LOW VISION GRAND ROUNDS

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OUTLINE

- No financial disclosures

CASE 1

**History:**
- Mature and motivated
- Accompanied by mother and father
- 10th grade
- History of oculo-cutaneous albinism with nystagmus
- Last eye exam: 2 months ago with primary care optometrist
- No history of systemic or ocular surgery
- No medications
- Full time glasses wearer
- Use to wear contacts but d/c as she thought they were no better than her glasses

**CASE 1: LOW VISION HISTORY**

- What questions are important in this case?
  - Where do you sit in school?
  - Do you have additional resources at school?
  - What size print do you read?
  - Do you have additional time for test taking?
  - What low vision devices do you use currently? Are they working well for you?

- Goals:
  - Glasses or devices for distance and near
  - Assistance with photophobia
  - Any additional resources...

**CASE 1: EXAM FINDINGS**

- Unaided Visual Acuity: (w/Feinbloom chart and Lighthouse near acuity card)
  - OD: Distance: 10/60 Near: 0.40/1.6M
  - OS: Distance: 10/80 Near: 0.40/1.6M
  - OU: Distance: 10/60 Near: 0.40/1.6M

- Aided visual acuity:
  - Rx: +1.25-3.00x180, +1.50-3.50x180
  - OD:10/60+1 0.40/1.6M
  - OS:10/60+1 0.40/1.6M
  - OU:10/60+1 0.40/1.6M

CASE 1

- History:
  - JS, 15 year old female high school student presents for low vision evaluation
  - Referred by local optometrist
  - Trouble reading near print
  - Difficulties seeing board at school
CASE 1: REFRACTION

- Subjective Refraction with trial frame:
  - OD: +1.75-3.00x180 10/60+1
  - OS: +1.75-3.50x180 10/60+1
  - Near: 0.4/1.6M OD and OS

CASE 1: DISTANCE VISION

- Telescopes:
  - Galilean?
  - Keplerian?
- BCVA was 10/60.
- What is our goal acuity?
  - 10/20 or 20/40
- 3x telescope would give what kind of acuity?
- What other devices can we show the patient?

CASE 1: NEAR VISION

- What would you recommend to the patient?
  - Goal acuity is 0.8M. Pt saw 0.40/1.6M.
  - (Near acuity/Goal Acuity) * Dioptric Value of Working Distance
  - (1.6/0.8M) * 2.50=

  - Kestenbaums rule (reciprocal of vision)
  - What would it be in this case?
  - +6.00 would theoretically let her see 1.0M print size
  - What is the working distance in this case?

CASE 1: NEAR OPTIONS/NON-OPTICAL

- Hand held magnifiers
- Stand magnifiers
- Electronic magnifiers
- Non-optical aids:
  - 20/20 PEN
  - Bold line paper

CASE 1: WHAT ABOUT THE PHOTOPHOBIA?

- Sunglasses
- Tinted (contact)lenses
- Transitions lenses
- Visors
- Hats
- Always recommend sunscreen!
ACCOMMODATIONS FOR SCHOOL

- Letter to be included in patients individualized education plan (IEP):
  - Seating at the front of the classroom
  - Seating away from windows
  - Allowance of sunglasses inside
  - Extra-test taking time
  - Access to enlarged print

NEGATIVE STIGMA OF ALBINISM

CASE 2

- History:
  - Diagnosed with AMD 2 years ago
  - Last visit with OMD was 3 months ago
  - Cataract surgery last year OU
  - No history of intra-vitreal injections
  - Heavy smoker, 1 pack a day since he was 15
  - DM, HTN, high cholesterol
  - Insulin, atenolol, simvastatin, preservision

- Goals:
  - Want to be able to read again.
  - Books, magazines, medicine
  - Strategies for seeing faces
  - Any additional resources

CASE 2

- Chief Complaint:
  - TM, 75 year old male, retired teacher, presents for low vision evaluation
  - Referred by local OMD
  - “Can’t see anything, things jump in and out of my vision. Can’t see faces!”

- Unaided Visual Acuity: (w/Feinbloom chart and Lighthouse near acuity card)
  - OD: Distance: 10/50    Near: 0.35/4.0M
  - OS: Distance: 10/40 Near: 0.35/4.0M
  - OU: Distance: 10/40 Near: 0.40/4.0M

- Aided visual acuity:
  - Rx: +2.00-0.50x090, +1.75-1.00x084, +3.00 PAL
  - OD:10/40+1 0.35/3.2M
  - OS:10/32+1 0.35/2.5M
  - OU:10/32+1 0.35/2.5M
CASE 2

Subjective Refraction with trial frame:
- OD: +2.00-1.00x090  10/40
- OS: +2.00-1.00x080  10/32
- +3.00 ADD for near 0.33/2.5M OU

CASE 2: NEAR VISION

- ROV: 10/32 which translates to a +3.2 ADD to read 1M.
- Pt saw 0.33/2.5M at near. Wants to see 0.6M.
  \[(2.5/0.6) \times 3 = 12.5\]
- What devices can we try?
- Hands free options?

CASE 2: DISTANCE VISION

- Pt saw 10/32 for distance. What options do we have at this point?
  - Hand held telescope
  - Max TV
  - Beecher Sport Scope

NONOPTICAL

- 20/20 pens
- Large print watch
- Large print checks and check registry
- Kitchen aids
- Task light
  - Medicine management
  - Check writing
  - Reading newspaper
- Referral for Occupational Therapy
  - Eccentric viewing
Technology evaluation for portable and desktop CCTV's
- Computer software such as Zoom Text
- "Ctrl +" or "ctrl scroll"
- "Do those vitamins really help??"

CASE 2: OTHER OPTIONS

AREDS 1 AND 2
- The Age-Related Eye Disease Study was the first large-scale clinical trial to evaluate the efficacy of high-dose antioxidants on the progression of AMD. Its results showed that increased intake of antioxidants and zinc lowered the risk for disease progression by 25% in patients with intermediate or advanced AMD.
- The AREDS2 results suggest that lutein and zeaxanthin have a role in AMD management, and should replace beta-carotene in the original AREDS formula.

CASE 3

Chief Complaint:
- MT, 80yr old female, presents for low vision evaluation
- Referred by local OMD
- Store bought magnifier is not strong enough, can’t read like she used to.

History:
- Diagnosed with wet macular degeneration 4 years ago
- Cataract surgery OU, 10 years ago
- Last visit with OMD was 3 months ago
- Numerous intra-vitreal injections OU
  - Is one better than the other?
- DM, HTN, high cholesterol
- Metformin, atenolol, simvastatin
- Quit smoking 10 years ago
- Family history unremarkable
- States that she sometimes sees kids playing in front of her

Goals:
- Want to be able to read again.
  - Books and magazines
  - Any additional resources

Unaided Visual Acuity: (w/Feinbloom chart and Lighthouse near acuity card)
- OD: Distance: 10/400 Near: 0.35/8.0M
- OS: Distance: 10/400 Near: 0.35/8.0M
- OU: Distance: 10/400 Near: 0.40/8.0M

Aided visual acuity:
- Rx: pl-1.00x90  pl-1.00x84
- OD:10/200
- OS:10/200
- OU:10/200 0.35/8.0M

Observation:
- Pt moves her head and eyes in varied positions to see better
CASE 3

- Subjective Refraction with trial frame:
  - No change in refraction
  - Visual field testing: Large central scotomas in both eyes

CASE 3: NEAR VISION

- ROV: 10/400 which translates to a +40 ADD to read 1M.
- Pt saw 0.4/8.0M at near. Wants to see 1.0M.
  \((8/1) \times 2.5 = +20\)

What devices can we try?
- Hand held options?
- Hands free options?

MICRO-PERIMETRY

- Micro-perimeters map the pattern of a patient’s retinal sensitivity onto an image of that individual’s fundus. They measure the patient’s response to light stimuli at various retinal points and superimpose that data on an image captured by scanning laser ophthalmoscopy (SLO) or fundus photography to precisely identify areas of impaired or preserved function.

CHARLES BONNET SYNDROME

- Charles Bonnet syndrome (CBS) is an under-recognized and under-reported disorder that involves visual hallucinations in visually impaired individuals.
- These patients have intact cognition and retain insight into the unreal nature of their hallucinations.
- It is important to include direct questions regarding visual hallucinations in the case history of a low vision examination.

CCTV'S

ANTI-VEGF ERA

- Historically, treatments for wet AMD, such as macular photocoagulation, verteporfin photodynamic therapy (Visudyne PDT, QLT), and pegaptanib sodium (Macugen, Eyetech), the first intravitreal anti-VEGF therapy to be approved, were only able to slow the rate of vision loss in a subset of wet AMD patients.
  - Ranibizumab (Lucentis, Genentech)
  - Bevacizumab (Avastin, Genentech)
  - Eyelea (Regeneron)
Chief Complaint:
- TM, 16yr old female, presents for low vision evaluation
- Previous patient at your clinic
- Would like to investigate options for driving

Diagnosis: oculo-cutaneous albinism
Last visit with OMD was 3 months ago, last visit at your office was 1 year ago.
Currently possesses a LED HHM, a 3x HH telescope, transitions SV distance, and SV reading glasses
Medical history: unremarkable
Family ocular and medical history: unremarkable

Goals:
- Tools to obtain drivers license.

Unaided Visual Acuity: (w/Feinbloom chart and Lighthouse near acuity card)
- OD: Distance: 10/60 Near: 0.2/1.25 M
- OS: Distance: 10/60 Near: 0.2/1.25 M
- OU: Distance: 10/60 Near: 0.2/1.25 M

Aided visual acuity:
- Rx: OD: +1.25-1.25x180, OS: +1.50-1.25x180
- OD: 10/50 0.15/1.0M
- OS: 10/50 0.15/1.0M
- OU: 10/50 0.15/1.0M

Visual acuity standards in California
- At the DMV office(screening standard):
  - 20/40 with both eyes tested together, and
  - 20/40 in one eye and at least 20/70 in the other eye.
- If you fail, a DMV DL-62 form must be filled out by an OD or OMD
  - Must have a minimum best corrected visual acuity in at least one eye better than 20/200
  - Bioptic can not be used to obtain acuity

Restrictions
- Wear corrective lenses
- Geographic Area
- Hours (No night driving)
- Specific Roads (No freeway)
- Special Vehicle & Equipment
- Driving to specific destinations
- No Restrictions
37 states have visual field requirements, but most of these states do not address hemianopsias. California does not have a visual field requirement.

Bi-optic driving:
- Permitted in 34 states

CASE 4: BI-OPTIC TRAINING

- Range of tasks progressing from simple to complex:
  - Locate objects while stationary
  - Locate moving objects while standing or sitting still
  - Locate moving objects while moving
  - Once training is complete, the patient should scan for traffic signals, signage, and building signage while in the passenger seat

CASE 4: GPS SYSTEM

- Chief Complaint:
  - 40 yr old female presents for low vision evaluation
  - Extreme photophobia

- History:
  - Achromatopsia (rod monochromatism)
  - Last eye exam: 1 year ago
  - Medical history: unremarkable
  - Family history: unremarkable
  - Has had previous low vision services elsewhere
    - HHM, HHT, portable CCTV, tinted glasses
CASE 5

- Unaided Visual Acuity: (w/ Feinbloom chart and Lighthouse near acuity card)
  - OD: Distance: 10/100  Near: 0.20/1.6M
  - OS: Distance: 10/100  Near: 0.20/1.6M
  - OU: Distance: 10/100  Near: 0.20/1.6M

- Aided visual acuity:
  - Rx: -1.00DS OU
  - OD: 10/63  0.20/1.25M
  - OS: 10/63  0.20/1.25M
  - OU: 10/63  0.20/1.25M

CASE 5

- Subjective refraction:
  - No change in refraction noted
  - Not interested in seeing LV devices, wants help with her photophobia

CONTACT LENSES

TINTS IN ACHROMATOPSIA

- Shorter wavelengths have higher energy than red light. Red light has only 1/15 the energy of the blue light.

THE VISIBLE SPECTRUM - Wavelength in Nanometers

400 450 500 550 600 650 700 Red (750)
Blue Cyan Green Yellow Orange (700)

AFTER
CASE 6

Chief Complaint:
- RF, 45yr old man, presents for low vision evaluation
- Referred by friend in local support group
- Missing visual field from the side, runs into things

CASE 6: HISTORY

- Diagnosed with retinitis pigmentosa 20 years ago
- Last visit with OMD was 5 years ago
- Medical history: unremarkable
- Family ocular and medical history: unremarkable

Goals:
- Wants to avoid running into things.
- Driving???

CASE 6

Unaided Visual Acuity: (w/Feinbloom chart and Lighthouse near acuity card)
- OD: Distance: 10/15 Near: 0.5/1.0M
- OS: Distance: 10/15 Near: 0.5/1.0M
- OU: Distance: 10/15 Near: 0.5/1.0M

Can only see a few words at a time on near card??

CASE 6

Subjective Refraction with trial frame:
- OD: -1.00x090 10/15
- OS: -1.00x080 10/15
- +1.50 ADD for near 0.4/.8M OU

What other tests would you consider?

CASE 6: VISUAL FIELD

CASE 6: CONTRAST

Reverse telescopes
- Hand held, mounted
- Advantages? Disadvantages? Is it for everyone?

CASE 7: VISUAL FIELD EXPANSION FOR RP

CASE 7: ORIENTATION AND MOBILITY

ARGUS 2

AUTONOMOUS/SELF DRIVING CAR

- Autonomous cars are also now legal in California, Florida and Michigan.
CASE 8: HIGH MYOPE
- Chief Complaint:
  - AB, 25yr old male, presents for low vision evaluation, just started working at an IT company
  - Referred by local OD
  - CC: can’t see the computer screen well enough at new job.

CASE 8 HISTORY:
- Diagnosed with pathological myopia at age 5
- Last visit with OD was 3 months ago
- Ocular history: retinal detachment OD 10 years ago, s/p pneumatic retinopexy and cryotherapy
- Medical history: unremarkable
- Family medical and ocular history: unremarkable

CASE 7
- Who is responsible if the car crashes?
  - Driver?
  - Vehicle manufacturer?

CASE 8
- Goals:
  - Wants to see computer screen better.
  - Get rid of thick glasses
  - Any additional resources
CASE 8

Unaided Visual Acuity: (w/Feinbloom chart and Lighthouse near acuity card)
  OD: Near: 0.02/0.8M
  OS: Near: 0.02/1.0M
  OU: Near: 0.02/0.8M

Aided visual acuity (rx 2 yrs. old)
  Rx: -18.00-1.00x180, -20.00-2.00x180.
  OD: 10/100
  OS: 10/120
  OU: 10/100

CASE 8: NEAR VISION

What would you recommend to the patient?

Goal acuity is 1.0M. Pt saw 0.2/3.0M.

(Near acuity/Goal Acuity) x Dioptric Value of Working Distance

(+3.0/1.0M) x +5.00 = +15

Kestenbaum's rule (reciprocal of vision)

What would it be in this case?

+10.00 would theoretically let him see 1.0M print size

What is the working distance in this case?

Are glasses for near an ideal option?

CASE 8: REFRACtion

Retinoscopy:
  OD: -20.00
  OS: -20.00

Subjective Refraction with trial frame:
  OD: -18.00-1.00x180, 10/100
  OS: -20.00-2.00x180, 10/120
  Near: 0.2/3.0M

CASE 8: DISTANCE OPTIONS

What distance options are available for this patient?

CASE 8: NEAR VISION

What would you recommend to the patient?

Goal acuity is 1.0M. Pt saw 0.2/3.0M.

(Near acuity/Goal Acuity) x Dioptric Value of Working Distance

(+3.0/1.0M) x +5.00 = +15

Kestenbaum's rule (reciprocal of vision)

What would it be in this case?

+10.00 would theoretically let him see 1.0M print size

What is the working distance in this case?

Are glasses for near an ideal option?

CASE 8: SPECTACLE MATERIALS

- High index
- Roll and polish edges
- Polycarbonate or Trivex
- Small frame size

Contact lenses:
  - Soft
  - RGP
  - Wear glasses over for protection

CASE 8: TECHNOLOGY
Chief Complaint:
HM, 75yr old man
Referred by local ophthalmologist
Accompanied by son and daughter
Mention how father keeps running into things
Patient states he can not read newspaper like he use to. Things are dimmer.
Does not notice things like he use to.

History:
Glaucoma OU
Taking 3 different medications
Trabeculectomy performed in both eyes 3 years ago in addition to SLT OU 5 years ago.
Cataract surgery OU
Systemic history includes DM, HTN, and asthma
Taking insulin, metformin, HCTZ, and albuterol

Unaided Visual Acuity: (w/Feinbloom chart and Lighthouse near acuity card)
OD: Distance: 10/20 Near: 0.40/1.6M
OS: Distance: 10/20 Near: 0.40/1.6M
OU: Distance: 10/20 Near: 0.40/1.6M

Aided visual acuity:
Rx: -0.75-0.50x180, -0.50-0.50x180, +2.50 ADD
OD:10/20+1 0.40/0.8M
OS:10/20+1 0.40/0.8M
OU:10/20+1 0.40/0.8M

What questions are important in this case?
What type of lighting do you have in the house?
Where do you live? Live alone?
Transportation?
Family support?
Have you tripped or fallen lately?
What low vision devices do you use currently, are they working well for you?

Goals:
Improve orientation and mobility
See newsprint better

Visual Field Testing
What would you recommend for this patient?
O&M
Can try various visual field rehab techniques

What additional testing do you think is needed at this time?
CASE 9: I STILL CAN’T READ

- Contrast!
- Always test contrast with low vision patients, regardless of diagnosis!
- Variety of tests that can be used:
  - Bailey Lovie
  - Pelli-Robson
  - MARS

CASE 10

- Unaided Visual Acuity: (w/Feinbloom chart and Lighthouse near acuity card)
  - OD: Distance: 5/400 Near: 0.1/8.0 M
  - OS: Distance: 2/700 Near: UTT
  - OU: Distance: 5/400 Near: 0.1/8.0 M
- Aided visual acuity:

CASE 9: TREATMENT FOR DECREASED CONTRAST SENSITIVITY

- Filters
- Lighting
- Magnification
- Electronic magnification
  - CCTV, Portable CCTV, Kindle, Ipad

CASE 10: OPTIONS

- Would you prescribe glasses?
- What technology would you show him?
- Do we need to refer him?
  - Where and what services should we recommend?
  - Any other tests we should order?

CASE 10

- 55yr old Male
- His retinitis pigmentosa
- Referred by OMD for new glasses??
- CC: I can’t see anything, only shapes and shadows; wants to be able to read again
- Medical history: unremarkable
- History of previous low vision care: stopped using HHM’s 10 years ago, they didn’t really help
  - 20 year old daughter was diagnosed with RP 5 years ago