Care and Maintenance of Contact Lens – An Overview

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Care and maintenance is one of the most critical aspects of contact lens wear. It can influence the success of contact lens wear and patients’ satisfaction with their lenses. Choice of lens care regimen depends on factors such as lens type, lens material, replacement schedule of lens, lifestyle and specific patient needs.

“The biggest risk factor in Contact Lens wear is the person wearing them”

- Geoff Wilson

Safe and effective wear depends on synergism of a good lens, a compliant patient and periodic professional monitoring. It is imperative that the purposes and importance of proper care and maintenance be impressed upon the prospective contact lens wearer as soon as contact lens wear is considered seriously.

Role of Care and Maintenance

The overall aims of care and maintenance are

- to prevent and minimise microbial contamination
- reduce deposits
- and attain and maintain ready-to-wear state of lenses

The various products of care maintenance provide one or more of the following functions:

- Cleaning
- Disinfection
- Protein Removal
- Wetting / re-wetting

Regardless of the type of contact lens (except daily disposables), an appropriate care system must be used. A typical care system consists of the components listed

Components of Care and Maintenance

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

DAILY CLEANER - Function

Daily cleaners usually contain surfactants and are used to remove most loosely bound foreign matter on the lens surface, such as, Cell debris, Mucus, Lipids, Proteins, Cosmetics, Micro-organisms, and inorganic deposits.

The main functional component in a cleaner solution is the surface-active agent(s) also known as surfactant(s) (e.g. isopropyl alcohol, tyloxapol, polyvinyl alcohol, poloxamer-407, amphoteric 10, poloxamine, hexylene glycol, octylphenoxy ethanol, tween 21). Surfactant molecules emulsify, dissolve and/or disperse lipid globules, debris and other lens contaminants. This is accomplished by the surfactant forming a monomolecular layer over the contaminant using the polar ends of its molecules to bind the layer to the contaminant’s surface. The ‘coated’ contaminants repel one another mutually or exhibit a lowered surface tension’.
The other main components are **Non-ionic or ionic chemical compounds**, to reduce interaction between the lens and the solution, and **anti-microbial agents**, primarily used as preservatives.

The additional components in a cleaner include **Osmolality adjusting agents**, a buffer system to adjust the pH, **Chelating agents** for removing lens contaminants and **viscosity enhancing agents**. Viscosity-enhancing agents such as polyvinyl alcohol or methylcellulose also facilitate cleaning.

**Hypertoncity** and **abrasiveness** are properties that have been added to enhance the efficacy of some lens cleaners. Hypertoncity results in extraction of water from soft lenses, which may help remove some soluble contaminants. **Polymeric beads** in some cleaners have a mildly abrasive effect on protein and other surface deposits. Apart from this **Alcohol** to remove lipids and **Enzymes** to digest proteins are also added.

Rubbing also enhances the efficacy of the cleaning solution’s surfactant properties.

Caution to be observed when using abrasive cleaners. Excessive rubbing may cause scratches on the lens and can also sometimes induce minus power $^2$.

**Rinsing Solution**

**Value of Rinsing** - regardless of the type of cleaner used it is important for the lens to be thoroughly rinsed to remove the excess Daily Cleaner, Loosened deposits and Micro-organisms. If the cleaner is allowed to remain on the lens and placed in the enzymatic cleaner, it may induce foaming resulting in the solution bubbling out and leaving the lens in a dehydrated state $^3$. It is also good to rinse lenses after overnight storage.

Buffering agents are included in rinsing solution formulations so that their pH is approximate that of tears. The pH of normal tears is, on average 7.2, but is subject to individual variation. To enhance the compatibility of solution and tear pHs at lens insertion, the solution is normally buffered lightly.

Many different types of solutions can be used for rinsing, such as, Unpreserved Saline, Preserved Saline and Multi-purpose solutions. Use of buffered isotonic saline is preferred to un-buffered as absorption of atmospheric carbon dioxide lowers the pH.

**Disinfecting Systems**

Purpose of disinfection

Contact lenses may compromise the eye’s natural defence by:

- Inhibiting tear film washing action
- Introducing more micro-organisms
- Compromising epithelial barrier function

**Functions** of the disinfecting solution are to kill or deactivate potentially pathogenic organisms including: Bacteria, fungi, viruses, amoebas and maintain lens hydration

Antimicrobial activity can be divided into three levels of efficacy (Anger and Currie, 1995) $^5$.

- **Sterilisation** is the killing of all microbial life forms, a situation impossible to achieve with normal lens care products and procedures.

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**DAILY CLEANER – Procedure**

1. Wash hands and dry them (avoid moisturizing/perfumed soaps)
2. Place lens in the palm of the hand
3. Place 2-3 drops of cleaner on each lens surface
4. Rub with forefinger for about 15 seconds per side using a ‘to & fro’ and ‘L-R’ action. Rolling the forefinger in both directions cleans the lens periphery
5. Rinse well

Cleaning should be done with all types of lens including disposables.

The mechanical action of **rubbing and rinsing** reduces significantly the amount of loose debris and the number of microorganisms on a lens.
**Disinfection** is a dynamic process, usually preceded by a cleaning and rinsing step, intended to kill and/or remove microbial and viral contaminants from contact lenses.

**Preservation** is the killing or inhibition of growth of a select range of microorganisms to prevent product spoilage during consumer use. The choice of preservative is governed to a large extent by the resistance of the microbial targets and the sensitivities of the eye exposed to the preservative via contact lenses or eye drops.

**Disinfection Systems Types**

The two main types of disinfection systems available for soft contact lenses are heat and chemical.

1. **Heat-based disinfection systems** use heat in the range from 70°C to 125°C to kill or deactivate living lens contaminants (ideally 80-90 degrees for 10 minutes). The advantage is that it is very effective and does not cause any allergy or discomfort. However, heat can cause problems for the patient due to alterations that occur within the lens following long-term use. Heat disinfection systems generally decrease lens life span and eventually cause lens discolouration. The Optical and physical properties of the lens can sometimes be altered due to excessive heating and can result in denaturation of protein in and on the lens RGP lenses will warp when heated and hence cannot be used. Recently, a system for thermal disinfection of contact lenses in a domestic microwave oven has been released.

2. **Chemical disinfection systems** vary greatly and a wide variety of types exist. Included in the chemical systems category are the current hydrogen peroxide and multi-purpose solutions. Chemical disinfection can be subdivided into **oxidative** (hydrogen peroxide and chlorine) and **conventional cold chemical**.

**Conventional Cold Chemical Disinfectant-Based Solutions**

The characteristics of the disinfectants should be such that they are compatible with other ingredients, non-toxic and non-irritating, stable over time and effective against a wide range of organisms.

Disinfectants such as thimerosal, chlorhexidine, benzalkonium chloride and sorbic acid should be used with caution because of their potential for disinfectant-induced sensitivity reactions. The various chemicals used as disinfectants are listed below.

**Thimerosal**, a mercurial antibacterial, is effective as an antifungal agent. It has been used extensively in the past in solutions for both rigid and soft CLs. It is most effective neutral or slightly alkaline pHs. It acts by bonding with cell enzymes, inhibiting their activity and killing the organism. Its concentration in the solution varies from 0.001 % - 0.2 %. However, it is reported to have reduced activity in combination with ethylenediamine tetracetic acid (EDTA or sodium edetate) and is incompatible with BAK. Thiomerosal can be decomposed by light. Cytotoxic reactions of the corneal epithelium have been reported.

**Chlorbutanol** is a chlorinated alcohol preservative with broad spectrum of action. It is however, slow acting against and bacteria and has a distinctive odour. Originally used on PMMA lenses, it is now not a common ingredient. It is effective in acidic pH and used along with other preservatives. This unstable and volatile preservative is used in a concentration of 0.5 %.

**Benzyl Alcohol** is a disinfectant and preservative for RGP and PMMA lenses. It is unsuitable for use with soft contact lenses. It is non-cytogenic and relatively non-sensitizing. It is a bactericidal and viricidal but ineffective against Pseudomonas aeruginosa in low concentrations. Like other alcohols (isopropyl alcohol, isopropanol, ethanol), it behaves like a lipid solvent.

**Chlorhexidine gluconate** (CHG - a biguanide antimicrobial) is used both in hard and soft contact
lens solutions. Chlorhexidine inhibits cation transport and membrane bound ATP in cell membranes. It can bind on protein deposits on lenses and can cause irritation. Not compatible with Thimerosal. It is known to adsorb until saturation and leach from the lens causing toxic reactions on the cornea.

**Benzalkonium chloride** (BAK) is a quaternary ammonium compound and used mainly for PMMA lenses. It works by adsorbing to cell’s membrane, thereby increasing its permeability and leading to rupture of the cell. For this reason corneal exposure to the solution should be avoided. The concentration of BAK in solution is 0.001 – 0.01% and is effective at an alkaline pH of 8. BAK decomposes in light. Long-term use of this preservative may cause the lens surface to become hydrophobic.

**EDTA, Edetate, Disodium edentate, Edetic acid** are not strictly preservatives. They are variously described as preservative enhancers, preservative potentiators and chelating agents. EDTA is contained in most CL solutions. EDTA potentiates the action of quaternary ammonium compounds against gram-negative organisms but not gram-positive ones. EDTA’s action removes, by chelation, divalent cations such as calcium and magnesium ions from solutions and/or cell walls of gram-negative organisms. Such cell wall disruptions slow or prevent cell growth. EDTA does not bind to lens materials significantly and is normally used in combination with other preservatives. It has a synergistic action with BAK, which enhances the effectiveness of the blended solution.

**Sorbic acid** has antibacterial and limited antifungal activity. Its concentration in SCLs has not been shown to cause death of the corneal epithelial cells but adherence to contact lenses is facilitated by its organic reaction with the amino acid (lysine) in tear proteins, and causes a yellow or brown discoloration.

**DYMED : Poly aminopropyl biguanide (PAPB), Poly hexamethylene biguanide (PHMB)** are new generation of preservatives developed to address the problems previous preservatives created, like ocular irritation and hypersensitivity. Dymed is the marketing name for PAPB. Initially used in anti-malarial water treatment and swimming pool chemical has now found a place as an adjuvant in the treatment of Acanthamoebakeratitis.

PAPB selectively binds with negatively charged phospholipids of the cell walls causing membrane damage, cell content leakage and ultimately cell death. It is used in a low concentration of 0.00005 – 0.0005 %.

**Polyquad** is the marketing name for a high molecular weight (polymeric) quaternary ammonium compound: Poly(quaternium-1), polidromium chloride, onamer M

This type of preservative is used in both rigid and soft lenses in concentrations of 0.001 – 0.005 %. Its high molecular weight of 5000 restricts its entry into lens materials thus minimizing ocular reactions.

**Chlorine Systems :** The use of chlorine-releasing tablets in SCL disinfection systems dates back to the 1970s. The recent systems are supplied as convenient blister packed anhydrous effervescent tablets of either stabilized halane or halazone benzoic acid. Both tablets slightly differ in the amount of available chlorine (4–8 ppm). The tablet is dissolved in 10ml of unpreserved saline to make a disinfecting solution of pH between 5.5 and 7.5.4 hours exposure is recommended. The antimicrobial activity will depend on the concentration of undissociated hypochlorous acid. Lenses should be thoroughly rinsed before re-insertion.

The dissociated hypochlorous acid produces hypochlorite and chlorine, which are also bleaching agents. Lenses tinted with reactive dyes can have their colour altered.

**Hydrogen Peroxide** based chemical disinfectant solutions may be either preserved or preservative free and can be divided into two main types:

- One-step system
- Two-step systems

Hydrogen peroxide systems are normally formulated
with a 3 % peroxide concentration whose pH is often acidic at 3.0 – 4.0. For a lens to be wearable following disinfection, neutralization is required. For the purpose of neutralization substances like sodium pyruvate, sodium thiosulphite, catalase and sodium bicarbonate have been used. Most systems decompose hydrogen peroxide into saline and oxygen catalytically. Disinfection in hydrogen peroxide is reasonably effective in 15-20 minutes.

**One-step systems** are formulated so that the peroxide disinfection and neutralization are performed during the recommended time. With tablet-using systems a delay is applied to the neutralization phase. With disc-based systems, no delay is applied to the neutralization phase. Regardless of which of these systems is used special vented lens cases are required to allow the oxygen generated to escape. One-step systems use either a catalytic (platinum) disc (6 hours) or a time-delayed catalase tablet (2 hours).

When neutralization is performed as a separate step, the system is called a **two-step system**. Very early systems ‘neutralized’ peroxide using pre-measured quantities of sodium bicarbonate for a minimum of 10 minutes. In fact, the process was not true neutralization and usually took longer than 10 minutes. Rather, the bicarbonate altered the solution pH (upwards) to levels at which peroxide was inherently less stable. The peroxide solution then began to decompose slowly into water and oxygen.

With two-step systems it is recommended that lenses are stored overnight in the peroxide and neutralized immediately before lens usage.

**Advantages** of the hydrogen peroxidase system is that they are rapid killing large numbers of most organisms in a short time period, 10-20 minute soaking time. High anti microbial efficacy and non-toxic decomposition products are its other advantages.

**Disadvantages** being that once it is neutralized, a peroxide system has no antimicrobial power and can sometimes cause irritation in the eye if not neutralized properly. It is not perfectly compatible especially with high water content, ionic contact lenses in that it can reversibly alter lens parameters and water content. Multi-step peroxidase systems can be overly complex and confuse the patient.

**Multi- Purpose Solution**

Many modern lens care systems use one solution to perform the functions of a number of components, thereby reducing the actual number of solutions required.

For ease of use and patient convenience, multi-purpose solutions (one-bottle systems) are formulated to allow

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**Table: Summary of recommended Disinfecting Systems based on Lens Material**

<table>
<thead>
<tr>
<th></th>
<th>HEAT</th>
<th>COLD CHEMICAL</th>
<th>CHEMICAL</th>
<th>PEROXIDE</th>
<th>MULTI-PURPOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Non-ionic</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Low Ionic</td>
<td>X</td>
<td>Yes</td>
<td>X</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>High Non-ionic</td>
<td>Some</td>
<td>Yes</td>
<td>X</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>High Ionic</td>
<td>X</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

| **PMMA** | | | | | |
| RGP | X | Yes | Yes | Special Formulation | Yes |

For **coloured contact lenses** heat or hydrogen peroxide should not be used as it cause bleaching/ fading of the colour.
cleaning, rinsing and disinfection functions to be combined. More recently even protein removers have been added to these solutions.

**Protein Remover**

Protein removers, also known erroneously as enzymatic cleaners, are included in the care systems for soft contact lenses, and some RGP lenses, that are not replaced regularly (>1 month). Not all protein removers are enzyme-based.

Those that are, are usually supplied in tablet form. Chemical-based systems are usually supplied as ready-to-use liquids. These cleaners are effective in loosening tightly bound protein deposits.

However, they cannot be expected to remove all proteins.

Prior to protein removal, the lenses should be cleaned and rinsed before being placed in the recommended container with the tablet or solution for the recommended time. Enzyme cleaners are ineffective in the presence of lipid deposits or other debris. Protein treatment is usually done weekly or at a frequency dependent on the rate of patient protein deposition. Heavy protein depositors, especially ionic high water material lens wearers, may require an increased frequency. Frequent use of protein removers are required if heat is used as a disinfectant.

Lenses should be soaked in the remover for 15 minutes to two hours, depending on the type of protein remover used and rate of protein build-up. Enzymes used include **papain, pancreatin, subtilisin, pronase, amylase, lipase, and hydroxyalkylphosphonate**. It is to be noted that Papain is not compatible with hydrogen peroxide ⁹.

**Cleaving**

Enzyme tablets act as protein removers by cleaving the peptide bonds in tear proteins deposited on contact lens surfaces ¹. Since the action of the enzyme tablet only loosens the protein, it is important to instruct the patient to clean the lenses by rubbing and rinsing upon completion of the deproteinizing process.

**Rewetting Drops and Lubricants**

Lens Lubricants permit lubrication and rewetting of the lens while on the eye. Typically, they contain a low concentration of a non-ionic surfactant to promote cleaning, a polymer to lubricate the lens, buffering agents and preservatives ¹⁰. Lens lubricants are particularly helpful for wearers of extended wear lenses, but can also be used with daily wear lenses. The drying out of the lens on the eye from exposure to wind, low humidity, and high temperatures may be relieved by these products. Patients who experience difficulty removing hydrogel lenses because of dehydration or who frequently damage their lenses on removal may also benefit from the use of lubricants. Lubricating and re-wetting drops are formulated with viscosity-enhancing agents (commonly polyvinyl alcohol, methylcellulose, etc.).

**Lens Storage and Cases**

A poorly maintained contact lens case can be a source of heavy contamination of contact lenses with microorganisms. Biofilm or glycocalyx formation on the surface of contact lens storage cases can harbour *Pseudomonas aeruginosa* and *Serratia marcereens* ¹¹. The biofilm is produced by the bacteria themselves. It protects the host bacterial cells from chemical or preservative attack and traps nutrient particles and biofilm or glycocalyx formation on the surface of contact lens storage cases can harbour *Pseudomonas aeruginosa* and *Serratia marcereens* ¹¹. The biofilm is produced by the bacteria themselves. It protects the host bacterial cells from chemical or preservative attack and traps nutrient particles and...
organisms. To avoid contamination, the lens case should be rinsed after use and the lenses should be stored in fresh solution.

CIBA vision has come out with a unique Pro Guard lens case, infused with an anti-microbial agent that helps prevent contamination. The contact lens case contains silver atoms that have been electrically charged (ions), and help reduce the possibility of contamination by up to 40%.

**Care of Lens Cases**

Discard all the used solution from the case. This prevents loss of disinfecting efficacy when fresh solution is mixed with used solutions.

Scrub with a toothbrush and detergent weekly. Oil free soaps or detergents are recommended for this step.

Rinse with hot water and rub thoroughly with a clean, dry tissue.

Air dry. Keeping the lens case dry will prevent colonization by microorganisms such as protozoa that thrive in moist or wet environments.

It is also recommended that the lens case be replaced at frequent intervals.

**Lens Replacement Schedule and Care Regimen**

**Daily Disposables**

Because of its single use concept, this lens does not require use of surfactant cleaner, disinfecting solution or weekly enzyme. If needed, the patient can use in-eye re-wetting drops or sterile saline for rinsing prior to insertion.

**Regular Disposables**

These lenses are replaced weekly or bi-weekly. Suitable care includes multi-purpose solutions given as complete care system. If preferred, lenses can be rinsed with saline prior to insertion or a lubrication solution used to re-wet the lenses. No weekly protein removal is needed.

If a multi-purpose solution causes irritation or discomfort, a surfactant cleaner can be used along with hydrogen peroxide as disinfectant.

**Frequently Replaced Lenses**

Clean lenses with a multi-purpose solution or a surfactant cleaner. Rinse with multi-purpose solution or a saline solution (unit-dose, aerosol or preserved). Disinfection may be done with heat, cold chemical, oxidative or multipurpose systems. The final choice depends on lens material and patient compliance. Protein removal is required for 3 and 6 monthly-replaced lenses but with lower frequency compared to conventional lenses. It can be avoided in the case of monthly disposables. Lubricating/re-wetting drops may be used if required.

**Conventional Lenses**

Clean lenses with a multi-purpose solution or a surfactant cleaner. Rinse with multi-purpose solution or a saline solution (unit-dose, aerosol or preserved). Disinfection may be done with heat, cold chemical,

<table>
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<tr>
<th></th>
<th>Conventional &gt; 6 months</th>
<th>Frequent Replacement 1 month ≤ 3 months</th>
<th>Disposable ≤ 1 month</th>
</tr>
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<tbody>
<tr>
<td>Surfactant Cleaner</td>
<td>Yes</td>
<td>Maybe</td>
<td>No</td>
</tr>
<tr>
<td>All Purpose</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Peroxide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>· One Step</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>· Two Step</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Enzyme</td>
<td>Yes</td>
<td>Maybe</td>
<td>No</td>
</tr>
<tr>
<td>Clean Lens Cases weekly</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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oxidative or multipurpose systems. The final choice depends on lens material and patient compliance. Protein removal is done weekly. It is performed using a tablet or liquid form of protein remover which may be chemical or enzymatic in nature. Some wearers may benefit from wetting drops especially if they are working in air-conditioned environment.

For regular wearers of conventional lenses heat or thimerosal/chlorhexidine-based disinfection is not recommended.

In-office Maintenance Of Diagnostic (Trial Set) Lenses

SCL: Use heat if possible, otherwise peroxide
RGP: Use peroxide or store lenses dry
Re-disinfect non-disposable inventory trial lenses at least once a month.

Multi-purpose solutions should only be applied to trial lenses used very frequently and are not suitable for long term storage. Regardless of the storage method, all trial lenses should be cleaned and rinsed thoroughly before storage.

In-office Procedures to Clean and Disinfect Lenses

Various in-office procedures can be used to clean and disinfect lenses.

Heater/stirrer units with/without:
-oxidizing agents

Oxidizing agents (e.g. hydrogen peroxide, sodium perborate, sodium percarbonate, sodium hypochlorite, etc.)

Standing waves. A lens cleaning system involving low-frequency agitation of a lens vial containing contact lenses and a cleaning solution is said to create turbulence, which in turn dislodges surface contaminants.

Ultrasound. Ultrasonic (using high frequency audible waves between 15 and 20 kHz) agitation causes removal of particulate matter from contact lens surfaces by cavitation (intense agitation of small bubbles at the lens surface). It is effective on low water content soft lenses. If used for longer duration lens can become opaque.

Ultraviolet. A lens disinfection system using either direct UV irradiation of microbes or the production of ozone by a UV-emitting (253.7nm) discharge tube. The ozone is the actual disinfectant. It kills microorganisms by breaking bonds and cross-links between nucleic acids. It effectively disinfects SCLs and RGPs.

Microwaves. This is an alternative form of heat disinfection, albeit high heat. Microwave oven of 2.5GHz, 500 watts and turntable is used. While undoubtedly effective against microorganisms, the temperatures involved may also have deleterious effects on the lenses and decrease their life expectancy. Vented containers must be used and the lenses should be re-hydrated in saline after irradiation.

Some systemic medications can cause lens damage and ocular signs and symptoms, which have to be differentiated from those of the care products. Some care products may also not be compatible with certain systemic medication.

Table: Possible Systemic Medication Interaction with Soft contact lenses

<table>
<thead>
<tr>
<th>Medication</th>
<th>Lens Discolouration (yellow to orange)</th>
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<tbody>
<tr>
<td>Ntrofurantoin</td>
<td>Phenazopyridine</td>
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<tr>
<td>Phenolphthalein</td>
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<tr>
<td>Rifampin</td>
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<tr>
<td>Rifadin</td>
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<tr>
<td>Sulfasalazine</td>
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<tr>
<td>Tetracycline</td>
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<tr>
<td>Corneal Staining</td>
<td></td>
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<tr>
<td>Tetracycline when used with Thiomerosal</td>
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<tr>
<td>Preserved products</td>
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<tr>
<td>Contact lens-related epithelial irritation</td>
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</table>
Acetylsalicylic acid (aspirin)
Decreased lens wetting comfort
Antihypertensives
Tricyclic antidepressants
Antihistamines
Belladonnas
Anticholinergics

Current trends in solution and lens care

The trend in contact lens care is toward simpler, less toxic systems that rely on patient compliance to function optimally.

Simplified soft Lens Regimens

The common approach to soft contact lens care is to use a one-bottle system. The leading, simplified soft lens care products, ReNu (Bausch and Lomb), SOLO-care (CIBA), Complete (Allergan), Opti-free and Opti-one (Alcon) are very similar in their low toxicity and reliance on digital cleaning and rinsing with clean hands, followed by soaking in a clean case. While these products have helped reduce toxic and allergic reactions by using low toxicity preservatives and avoiding thimerosal, chlorhexidine and exposure to hydrogen peroxide, there is little evidence that they have led to better compliance. Fortunately, frequent lens replacement and the eye’s defence mechanisms have kept most patients safe most of the time.

Sicca-like syndrome has been sometimes associated with one-bottle lens care systems that contain surfactants. These patients need a saline rinse (sorbic acid preserved or sterile non-preserved) prior to lens insertion. If stronger measures are needed, switching to a hydrogen peroxide system can sometimes dramatically improve comfort.

Hydrogen Peroxide and other Regimens

The more difficult to use and more expensive hydrogen peroxide systems are often used only as problem-solvers and have lost market share in the last decade. AOSEPT one step is quick and ideal product for in-office disinfection before re-inserting for a patient. Liquid protein remover Unizyme, a product from CIBA Vision for use with peroxide products, is said to work in 10 minutes. For in-office trial lens storage, however there is no substitute for heat disinfection.

RGP Lens Care

RGP solutions for the most part are not new, but if one switches from cleaning/disinfecting/wetting/conditioning/cushioning solution to cleaning/disinfecting/conditioning/but not wetting/cushioning solution it should be made sure that wetting/cushioning solution is added to the regime. Most of the currently available products for RGP equally work well.

Allergy Sufferers

For allergic patients pre- and post lens wear use of topical anti-histaminics or mast cell stabilizers or non-steroidal anti-inflammatory agents will maximize comfort.

To summarise while selecting a care regimen the practitioner needs to consider the wearing schedule of the patient, the lens type, replacement schedule and convenience of the patient and ocular sensitivity issues as well.

It is a good practice to repeat instructions and assess demonstration by patient. Patients should be instructed not to mix solution types and brands and to consult the practitioner before substituting solutions.

The message for care and maintenance can be stressed with the acronym CRADLE – Clean, Rinse And Disinfect Lenses Everytime

References

1.  Sylvie Sulaiman, IACLE Contact Lens Course, Module 5: Units 5.1, pg 9, 1998


15. Edward S. Bennett and Barry A. Weissman, Clinical Contact Lens Practice text book, Chapters 25, 34 and 35

16. IACLE Contact Lens Course, Module 5: 1998