Blindness 101

Kevin Houston, O.D., F.A.A.O.
Clinical Assistant Professor
Indiana University School of Optometry
kehousto@indiana.edu

Outline
- Ocular Anatomy (Healthy and diseased eyes)
- Typical Eye Exam
- Reading the "eye report"
- Low vision consultation
- Services at IU School of Optometry clinics

Ocular Anatomy
1. Cornea
2. Pupil
3. Iris
4. Sclera
5. Macula
6. Optic Nerve
7. Arcade
8. Equator

Additional Anatomical Features
- Extra-ocular muscles
- Conjunctiva
- Sclera
- Neural visual pathways
**Visual Pathway**

Cortical Representation of Visual Space

Blue = Left Brain

Purple = Right Brain

**Most Common Eye Diseases Causing VI**

- Cataract
- Glaucoma
- Macular Degeneration
- Diabetic Eye Disease
- Glaucoma
- Stroke
- Traumatic Brain Injury

**Cataract**

**General Eye Examination**

- History
- Visual Testing
  - Visual acuity
  - Motility
  - Pupil testing
  - Visual field
  - Refraction
- Other (Stereopsis, color, accommodative and binocularity testing)
- Eye Health evaluation

**Distance Visual Acuity**

20/20 equals testing distance over the lettersize

- 20 is the smallest lettersize a normal eye can see at 20 feet
- 20/200 would mean the person could only see the same letter if it was 10x larger or 10x closer

**Snellen Visual Acuity**

![Snellen Chart]

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Contrast Sensitivity

Recorded as Cycles/Degree (CPD)

Feinbloom Visual Acuity

10/160

Visual Acuity at Near

- Same idea as distance acuity
- Usually tested at 40 cm unless documented otherwise
- Normal is 20/20
- May be different than distance acuity!
  - Why? Poor accommodation, poor contrast sensitivity...

Lighthouse Near Chart

Visual fields

- Test of peripheral vision
  - Confrontation (Examiner testing)
  - Full to examiner’s field
  - Full to finger counting (FTFC)
  - Humphrey visual field
    - Automated test
    - Can be threshold or screening test
  - Amsler Grid
    - Central twenty degrees tested
Normal Visual Fields

- 90 degrees temporally and 70 degrees nasally
- Natural blindspot at 15 degrees temporal to fixation

Refraction

- Retinoscopy
- Subjective responses to changes in lenses
- Will correct for error in lens and corneal powers
- Will NOT bring everyone to 20/20

Other tests

- Stereopsis – Testing depth perception
- Cover test -- Testing how eye work together
- Color test – Testing color vision
- Accommodative testing – Testing ability to focus at near

General Eye Examination

- Eye health evaluation
  - Intraocular pressures
  - Anterior segment
  - Posterior segment
  - Dilated fundus exam best

Reading an Eye Report

OD/OS
OD=Right eye
OS=Left eye
OU=Both eyes
D=Distance N or N’=Near
General Rule: Right eye results listed first

Visual acuities

- Look for corrected and uncorrected
  - cc (with correction) or sc (without correction)
- BEST CORRECTED
  - LOOK for acuities after refraction
  - May be better!
- 10/40 means?
  - Tested at 10 ft
  - Need to convert as you would any fraction
  - E.g. 10/40 equivalent to 20/80
Reading an Eye Report: M-Notation (Metric)

- \(1 \, \text{M} = 1.45 \, \text{mm} = \) magazine print
- \(2 \, \text{M} = 1.95 \, \text{mm} = \) newspaper subheadlines

Reading an “Eye Report”

Glasses Prescription:
- OD: \(-1.00-1.50 \times 180\)
- OS: \(-2.50-1.00 \times 095\)
- ADD: +2.50

Spherical correction – for hyperopia or myopia
Cylinder correction – for astigmatism
Axis – orientation of cylinder
ADD – Bifocal power

Concave and Convex Lenses

Cylinder for Astigmatism

Low Vision Evaluation

- Different charts
- Devices evaluated
- Focus on function and goals
  - Meet threshold acuities if possible
- Threshold acuities
  - Newsprint 20/50
  - Large Print 20/100
- Glare control evaluated
Low Vision evaluation
goal for VR

- Give access to standard text if at all possible
- Devices prescribed based on occupational goals
  - Eg. A custodian does not need enlargement software for a computer

Low Vision Devices for kids

- Near Devices
  - Bifocal or reading glasses
  - Stand and pocket magnifier
  - Bar Reader and Lopes
  - CCTV
- Distance Devices
  - Monocular
  - Bioptic
IU School of Optometry Clinics
- Indianapolis
- Bloomington
- Carmel