- Gave contact information for Bluegrass Council of the Blind
 - The Blind Life on YouTube
- Could benefit from residential stay at McDowell Center?

Patient PM

- 76 yo WM referred from neuro ophthalmology for low vision consult
- Right homonymous hemianopia secondary to occipital stroke
 - July 2025
- VA sc 20/20 OD, 20/25 OS
- Feels like peripheral vision had improved “by about 25%” around August 2025
- Wants to drive and feels he could do so, but acknowledges he has to move his head around to get past a blind spot
- Very active, plays tennis, walks, cycles about 40 miles/week

Patient PM

HVF from October 2025



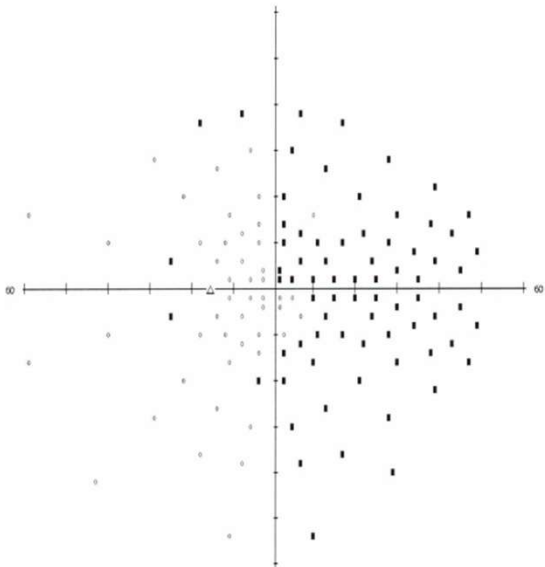
Patient PM

120 point VF from 3 days later

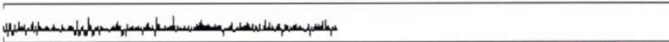
Full Field 120 Point Screening Test

Fixation Monitor: Gaze/Blind Spot	Stimulus: III, White	Pupil Diameter: 2.7 mm	Date: 05-02-2002
Fixation Target: Central	Background: 31.5 ASB	Visual Acuity:	Time: 1:53 AM
Fixation Losses: 3/20	Strategy: Two Zone	RX: DS DC X	Age: 52
False POS Errors: 0/16	Test Mode: Age Corrected		
False NEG Errors: 0/17			
Test Duration: 07:30			

Central Reference: 32 dB
Peripheral Reference: 32 dB



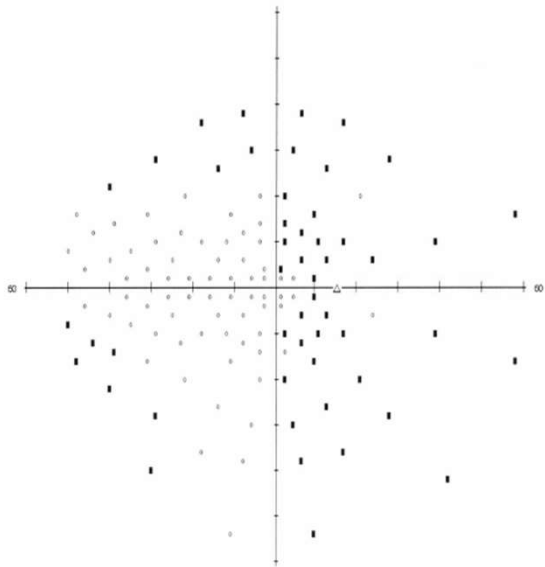
◊ Seen 47/120
■ Not Seen 73/120
△ Blind Spot



Full Field 120 Point Screening Test

Fixation Monitor: Gaze/Blind Spot	Stimulus: III, White	Pupil Diameter: 3.4 mm	Date: 05-02-2002
Fixation Target: Central	Background: 31.5 ASB	Visual Acuity:	Time: 1:42 AM
Fixation Losses: 1/17	Strategy: Two Zone	RX: DS DC X	Age: 52
False POS Errors: 0/16	Test Mode: Age Corrected		
False NEG Errors: 0/16			
Test Duration: 06:52			

Central Reference: 32 dB
Peripheral Reference: 32 dB



◊ Seen 69/120
■ Not Seen 51/120
△ Blind Spot



Patient PM

- Has about 10 degrees to the right OU thanks to macular sparing
- Kentucky requires 30 degrees to the right and left
- Pt says it's gotten so much better in the last few months, is shocked when he sees the extent of the field loss
- Has heard of prisms that can expand field, but these are not legal to drive with in KY
- "An emotional rollercoaster"

Effects of Visual Impairment on Mental Health

- Adults with any form of visual function impairment are at least 90% more likely to have depression than those without it
- Depression and visual impairment have bi-directional association in elderly people
- Prevalence of depression in adults seeking vision rehabilitation services is 22-30%

Mental Health Treatment and Visual Rehabilitation

- While physical aspects of vision loss are important, emotional and psychological impact needs to be understood
- Not just relearning basic skills
- Patients may be more inclined to lean on personal resources rather than ask for help
- Skills training, assistive devices, **and** counseling/therapy are shown to be more effective in lowering depression scores than training and devices alone

Mental Health Interventions

- Referral to counseling, therapy, etc
 - Psychology Today
 - Behavioral Health
- Peer support groups
- Affirm and validate emotional reactions
- Sit with them in it
 - ODs are great at this!

Patient PM

- Wait and see
- Pt was referred to mental health counseling
- Referred to UK Occupational Therapy as well as Kentucky Blind Services for O&M training
- Offered to fit into field expansion prisms, but pt defers
- A long, hard conversation
- Returning in 6 months to repeat 120pt VF and to neuro ophthalmology

Patient JH

- 6 yo WM referred by pediatric optometry and genetic retina
- Hx cone dysfunction syndrome, infantile nystagmus, chromosome 3q29 microdeletion
- Born premature at 33-34 weeks, no ROP
- Global developmental delay
- Does have IEP for speech and vision

Patient JH

- BCVA 20/200 OD, OS
- Habitual Rx:
 - OD: -8.00 +5.00 x 095
 - OS: -8.00 +4.50 x 060
- Did well with 2x dome magnifier and Smartlux 5-12x electronic magnifier
- Doesn't always get expected interventions at school
- IEP letter to be drafted
 - Extended time, scribes, visual breaks during testing

Pediatric Considerations

- Children have a right to a free and appropriate public education, but sometimes need different strategies to perform as well as their peers
- Individualized Education Plans (IEPs)
 - A written, legally enforceable document written by parents, teachers, school administrators, other relevant individuals, and even the student
 - Ages 3-21 or through high school graduation
 - Must have a visual impairment that is adversely affecting educational performance and that requires special educational and related services
 - Does not include standardized testing!
- 504 Plan
 - Ensures students with disabilities receive accommodations to provide access to their learning environment and academic success
 - Students who don't require specialized instruction
- A detailed report can make a huge difference in a student's life!

Pediatric Considerations

- Children with visual impairment are more likely to have coexisting mental health disorders
- Younger children will self-report similar quality of life to age-matched peers without visual impairment, but older children (ages 13-18 years) report a significantly lower quality of life
 - Younger children still have reduced QoL as it pertains to school performance

JH – 1 Year Later

- Having a hard time with receiving the needed interventions
- Does now have a TVI, but she's spread thin
 - Doing some O&M training now with her
- Now working with representative from Kentucky School for the Blind
- Did very well with Visolux 2-22x electronic magnifier
- Letter updated, spoke with KSB representative to help get accommodations in place

JH – Another Year Later

- All accommodations have been implemented and he is thriving!
- Cane training, extra time, other behavioral techniques
- Has good access to magnifiers, assistive technology at school and at home
- Some future discussions, like possible stay at Charles McDowell Center and other standardized testing recommendations
- O&M field trips?
- Driving?

Bioptic Driving

- Spectacles with patient's distance correction (carrier lens) with telescope mounted superiorly over one or both eyes
- Telescope only used for detail – signs, objects, people
- Requirements vary by state
- Loss of driver's license is associated heavily with increased depressive symptoms



Discussion

- Greatest benefit comes from *rehabilitation*, not just devices
- Multi-disciplinary approach
- All ODs can help connect with resources, even if you don't show magnifiers
 - Low vision specialists are scarce – do what you can!
- The eyes belong to a whole person

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