Driving and Low Vision in California

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DMV across the States

- 37 states have peripheral field requirements
  - Usually horizontal specs
  - Usually binocular
  - Varies from 30-140 with most requiring greater than 100 degrees
  - Most states do not address hemianopsia but they would fail in 22 states
- Bioptic driving permitted in 28 states

DMV’s Vision screening Standards

If 20/40 is still not seen on the Optec 1000, the person is referred to his or her vision specialist for complete vision examination. In California, the person is given a Report of Vision Examination form to be completed by the doctor.

What is the requirement in your state?

Measurement of visual acuity

CA DL62
### Restrictions
- Wear corrective lenses
- Geographic Area
- Hours (No night driving)
- Specific Roads (No freeway)
- Special Vehicle & Equipment
- Driving to specific destinations
- No Restrictions

### Field Restrictions
- What about acuity better than 20/40 but field loss?
- Homonymous Hemianopsia
- Depends on State Licensure requirements
  - California has no field restriction whatsoever!!

### Bioptic discussion

### Designs for Vision Bioptics

### Ocutech Bioptics
Optics of Bioptics - brief

- Review brief basics of Keplerian vs Galilean
- Monocular vs. binocular
- Expense
- Cosmeseis
- Field of view

Bioptic Telescopes

- Keplerian (Ocutech):
  - Two positive lenses
  - Long tube length (objective to ocular)
  - Image inverted unless extra element to upright image
  - Exit pupil is real (outside, behind ocular)

Largest field of view

Telescopes

- Galilean
  - Positive objective, negative ocular lens power
  - Short length
  - Final image is upright
  - Virtual exit pupil (inside TS)
  - Smaller field of view

Sidenote: Is this how you feel??
Galilean Telescopes

- The field of view is directly proportional to the diameter of the objective lens.
  - In order to expand the FOV, manufacturers produce telescopes called
    - wide angle telescopes (WATS)

Telescopic Prescribing: Considerations

- Cosmesis
- Need for refractive error correction in the ocular (or as a cap)
- Availability
- Cost
- Binocularity
- Uses/goals

BiOptic Driving Network
http://www.biopticdriving.org/index.htm

- This patient is using an Ocutech VES Mini 3x (Keplerian optics)

When is a Bioptic Telescope Recommended for Driving (Kammer opinion)

- Visual Acuity 20/100 or better
- Near normal peripheral visual fields
- Near normal contrast sensitivity
- Primary visual goals of seeing street signs
- What do you think?

Cons to bioptic driving

- Restricted visual field through bioptic
- Ring scotoma causing blind spot
- Vibration and speed blur
- Telescopic parallax & depth perception
- Sensitive bioptic frame adjustments

Bioptic Training Sequence

- Locate stationary objects while still
- Locate moving objects while still
- Locate moving objects while moving
- Develop rapid, accurate perception
- Spatial awareness & memory
- Adjustments to various lighting conditions
- Use of tracking cues
Filters For Driving

- Color
- Transmission
- Transitions
- Polarization
- Selective Filtration

Fitover Filters

Example: 2% Dark Amber, 40% yellow, 20% plum

Driving With Hemianopsia

- It may be possible in some states considering lack of field restriction criteria
- Always refer to Driver’s Rehab program who have worked with field restricted patients
- Mirrors on car
- Scanning techniques
- Restrictions on license most likely

CASE 1

ST

- ST, 58 yo male
- Left HH
- 20/20 central acuities
- Plano refractive error

ST

- Initially enrolled in EP lens study with Dr. Peli and Dr. Bowers– Harvard, Chadwick Optical (Karen Keeney)
- 6 week fitting protocol
  - Fit upper
  - Fit lower
  - Wear both two weeks
  - Satisfaction surveys completed throughout trial
Summary comments

- Week 37 – ST added occasional night driving
- Some confusion from headlights on left approaching from behind
- Drove in the far left lane to reduce confusion
- Drove 1200 miles accident free at 50 weeks

CASE 2
SF

- 78 yo male with wet ARMD
- SF had primary goals of reading CT and keeping driver’s license
- BVA’s 10/80 OU Variable results
- Drives dependent wife to doctor’s visits and grocery store

Issues

- CA requirement is better than 20/200 in the carrier lens
- Huge dilemma ethically
- Sole caregiver for sick wife

First visit with decreased vision

- 20/160 since previous visit one year ago
- No bioptic utilized
- Primarily local travel
- DMV form completed with no night driving and only local daytime driving
- Patient became upset!!!!

What would you have done?

End Result was ……………
CASE 3

SS

- SS 16 yo male living in desert area
- First license attempt
- Great family support
- Entering VAs = 20/80 OU
- Already driving on dry desert lakebeds for practice

Several Visits

- Discussed bioptic telescopes
- Primary purpose for viewing street signs
- SS loved the idea and responded well to bioptic fitting and demonstration
- Licensure and driving discussed at length with SS and parents. All eager to proceed

SS

- Fit with 2.2X bioptic TS
- VA with TS = 20/30
- Training in office, outdoors, later referred for more extensive training behind the wheel

SS

- Would you do anything different?

Result

Conclusions

- Driving with low vision = tough issues
- Don’t run from the issue, explore the topic thoroughly and help your patients with resources and straight talk
- Questions?

Resources

Association for Driver Rehabilitation Specialists
PO Box 49, Edgerton, WI 53534
608 884 8833
www.driver-ed.org
Resources

http://www.eri.harvard.edu/faculty/peli/index.html

Bioptic Driving Network
www.biopticdriving.org