

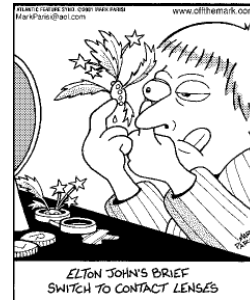


Contact Lens Basics

Lynn Lawrence, CPOT, ABOC, COA, OSC



A New Brand of Contacts



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



Fast Facts

- More than 30 million people in the U.S. wear contact lenses ^{1, 2}.
- Two-thirds of contact lens wearers are female ².
- The average age of contact lens wearers worldwide is 31 years old ³.
- Ten percent of contact lens wearers are under 18 years old, 15% are between ages 18-24, 50% are between ages 25-44, and 25% are age 45 or older ⁴.

<http://www.cdc.gov/contactlenses/fast-facts.html>

Benefits of Contact Lens Use

- People can use many different methods to improve their vision, and no single method is the best solution for everyone. Contact lenses are one of several effective options.
- Contact lenses can help people see better without affecting their appearance or interfering w many sports and activities.
- Some children and teens report feeling dramatically better about their appearance when wearing contact lenses ^{7, 8}.
- Compared to wearing glasses, children switching to contact lenses reported significant improvements in the areas of perceived appearance, participation in activities, and satisfaction with vision correction ⁸.
- Specially designed contact lenses can improve the ability to focus and temporarily reduce poor distance vision (near-sightedness) in certain contact lens wearers ^{4, 9}.

<http://www.cdc.gov/contactlenses/fast-facts.html>

Complications and Risks

- Serious eye infections that can lead to blindness affect up to 1 out of every 500 contact lens users per year ¹⁰.
- Not following proper contact lens care instructions has been linked to outbreaks of serious eye infections ¹¹.
- Between 40%-90% of contact lens wearers do not properly follow the care instructions for their contact lenses ¹².
- Improper cleaning and irregular replacement of contact lenses and contact lens cases—as well as other behaviors relating to contact lens hygiene and care—have been linked to a higher risk of complications ¹²⁻¹⁴.
- Keratitis—a painful eye infection often linked to improper contact lens use—leads to 1 million doctor and hospital visits annually, at a cost of \$175 million to the US healthcare system ¹⁵.

<http://www.cdc.gov/contactlenses/fast-facts.html>

Test Question

- On what does a contact lens rest?

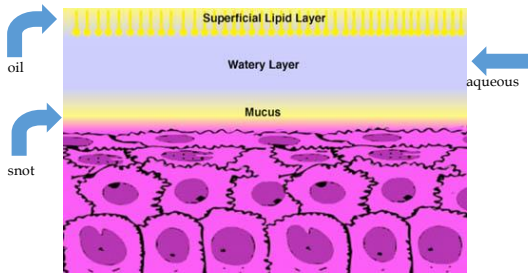


Big Question!

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

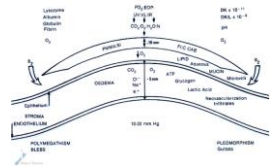


Tear Film Layers

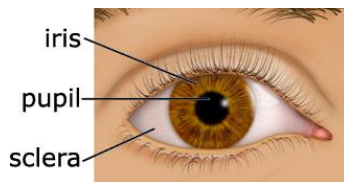


Riding on tears

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



Anatomy



Review all structures of the eye to determine contact wear feasibility

Cornea



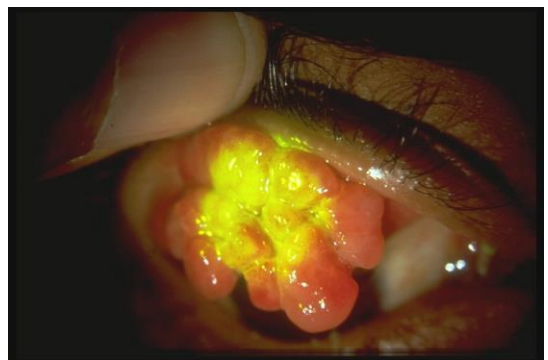
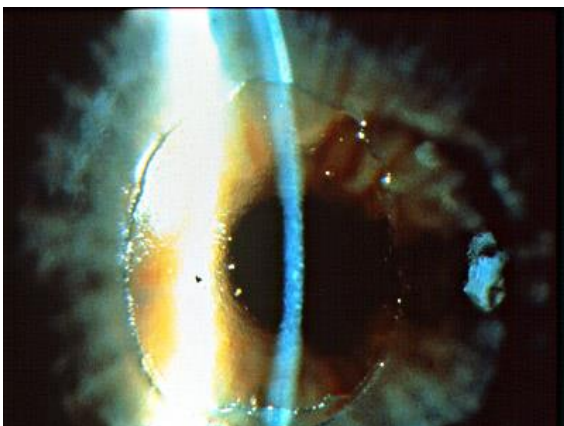
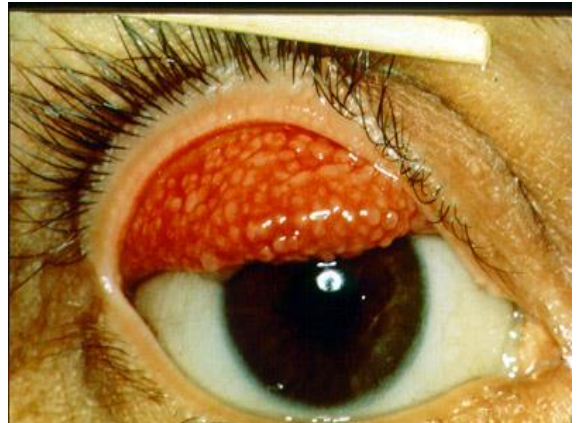
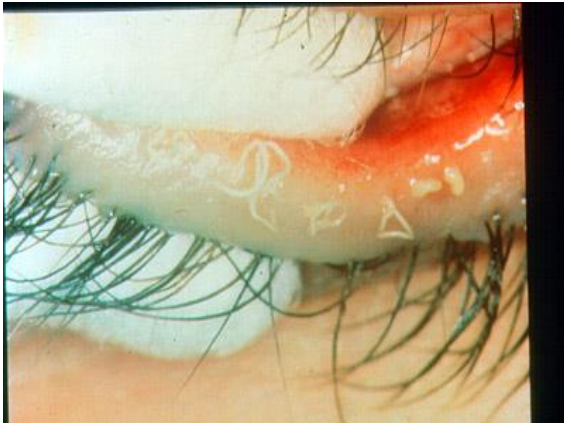
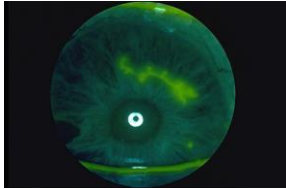
What is it called when blood vessels grow onto the cornea?

What happens when a patient gets a scar in the visual pathway?

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

Negative fitting factors

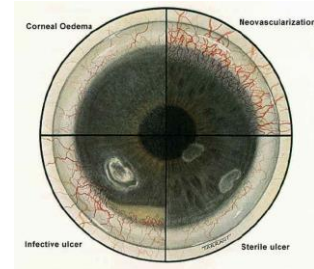
- Chronic blepharoconjunctivitis
- Bad acne or rosacea
- Larger Pterygium
- Seventh Nerve Palsy (Bell's Palsy)
- Severe allergies
- Severe dry eyes
- Poor hygiene



Article

- 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.

PANNUS/ NEOVASCULARIZATION



Contact Lens Uses

- Convenience
- Medical Uses
- Cosmetics
- Sports



Contacts Characteristics



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

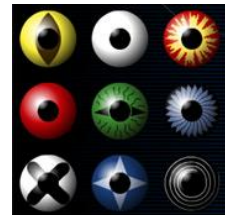
Characteristics Cont...

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



Contact Types

- Styles
- Materials
- Temple styles
- Children



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 hygienic habits? What is the best contact lens for this patient? This section will examine the pre-fitting evaluation of a patient, step by step.



Case History

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

Case History

- Tested during the CPOT practical exam
- Components
 - Medical and ocular history
 - Patient
 - Family
 - Occupation and avocation
- Confidentiality

HIPAA...how long are records maintained?

Lid Considerations

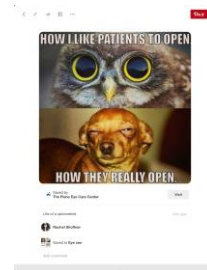
- The palpebral aperture, or the separation of the lid margins between blinks with normal relaxed distance gaze, can be measured with a millimeter rule or PD stick. The rule is placed vertically near the patient's eye, with fixation over the examiner's shoulder at a distant object.
- .
- The average 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.

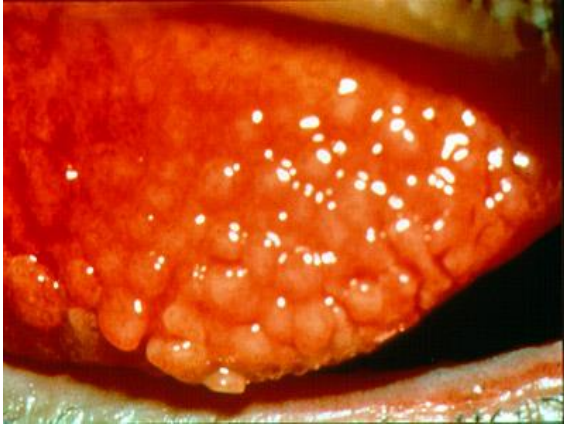


SIGNS AND SYMPTOMS

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





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



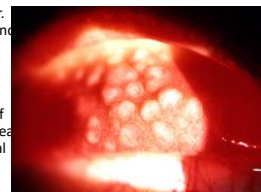
Corneal Evaluation

- A thorough corneal evaluation is needed to determine whether a patient is a viable contact lens candidate. After the standard illumination examination, the cornea 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



Lids 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 wear. 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.

Lid Evaluation



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

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- measure limbus to limbus**
- **Break up time- BUT- Tear Quality...15-20 secs**
- **Schirmer Tear test- Tear Quantity...**
- **Keratometry, Topography, Refraction**

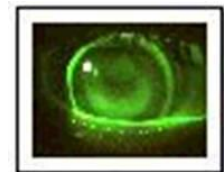


Fitting Theory

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

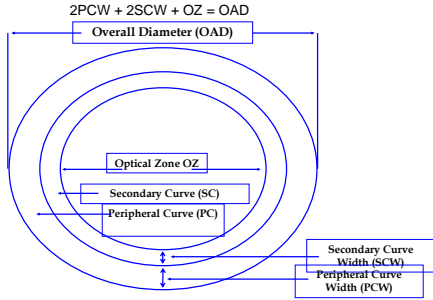


What is a good tear BUT?



What is the minimal tear BUT?

Contact Lens Parameters



Ordering Parameters

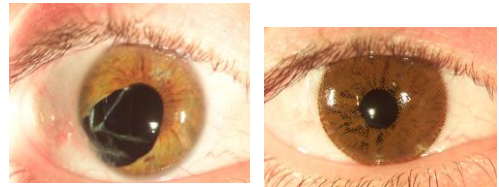
Eye	RX	BC	Dia	Brand	Remarks
OD	-2.75 - 1.00 x 030	8.7	14.4	AV Toric	
OS	-3.00 - 2.00 x 070	8.9	14.0	Ciba Toric	



Contact Lens Bible



TRAUMATIC IRIDECTOMY



What is the minimal information needed to order contacts?

TORIC

UV Protection

ACUVUE
lenticon A2
CONTACT LENSES

Power: BC 8.9 PWR -1.00 CYL 1.00 Axis of Cylinder 180
Diameter: DIA 14.5 MONTHLY TORIC

Base Curve: BC 8.7 DIA 14.0
Power: -2.50 2003/05
Expiration Date

Focus
TORIC VISI-TECH
MONTHLY LENSES

What is a prism ballast used for?

COLOR



SPORT TINT

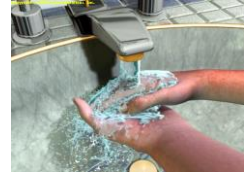


- Amber—tracking fast moving balls (baseball, soccer, tennis, football)
- Grey-green—decrease sun glare (golf, running)



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

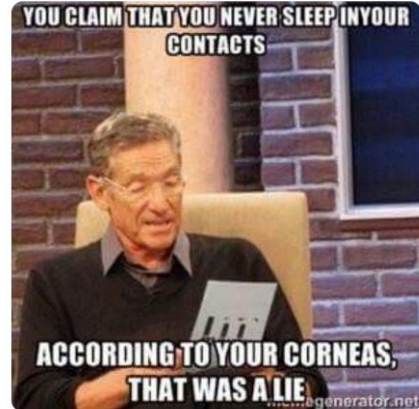


Care and Handling Techniques

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



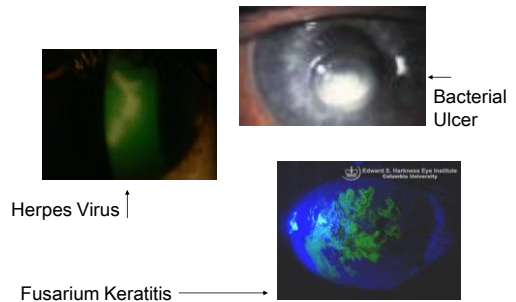
Why is it important to keep up with current trends?



2010 Article

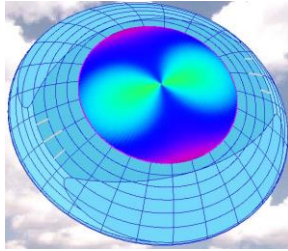
- CDC study suggests most contact lens solutions may not kill acanthamoeba.
- In the [Los Angeles Times](#) (7/22) Booster Shots blog, Shara Yurkiewicz wrote, "Most contact lens solutions do not kill the type of amoeba that causes severe eye infections," *Acanthamoeba*, "according to researchers at the Centers for Disease Control and Prevention." Investigators there examined "three species of amoebae 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



Insertion and Removal Techniques

- **Soft**
 - Patient comfort
 - Adaptability ease
 - Fits under both lids
- **RGP**
 - Adaptability difficulties
 - Small size
 - Use gravity
 - Best optics



Progressive Evaluations

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

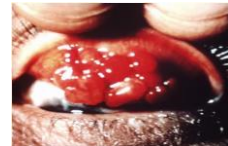


Special Lens Designs

- **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**



GPC

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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