Bringing Contact Lenses into Focus

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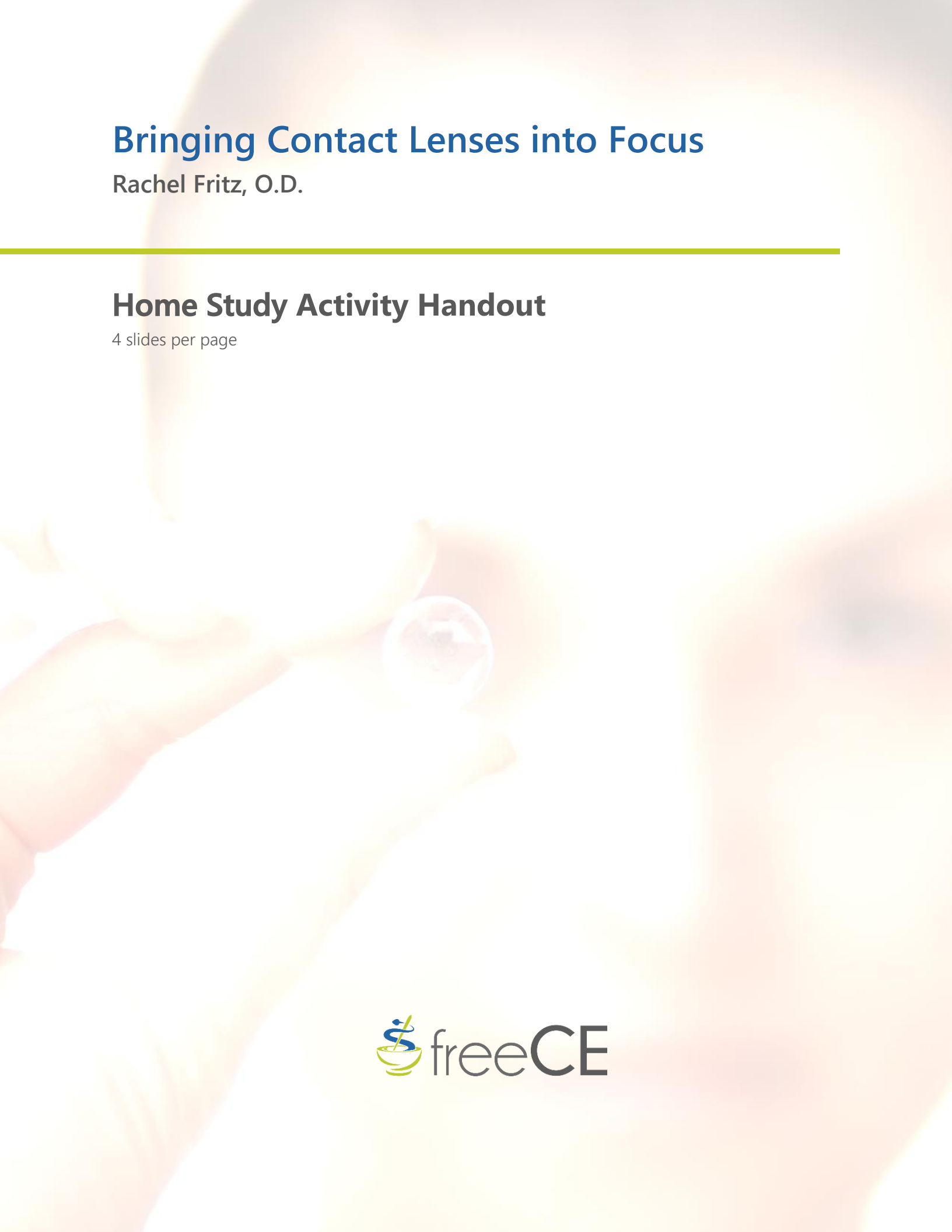
Home Study Activity Handout

4 slides per page



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Bringing Contact Lenses into Focus

ACTIVITY DESCRIPTION

Many patients are overwhelmed by the numerous over-the-counter options available for contact lens care. This presentation will review basics of contact lens solutions for both soft and hard lenses. It is important to be knowledgeable about the products available in order to accurately counsel patients. We will explain some common complications associated with poor lens hygiene. We will also go over topical ophthalmic medications to treat these complications. Facts on patient compliance will be reviewed.

TARGET AUDIENCE

The target audience for this activity is **pharmacists, pharmacy technicians,** and **nurses** in hospital, community, and retail pharmacy settings.

LEARNING OBJECTIVES

After completing this activity, the **pharmacist** will be able to:

- Review the different categories of contact lenses available.
- Examine contact lens solutions and OTC products available for lens care.
- Identify pertinent patient counseling points.
- Describe complications associated with contacts along with their treatment.

After completing this activity, the **pharmacy technician** will be able to:

- Recognize the different categories of contact lenses available.
- Examine contact lens solutions and OTC products available for lens care.
- Identify common complications associated with contacts along with their treatment.

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ACTIVITY TYPE

Knowledge-Based Home Study Webcast

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ABOUT THE AUTHOR

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Dr. Fritz's optometric interests include the management of ocular disease (diabetic retinopathy, macular degeneration, etc.), glaucoma, pediatrics, and contact lenses. She enjoys humanitarian work, and has traveled to El Salvador, in order to provide eye care to the impoverished in remote villages. She is a member of the Gold Key Optometric Honor Society, the Beta Sigma Kappa Optometric Honor Society, the American Optometric Association, and the Pennsylvania Optometric Association. Dr. Fritz resides in Lewisburg, PA with her husband

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Faculty: Rachel Fritz OD

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Objectives

- Review the different categories of contact lenses available.
- Examine contact lens solutions and OTC products available for lens care.
- Identify pertinent patient counseling points.
- Describe complications associated with contacts along with their treatment.

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Contact Lens Indications

- An estimated 45 million Americans wear contact lenses[7]
  - Global market of contact lenses expected to reach $12.47 billion US dollars by 2020, a 6.7% growth[2]
- Contacts are a medical device
  - Regulated by FDA
- Correct refractive error
  - Far-sighted (hyperopia), near-sighted (myopia), astigmatism, presbyopia
  - Orthokeratology

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Contact Lens Indications

- Medically necessity
  - Irregular corneas- keratoconus, post corneal transplant
- Cosmetic
  - Colored contacts
- Therapeutic
  - Bandage contacts (for corneal abrasion etc)

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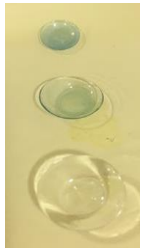
Contact Lens Modalities

- Soft contact lenses (CL)
  - Disposable
  - Planned replacement
  - 90% of CL wearers use soft lenses[7]
- Rigid gas permeable lenses (RGP)
  - Hard lenses
- Scleral lenses
- Hybrid lenses



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Soft Lenses

- Daily wear
  - Spherical
  - Toric - corrects astigmatism
  - Multi-focal - for presbyopic patients
  - Planned replacement
    - Monthly, bi-weekly, daily

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Soft Lenses

- Monthly Replacement
  - Easy replacement schedule
  - Cost effective
  - Brands
    - Alcon - Air Optix
    - Coopervision - Biofinity, Proclear
    - Bausch & Lomb - Ultra, Pure Vision
    - Johnson & Johnson - Acuvue Vita

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Soft Lenses

- Bi-weekly Replacement
  - Poor compliance
  - Brands
    - Coppervision - Avaria
    - Johnson & Johnson - Acuvue Oasys, Acuvue 2

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Soft Lenses

- Daily Replacement
  - Convenient - no solution/cleaning/storage
  - Great for part time wearers
  - Low incidence of eye infection / complications
    - For those with past hx of infections/ulcers
  - Comfort - fresh lens every day
    - Great for dry eye patients, those who failed contacts in past
  - Rebates available to offset higher cost
  - Brands
    - Alcon - Dailles aqua comfort plus, Total 1
    - Coopervision - Clariti, Proclear 1-day
    - Baush & Lomb - Biotrue, Soflens
    - Johnson & Johnson- Moist, TruEye, Oasys 1-days

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Soft Lenses

- Extended Wear
  - Approved to be slept in for continuous wear
  - High risk of infections/complications
  - Monthly replacement
    - Air Optix N&D - up to 30 nights
    - Biofinity - 6 days, 7 nights

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Counseling Points

- Follow replacement schedule!
- Non compliance in replacement schedule leads to increased risk of complications
  - Percentage of patients that are non-concomplicant with replacement in US(4)
    - Daily replacement 12%
    - Bi weekly replacement 52%
    - Monthly replacement 28%
- Do not sleep in contacts unless approved for extended wear

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Counseling Points

- Be careful when ordering from online vendor
  - Some companies may try to change pt brand/power due to what they have in stock
- Soft lenses dry and cannot regain shape when left out of solution
- Do not use costume contacts (ie for Halloween)
  - Illegal to sell colored contacts w/o a RX, not FDA-approved
  - High incidence of complications
  - No such thing as a 1 lenses fits all contact

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RGP - Hard Lenses

- Made of firm plastic - Primarily flurosilicone acrylate
- Retain shape resulting in crisper vision for some patients
  - Keratoconus patients
  - Corneal surface irregularities
- Good oxygen transmission

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RGP

- Very uncomfortable - difficult for new wearers
  - Edge of lens moves against cornea and lid with each blink
  - Most patients fine after adaptation period
- Low chance of infections/complications
  - Don't contain water like soft lenses
  - More resistant to deposits and therefore less likely to harbor bacteria
- One lens can last six months to years

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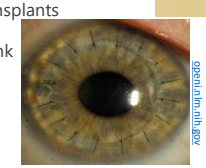
Scleral Contacts

- Large diameter RGP lens
- Vaults entire cornea - rests on white of eye (sclera)
  - Improved comfort over RGP
  - Safer for compromised corneas
    - No friction on cornea form lens movement
    - Keratoconus, s/p corneal transplants
  - More stable vision than RPG
    - Lens does not move with blink
- Becoming more popular



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Hybrid Contacts

- RGP lens in center encircled by soft lens outside skirt
- Clear vision as with RGP but improved comfort
- Not as large as sclerals, easier handling
- Issues with ripping of lens at material junction

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Counseling Points

- Always have a pair of glasses
  - In case contacts have to be discontinued for some amount of time due to a complication, ran out of supply, etc
- Eye irritation
  - Remove contacts and rinse
  - If irritation continues do not re-insert contacts
  - See eye care provider for irritation redness that continues
  - After infection/complication discard old lenses
- See eye care provider yearly for complete contact lens evaluation

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Counseling Points

- Always wash hands with soap and water before touching lenses
- Only use contact lens solution when handling
  - NO tap water
- Always rub lenses -even if solutions states "no rub"
- No swimming in contacts -especially hot tubs
  - No showering in contacts

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Counseling Points

- Proper lens case hygiene
  - Eye infections common from cases becoming contaminated
  - Dump out solution in AM and leave case open in safe place to air dry
  - Fill case with fresh solution each night before storing lenses
    - NEVER "top off" solution
  - Clean case bi-weekly - hot water, soap, rinse, dry
  - Replace cases at least every 3 months
    - With new solution bottle use new case

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Lens Care

- Multipurpose solutions (MPS)
- Hydrogen peroxide systems
- RGP disinfecting systems
- Saline

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Multipurpose Solution

- Used for soft contact lens care
  - Disinfects - kills wide range of bacteria and fungus
  - Cleans - removes lens deposits (proteins and lipid)
  - Storage
  - Hydrate/surface wetting - lens soaks up solution
- For RGP lenses
  - Rinse cleaning agent from lens

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Multipurpose Solution

- Common components
  - Buffers
  - Salts
  - Preservatives/disinfectants
  - Cleaning agent
  - Chelating agent
  - Lubricating agent

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Multipurpose Solution

- Can be put directly into eye
- Many different brands
- Try to stay away from generics
  - Formulas have older preservatives
  - Leads to sensitivity problems
  - Manufacturer can change formula frequently
  - Less reliable cleaning agents

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Multipurpose Solution

- To disinfect and store SOFT lenses
  - Wash hands with soap and water then dry
  - Remove contacts
  - Rinse lens
  - Gently rub each lens in palm with index finger for 20 seconds with a few drops of MPS
  - Rinse lens again
  - Fill case up with solution and submerge lens completely
- Always rub lens - need mechanical rubbing to adequately clean debris and deposits from lenses

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Multipurpose Solution

- Opti-Free Pure Moist
  - Newest technology from Alcon
  - "Hydraglyde Moisture Matrix"
    - Wetting agent
    - Hydrophobic head of molecule embeds itself on and within the lens surface
    - Dual disinfectant system
  - Older generations
    - Opti-Free Replenish
    - Opti-Free Express

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Multipurpose Solution

- Bio True
  - Product of Bausch and Lomb
  - "Bio-inspired innovations"
    - Matches the same pH as healthy tears (7.5)
    - Hydrates contacts using hyaluronan (a glycosaminoglycan found in the tears and corneal epithelium)
    - Keeps tear proteins active (lysozyme and lactoferrin) while getting rid of denatured proteins
      - Aids in anti-microbial activity

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Soft Lens Care

- Renu - Advanced Formula
  - From Baush & Lomb
  - Triple disinfectant - kills 99.9 % of germs
  - Older generations
    - Two different formulas
    - "Fresh" and "Sensitive"
    - Formulated to work with natural tear
    - Some sensitivity issues

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Soft Lens Care

- RevitaLens
  - Recently acquired by Johnson & Johnson
  - Disinfection similar to peroxide solutions
  - Very effective against pathogens
    - Superior disinfection against *acanthamoeba* and *fusarium* to other MPS
  - Significantly less lens case contamination
  - Reduced corneal staining
  - Conditions the contact

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Soft Lens Care

- Complete®
  - Recently acquired by Johnson & Johnson®
  - Older generation formula
  - "Easy Rub Formula" - 4 beneficial electrolytes

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Hydrogen Peroxide Solutions

- **Use to disinfect all lens types**
  - **Rub with RGP lense**
- **Most effective cleaning**
  - **More effective than any MPS**

- **DO NOT put solution with red cap directly into eyes**
  - **Warn other CL wearers in same home**
  - **Solution needs to be completely neutralized**
    - **Chemical burn - Severe pain, eye redness, blur**

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Hydrogen Peroxide Solutions

- Clear Care®
  - Newest formula - Clear Care Plus with Hydraglyde®
  - Microfiltered 3% hydrogen peroxide
  - 6 hour soak time to neutralize H_2O_2
    - Catalytic disc built into bottom of cap neutralized H_2O_2
    - Remaining solution after neutralization is gentle saline
  - Great for sensitive eyes
  - Made by Alcon®

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Hard Lens Care

- RGP lens care systems
  - Multiple solutions needed
  - Separate solutions for cleaning, storage, and conditioning
  - Different instructions for various manufacturers
  - More thorough cleaning
- RGP multi-action solutions
  - Only one solution - cleans, disinfects, storage, and conditions
  - Same instructions as soft lens multipurpose solution

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RGP Lens Care Systems

- To clean lens, put a few drops of cleaning solution onto lens in palm of hand and rub with index finger for 20 secs
- Cleaners must be thoroughly rinsed from each lens with saline or multipurpose solution
  - They can not go directly into eye until rinsed
    - Remember RED cap
  - Do not use water to rinse

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RGP Lens Care Systems

- Boston Advance®
  - Two part system
  - Daily cleaner
    - Contains silica gel as an abrasive
    - Must be rinsed thoroughly from lenses
  - Conditioning solution
    - Improved formula
    - For storage and cushioning with insertion
  - Made by Bausch & Lomb®

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RGP Lens Care Systems

- Optimum®
  - Three part system
  - Extra strength cleaner
    - Can be used daily or occasionally
    - Preservative-free
  - Cleaning/disinfecting/storage solution (CDS)
    - For rub-and-rinse and for overnight storage but must be rinsed thoroughly with saline or MPS before inserting lenses
  - Wetting/rewetting solution
    - Can be used before insertion or while wearing lenses
  - Made by Lobob Laboratories®

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RGP Multi-Action Solutions

- Mild solutions
  - Can go directly into eye
  - Low concentration of cleaning agent
  - Secondary daily cleaner might be necessary
- Boston Simplus®
  - Multi-Action Solution
  - Dual disinfection

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Saline

- Only used for rinsing lenses
  - After cleaning or before insertion
- Sterile isotonic buffered solution
- No disinfectants
- Also used to rinsing eyes, foreign material/chemical
- Brands
  - Generic Formulas
  - Sensitive Eyes®
  - Unisol 4® - preservative free

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Counseling Points

- Hydrogen peroxide solutions can not be placed directly into eye
  - Must keep in case for entire 6 hour neutralizing period
  - Be sure case is upright
    - Solution must be in contact with disc in bottom of case
- Use fresh solution with each use
  - No topping off
- Discard cases about every 3 months
- Generic solutions have harsher preservatives and cleaning agents not as effective

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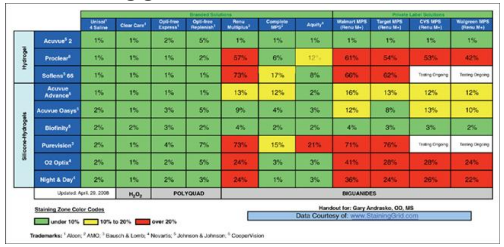
Counseling Points

- Biocompatibility of various contact lenses and multipurpose solutions can be an issue
  - Andrasko staining grid



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Counseling Points

- Soft contacts act like a sponge and can absorb chemicals and preservatives in solutions/eye drops
- Do not put any ophthalmic medicine in eye while wearing contact lenses
  - Contact lens will absorb medicine and keep eye exposed to chemicals for prolonged periods
  - Prolonged exposure to medicine can be toxic to cornea
    - Preservative free drops
- Eye drops should be used at least ten minutes prior to inserting contacts

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Counseling Points

- Re wetting drops
  - Can use artificial tears made for contacts
    - Blink, Refresh, Systane, Thera Tears for contacts
    - Opti-free rewetting drops, Renu rewetting drops
    - Preservative free drops
  - Stay away from more viscous drops - will blur vision
- No Visine or get the red out products
  - Vasoconstrictors

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Complications

- In a study, 27% of patients admitted that they don't clean their lenses daily[10]
- Between 40%-90% of contact lens wearers do not properly follow the care instructions for their contact lenses[8]
- Common reasons: laziness, expense, forgetful, **uneducated**

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Complications

- ⅓ of CL wearers in a national survey reported going to a doctor for a red and painful eye related to contact lens wear[5]
- 99% of those surveyed reported a past of at least 1 risky CL behavior[5]
  - Not following replacement schedule 82.3%
  - Topping off solution 55.1%
  - Sleeping in CL 50.2%

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Counseling Points

- Serious eye infections that can lead to blindness affect 1 out of every 500 contact lens users per year[8]
  - The lowest rate of infections overall occurs with RGP lenses
  - Daily disposable soft lenses have the lowest risk of severe infections.
- Keratitis from improper CL use leads to 1 million doctor and hospital visits annually[8]
  - Costs $175 million to US healthcare system[8]

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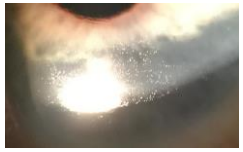
Minor Complications

- Deposits on the lens surface
  - Protein and lipid deposits
  - Cause corneal and conjunctival irritation
  - Due to old lens or poor hygiene, other patients are just more prone
  - Symptoms
    - Eye feels dry and gritty but better once lens is removed
    - Blur
  - Treatment
    - Try Clear Care® solution
    - Refit into daily disposable



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Minor Complications

- Corneal neovascularization
  - Blood vessels grow into avascular cornea
    - Due to chronic hypoxia and edema from tight fitting lens, overwear, or low oxygen contact material.
    - No symptoms typically
    - Can lead to CL intolerance
    - Vessels will continue to extend into line of sight if not treated
    - Incidence 1-20% of CL wearers[2]
  - Treatment
    - Re-fit into contact with higher oxygen transmission (but not extended wear) or a looser fit
    - Educate patient on risks of over wearing lenses

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Minor Complications

- Solution Hypersensitivity
  - Usually due to the preservative
  - Could go months without symptoms
  - Symptoms - redness, mild discomfort, stinging after insertion
  - Treatment
    - Discontinue lens wear temporarily
    - Lubrication or even a mild steroid drop, such as FML® (flurometholone), if inflammatory cells in cornea - QID with fast taper
    - Try a different solution such as Clear Care® or refit into daily contacts

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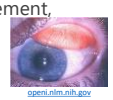
Minor Complications

- Giant Papillary Conjunctivitis (GPC)
  - Large bumps (papillae) on the inside surface of the upper lid
  - Part of IgE mediated response - from deposits or debris on lenses and mechanical rubbing of upper lid
  - Symptoms - itch with lens removal, can feel excessive lens movement, contact intolerance, mucous discharge
  - Treatment
    - Temporarily discontinue contacts, switch to Clear Care® or daily disposables
    - Mild - A mast cell-antihistamine combo like Pataday® BID (olopatadine hydrochloride)
    - Severe - A mild steroid drop like Lotemax® (loteprednol etabonate) QID with fast taper



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Contact Lens Acute Red Eye (CLARE)

- Corneal inflammation and edema
- Mostly occurs upon awakening after wearing contacts overnight
- Symptoms -severe injection (redness), moderate pain, photophobia, tearing
- Treatment
  - Discontinue contacts then refit in silicone hydrogel (approved for extended wear) or dailies
  - Rx mild steroid or antibiotic/steroid combo like Tobradex® (tobramycin and dexamethasone) QID x 1 week (no taper)

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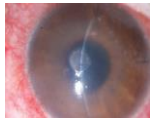
Microbial Keratitis

- Most devastating complication - Vision loss
- Most commonly cultured - *Pseudomonas aeruginosa, Staphylococcus aureus, Staphylococcus epidermidis*
  - Bacteria bind to deposits on surface of dirty lenses
- Loss of corneal tissue due to invading pathogenic bacteria
- Symptoms -Severe injection, severe pain, tearing, photophobia, mucous discharge, blur



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Microbial Keratitis

- Treatment
  - Discontinue contacts indefinitely
  - Aggressive use of drops (every 30 mins/1 hour at first) fluoroquinolone drops, such as Vigamox® (Moxifloxacin), sometime around the clock
  - May add a fortified antibiotic such as tobramycin, cefazonlin, and/or vancomycin
  - If severe, drops with systemic antibiotic and hospitalization
  - Very close follow up - if severe need corneal specialist
  - May need cultured if no improvement

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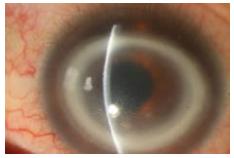
Microbial Keratitis

- *Acanthomeba* infection
  - Rare but potentially blinding
  - Perforate cornea needing corneal transplant
  - Cause
    - Found in pools, hot tubs, and tap water
      - Do not swim or shower with contacts in
    - Never use water to clean or store lenses
    - Using ineffective lens care solutions
    - Failure to follow lens care instructions



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Fungal Keratitis

- Sight threatening complication
  - Candida, Fusarium, and Aspergillus
- Symptoms - red painful eye, feathery edges to inflammation
- Treatment -Topical antifungal, oral antifungal, patient needs managed by a corneal specialist
  - May need hospitalized
- Corneal transplant may be needed if severe
- Outbreak in 2006 has been associated with the solution, ReNu MoistureLoc® - product was recalled[2]

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Complications

- Risk of ulcerative keratitis in soft hydrogel lenses
  - 10 - 15 x greater in extended wear vs daily wear users[6]
  - 12 x greater in individuals misusing daily wear lenses for overnight wear[6]
  - Proportionally greater with increased consecutive days of wear of extended wear lens before removal
  - Greater risk in smokers, poor case hygiene, purchase lenses over the Internet, and newer wearers
- Decrease your risk with more frequent lens removal, discarding lens with recommended replacement schedule, lens cleaning, and frequent case cleaning.

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Patient Counseling

- Any discomfort with contacts
  - Remove lens and try rinsing thoroughly with MPS or saline
  - If eye continues to feel irritated remove lenses and make appointment with an eye care provider
- Eye pain is an urgent problem in CL wearers
  - Call for an appointment immediately

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Patient counseling

- Contacts are a medical device
  - Patients should comply with recommended wearing schedule and cleaning systems
- Yearly contact lens exam
- Patient education is extremely important

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Questions?

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Exam Questions:

1. Which contact lens solution is NOT appropriate to use to disinfect soft contacts lenses?
    a. Clear Care
    b. Unisol Saline
    c. BioTrue
    d. Opti-free Pure Moist

2. How frequently should contact lens cases be discarded and replaced?
    a. 1 month
    b. 3 months
    c. 6 months
    d. 1 year

3. Which solution is MOST appropriate for soft lens wearers with a history of sensitivity to their multipurpose solution?
    a. Clear Care
    b. BioTrue
    c. RevitaLens
    d. Opti-free Pure Moist

4. Which contact lens modality is MOST appropriate for patients who experience dryness with their contact lenses?
    a. Extended wear
    b. Monthly replacement
    c. Biweekly replacement
    d. Daily replacement

5. Which planned replacement soft contact lenses modality is MOST likely to be associated with serious complications?
    a. Extended wear
    b. Monthly replacement
    c. Biweekly replacement
    d. Daily replacement

6. Which ocular complication associated with contact lenses is MOST likely to lead to vision loss?

a. Giant papillary conjunctivitis
b. Neovascularization of cornea
c. Microbial keratitis
d. Contact lens associated acute red eye

7. Serious complications associated with contact lenses are typically due what?

a. Contact lens intolerance
b. Patient not following replacement/cleaning instruction
c. Ordering contact lenses online
d. Solution sensitivity

8. Which contact lens solution required 6 hours of neutralizing and therefore CANNOT be placed directly into the eye?

a. Clear Care
b. BioTrue
c. RevitaLens
d. Opti-free Pure Moist

9. Which soft contact lenses modality is LEAST likely to lead to a complication when used appropriately?

a. Extended wear
b. Monthly replacement
c. Biweekly replacement
d. Daily replacement

10. Which statement is NOT true regarding drops and the use of soft contact lenses?

a. Rewetting drops can be used with soft lenses
b. Topical ophthalmic medications can be used PRN with any contacts
c. Topical ophthalmic medications should be used before/after contact wear
d. Gel/viscous drops will blur vision significantly and therefore should not be used with soft contact lenses