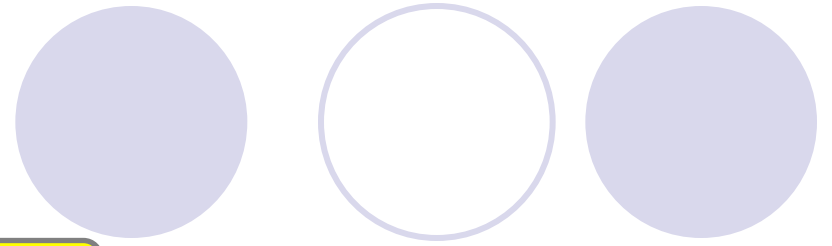
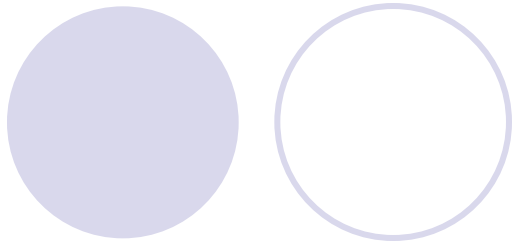


# Differences in Uses of H<sub>2</sub>O<sub>2</sub>, Saline, and Multi-Purpose Solution

Jeanette Romualdez-Oo, OD,  
FPCO, FAAO, FIACLE



Cleaning



Rinsing

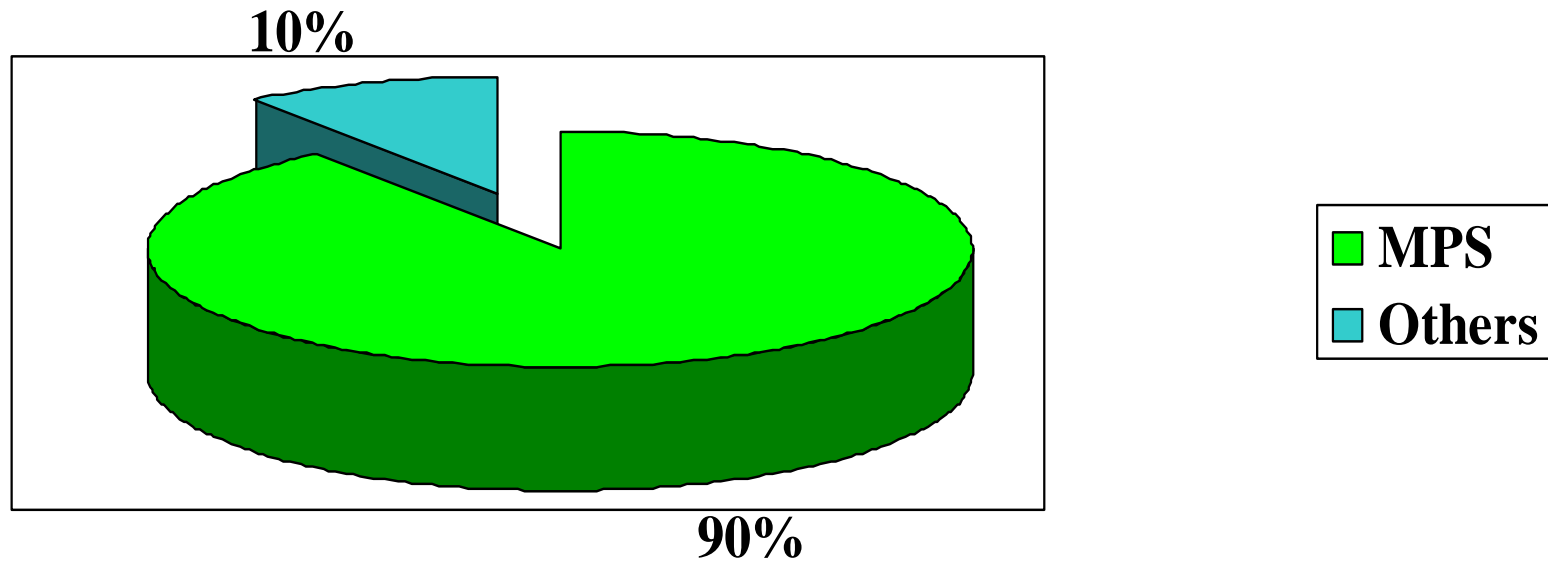


Disinfection



Storage

# LENS CARE SYSTEM Market Share



Larsen S, Smith C, Mathis J, Smith P, et al. Comfort Differences Between Multipurpose Solutions. Contact Lens Spectrum. December 2002: <http://www.clspectrum.com>

# CONVENIENCE OF A SYSTEM

- Determines:

- Patient compliance

- Frequency of lens wear

- Patient satisfaction

- Continued use of recommended care system components

# SALINE SOLUTION

- Can be used for rinsing
  - Preserved
  - Unpreserved
    - Discarded two weeks
  - Unit dose packaging avoid all these shortcomings
  - Home made saline has no role in CL care
  - The efficacy of saline solution relies on the stability of its properties including pH, buffering capacity, osmolality and refractive index

# MULTI-PURPOSE SOLUTIONS

- For Rinsing
- For **Disinfection( preservative content)**
- For Cleaning
- Maintains Lens Hydration
- For Storing

# MULTI-PURPOSE SOLUTIONS

## CONCENTRATION OF PRESERVATIVES

- Benzalkonium Chloride
  - Chlorhexidine
  - Thimerosal
  - Dymed ( PHMB)
  - Polyquad
- 0.002-0.01%
  - 0.001-0.006%
  - 0.001 – 0.004%
  - 0.00005 – 0.0015%
  - 0.001 – 0.005%

# MULTI-PURPOSE (DISINFECTING) SOLUTION DILEMMA

- Effectiveness depends on:
  - Type of disinfecting agents
  - Concentration of disinfecting agents
- High concentration is effective, but there is an increased potential for eye irritation
- Disinfecting agents can bind to lens materials





# MULTI-PURPOSE (DISINFECTING) SOLUTION DILEMMA

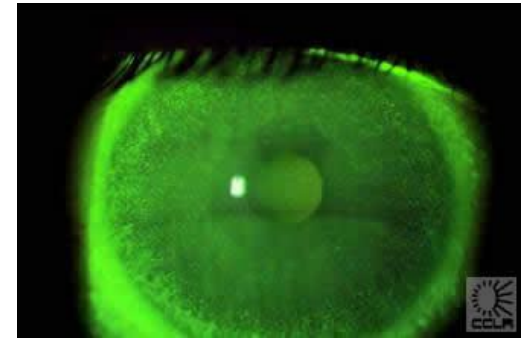
## **PRESERVATIVE SENSITIVITY**

### **SYMPTOMS**

- Sudden increase in ocular tolerance
- Decreased wearing time ( 3-4 hours)
- Burning, gritty, dry sensation

### **SIGNS**

- Conjunctival redness (generalized/localized)
- Epithelial damage ( diffuse corneal staining)
- Corneal inflammation ( if severe)



# WWW.STAININGGRID.COM

Lens / Solution	AOSEPT PLUS		SOLOCARE AQUA		OPTI-FREE Express®		OPTI-FREE RepleniSH®	
	IER	Andrasko	IER	Andrasko	IER	Andrasko	IER	Andrasko
ACUVUE® ADVANCE™	0.0%	1.0%	0.9%	2.0%	0.0%	1.0%	0.0%	1.0%
ACUVUE® OASYS™	0.9%	1.0%	2.5%	3.0%	6.2%	3.0%	7.1%	5.0%
O <sub>2</sub> OPTIX™	0.5%	1.0%	3.2%	3.0%	5.9%	2.0%	6.7%	5.0%
PureVision®	0.9%	1.0%	23.2%	21.0%	11.3%	4.0%	14.2%	7.0%

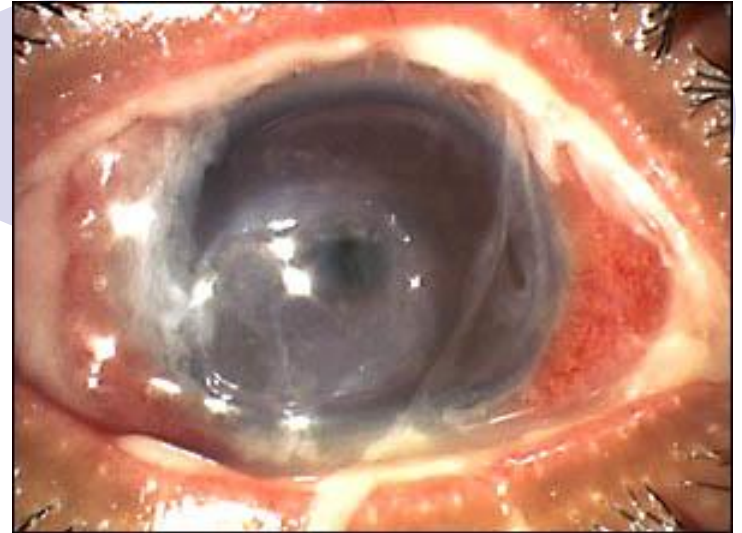
# Fungal Keratitis Outbreak March 2005



PHILIPPINE  
COLLEGE OF  
OPTOMETRISTS

# Main Factor involved:

- Preservative/Polymers
  - Alexidine
- 81.8% Non-compliance (Singapore)
  - 19.7% overnight use of daily wear CL
  - 43.9% use of CL past replacement date
- 7.4% (5 patients) underwent Corneal Transplant



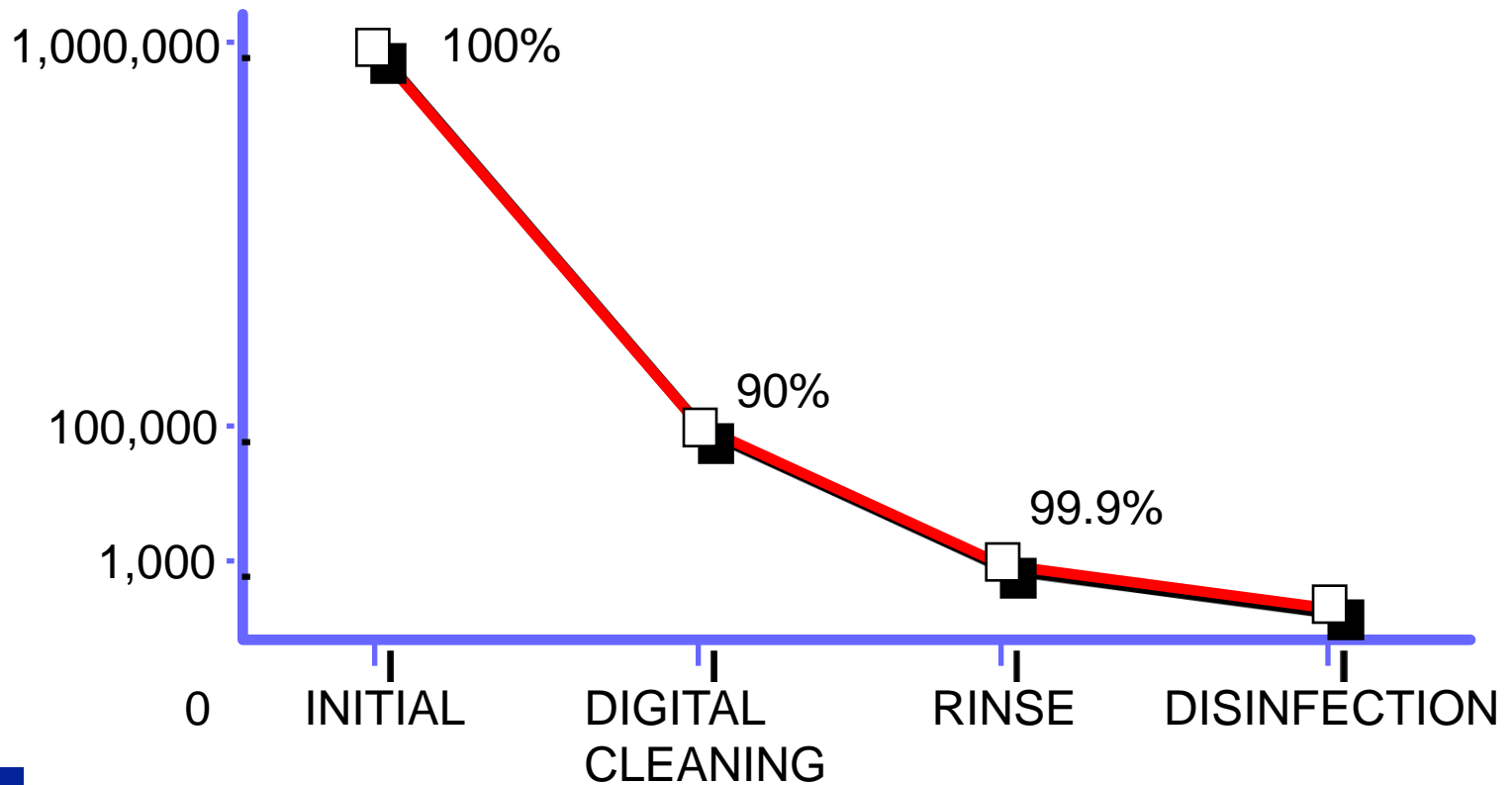
HealthDay. Tue Jun 27 7:00 PM ET



Consumer Information on Fusarium (Fungal) Keratitis. American Academy of Ophthalmology

Khor WB, Aung T, Saw SM, Wong Ty, et al. An outbreak of Fusarium keratitis associated with contact lens wear in Singapore. JAMA. 2006 Jun 28;295(24):2867-73.

# MULTI-PURPOSE SOLUTIONS CONTRIBUTION OF ELEMENTS

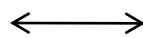


# HYDROGEN PEROXIDE

- Offer antimicrobial efficacy without the use of preservatives.
- Can be used for diagnostic lens disinfection of scl and rgp
- Rapid rate
- High antimicrobial efficacy
- Non-toxic decomposition products

# Hydrogen Peroxide Mechanism

- Produces free radicals which are very reactive and quickly bind to many cell components





# Peroxide Disinfection Neutralization

- One- Step

- Catalytic disc/Platinum disc
- Delayed-release neutralizing tablet

- Two-Step

- Dilution
- Chemical
- Catalytic disc
- Catalase



# Soft Contact Lens Solutions

Product /Manufacturer	Preservatives	Cleaning Agents	Wetting Agents
Solocare Aqua/Ciba Vision	Edetate disodium 0.025%, polyhexanide 0.0001%	Poloxamer 407 0.025%	Provitamin B5 Sorbitol
Opti-Free Replenish/Alcon	Polyquad 0.001%, Aldox 0.0005%	Sodium citrate, AMP-95, Tetronic 1304	Tetronic 1304
Complete/AMO	Polyhexamethylen e biguanide 0.0001%	Poloxamer 237, edetate disodium	HPMC
ReNu MultiPlus/B&L	Dymed 0.0001%	Poloxamine 1.0%	None
AOSEPT PLUS/ Ciba Vision	None	Pluronic 17R4	None

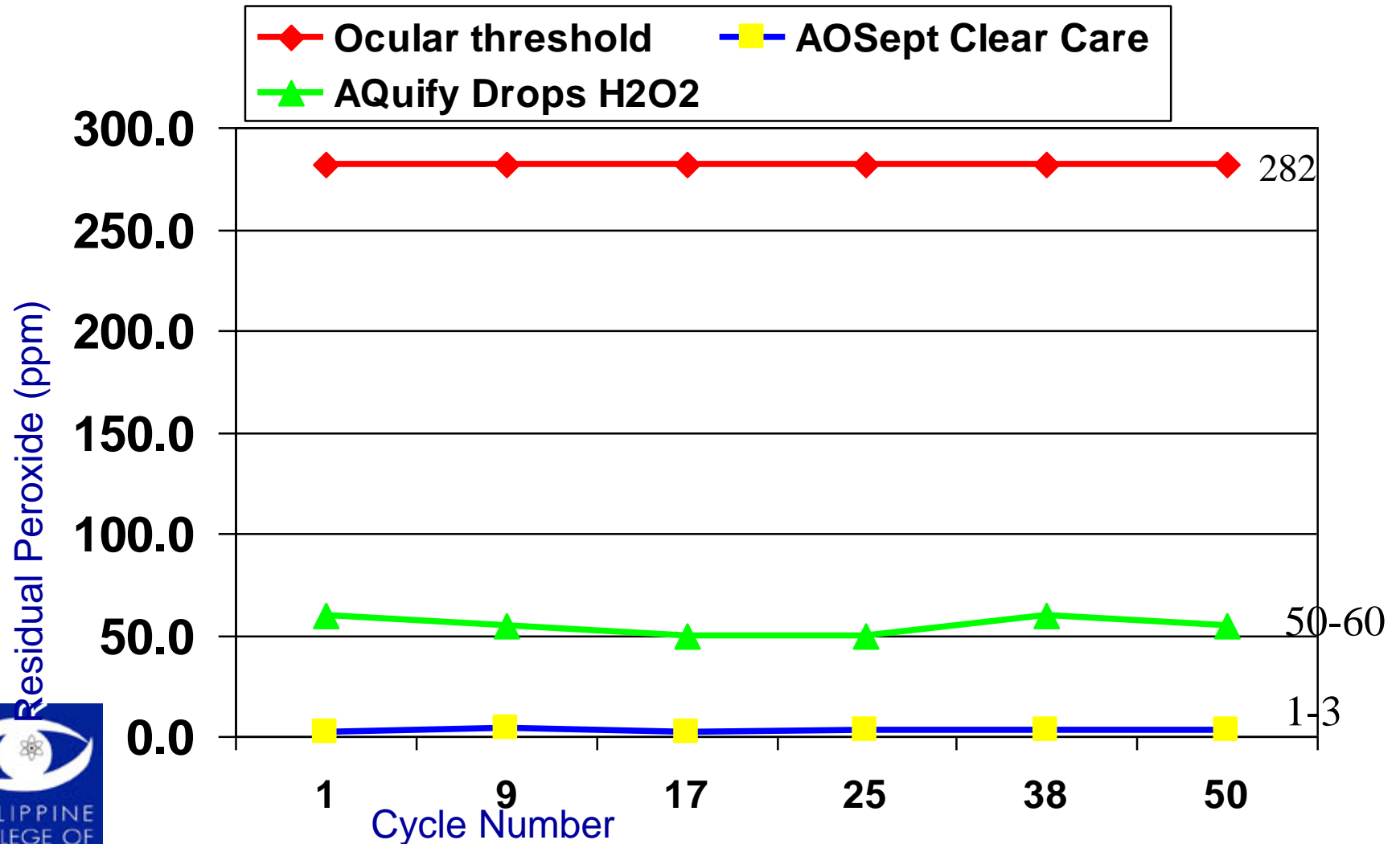
# Hydrogen Peroxide Disadvantages

- Irritate the eye if not neutralized
  - A type of chemical burn, although painful, is superficial and self-limiting.
- Some systems can be complicated
  - Two step peroxide

# What should a patient do if they accidentally put un-neutralized H<sub>2</sub>O<sub>2</sub> into their eye?

- Rinse and don't worry.
- Remove the lenses immediately and flush (rinse) the eye with a large amount of sterile saline solution or water (if no saline is immediately available).
- Though there are no long-term effects to temporary exposure to un-neutralized hydrogen peroxide, residual redness and irritation may last approximately 24 to 48 hours.
- If burning or irritation persists, assistance should be sought from an eye care professional.
- For more than 25 years, hydrogen peroxide has been safely used as an effective disinfectant and natural preservative in contact lens care and eye care products.

# Residual H<sub>2</sub>O<sub>2</sub> Levels vs. Ocular Threshold



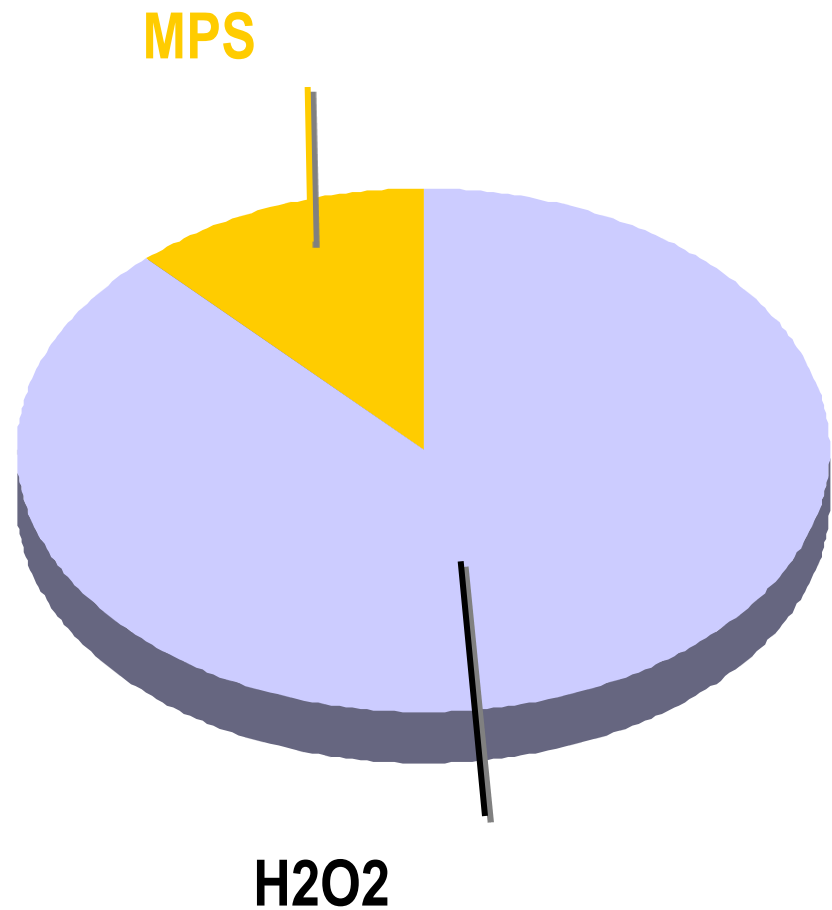


**Disinfecting Action**

**H<sub>2</sub>O<sub>2</sub> vs MPS**

# 6:1 Preference Over MPS®

Patients had a 6:1 overall preference for H2O2 than MPS solution after three months of use



# SUMMARY

	Conv >6 mnths	F Repl 1m, <3 m	Disp <1 m
Surfactant cleaner	😊	maybe	✘
<b>All Purpose</b>	✘	😊	😊
<b>Peroxide</b>			
One-Step	😊	😊	😊
Two-Step	😊	✘	✘
Enzyme	😊	maybe	✘
Cleans lens cases weekly	😊	😊	😊

# CARE AND MAINTENANCE REMEMBER

- Do not mix solution types and brands
- Assess patient's compliance
- Repeat instructions and assess demonstration by patient
- Not all lens materials are compatible with all lens care products
- Remind patient to throw away lens cases regularly
- As simple as changing the solution may resolve the problem