Contact Lens Parameters and Ordering Principles

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Objectives

- Basic Anatomy 5 min
- Contact Uses 5 min
- Contact Characteristics 5 min
- Patient Education
- Pre-Fitting Considerations
  - Patient Hx
  - Medications
  - Patient motivation
  - Patient hygiene
- Patient Compliance
- Complications

Test Question

- On what does a contact lens rest?

Big Question!

- What anatomical structures are critical to a successful contact lens fit?

Tear Film Layers
Riding on tears

• Important to know that tear quality is a critical aspect for contact lens fitting success

Anatomy

Cornea

• Transparent Organ (no blood vessels/avascular)
• Primary function is refraction of light rays
• Refractive power approx + 45.00 D

Negative fitting factors

• Chronic blepharoconjunctivitis
• Bad acne or rosacea
• Larger Pterygium
• Seventh Nerve Palsy (Bell’s Palsy)
• Severe allergies
• Severe dry eyes
• Poor hygiene
• A Taiwanese student has gone blind after keeping contact lenses in her eyes for six months straight. NO NO NO NO NO.

• By not taking her lenses out or cleaning them at all, Lian Kao created the perfect condition between her eyeball and the lens for acanthamoeba to develop. The single cell bugs can apparently "burrow their way through the cornea," and that's exactly what happened to Kao—that shit literally ate up the surface of her eyeballs.
Contact Lens Uses

- Convenience
- Medical Uses
  - Keratoconus
  - Migraines
  - Traumatic injuries
- Cosmetics
- Sports

Contact Lens Characteristics

- Low water contacts are 38%
- High water content contacts are 55% and up
- Visitints are for pts with high Rx’s to see the lens

Characteristics Cont...

- Daily wear
- Extended wear
- Daily disposable
- RGP
- Keratoconus
- Bifocal
- Scleral lens

Contact Types

- Styles
- Materials
- Temple styles
- Children

Scleral Contact Lens

- Ideal scleral contact lens candidates include the following:
  - Irregular Corneas
  - Post Lasik Surgery Complications
  - Keratoconus
  - Pellucid Marginal Degeneration
  - Corneal Ectasia
  - Dry Eye
  - Keratoplasty Patients

Fitting a Scleral Contact
**Insertion and Removal of a Scleral Contact**

- Use a special device, called a DMV® Scleral Cup™ to support the lens for application. The application process with the DMV Scleral Cup starts by lightly squeezing the tapered handle so you create a mild suction. Carefully place the scleral lens on the top of the DMV, making sure it is centered. When the lens is centered on the DMV, stop squeezing the device.

http://www.gpspecialists.com/isight-scleral-contact-lens/

**Pre-fitting Evaluation**

- When a patient interested in wearing contact lenses enters the office, no evaluation can be made without a thorough pre-fitting assessment of the feasibility of this person as a possible contact lens wearer. A thorough case history is necessary, as well as several testing procedures to evaluate the patient's ocular health. Even if all of the refractive and ocular health testing result in a very suitable candidate, several questions remain to be answered: Is the patient very motivated for lens wear? Does this person appear to have good hygiene habits? What is the best contact lens for this patient? This section will examine the pre-fitting evaluation of a patient, step by step.

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**Case History**

- **Chief Complaint...helpful in determining wear-ability**
- **History of present illness**
- **Medical/ocular history (Dx)**
  - Disease reveal a lot about contact lens wear
- **Family History (FHx)**
- **Work History**
- **Social history (age-appropriate)**
  - Alcohol? Smoke? Occupation? Illicit drugs?

**SIGNS AND SYMPTOMS**

**SIGN** - an indication of a particular disorder that is observed by a clinician but is not necessarily apparent to the patient

**SYMPTOM** - an indication of a disease or disorder noticed by the patient

**Lid Considerations**

- The palpebral aperture, or the separation of the lid margins between blinks with normal relaxed distance gaze, can be measured with a millimeter rule or PD stick. The rule is placed vertically near the patient's eye, with fixation over the examiner's shoulder at a distant object.
  - The average fissure size is 9 to 10 mm.
  - The Visible Iris Diameter (VID) is the distance from the nasal limbus to the temporal limbus and constitutes the lateral diameter of the iris. With the patient fixating straight ahead, a millimeter rule is angled toward the iris. A normal reading is between 10.5 and 12.5 mm.
Other Lid Defects

Blink Rate

• Determining the rate of blinking can be accomplished quite easily by counting the number of blinks made by the patient in a minute. The procedure should be performed without the patient’s knowledge or the results could be affected. Patients should be aware that blink rate prior to fitting can be useful as a baseline value with which to compare values obtained after lens wear has begun. A blink rate of 10 to 15 times per minute is considered normal.

Corneal Sensitivity

• Sensitivity of the cornea may be quickly checked by gently holding the lids apart and touching a wisp of wet sterile cotton wool or swab on to the cornea from one side, so that its approach is not seen by the patient. *be careful with diabetic patients!

Tear Film Evaluation

• The tear film should remain uniform over the corneal surface for a minimum of 15 to 20 seconds following a normal blink. If it quickly breaks up and becomes discontinuous, the outer layer of the cornea will become drier and susceptible to injury. A short break-up time (BUT) indicates a problem with the mucoid layer of the tear film.

• Tear film quality is best observed by applying fluorescein above or below the cornea and immediately observing the cornea with the slit lamp using the cobalt blue light and the largest possible circular aperture to illuminate the entire cornea.

• 15-10 is minimal and anything below 10 seconds is too low

Corneal Evaluation

• A thorough corneal evaluation is needed to determine whether a patient is a viable contact lens candidate. After the standard illumination examination, the corneas should be stained with fluorescein. Fluorescein sodium is used in fluorescein-impregnated strips and stains dry or irritated areas of the cornea, which show up as bright areas of green with the cobalt blue filter of the slit lamp is used, since the damaged cells will absorb the fluorescein.
Lid Evaluation

Both the upper and the lower lids should be evaluated as to their appearance. Previous contact lens wearers may have raised areas on the under side of the lids called papillae; these are commonly caused by irritation from the lens edge, reactions to lens surface coating, or an allergic reaction to the solution regimen. Papillae can also be present prior to lens war. Therefore, the upper lid should be everted and evaluated. A satin (S) appearance of the lid conjunctiva is present when it is devoid of papillae and has a smooth surface. Uniform cobblestone appearance (UCA) indicates several papillae are present per millimeter of conjunctiva. Usually they are congregated near the tarsal fold and become larger at the nasal and lateral junctions.

General Health History

- Rule out specific health problems
- Current health status
  - Diabetes
  - High blood pressure
  - Heart disease
  - Other...allergies and meds

Why is a patient’s general health history important?

Medications Matter

- Name
- Amount taken
- Frequency
- Prescribed for
- Prescribed by
- Illegal drugs too!

Why is illegal drug use important?

Dispensing Contacts

- Fitting...if you get the chance, have pt practice technique
- Check VA’s before and after dispensing
- Care and Handling
  - Do’s and Don’ts of contact lens wear
    - Hand washing
    - Soaps
    - Towels
    - Activities
    - Make-up
    - Medications
    - Fumes and vapors...high school kid
  - Patient appearance
  - Patient motivation
  - Work Conditions
  - Cleaning System...do not keep solutions opened for more than 90 days
  - Contact lens case...clean daily, let air dry
  - Follow-up Care...emphasis on the value of scheduled follow-ups
  - Pre-appointment Instructions

Do’s and Don’ts

- Rub your eyes
- Swim in your contacts
- Shower
- Hairdryer
- Makeup
- Cleaning solution 3 mo
- Eye irritation
- Fancy soaps
- Use water to clean
- Forget to clean CL case
- Inspect CL upon insertion
- Expiration dates
- Routine
- Lint-free cloth
- Make follow up appts
The New Experience

- Your eyes may feel funny
- You are more aware of one lens
- Your vision may seem different than with glasses
- You may have better vision in one eye
- You may have trouble handling your lens at first
- It may take longer at first

Contact Lenses

Pre-fit evaluation
- Palpebral fissure size...prevents glares issues
- Visual Iris Diameter measures limbus to limbus
- Break up time- BUT- Tear Quality...15-20 secs
- Schirmer Tear test- Tear Quantity...
- Keratometry, Topography, Refraction

Fitting Theory

- Always consider the lacrimal tear layer, aka the lacrimal tear lens when fitting gas permeable lenses.

What is a good tear BUT?
What is the minimal tear BUT?

Contact Lens Parameters

2PCW + 2SCW + OZ = OAD

Ordering Parameters

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<th>Eye</th>
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<th>BC</th>
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Contact Lens Bible
TRAUMATIC IRIDECTOMY

What is the minimal information needed to order contacts?

TORIC

What is a prism ballast used for?

COLOR

SPORT TINT

• Amber—tracking fast moving balls (baseball, soccer, tennis, football)
• Grey-green—decrease sun glare (golf, running)

Customizable Contacts
The Future of Contacts

Diabetic Contacts

Safety First!

- Wash your hands!
- Procure all supplies
- Procedure must be safe
- Explain procedure
- Explain do's and don'ts
- Practical exams automatic failure for contact lens station

Care and Handling Techniques

- Lens Care Systems
  - Clean
  - Rinse
  - Disinfect & Store
  - Protein Removal

Why is it important to keep up with current trends?
Insertion and Removal

• Wash hands
  – Correct soap
  – Correct towels

• Inspect lens
  – Check for debris
  – Check for tears

• Insert lens
  – If inside out feels funny

• Verify vision
  – Not blurred

Top 3 Problems w CL Cases

• Researchers determined that three specific hygiene habits were associated with higher levels of contamination in the contact lens cases:
  • Not washing hands with soap and water before handling contact lenses
  • Not air-drying the lens case
  • Using mismatched lens cases and disinfecting solutions

The study found that patients who washed their hands with tap water only and those who didn’t wash their hands at all both had higher contamination levels than those who used soap and water. It also found the contamination levels were higher in the cases that were wet when received for testing. And finally, contamination was more likely when patients used cases and solutions from different manufacturers.

2010 Article

• CDC study suggests most contact lens solutions may not kill Acanthamoeba.

• In the Los Angeles Times (7/22) Booster Shots blog, Shara Yurkiewicz wrote, “Most contact lens solutions do not kill the type of amoeba that causes severe eye infections.” Acanthamoeba, "according to researchers at the Centers for Disease Control and Prevention." Investigators there examined “three species of amoeba that frequently cause the infection. They added solutions containing dormant, inactive forms (cysts) from each of these species to 11 different brands of contact lens solutions.” Next, “the cysts were soaked in lens solution for between four to six hours (depending on the manufacturer’s soaking time instructions) or 24 hours.” The researchers then “watched for two weeks to see which cyst solutions resulted in the growth of active, disease-causing amoebae.” Notably, “out of 11 solutions tested, the only two that disinfected against the bugs after four to six hours were the two that contained hydrogen peroxide.”

FUSARIUM

• History
• Visual Acuity
• Over-refraction
• Slit Lamp examination
• Follow-up care

Progressive Evaluations
Special Lens Designs

• Bifocal
• Toric
  – Front
  – Back
  – Bitoric
• X-Chrome- color vision
• Rose K- keratoconus
• Diabetic Lens (not yet approved)
• Orthokeratology
  – CRT- Corneal Refractive Therapy

Contact Lens Complications

• GPC- Giant Papillary Conjunctivitis
  – Contact Lens Induced Papillary Conjunctivitis
• Keratitis-inflammation of the cornea
• Abrasion- rubbing off of the superficial layer
• Acanthamoeba
• Pseudomonas

Which part of the conjunctiva is infected?

Success =

1. Great Patient Education
2. Optimum vision
3. Optimum comfort
4. Patient Compliance
5. Healthy eyes
6. Happy customers

Questions

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References

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• http://optometrytimes.modernmedicine.com/optometrytimes/news/relieve-migraines-tinted-contact-lenses