



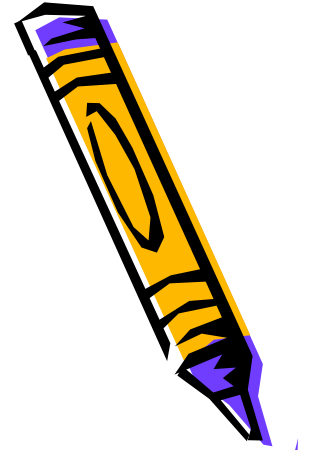
CL Care & Maintenance

-Prakash Paudel,
BOptom, FIACLE
BPKLCOS



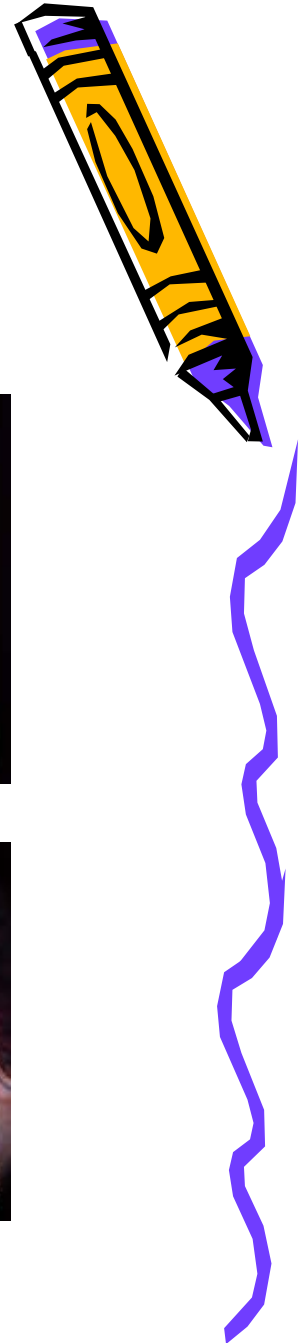
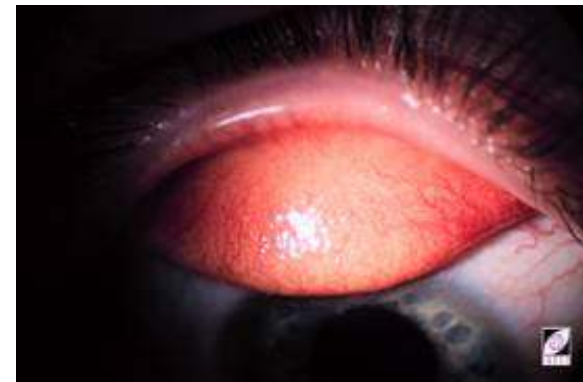
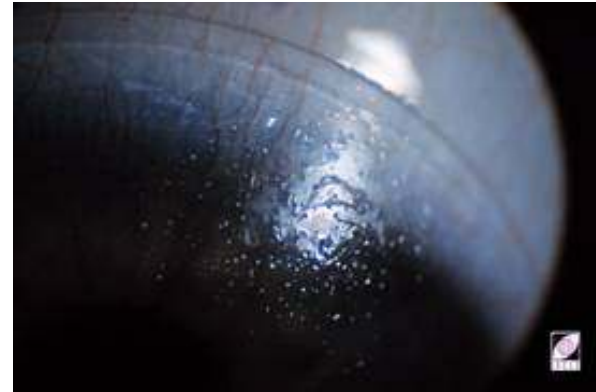
Care & Maintenance

- Purpose
- Function of different solutions
- Procedures for cleaning and disinfecting
- Lens storage
- Lens cases



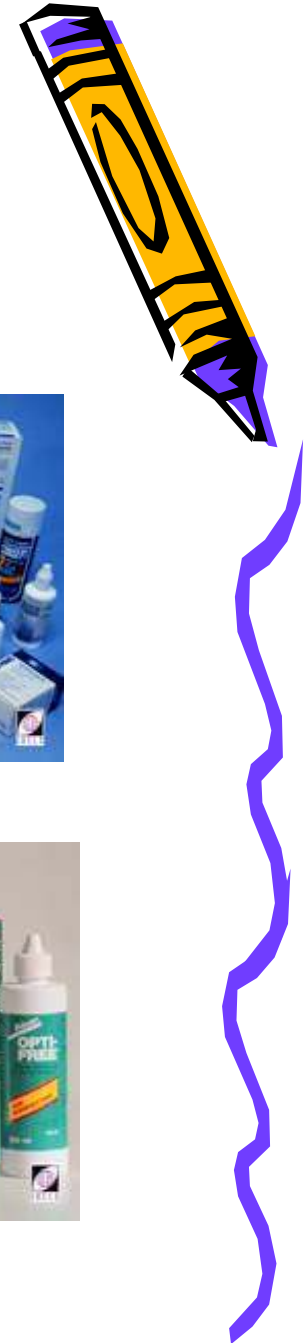
Purpose

- Clean lens
- Good vision
- Good comfort
- Safe lens wear



Components

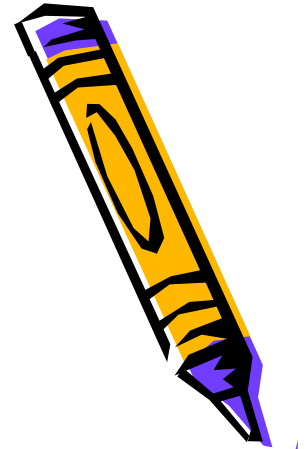
- Daily cleaner
- Rinsing solution
- Disinfecting solution/unit
- Weekly/protein cleaner
- Lubricating/rewetting solution
- Lens storage case



Daily Cleaner Function

To remove:

- Loosely bound foreign matter
 - cell debris
 - mucus, lipid, protein
 - cosmetic or other surface contamination
- Majority of micro-organisms

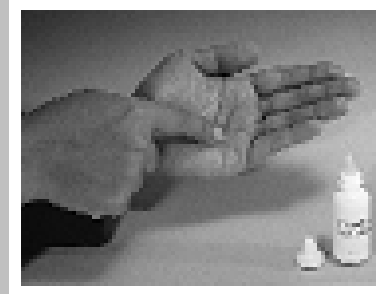


Procedures

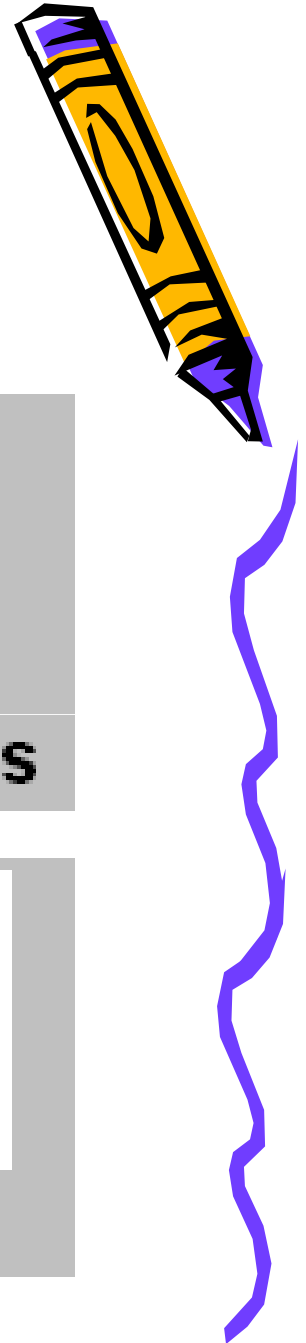
- Wash hands
- Place lens in the palm of the hand
- Place 2-3 drops of cleaner on each lens surface
- Rub with forefinger - 15 seconds per side
- Use a 'to & fro' and 'L-R' action.
- Roll the forefinger in both directions to cleans lens periphery
- Rinse well



Wash hands

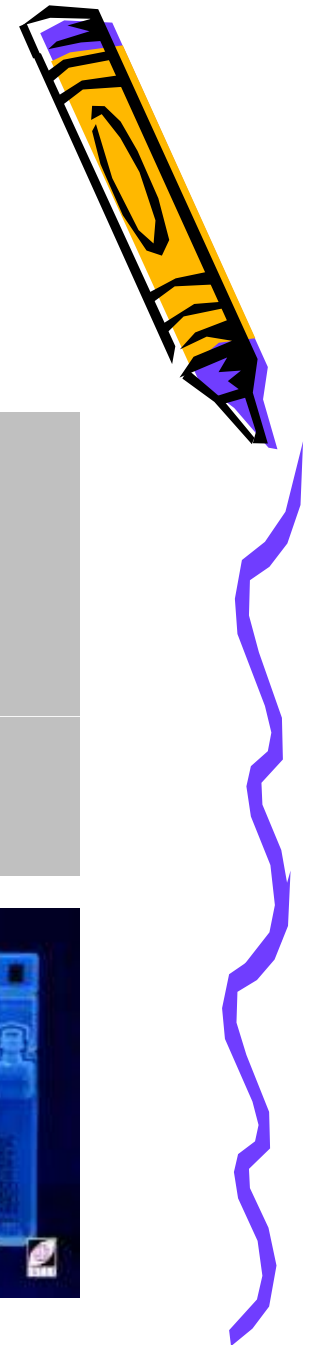


Clean



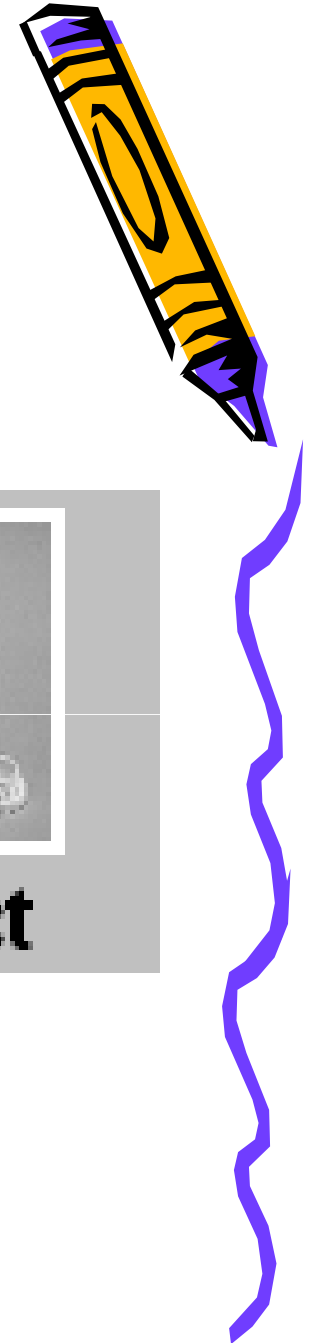
Rinsing Functions

- To remove:
 - Daily cleaner
 - Loosened deposits
 - Micro-organisms
- Rinse lenses
 - after overnight storage
- Rinse with
 - Saline (preserved- 3wks /unpreserved- unit dose)
 - Multipurpose solution



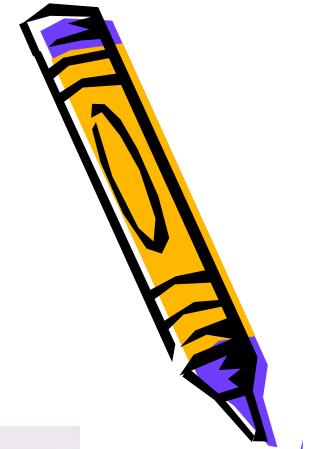
Disinfecting function

- Kill or deactivate potentially pathogenic organisms including:
 - bacteria
 - fungi
 - viruses
 - amoebas
- Maintain lens hydration or deactivate potentially



Disinfection types

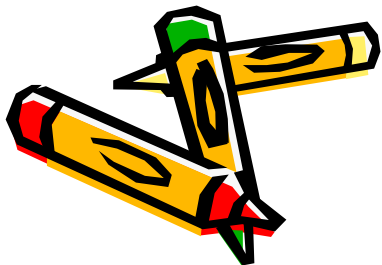
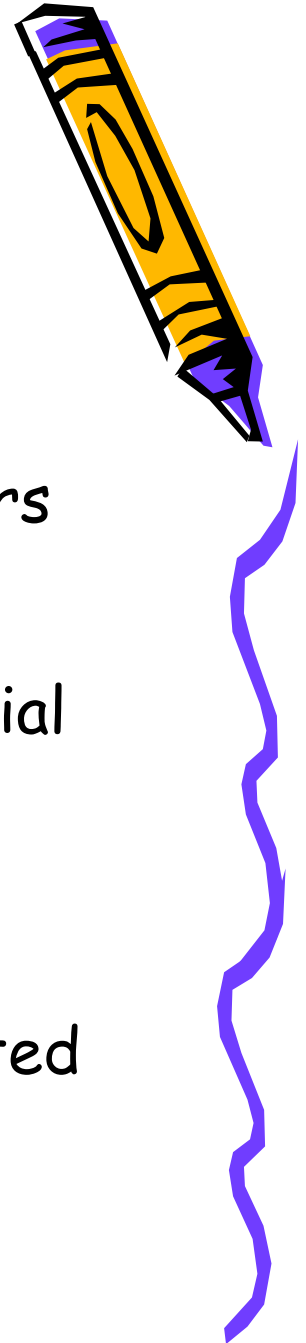
- Heat
 - thermal unit, microwave
 - 70 to 80 deg centigrade for 10-12 mins
- Chemical
 - Oxidative
 - hydrogen peroxide
 - chlorine
 - Cold chemicals
 - various disinfectants



** Avoid high heat and strong preservatives/disinfectants (thimerosal, chlorhexidine)

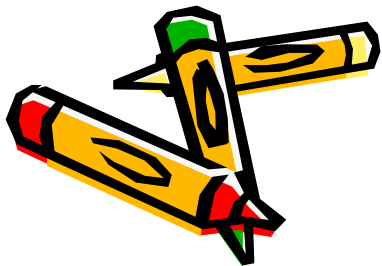
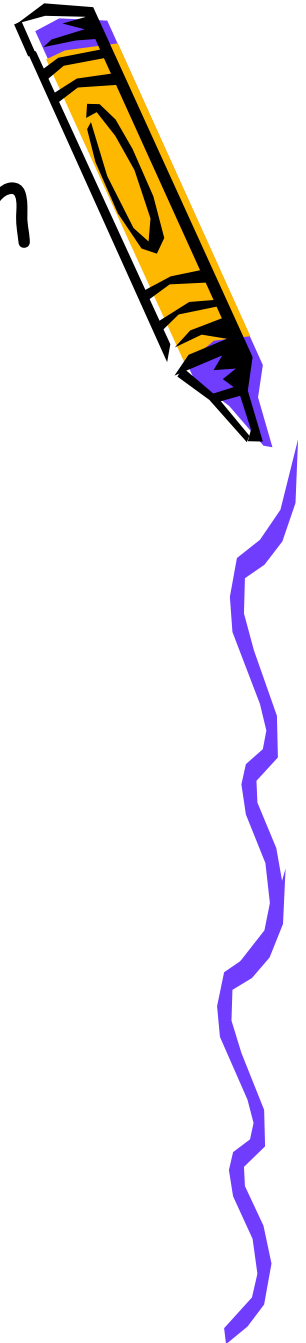
Level of efficacy

- **Sterilization:**
 - Killing of all microbial life forms - sterilizers
- **Disinfection:**
 - Killing and/or removal of vegetative microbial and viral contamination from inanimate objects/disinfectants
- **Preservation:**
 - Killing and/or inhibition of growth of selected micro-organisms - preservatives.



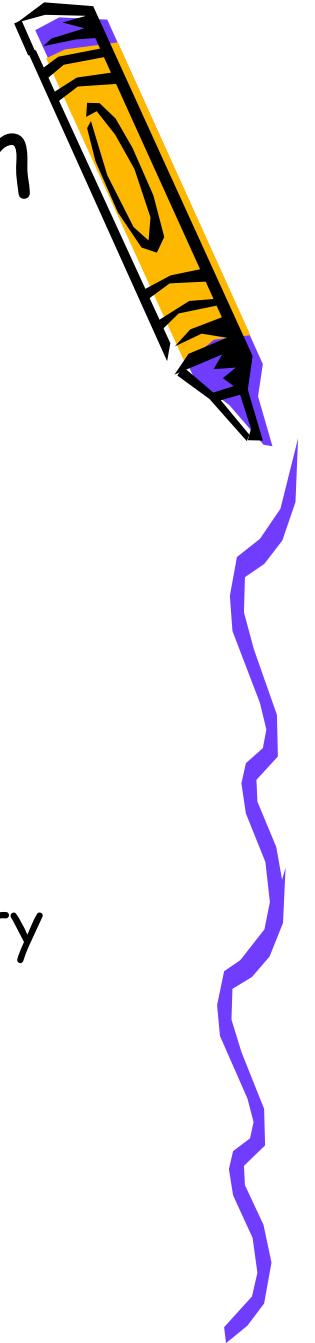
Disinfectant Based solution

- **Thimerosal:**
 - Effective as antifungal agent
 - Reduced effect when combined with EDTA
 - Cytotoxic to corneal epithelium
- **Chlorhexidine gluconate (CHG):**
 - Antibacterial agent
 - Adsorbed until saturation
 - Leaches from Group I and IV lenses



Disinfectant Based solution

- **Benzalkonium chloride (BAK):**
 - Antibacterial agent
 - Cytotoxic
 - Adsorption can reach toxic Concentrations
- **Sorbic acid:**
 - Antibacterial with limited antifungal activity
 - Not cytotoxic
 - Causes discolouration of old lenses



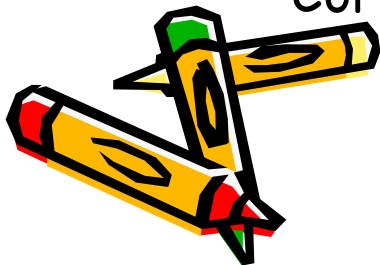
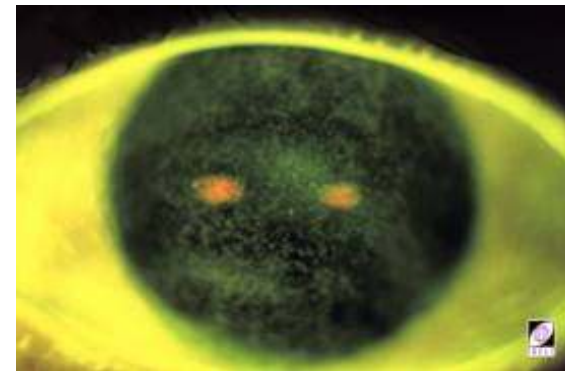
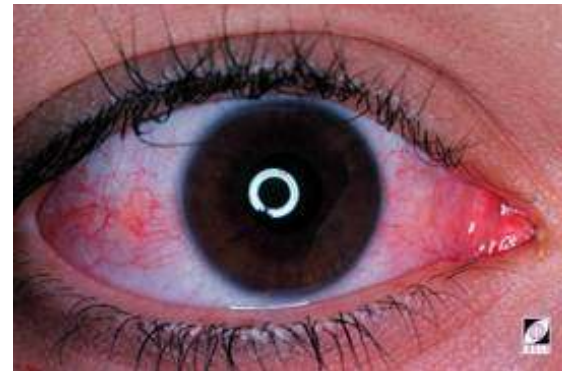
Disinfectant Sensitivity

- Symptoms

- Sudden increase in dissatisfaction
- Decreased wearing time (3-4 hrs)
- Burning, grittiness, dryness

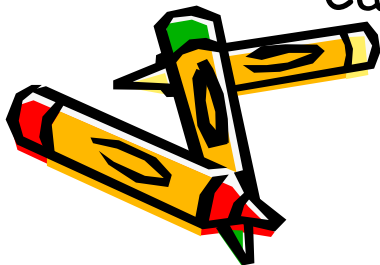
- Signs

- Conjunctival redness (general/local)
- Epithelial damage (diffuse corneal staining)
- Corneal inflammation (if severe)



Hydrogen peroxide-based disinfection

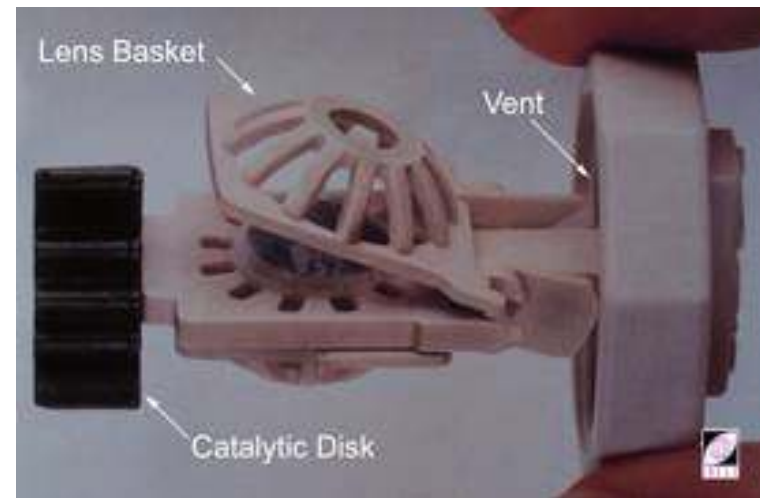
- Preservative-free or preserved
- **One-step:**
 - Catalytic disc
 - Delayed-release neutralizing tablet
- **Two-step:**
 - Dilution
 - Chemical (stoichiometric)
 - Catalytic disc
 - Catalase



Hydrogen peroxide-based disinfection



- Minimum 3 hours in 3% H_2O_2 recommended:
 - Bacteria 10-15 mins
 - Fungi 60 mins
 - Acanthamoeba 3-6 hours
- Suitable for all lens types
- Neutralizers:
 - Sodium Pyruvate
 - Sodium Sulphite
 - Sodium Thiosulphate



Protein Remover

- Help to remove/loosen tightly bound protein deposits
- Enzymes - papain, subtilisin, pronase and pancreatin.
- Protein treatment - *weekly* (increased frequency - ionic high water)
- Lenses should be cleaned and rinsed again after enzyme



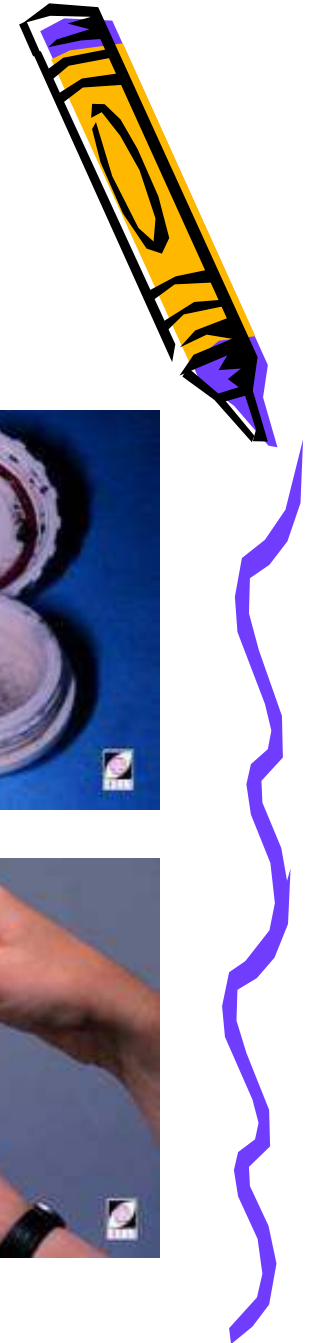
Rewetting drop

- Functions
 - To alleviate discomfort (insufficient lubrication)
 - To rehydrate the contact lens
 - To flush debris from lens and eye
- Formulated with viscosity-enhancing agents
 - commonly polyvinyl alcohol, methylcellulose, etc.



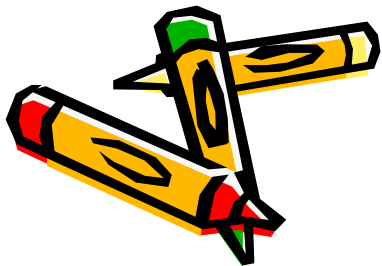
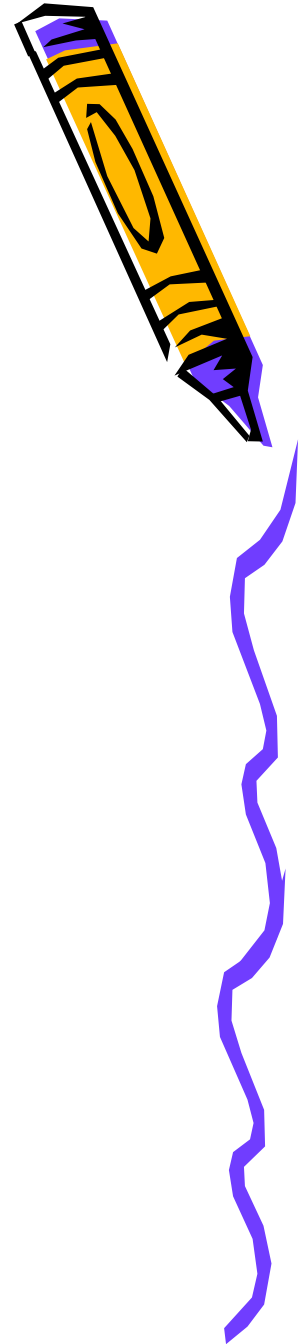
Lens storage & cases

- Contact lenses stored in:
 - A clean contact lens storage case
 - Fresh disinfecting solution
- Care of lens cases
 - Discard used solution
 - Scrub with a toothbrush and detergent weekly
 - Rinse with hot water
 - Air dry

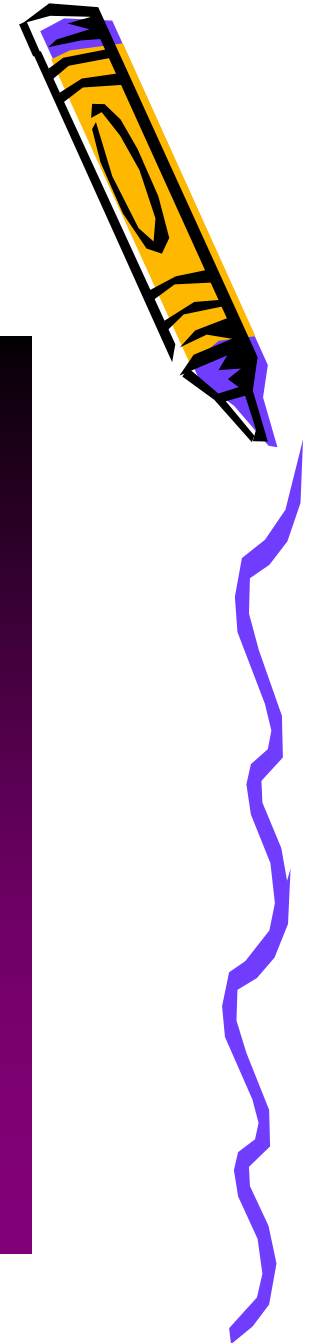


Selection of care system

- Wearing schedule
- Lens material
- Lens replacement schedule
- Convenience
- Ocular sensitivity



Selection of care system

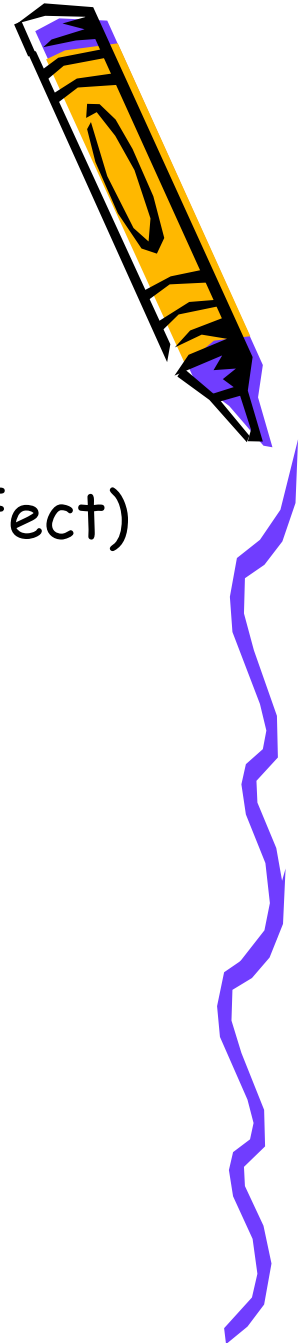


	HEAT	H ₂ O ₂	PEROXIDE	MULTI-PURPOSE
SCL				
Low, Non-ionic	✓	✓	✓	✓
Low, Ionic	X	✓	X	✓
High, Non-ionic	some	✓	✓	✓
High ionic	X	✓	X	✓
PMMA	X	✓ uncommon	✓	✓
RGP	X	✓ uncommon	special formulations	✓



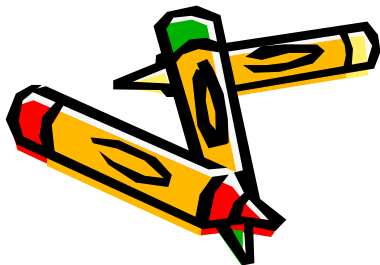
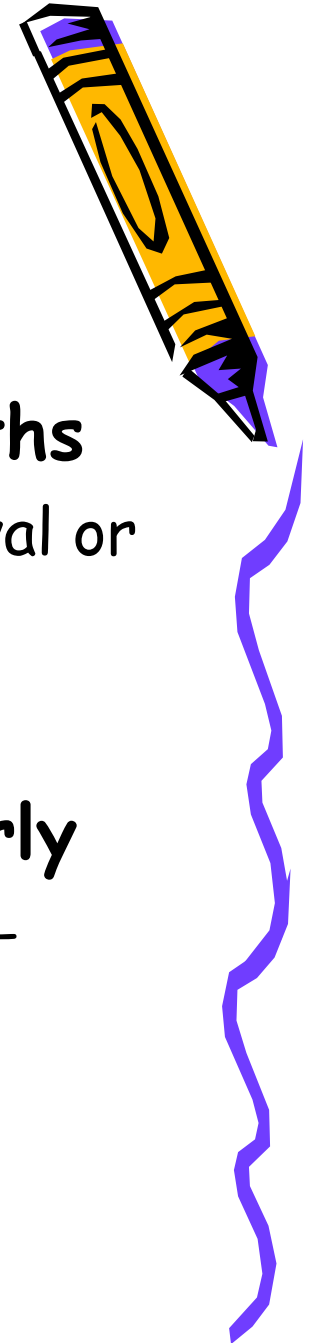
Care of Disposable lens

- Conventional method
 - Multi-purpose solution (clean, rinse & disinfect)
 - Re-wetting solution or sterile saline
 - No weekly/enzyme cleaner
- Other options:
 - Single-purpose surfactant cleaner.
 - One-step hydrogen peroxide disinfection.
 - Lubricating/re-wetting solution or sterile saline.

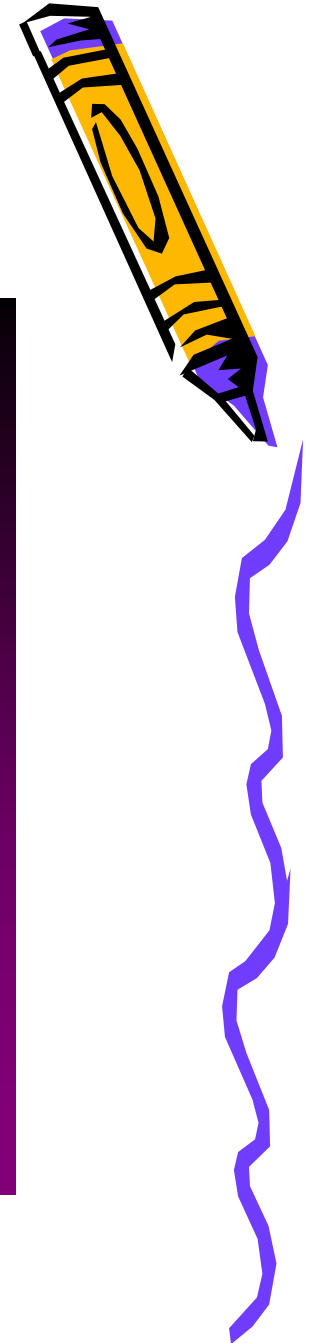


Care of Disposable lens

- **For lenses replaced every 1 - 6 months**
 - Clean, Rinse, Disinfect, Omit protein removal or apply less frequently, Re-wetting drops if required
- **For lenses replaced >6 months - yearly**
 - Clean, Rinse, Disinfect, Remove protein, Re-wetting drops if required



Care of Disposable lens



SUMMARY

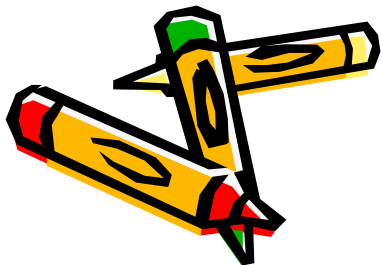
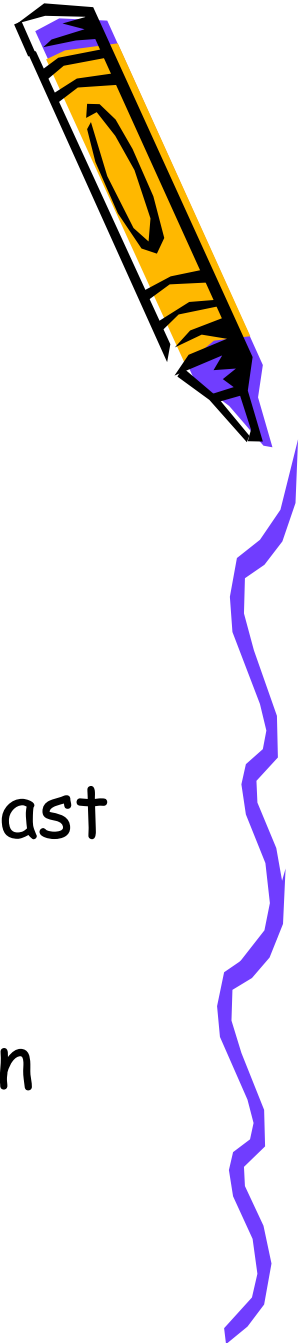
	Conv > 6mth	F Repl 1m, ≤ 3m	Disp ≤1m
• Surfactant cleaner	✓	maybe	X
• All purpose	X	✓	✓
• Peroxide			
One-Step	✓	✓	✓
Two-Step	✓	X	X
• Enzyme	✓	maybe	X
• Clean lens cases weekly	✓	✓	✓

96409-43S.PPT



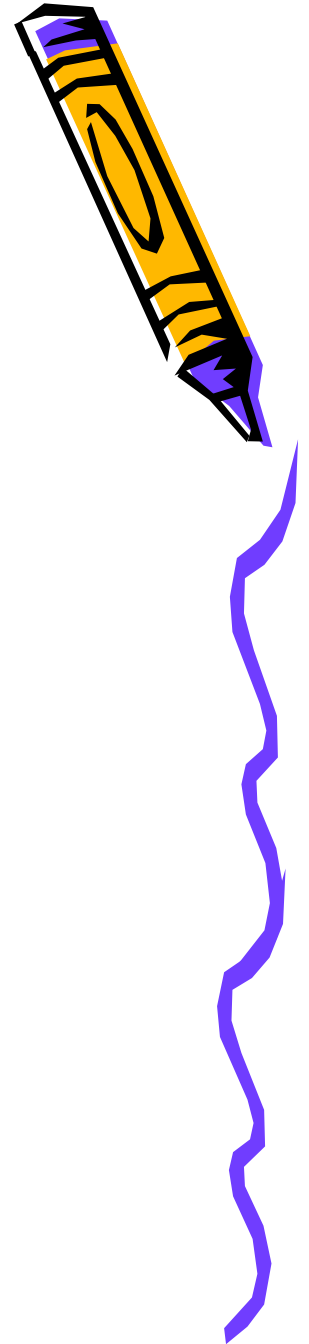
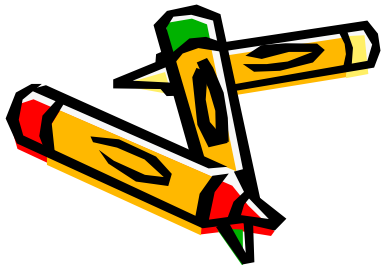
Care of diagnostic lenses

- SCLs: use heat or peroxide
- RGPs: use peroxide or store dry
- Re-disinfect inventory trial lenses at least monthly
- Caution when using chemical disinfection



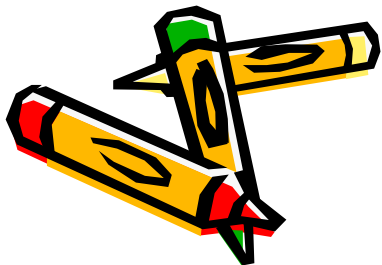
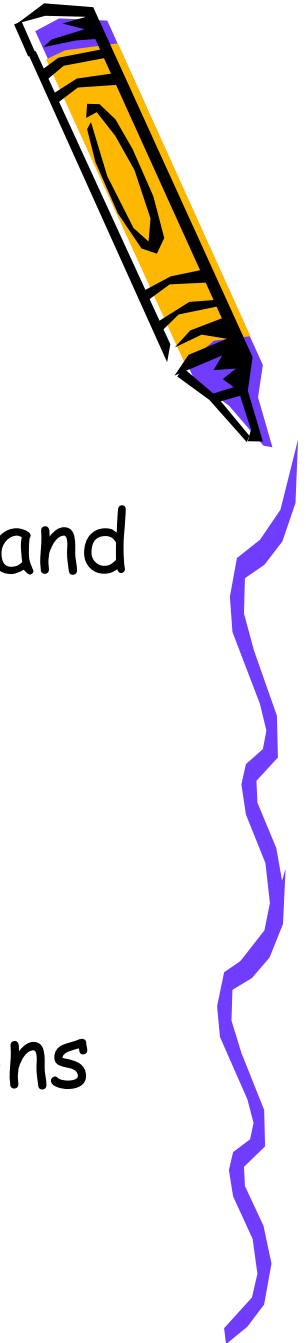
Care of diagnostic lenses

- Oxidizing agents
- Standing waves
- Ultrasound
- Ultraviolet
- Microwave



Oxidizing agents

- Depends on type
- Lenses must be thoroughly rinsed and cleaned
- Common agents:
 - Liprofin TM
 - 6 or 9% peroxide
- Follow the manufacturer's directions



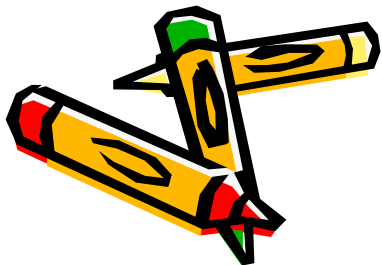
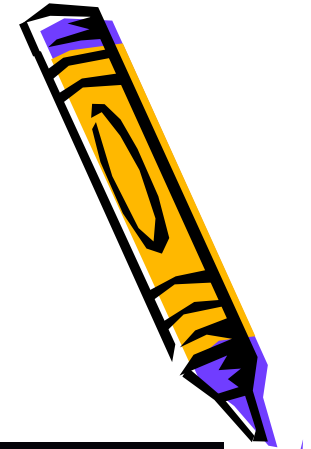
Standing Waves

- Vertically oriented high energy standing waves generated by a vibrating plate
- Results in turbulence that dislodge surface contaminants.
- Used for cleaning, and *not* disinfection.
- Example: Softmate Professional Cleaning Unit



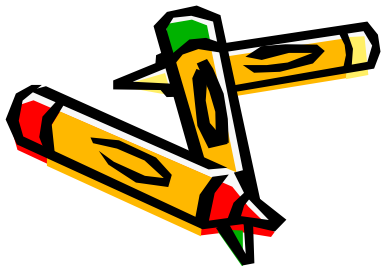
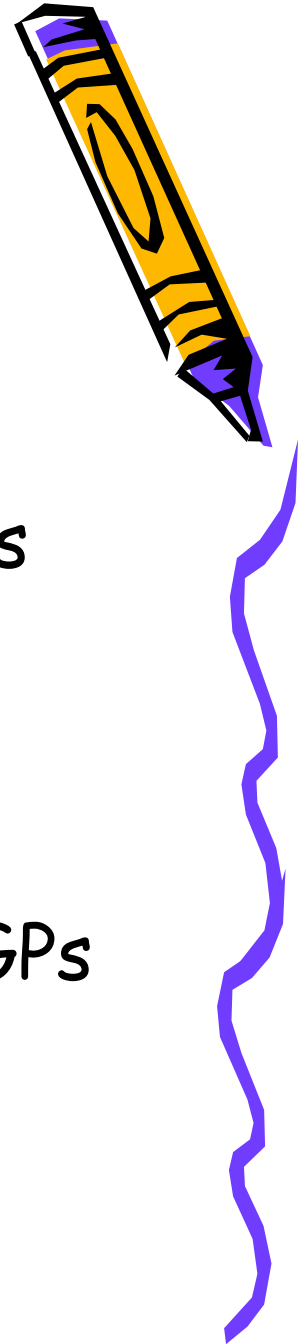
Ultrasound

- High frequency audible waves (15 and 20kHz).
- Cleaning by cavitation (intense agitation of small bubbles at the lens surface).
- Effective on LWC SCLs
- Limited antimicrobial effect
- Example: Sonasept TM Ultrasonic



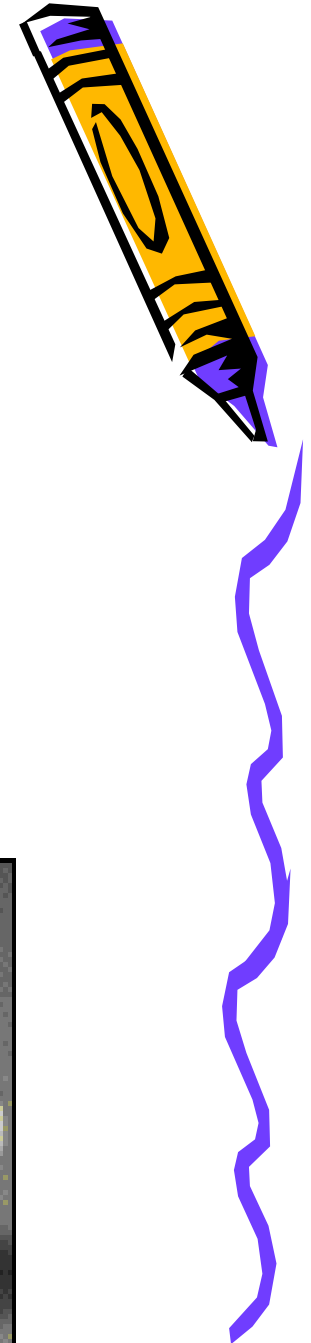
Ultraviolet

- UV C radiation, $\lambda = 253.7\text{nm}$
- Kills micro-organism's by breaking bonds and cross links between nucleic acids
- Source: specialized fluorescent tubes
- Storage: lens vials with saline solution
- Effective: disinfection for SCLs and RGPs



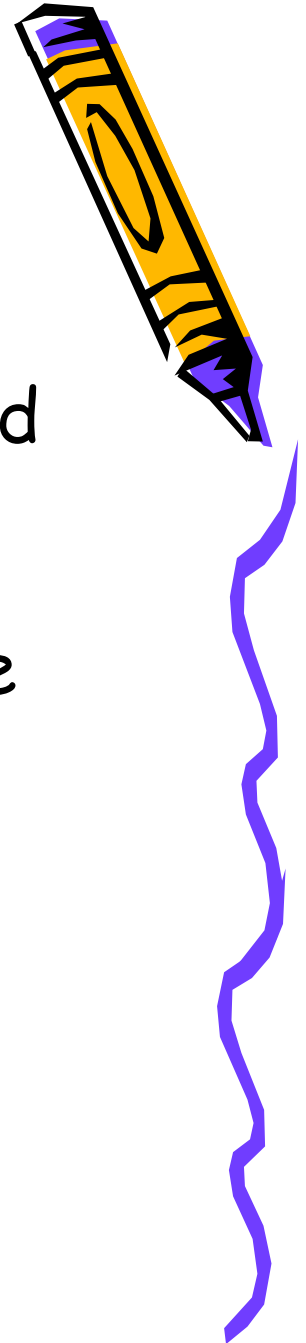
The PuriLens System

- The three major components
 - UV generating lamp,
 - a subsonic agitation cleaning mechanism and
 - a nonpreserved Purilens solution.



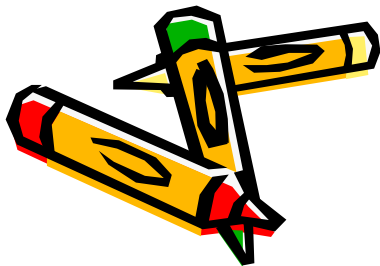
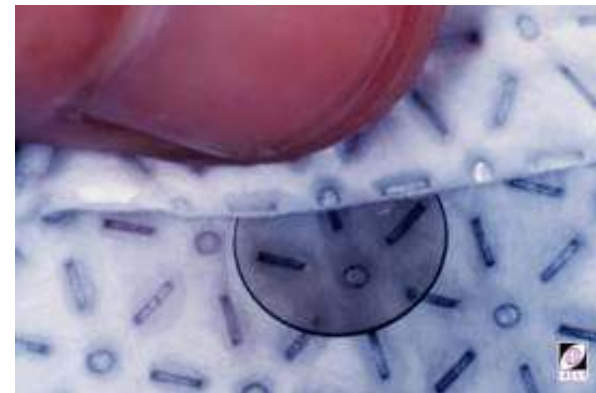
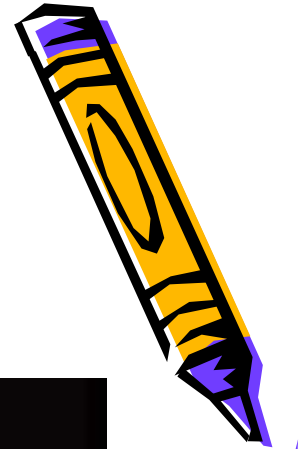
Microwave

- Microwave oven, 2.5 GHz, 500 watts and turntable
- 5 minutes exposure
- Large no of lenses disinfected at a time
- Vented lens containers must be used
- No significant effect on unworn lens parameters
- Rehydrate the lenses in saline after irradiation



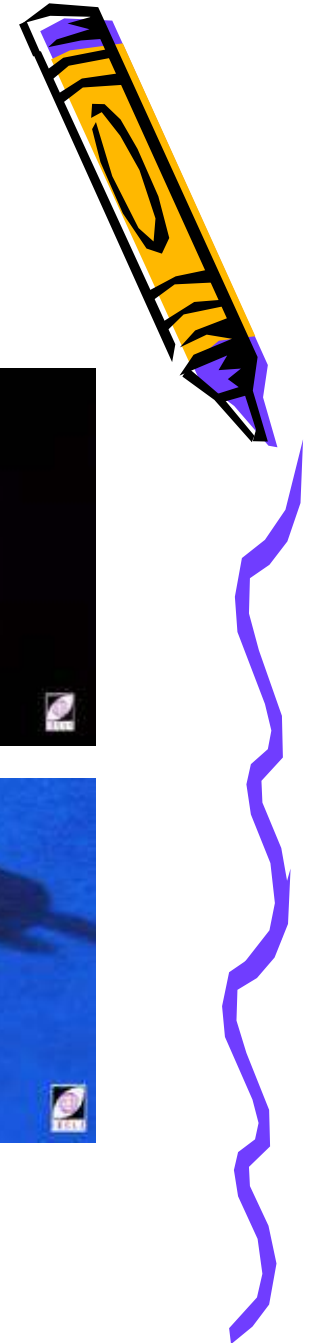
RGP lens care

- Use GP MPS solution
- Rub lens vigorously to remove deposits
- Removing pad used
- Use Surfactant/Enzymatic cleaner
 - Siloxane - attracts proteins
 - Fluoride - attracts lipids

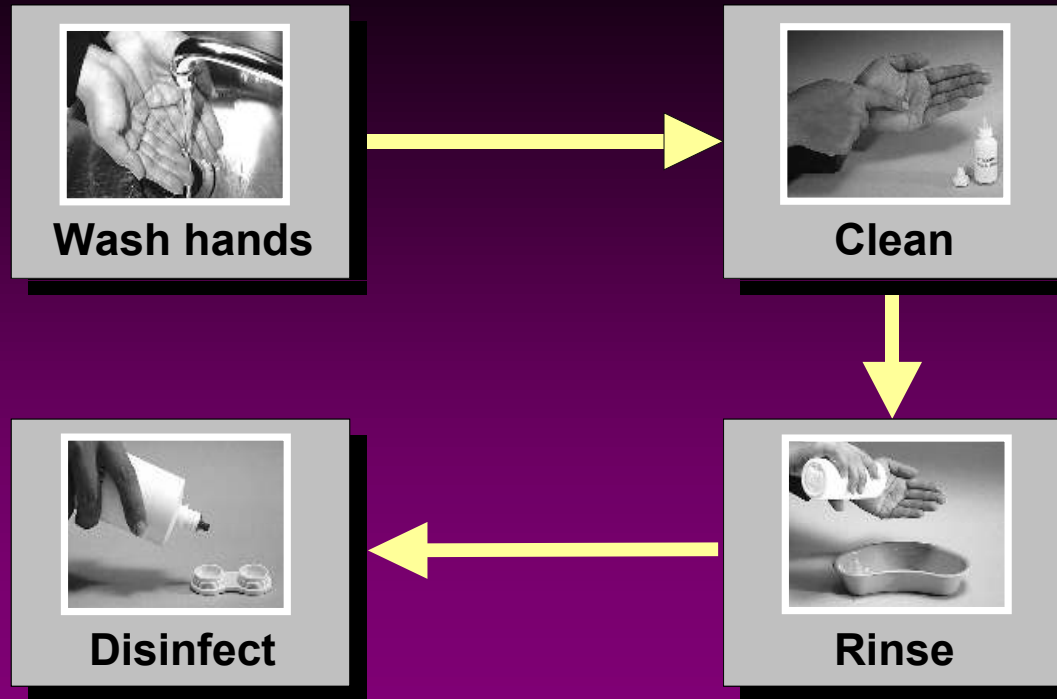
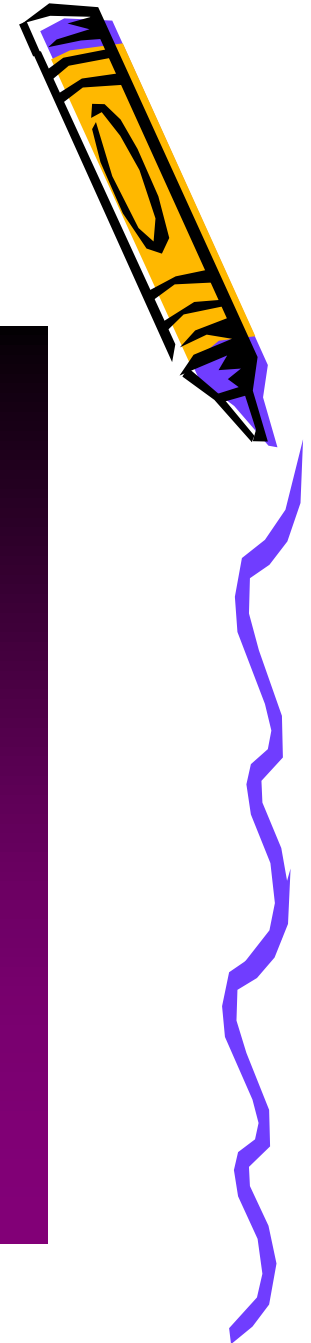


RGP lens care

- Polish lens at least a year or change lens
- Storage in soaking solution or dry storage
- Disinfect - hydrogen peroxide based solutions / alcohol
- No thermal disinfection



Summary

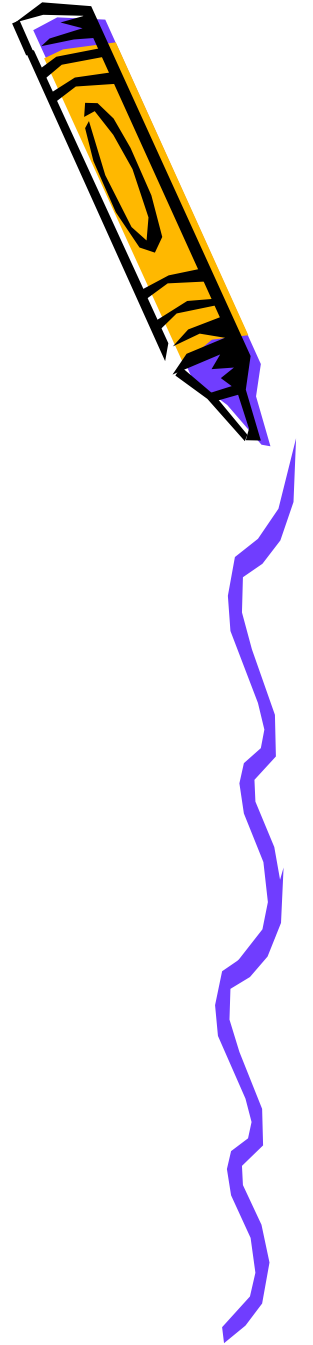


96409-55S.PPT



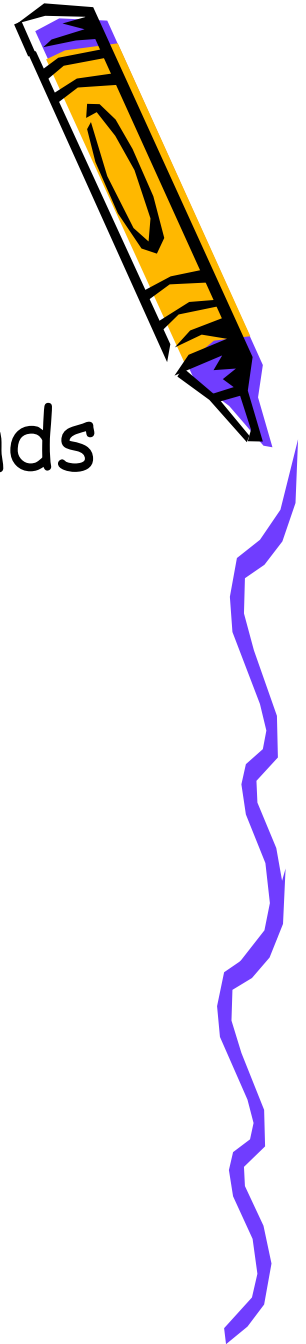
Remember

- Wearing schedule
- Lens type
- Replacement schedule
- Convenience
- Ocular sensitivity



Remember

- Do not mix solution types and brands
- Assess patient's compliance
- Repeat instructions and assess demonstration by patient
- Remind patient to clean lens case weekly



The message

- **C** - lean
- **R** - inse
- **A** - nd
- **D** - isinfect
- **L** - enses
- **E** - very time

