Advanced Diagnostic Equipment and Why It's Used
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Course Outline
• For each test:
  • Purpose
  • Indications
  • Different models
  • Basic operating technique
  • Troubleshooting
  • Basic interpretation

Instrumentation
• OCT
• Tearlab
• Adenoplus
• Topography
• Pachymetry
• Aberrometry

Course Goals
• The technician should be able to:
  • Explain the purpose of the test to the patient
  • Run the test
  • Troubleshoot poor results and repeat as necessary
  • Understand basic interpretation

OCT (Optical Coherence Tomography)
• What is it?
  • "Like an MRI for the eye" (but much less expensive!)
  • Shows cross sectional detail of ocular structures
• When is it used?
  • Diagnose or monitor diseases
  • Macular degeneration, diabetic retinopathy, glaucoma
  • Less frequently: corneal thickness, anterior chamber angle, contact lens fit

OCT Manufacturers
• Most common models
  • Zeiss
  • Topcon
  • Optovue
  • Heidelberg
OCT Operating Technique

- Input patient data
- Position the patient comfortably (chinrest and table height)
- Select the appropriate test
- Instruct on fixation target
- Capture data
OCT Troubleshooting

- Out of alignment
- Solution: refocus and rescan

OCT Interpretation
OCT Interpretation

Tearlab

- A test for dry eye
- Measures osmolarity of the tears
  - Salt content
- Collects a tiny amount of tears and analyzes them instantly
  - "This tells us about the quality of the tears your eyes produce"
- When is it used?
  - During initial diagnosis and ongoing management of dry eye disease

OCT

- Questions about OCT?

Tearlab Technique

Tearlab Results
Tearlab Cards

Tearlab troubleshooting

• Handheld “pen” starts beeping after collection
  • Attach to base within 40 seconds
• Results are outside of anticipated range (285-400)
  • Use the check card to test calibration

Tearlab interpretation

• Above 308 suggests dry eye disease
• Used along with other tests and patient symptoms
• Should see improvement with treatment
• Record the higher of the two eyes

Adenoplus

Adenoplus

• What is it?
• A test for “pink eye”
  • Viral conjunctivitis
• When is it used?
  • To determine if a red eye is caused by a virus

Adenoplus Technique

1: Take a Sample
2: Assemble the Test
3: Run the Test
4: Read and Interpret
Corneal Topography

- A method of measuring the shape and curvature of the cornea
- Gives a topographical map of the cornea
- Why is it used?
  - Contact lens fitting
  - Surgical management (before and after)
  - Unexplained vision changes
- "This measures the shape of your cornea, the front part of your eye. That's where your contact lens sits."

Corneal Topography

- Different Models
  - Topcon
  - Zeiss
  - Tomey
  - Medmont
  - Orbscan
  - Pentacam

Corneal Topography

- Components
  - Joystick or controls
  - Usually bright rings

Corneal Topography

- Troubleshooting
  - Poor scans usually due to dry eye, blinks, or misalignment
  - Make sure bulls eye is centered on pupil
  - Want good, smooth tears
    - Best to do before other drops such as numbing or dilating drops
    - Ask patient to blink normally until you're ready to scan
    - May use artificial tears to smooth tear film. Wait a minute after putting them in before doing scan

- Hot colors = steep
- Normal: steeper centrally
  - Symmetry!
**Corneal pachymetry**

- Measures thickness of cornea
- Glaucoma, corneal swelling, contact lens wear, surgical comanagement
- OCT vs ultrasound

**Corneal pachymetry**

- Glaucoma
  - Thin corneas increase risk
- Corneal swelling
  - From contact lens overwear
- Surgical candidates
  - LASIK has minimal corneal thickness before surgery
- CENTRAL corneal thickness (CCT)

**Corneal pachymetry- OCT**

![Image of OCT scan]

**Corneal pachymetry- ultrasound**

![Image of ultrasound]

**Aberrometry**

- How well does the eye focus?
- Gives more information than simple nearsightedness/farsightedness/astigmatism
  - "Higher order aberrations"
- When to use?
  - Varies
  - All patients?
  - Difficult cases
  - Surgical comanagement
Aberrometry

Billing for Advanced Diagnostics

- Insurance
- Requires a diagnosis and doctor's order
- Out of pocket
- Some may be offered as a screening device (i.e. OCT)

Questions?

- Thank you!